

August 2023 Monthly Compliance Report

Solid Waste Permit No. 498
Bristol Integrated Solid Waste Management Facility
2655 Valley Drive
Bristol, VA 24201
(276) 645-7233

SCS ENGINEERS

02218208.05-30 | September 8, 2023

15521 Midlothian Turnpike Suite 305
Midlothian, VA 23113
804-378-7440

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INTRODUCTION

On behalf of the City of Bristol, Virginia (City), SCS Engineers has prepared this report to the Virginia Department of Environmental Quality (VDEQ) in accordance with item 8 in Appendix B of the Consent Decree between the City and VDEQ. This report provides updates regarding the progress towards completion of the items outlined in Appendix B of the Consent Decree between the City and VDEQ. The following sections outline progress during the month of August 2023 related to Solid Waste Permit (SWP) No. 498.

1.0 LEACHATE PUMP STATION

The City is in the process of repairing the pumps and addressing other concerns related to the leachate pump station. The steps taken by the City are outlined in the following sections.

1.1 FLOATING MATERIAL

On July 6, 2022 SCS received the results of samples taken from the Solid Waste Permit 498 Wet Well on May 25, 2022. Based on SCS' review of the data, the data indicated the liquid is non-hazardous. SCS submitted a letter to the City on July 7, 2022 with SCS' review of the data and the underlying lab analysis. A copy of this letter was included in the October 2022 Monthly Compliance Report for the SWP No. 498 Landfill.

As described in the October 2022 Monthly Compliance Report for the SWP No. 498 Landfill, the floating material in the wet well was resolved.

1.2 PUMP REPLACEMENT

The City contracted with Buchanan Pump Service (Buchanan) to complete repairs to the pumps and infrastructure at the 498 pump station. Buchanan completed repairs to one pump (in addition to the pump currently operating at the pump station). Buchanan installed a replacement for the third pump during the month of July of 2023.

1.3 ALARM/NOTIFICATION SYSTEM

The alarm system at the SWP No. 498 Landfill pump station is currently functional and sending alerts to landfill staff via text message.

2.0 COVER INTEGRITY AND EXPOSED WASTES

The sections below describe steps taken by the City to address cover integrity and exposed wastes.

2.1 ALTERNATE DAILY COVER

During the month of August, surface disturbance that would require alternate daily cover was not anticipated on the SWP No. 498 landfill in 30 to 60 days. Alternate daily cover (ADC) tarps were not required because the landfill is currently covered by soil intermediate cover as discussed in section 2.2.

2.2 INTERMEDIATE COVER

Placement of intermediate soil cover on the SWP No. 498 landfill is complete. Soil placement and thickness verification was documented in the April 2023 Compliance Report for the SWP No. 498 Landfill. The City will continue to monitor the intermediate cover integrity on a regular basis until final cover has been installed.

2.3 SURFACE EMISSIONS MONITORING

On August 23, 2023, SCS performed the third quarter 2023 surface emissions monitoring event on the landfill. The monitoring was performed in accordance with the site-specific GCCS Design Plan, the facility's Title V Permit, the requirements of 40 CFR 63.1960(c) and (d), 40 CFR 60.36f(c) and (d), and 40 CFR 60, Appendix A, Method 21. The landfill gas (LFG) collection system is required to operate such that the methane concentration is less than 500 ppm above background at the landfill surface.

The monitoring route included all applicable areas of the Permit No. 498 landfill. Sampling was conducted with a Thermo Scientific TVA-2020 Flame Ionization Detector (FID) at 30-meter intervals and where visual observations indicated the potential for elevated concentrations of LFG, such as distressed vegetation and surface cover cracks. In addition, in accordance with 40 CFR 63.1958(d)(ii)(2) and 40 CFR 60.34f(d), monitoring was conducted at all surface cover penetrations within the waste footprint.

VDEQ will be copied on a letter outlining the results at a later date. Table 1 summarizes the results of the monitoring event.

Table 1. Summary of March Surface Emissions Monitoring

Description	Aug. 23, 2023
Number of Points Sampled	69
Number of Points in Serpentine Route	65
Number of Points at Surface Cover Penetrations	4
Number of Exceedances	0
Number of Serpentine Exceedances	0
Number of Pipe Penetration Exceedances	0

These results are consistent with the SEM performed in October 2022, December 2022, March 2023, and May 2023, in which no exceedances were detected. No further SEM is required at the landfill during this quarter.

3.0 GAS COLLECTION

The City has taken steps to optimize gas collection and minimize air intrusion as outlined in the sections below.

3.1 SYSTEM OPTIMIZATION

The SWP No. 498 Landfill is approximately 12.0 acres and is located south of the SWP No. 221 Landfill and east of the SWP No. 588 Landfill. As of September 2022, mining in the SWP No. 498 Landfill has concluded. The majority of the SWP No. 498 Landfill does not have an active LFG collection system, due to mining operations which have occurred since waste placement was completed. The current system includes three vertical wells (EW-19, EW-20, and EW-21) and a condensate trap (CT-1) at the low point. Field reconnaissance efforts in September/October 2022 identified that the header pipe serving the three wells had been severed, blocked, or otherwise compromised. Vacuum was restored to EW-19 in November 2022. As of January 18, 2023, the blocked header piping was replaced, restoring vacuum to wells EW-20 and -21. As construction efforts continue in Area 588, multiple tie-ins and infrastructure relocations continued to occur in August. Additionally, large rain events have affected the landfill gas collection system as these events can occasionally limit the overall system pressure for all three landfills. Despite the weather and construction challenges, the overall system pressure, or available vacuum, has increased significantly.

The buried waste in SWP No. 498 Landfill Area is greater than 25 years old. Thus, the rate and quantity of decomposition gas production has declined significantly compared to the rate and quantity of LFG generated in more recently buried wastes. Due to the age of the waste in place, the methane concentration is substantially lower in several collection devices within this area. However, in the northwestern portion of SWP No. 498, devices EW-16, EW-17, and EW-18 have consistently shown normal methane concentration and are tuned accordingly each month. During the August extraction well monitoring event, there was a small decrease in methane and a slight increase in oxygen. These changes indicate more efficient LFG collection now that normal system pressure ranges have been achieved. Devices EW-19, EW-20, and EW-21 exhibit gas concentrations that are consistent with older landfill gas. These collectors show low methane concentrations, as well as low flow, and are kept under minimal vacuum.

There is no historical evidence of elevated temperatures in Area 498; however, the methane-to-carbon dioxide ratio measured in the wellheads can sometimes be less than 1 because organic fraction is more fully decomposed and the rate of methanogenesis has declined. Also, the Area 498 Landfill is not believed to be a significant source of odors. For the month of August, EW-19, EW-20, and EW-21 show lower, normal methane values compared to the previous month and were adjusted accordingly. Adjustments to flow and vacuum are made where necessary to all devices in Area 498 while being monitored.

3.2 OPTIMIZATION PLAN AND REPORTING

3.2.1 Optimization Plan

On December 1, 2022, on behalf of the City, SCS submitted a plan that provides for means and methods for optimizing the performance of the existing gas extraction system in the Solid Waste Permit No. 498 landfill. Additional details about that plan were included along with a copy of the plan in the November Monthly Compliance Report for the SWP No. 498 Landfill.

3.2.2 Optimization Actions

During the month of January 2023 actions were taken to implement the submitted Optimization Plan. The actions taken at the SWP No. 498 Landfill in accordance with the plan were summarized in the January 2023 Monthly Compliance Report for the SWP No. 498 Landfill.

3.2.3 Monthly Wellhead Monitoring

On August 1, 2023; August 2, 2023 and August 7, 2023, SCS-FS visited the landfill and performed monitoring of the landfill gas wells. The results of the monthly monitoring were submitted to VDEQ on September 6, 2023 and are included in Appendix A.

4.0 GRADING, GEOMETRIC CONFIGURATION AND GAS EXPANSION

The City has taken the steps outlined in the sections below to grade the surface of the SWP No. 498 landfill to an appropriate geometric configuration to allow for final closure.

4.1 CLOSURE AND LFGCCS PLAN

SCS prepared plans on the City's behalf for closing and installing final cover on the Solid Waste Permit No. 498 landfill. The plans also include a comprehensive gas collection and control system and comprehensive stormwater management plan. These drawings along with supporting information to facilitate a modification to the facility's Solid Waste Permit were submitted on January 31, 2023 and February 24, 2023. SCS revised the permit modification based on the letter received from VDEQ on March 10, 2023. The revised permit modification drawings and documents were submitted to VDEQ on July 11, 2023, and draft Solid Waste Permit modules were received from VDEQ on July 31, 2023.

The permit modification package includes the addition of supplemental LFG monitoring network probes along the eastern perimeter of the SWP No. 498 landfill. Additionally, the permit modification drawings propose expanding the existing stormwater basin adjacent to the northeast corner of the landfill, and a new outlet structure is proposed to control the discharge from the basin.

SCS will continue to work with VDEQ to complete the permit modification incorporating the revised closure design into the facility's solid waste permit. As discussed previously with VDEQ, SCS intends to incorporate into the solid waste permit the use of AGRU MicroDrain Liner and the associated AGRUTex geotextile as an approved equivalent option for the conventional final cover geomembrane and drainage geocomposite. SCS is preparing new and revised specifications and hydraulic analyses (United States Environmental Protection Agency Hydraulic Evaluation of Landfill Performance Model) to support this effort.

4.2 FINAL COVER AND LFGCCS INSTALLATION

The drawings described in Section 4.1 were used as the basis of bid drawings for procurement of a contractor to complete final cover and LFGCCS installation. The drawings used for the purposes of bidding, procurement and construction of the final closure, gas collection system, and stormwater controls generally conform to the layout and details in the permit modification drawings.

The bid drawings and project manual were assembled, and an invitation to bid was issued on August 25, 2023. The invitation to bid is included in Appendix B and the bid drawings in Appendix C. The pre-bid meeting was held on-site at ISWMF on September 5, 2023.

5.0 LEACHATE SEEPS AND PONDING

The sections below outline the steps taken by the City to address leachate seeps and ponding.

5.1 PERIODIC INSPECTIONS

The City initiated a process of tracking precipitation events that have the potential to create ponding and leachate seeps. Inspections are made following events that exceed 0.25 inches as recorded by the on-site weather station. For the purposes of these inspections, if precipitation is continuous for at least 8 hours during a storm that lasts multiple days, that storm will be considered a single event requiring a single inspection. After each such event, City personnel will inspect the landfill for ponding and leachate seeps. Locations of ponding and seeps will be marked in the field.

The City performed inspections as appropriate during the month of August. Section 6 describes the self-inspection logs that were used to record observations during the inspections. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records. Completed inspection forms are available for VDEQ to review upon request.

5.2 COMPLETION OF WORK ACTIVITIES

During the month of April 2023, the City completed work activities which eliminated areas of ponding and accomplished leachate seep repairs. These details about these activities were included in the April 2023 Compliance Report for the SWP No. 498 Landfill. The City will address any conditions that require remedial actions identified in future inspections as part of regular maintenance of the facility.

6.0 STORMWATER DRAINAGE AND MANAGEMENT

The sections below outline the steps by the City to improve stormwater management and drainage.

6.1 STORMWATER MANAGEMENT PLAN

As noted in Section 4.1 the plans that SCS prepared for Closure of SWP No. 498 included measures to address stormwater management on the landfill. The stormwater management plans were discussed and included in the January 2023 Monthly Compliance Report for the SWP No. 498 landfill.

6.2 CLEANOUT OF STORMWATER DIVERSION CHANNEL/TRENCH BERM

Clean-out of the stormwater diversion channel/trench berm was completed in February 2023. The clean-out of the stormwater diversion channel/trench berm was discussed in the February 2023 Monthly Compliance Report for the SWP No. 498 Landfill. On March 15, 2023 SCS submitted a letter to VDEQ verifying completion of the stormwater diversion channel/trench berm clean-out. A copy of

that letter and supporting documentation were included in the March 2023 Monthly Compliance Report for the SWP No. 498 Landfill.

7.0 SELF-INSPECTION AND RECORDKEEPING

SCS prepared two self-inspection log templates, the Stormwater Management Inspection Log and the Daily Landfill Inspection Log. SCS provided updated self-inspection logs for SWP 498 to the City and VDEQ and completed self-inspection training with facility staff on November 30, 2022.

7.1 UPDATED SELF-INSPECTION LOGS


Copies of updated self-inspection log templates were submitted to VDEQ on November 30, 2022. Details about this log and the intended inspection process were detailed in the November 2022 Monthly Compliance Report for the SWP No. 498 Landfill. Copies of the log templates are also included in that report.

7.2 FACILITY TRAINING

On November 30, 2022, SCS personnel, Ryan Mahon, met members of the Facility staff to complete self-inspection training. A summary of this training and a record of attendees was included in the November Monthly Compliance Report for the SWP No. 498 Landfill.

7.3 SELF-INSPECTION AND RECORDKEEPING ASSIGNMENTS

Completed inspections will be held on-site at the facility office available for review by VDEQ upon request. Currently, self-inspections are being completed by Jonathan Hayes. Dave Cochran will serve as the primary alternate for inspections with the other members of the staff trained on inspection procedures filling in as needed. Inspection forms will be scanned and stored on the landfill computer server in a folder designated for the purpose of storing environmental records.



Appendix A
August Monthly Wellhead Monitoring Data

Bristol Virginia Landfill - Permit 498 Well Data - 06/01/2023 to 08/31/2023

Point Name	Record Date	CH4 (% by vol)	CO2 (% by vol)	O2 (% by vol)	Bal Gas (% by vol)	Init Temp (F)	Init Static Pressure ("H2O)	Adj Static Pressure ("H2O)	System Pressure ("H2O)	Comments
16	6/1/2023 10:56	27.0	31.2	0.0	41.8	83.9	-17.5	-17.8	-22.9	No Change
16	6/14/2023 15:15	31.1	32.7	0.0	36.2	89.4	-21.1		-27.3	Closed valve 1/2 to 1 turn
16	6/27/2023 14:11	52.7	35.1	0.0	12.2	86.0	-10.5	-10.4	-11.3	Valve completely open
16	7/5/2023 10:06	57.4	35.0	0.0	7.6	88.2	-5.4	-5.4	-5.6	Valve completely open
16	8/1/2023 09:52	44.5	37.6	0.0	17.9	76.9	-16.9	-16.9	-17.4	No Change
17	6/1/2023 10:57	46.2	36.0	0.0	17.8	79.6	-23.1	-23.1	-22.9	No Change
17	6/14/2023 15:18	54.2	41.4	0.0	4.4	90.1	-27.4		-27.3	Opened Valve 1/2 to 1 turn
17	6/27/2023 14:13	56.4	41.6	0.0	2.0	85.8	-11.2	-11.2	-11.2	Valve completely open
17	7/5/2023 10:07	53.2	35.1	0.0	11.8	85.6	-5.4	-5.4	-5.4	Valve completely open
17	8/1/2023 09:51	50.3	34.8	0.8	14.2	73.8	-16.8	-17.1	-16.9	No Change
18	6/1/2023 10:48	45.7	35.3	0.1	18.9	78.7	-12.6	-12.5	-22.9	No Change
18	6/27/2023 14:16	49.8	39.0	0.0	11.3	87.6	-8.5	-8.5	-11.1	Opened Valve > 1 turn
18	7/5/2023 10:09	56.7	40.0	0.3	3.0	89.5	-4.6	-4.6	-5.7	Valve completely open
18	8/1/2023 09:56	48.5	39.8	0.0	11.8	80.4	-16.3	-16.6	-17.2	No Change
19	6/1/2023 10:34	2.8	15.3	0.2	81.6	85.3	-22.4	-22.5	-22.8	No Change
19	6/27/2023 14:19	7.3	18.6	0.0	74.1	86.7	-8.8	-8.5	-11.1	Closed valve 1/2 to 1 turn
19	7/5/2023 10:11	51.7	38.5	0.6	9.2	86.0	-5.2	-5.2	-5.5	Valve completely open
19	8/1/2023 09:58	13.5	22.1	2.0	62.4	77.8	-16.9	-16.9	-17.0	No Change
20	6/1/2023 10:38	10.7	13.4	7.7	68.1	89.4	-5.8	-5.8	-23.0	No Change
20	6/27/2023 14:25	17.7	16.5	4.3	61.6	85.1	-3.6	-3.6	-11.1	No Change
20	7/5/2023 10:13	63.6	31.1	0.3	4.9	85.6	-5.2	-5.1	-5.4	Valve completely open
20	8/1/2023 10:02	5.6	14.6	18.4	61.4	75.9	-16.9	-16.9	-17.2	No Change
21	6/1/2023 10:41	5.4	8.0	13.4	73.2	79.0	-0.8	-0.8	-22.9	No Change
21	6/27/2023 14:28	10.4	12.7	9.3	67.6	82.6	-5.4	-5.4	-11.1	Valve completely closed
21	7/5/2023 10:16	27.1	19.6	4.1	49.2	83.2	-0.5	-0.5	-5.4	No Change
21	8/1/2023 10:07	5.6	9.3	12.3	72.8	84.7	-1.1	-1.1	-17.1	No Change
23	6/1/2023 11:39	0.9	3.2	19.6	76.3	75.1	0.0	-0.1	-16.6	No Change
23	6/14/2023 14:12	0.4	1.3	19.5	78.9	71.9	-0.1	0.0	-16.9	Closed valve 1/2 to 1 turn
23	7/24/2023 15:29	0.5	1.1	19.4	79.0	92.6	-0.1	-0.1	0.3	No Change
23	7/28/2023 08:27	1.2	2.2	19.8	76.8	77.3	-0.2	-0.1	-3.1	No Change
23	8/2/2023 10:47	0.0	0.2	19.6	80.3	77.4	-0.4	-0.3	-1.3	No Change
23	8/7/2023 09:59	0.1	0.9	19.9	79.1	76.8	-0.2	-0.1	-0.3	No Change



Appendix B

SWP No. 498 Final Cover System Construction Invitation to Bid

DOCUMENT 00 11 16
INVITATION TO BID

Project: Solid Waste Permit #498 Final Cover System Construction (ITB# SW-24-001)

Owner:

City of Bristol
2655 Valley Drive
Bristol, VA 24201

Engineer:

SCS Engineers
15521 Midlothian Turnpike, Suite 305
Midlothian, VA 23113 USA

Date: August 25, 2023

Prospective Bidders

Your firm is invited to submit a sealed Bid clearly labeled as follows:

City of Bristol, VA
Attention: Procurement Department
300 Lee Street
Bristol, VA 24201
Bid on Solid Waste Permit#498 Final Cover System Construction
Due Date: September 26, 2023 2:00 PM
ITB# SW-24-001

Bids should be submitted to the City of Bristol for the SWP#498 Final Cover System Construction. Three (3) complete sealed copies of bidding documents for the SWP#498 Final Cover System Construction must be received at the City of Bristol, Virginia Procurement Department at 300 Lee Street, Bristol, VA 24201, no later than 2:00 p.m. Eastern Standard Time (per time.gov) on Tuesday the 26th day of September 2023. If proprietary information is included in the bid, then Bidders shall provide one (1) additional copy with all information considered proprietary redacted and suitable for public inspection in accordance with Section 2.2-4342 of the Code of Virginia. Each copy shall be complete and separately bound. Sections shall be identified to facilitate evaluation and to prevent evaluators from unnecessary search or arranging of materials for evaluation purposes. No FAXED nor emailed proposals will be accepted.

The Bid package shall also include one (1) separate unbound copy of the Bid Form to facilitate opening and reading of the Bids. The Bid must be enclosed in a plainly marked package with the Project title, the name and address of the Bidder, and must be accompanied by the Bid Security and other required documents. The sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED - Invitation to Bid #SW-24-

001 for Solid Waste Permit #498 Final Cover System Construction” A mailed Bid must be addressed to the location designated in the Advertisement.

The public opening of the bids will take place at the Council Chambers at City Hall located at 300 Lee Street, Bristol VA 24201, immediately following the bid due deadline. Bids received after the date and time prescribed for the opening of the bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

The Owner requires the Project to be completed by March 28, 2024. Parts of the Work must be substantially completed on or before the following Milestone(s):

- Solid Waste Permit #498 Final Cover System – March 1, 2024

Electronic Bidding Documents may be obtained from the City of Bristol’s website or the office of the Engineer by emailing aworth@scsengineers.com (copy twilliams@scsengineers.com).

Hard Copies of Bidding Documents may be obtained from the office of the Engineer at a cost of \$200.00 for one set.

Prospective Bidders must either attend the Pre-Bid Conference in person or schedule and conduct a separate site visit prior to Bid submittal. The Pre-Bid Conference will be held at 10:00 AM on the 5th day of September 2023 at the scalehouse at the Bristol Integrated Solid Waste Management Facility, 2655 Valley Drive, Bristol, VA 24201. Prospective Bidders are encouraged to attend this meeting. Site visits other than the pre-bid meeting should be coordinated with Mike Martin by calling 1 (276) 645-7380.

Bidders should submit questions to the Engineer at the pre-bid meeting or via e-mail to aworth@scsengineers.com (copy twilliams@scsengineers.com) prior to the pre-bid meeting. Only responses set for in an Addendum will be binding. Questions are to be submitted by Wednesday, September 13th, 2023.

Submit your Bid on the Bid Form provided. Bidders are required to complete Bid Form 00 41 13.

Your Bid will be required to be submitted under a condition of irrevocability for a period of 60 days after submission subject to Section 2.2-4330 of the Code of Virginia, as amended.

The Owner reserves the right to accept or reject any or all Bids.

END OF DOCUMENT 00 11 16

Appendix C

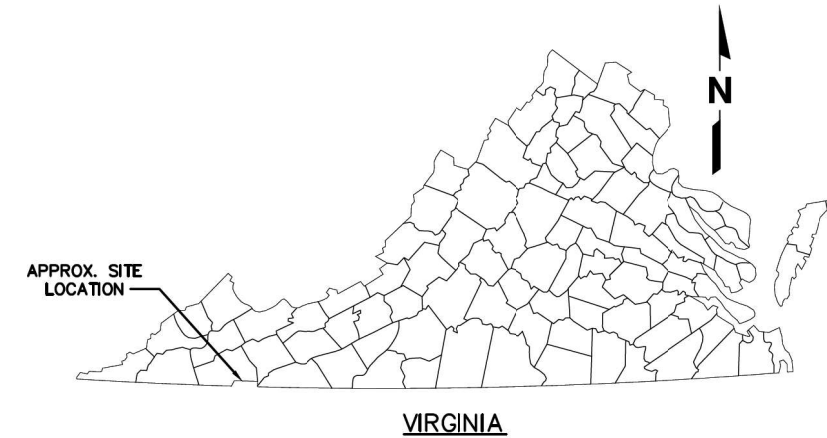
SWP No. 498 Final Cover System Construction Plans

BRISTOL, VIRGINIA INTEGRATED SOLID WASTE MANAGEMENT FACILITY

SOLID WASTE PERMIT #498

FINAL COVER SYSTEM CONSTRUCTION PLANS

BRISTOL, VIRGINIA



SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	GENERAL NOTES AND LEGEND
3	EROSION AND SEDIMENT CONTROL NARRATIVE AND NOTES
4	OVERALL SITE MAP
5	EXISTING CONDITIONS
6	PHASE 1 EROSION AND SEDIMENT CONTROL PLAN
7	LFG SYSTEM DESIGN AND MEMBRANE DEPLOYMENT GRADE
8	FINAL COVER GRADE AND STORMWATER FEATURES
9	ACCESS ROAD
10	CROSS SECTIONS 1
11	CROSS SECTIONS 2
12	CROSS SECTIONS 3
13	LFG PROFILES 1
14	LFG PROFILES 2
15	SITE MONITORING PLAN
16	EXISTING DRAINAGE PLAN
17	STORMWATER MANAGEMENT PLAN
18	STORMWATER CALCULATIONS
19	DETAILS 1
20	DETAILS 2
21	DETAILS 3
22	DETAILS 4
23	DETAILS 5
24	DETAILS 6
25	DETAILS 7
26	DETAILS 8

PREPARED FOR:
CITY OF BRISTOL, VIRGINIA
300 LEE STREET
BRISTOL, VIRGINIA 24201

INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VIRGINIA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
 15521 MIDLOTHIAN TURNPIKE, SUITE 305
 MIDLOTHIAN, VIRGINIA 23113-7313
 PH. (804) 378-7440 FAX. (703) 471-6676
 WWW.SCSENGINEERS.COM

SCS PROJECT NO. 02218208.17

AUGUST 18, 2023

TOTAL AREA FOR LIMITS OF DISTURBANCE:
 19.14 ACRES



NO.	REVISION	DATE

SHEET TITLE	COVER SHEET
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

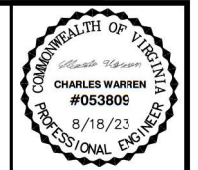
CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
 15521 MIDLOTHIAN TURNPIKE, SUITE 305
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 PH. (804) 378-7440 FAX. (703) 471-6676

PROJ. NO. 02218208.05
 DATE 8/18/2023
 DWG. BY TRW
 CHK. BY TRW
 APP. BY TRW
 S/A C.W./D.B.K.
 APP. BY C.W.

CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN

DRAWING NO. **1** of 26



NO.	REVISION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		

SHEET TITLE	GENERAL NOTES AND LEGEND
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY 2655 VALLEY DRIVE BRISTOL, VA 24201
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SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 15521 MIDLOTHIAN TURNPIKE, MIDLOTHIAN, VA 23113 PH: (804) 378-7440 FAX: (804) 378-7453	DATE: 02/21/2023 DWN BY: TRW/LLH CHK BY: C/JW APP BY: C/JW
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CADD FILE:	02218208.05
DATE:	8/18/2023
SCALE:	AS SHOWN
DRAWING NO.	2 of 26

- LEGEND:**
- 1850 — EXISTING CONTOUR, MAJOR (10')
 - - - - EXISTING CONTOUR, MINOR (2')
 - 1850 — PROPOSED CONTOUR, MAJOR (10')
 - — — — PROPOSED CONTOUR, MINOR (2')
 - - - - EXISTING 2" AIR LINE
 - - - - EXISTING 4" FORCE MAIN
 - LFG — EXISTING LFG HEADER
 - 4G — EXISTING 4" LFG HEADER
 - 6G — EXISTING 6" LFG HEADER
 - 8G — EXISTING 8" LFG HEADER
 - 12G — EXISTING 12" LFG HEADER
 - — — — BUILDING
 - L — EXISTING LEACHATE PIPE
 - L — PROPOSED LEACHATE PIPE
 - L — LEACHATE CLEANOUT
 - — — — STORMWATER PIPE
 - — — — EXISTING GRAVEL ROAD
 - — — — RIP RAP/ ROCKS/ AGGREGATE
 - — — — FLEXAMAT
 - > — DIVERSION BERM
 - SF — SILT FENCE
 - SSF — SUPER SILT FENCE
 - △ GP-## LANDFILL GAS PROBE
 - LFG — LANDFILL GAS PIPE
 - ⊕ P-## PIEZOMETER
 - MW-## MONITORING WELL
 - Ldb — LIMITS OF DISTURBANCE
 - S — SOIL TYPE BOUNDARY
 - - - - DRAINAGE AREA
 - — — — STREAM OR WATERLINE
 - — — — CENTERLINE
 - - - - SURVEY BOUNDARY LINE
 - ⊙ TS TEMPORARY SEEDING
 - ⊙ PS PERMANENT SEEDING
 - ⊙ CP CULVERT INLET PROTECTION
 - ⊙ OP OUTLET PROTECTION
 - ⊙ SF SILT FENCE
 - ⊙ SSF SUPER SILT FENCE
 - ⊙ CE CONSTRUCTION ENTRANCE
 - ⊙ MU MULCHING
 - ⊙ B/M BLANKETS AND MATTING
 - ➔ RUNOFF FLOW DIRECTION

- LEGEND:**
- TP-3 EXISTING TEMPERATURE PROBE
 - ⊕ EXISTING WELLHEAD
 - ⊕ EXISTING AIR RELEASE VALVE
 - ⊕ EXISTING ISOLATION VALVE
 - ⊕ EXISTING LEACHATE CLEANOUT
 - EXISTING U-TRAP
 - EXISTING CONDENSATE PUMP STATION
 - EXISTING HORIZONTAL COLLECTOR SUMP
 - EXISTING LFG LIQUIDS CONTAINMENT TANK
 - △ GP-5 EXISTING GAS PROBE
 - ⊕ MW-110 EXISTING GROUNDFWATER MONITORING WELL
 - ⊕ EXISTING MANHOLE
 - ⊕ HC-## PROPOSED LFG WELLHEAD
 - ⊕ EW-## PROPOSED AIR RELEASE VALVE
 - ⊕ DP-## PROPOSED DRAINAGE PIT
 - ⊕ PROPOSED LFG ISOLATION VALVE
 - ⊕ PROPOSED AIR ISOLATION VALVE
 - ⊕ PROPOSED FORCE MAIN ISOLATION VALVE
 - ⊕ PROPOSED CONDENSATE SUMP
 - ★ EXISTING BENCHMARK
 - — — — PROPERTY LINE
 - — — — FACILITY BOUNDARY
 - — — — WASTE MANAGEMENT UNIT BOUNDARY
 - — — — APPROXIMATE LOCATION OF SIDEWALL
 - — — — EXISTING ROAD OUTLINE
 - — — — EXISTING LFG HORIZONTAL COLLECTOR
 - — — — PROPOSED LFG HORIZONTAL COLLECTOR
 - LFG — EXISTING LFG COLLECTION PIPING
 - LFG — PROPOSED LFG COLLECTION PIPING
 - 4G — 4G — 4G — PROPOSED 4" LFG COLLECTION PIPING
 - 8G — 8G — 8G — PROPOSED 8" LFG COLLECTION PIPING
 - 12G — 12G — 12G — PROPOSED 12" LFG COLLECTION PIPING
 - - - - PROPOSED 2" AIR LINE
 - - - - PROPOSED 4" FORCE MAIN

GENERAL NOTES:

- OWNER/DEVELOPER: CITY OF BRISTOL, VIRGINIA
- CONSULTING ENGINEER: SCS ENGINEERS, 15521 MIDLOTHIAN TURNPIKE #305, MIDLOTHIAN, VA 23113
- LOCATION OF EXISTING SEWER, WATER, OR GAS LINES, CONDUITS, OR OTHER STRUCTURES ACROSS, UNDERNEATH, OR OTHERWISE ALONG THE LINE OF PROPOSED WORK ARE NOT NECESSARILY SHOWN ON THE PLANS, AND IF SHOWN ARE ONLY APPROXIMATELY CORRECT. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF UNDERGROUND UTILITIES SHOWN ON THE PLANS IN AREAS OF CONSTRUCTION PRIOR TO STARTING WORK. CONTACT ENGINEER IMMEDIATELY IF LOCATION OF ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS, IF THERE APPEARS TO BE A CONFLICT, OR UPON DISCOVERY OF A UTILITY NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL OBTAIN FIELD UTILITY LOCATIONS BY CALLING "MISS UTILITY" FORTY EIGHT (48) HOURS PRIOR TO WORKING IN THE VICINITY OF EXISTING UTILITIES.
- BOUNDARY INFORMATION TAKEN FROM OTHERS.
- HORIZONTAL DATA IS BASED ON US STATE PLANE NAD 1983 VIRGINIA SOUTH ZONE. VERTICAL DATA BASED ON NAVD 88.
- EXISTING LFG HEADER WAS PARTIALLY OBTAINED FROM SCS CONSTRUCTION DRAWINGS, LAST UPDATED JULY 6, 2022. EXISTING LFG HEADER LOCATIONS WITHIN THE SWP #498 AREA ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION.
- THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY OTHERS. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
- THE LOCATIONS OF WELLS EW-16, EW-17, EW-19, EW-20, AND EW-21 WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.
- HYDRAULICALLY ADEQUATE ALTERNATIVE MATERIALS FOR THE STORMWATER PIPES, CULVERTS, SEWERS, JUNCTIONS, AND DOWNCHUTES MAY BE SUBSTITUTED AT OWNER'S DISCRETION.
- THESE DRAWINGS ARE INTENDED TO BE PLOTTED IN COLOR.
- THE SWP#498 WASTE MANAGEMENT UNIT BOUNDARY IS AN APPROXIMATION BASED UPON DRAWINGS PREPARED BY OTHERS.

LANDFILL GAS PROJECT DESCRIPTION:

THIS PROJECT INCLUDES A COMPREHENSIVE EXPANSION OF THE EXISTING LANDFILL GAS (LFG) COLLECTION AND CONTROL SYSTEM AT THE BRISTOL #498 LANDFILL LOCATED IN BRISTOL, VA.

LANDFILL GAS GENERAL NOTES:

- THE WORK TO BE PERFORMED INVOLVES, BUT IS NOT LIMITED TO, THE CONSTRUCTION AND INSTALLATION OF THE LANDFILL GAS COLLECTION SYSTEM DEPICTED ON THESE CONSTRUCTION DRAWINGS. WORK SHALL INCLUDE THE INSTALLATION OF LANDFILL GAS EXTRACTION WELLS, WELLHEADS, HEADER AND LATERAL PIPING, VALVES, AND ANY OTHER ITEMS NEEDED TO MAKE THE PROPOSED LFG SYSTEM CONNECT TO THE EXISTING LFG SYSTEM AND OPERATE PROPERLY.
- CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, TESTING, TOOLS, EQUIPMENT, SUPERVISION AND INSTALLATION SERVICES REQUIRED TO CONSTRUCT THE LFG COLLECTION SYSTEM DEPICTED ON THESE CONSTRUCTION DRAWINGS.
- CONTRACTOR SHALL RECOGNIZE THAT MULTIPLE PROJECTS ARE UNDERWAY AT THE SOLID WASTE MANAGEMENT FACILITY AND SHALL COORDINATE HIS ACTIVITIES WITH OWNER AND OTHER CONTRACTORS SO AS TO NOT HINDER OR OBSTRUCT WORKING ACTIVITIES ASSOCIATED WITH LANDFILL PROJECTS.
- CONTRACTOR SHALL MINIMIZE LAND DISTURBANCE RELATED TO CONSTRUCTION ACTIVITIES TO THE GREATEST EXTENT POSSIBLE. CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS INSIDE AND OUTSIDE THE LANDFILL FOOTPRINT TO ITS ORIGINAL CONDITION OR SPECIFIED FINAL CONDITION.
- CONTRACTOR SHALL PROPERLY STORE ALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS IN AREAS DESIGNATED BY OWNER.
- ALL LANDFILL WASTE EXCAVATED DURING CONSTRUCTION SHALL EITHER BE REPOSITIONED WITHIN THE EXISTING SWP#498 LANDFILL WASTE MASS OR HAULED BY THE CONTRACTOR TO AN ACTIVE SOLID WASTE DISPOSAL FACILITY. REPOSITIONED WASTE SHALL REMAIN WITHIN THE WASTE MANAGEMENT UNIT BOUNDARY, UNDERNEATH THE FINAL CLOSURE SYSTEM INTERMEDIATE/DAILY COVER BEDDING LAYER. ALL EXCAVATED TRENCHES AND WASTE MUST BE COVERED AT THE END OF EACH WORKING DAY. NO EXPOSED REFUSE WILL REMAIN OVERNIGHT.
- THE CONTRACTOR SHALL PREPARE A WRITTEN SITE-SPECIFIC HEALTH AND SAFETY PLAN THAT ADDRESSES THE POTENTIAL HAZARDS ASSOCIATED WITH LANDFILL GAS CONSTRUCTION ACTIVITIES AT SOLID WASTE MANAGEMENT FACILITIES AND IMPLEMENT THE PROCEDURES AND PROTOCOLS NECESSARY TO MAINTAIN A SAFE WORK ENVIRONMENT.
- THE CONTRACTOR SHALL INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROLS DOWNSTREAM OF THE DISTURBED AREAS AS REQUIRED BY THE FACILITY'S EROSION AND SEDIMENT CONTROL PLAN, AND APPLICABLE STATE REGULATIONS.
- IF FIELD CONDITIONS DIFFER FROM NOTES AND DETAILS SHOWN ON THESE DRAWINGS, CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER AND OWNER FOR CLARIFICATION.

LANDFILL GAS PIPE REQUIREMENTS:

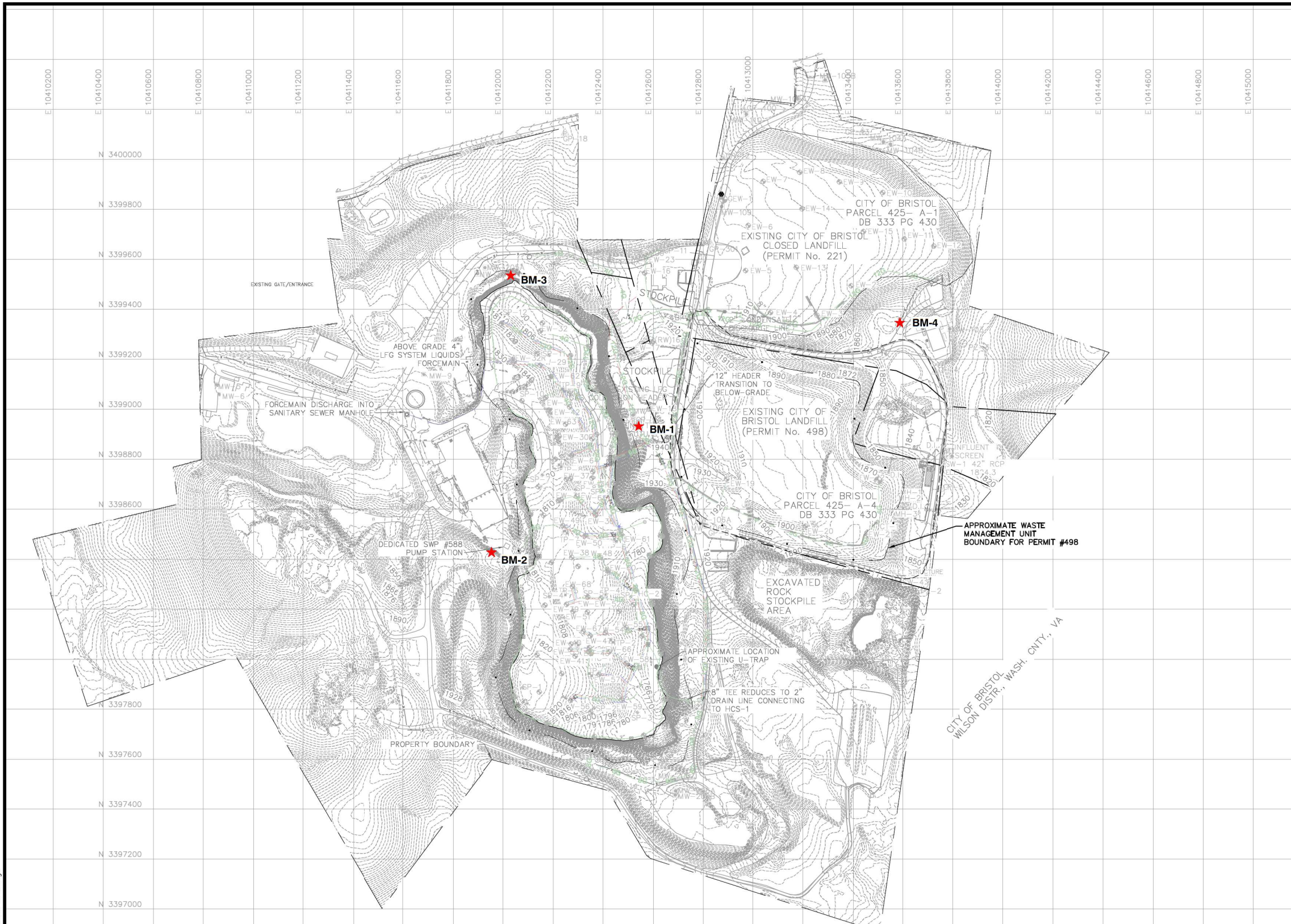
- ALL LFG SYSTEM HEADER AND LATERAL PIPING SHALL BE HIGH DENSITY POLYETHYLENE (HDPE), SDR-17, PE 4710, UNLESS OTHERWISE NOTED.
- ALL PNEUMATIC SUPPLY PIPING SHALL BE HDPE SDR-9, PE4710.
- ALL LIQUID FORCEMAIN PIPING SHALL BE HDPE SDR-11, PE4710.
- FLANGES FOR THE HDPE SHALL BE CONVULUTED DUCTILE IRON BACK-UP RINGS FINISHED WITH AN IRON OXIDE PRIMER. FLANGE NUTS AND BOLTS SHALL BE GALVANIZED STEEL AND COATED WITH ANTI-SIEZE COMPOUND. BURIED FLANGES SHALL BE WRAPPED IN 5-MIL POLYETHYLENE SHEETING PRIOR TO BACKFILLING TO HELP PREVENT CORROSION.
- PIPE INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF ASTM D-2321, PPI TR-31/9-79, AND THE MANUFACTURER'S RECOMMENDATIONS.
- ALL HEADER AND LATERAL PIPING SHALL BE SUBJECTED TO AN AIR TEST TO DETECT ANY LEAKS. TESTING SHALL BE CONDUCTED WITH THE PIPE IN THE TRENCHES. CONTRACTOR SHALL TEST THE PIPE AT 5 PSIG FOR A PERIOD OF NOT LESS THAN 1 HOUR. PRESSURE DROP DURING THE TEST SHALL NOT EXCEED ONE-PERCENT OF THE TESTING PRESSURE.
- ALL PNEUMATIC SUPPLY AND LIQUID FORCEMAIN PIPING SHALL BE SUBJECTED TO AN AIR TEST TO DETECT ANY LEAKS. TESTING SHALL BE CONDUCTED WITH THE PIPE IN THE TRENCHES. CONTRACTOR SHALL TEST THE PIPE AT 10 PSIG FOR A PERIOD OF NOT LESS THAN 1 HOUR. PRESSURE DROP DURING THE TEST SHALL NOT EXCEED TEN-PERCENT OF THE TESTING PRESSURE.
- MAINTAIN A MINIMUM 2% SLOPE FOR LANDFILL GAS HEADER INSTALLED OUTSIDE LINER LIMITS AND 4% MINIMUM SLOPE FOR LANDFILL GAS HEADER WITHIN THE LINER LIMITS. WHERE LFG DESIGN PROFILES SHOW LESS THAN THE MIN. SLOPES, CONTRACTOR WILL SURVEY INSTALLED HEADER AT MAX. 10' INTERVALS TO VERIFY INSTALLED SLOPE.
- LFG SYSTEM HEADER, PNEUMATIC SUPPLY, AND LIQUID FORCE MAIN ISOLATION VALVES ARE CLUSTERED TOGETHER AT ALL PERTINENT INTERSECTIONS, UNLESS OTHERWISE SHOWN ON THE DRAWING.
- LFG SYSTEM HEADER ISOLATION VALVES SHALL BE BUTTERFLY ISOLATION VALVES WITH VITON SEAL AND STEM EXTENSION WITH GEAR BOX NO LESS THAN 3 FEET ABOVE FINAL GRADE. EITHER SIDE OF THE VALVE SHALL HAVE A STAINLESS STEEL BRAIDED SAMPLING PORT INSTALLED ON THE LFG HEADER.
- THE PNEUMATIC SUPPLY AND LIQUID FORCE MAIN ISOLATION VALVES SHALL BE HDPE TIMESAVER VALVES OR EQUIVALENT ABOVE GRADE OPERATING VALVES. THE AIR AND FORCE MAIN VALVES SHALL BE EQUIPPED WITH AIR BLEED OFF VALVES.

EXTRACTION WELLS:

- THE PROPOSED VERTICAL CAISSON LANDFILL GAS WELLS HEREIN ARE SHALLOW AND WILL BE EXCAVATED. EXCAVATION OF THE VERTICAL CAISSON LANDFILL GAS WELLS WILL PROCEED WITH CAUTION. RECORDS ARE NOT AVAILABLE FOR THE LOCATION OF THE EXISTING BOTTOM LINER SYSTEM, AND CARE MUST BE TAKEN TO AVOID DAMAGING THE EXISTING LINER DURING EXCAVATION OPERATIONS. IF THE EXISTING LINER IS ENCOUNTERED DURING EXCAVATION, THE DESIGN AND CQA ENGINEER WILL BE NOTIFIED IMMEDIATELY. CONTRACTOR SHALL OBTAIN AUTHORIZATION FROM OWNER, DESIGN ENGINEER, AND CQA ENGINEER PRIOR TO PROCEEDING WITH EXCAVATION IN THE VICINITY OF THE EXPOSED LINER.
- CONTRACTOR SHALL SURVEY AND STAKE THE PROPOSED VERTICAL CAISSON WELLS LOCATIONS AND SOIL EXTRACTION WELL PRIOR TO EXCAVATING. THE SOIL EXTRACTION WELL SCHEDULE WILL BE REVISED AND FINALIZED BASED ON THE SURVEY FOR SIGNATURE BY THE DRILLER, CONTRACTOR, OWNER, DESIGN ENGINEER, AND CQA ENGINEER PRIOR TO THE COMMENCEMENT OF DRILLING. WELL LOCATIONS MAY BE ADJUSTED BY THE ENGINEER OR OWNER PRIOR TO DRILLING.
- CONTRACTOR SHALL PROVIDE WELL LOCATION ELEVATIONS TO ENGINEER PRIOR TO DRILLING. THE BORING DEPTHS MAY BE ADJUSTED BY THE ENGINEER OR OWNER.
- LANDFILL OWNER RESERVES THE RIGHT TO ADD OR DELETE ANY PROPOSED WELLS.
- CONTRACTOR SHALL KEEP DETAILED WELL LOGS FOR ALL WELLS DRILLED, INCLUDING THE TOTAL DEPTH OF WELL, THE STATIC WATER LEVEL (IF ANY), AND THE DEPTH, THICKNESS, AND DESCRIPTION OF SOIL OR WASTE STRATA. THE WELL LOGS SHALL INCLUDE DIMENSIONS THAT INDICATE TOTAL WELL DEPTH, LENGTH OF SLOTTED PIPE, LENGTH OF SOLID PIPE, THICKNESS OF BENTONITE PLUG, AND THICKNESS OF SOIL.
- FOLLOWING REVIEW OF ADJUSTED WELL SCHEDULE, CONTRACTOR SHALL OBTAIN AUTHORIZATION FROM OWNER AND CQA CONSULTANT PRIOR TO DRILLING.

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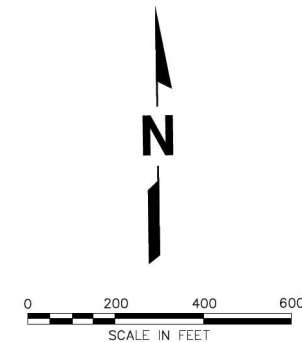
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BRISTOL VIRGINIA SOLID WASTE FACILITY CONTROL MONUMENTS 9-10-2020

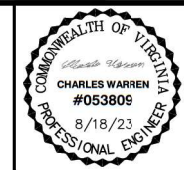
BENCHMARK	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM-1	3398930.8510	10412541.7390	1945.9200	BOLT IN CONCRETE MONUMENT
BM-2	3398427.2980	10411954.6380	1880.3510	BOLT IN CONCRETE MONUMENT
BM-3	3399535.2420	10412031.2950	1864.1110	TOP OF ANCHOR BOLT FOR ROCK PROTECTION FENCING
BM-4	3399345.9430	10413587.4720	1852.0750	1/2" REBAR IN CONCRETE AT FENCE CORNER

BENCHMARK INFORMATION PROVIDED BY THE CITY OF BRISTOL, VIRGINIA



GENERAL NOTES

- EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022.



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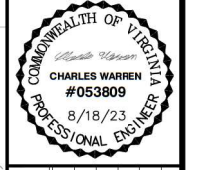
SHEET TITLE: **OVERALL SITE MAP**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 15521 MIDLOTHIAN TPK., MIDLOTHIAN, VA 23113
 PH: (804) 378-7440 FAX: (804) 378-7483

DWG. BY: TRW/LLH
 CHK. BY: C.J.W.
 PROJ. NO. 02218208.05
 CADD FILE: 02218208.05

DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO. **4** of 26



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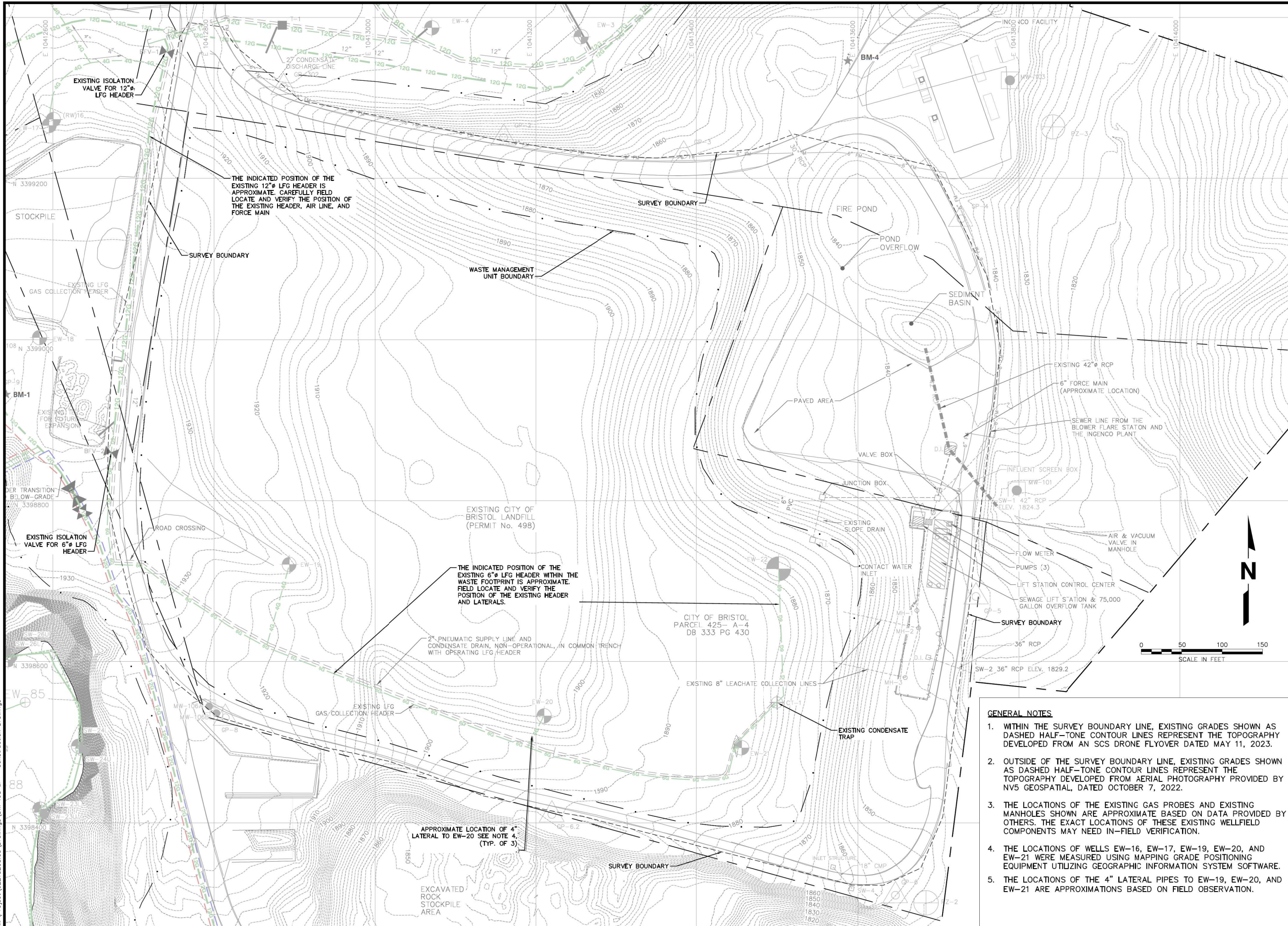
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 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

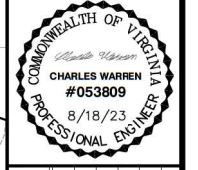
CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 2625 W. WOODBURN AVENUE, SUITE 200
 PH: (803) 376-7440 FAX: (803) 376-7433

PROJ. NO.: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO. 5

DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO. 5 of 26





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REVISION	
NO.	1

SHEET TITLE	PHASE 1 EROSION AND SEDIMENT CONTROL PLAN
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 2625 W. WOODBURN AVENUE, VA 23113
 PH: (803) 378-7440 FAX: (803) 378-7433

PROJ. NO. 02218208.05
 DATE 8/18/23
 DWG. BY TRW/LLH
 CHK. BY C.W/J.C.W.

CADD FILE:	02218208.05
DATE:	8/18/2023
SCALE:	AS SHOWN
DRAWING NO.	6 of 26

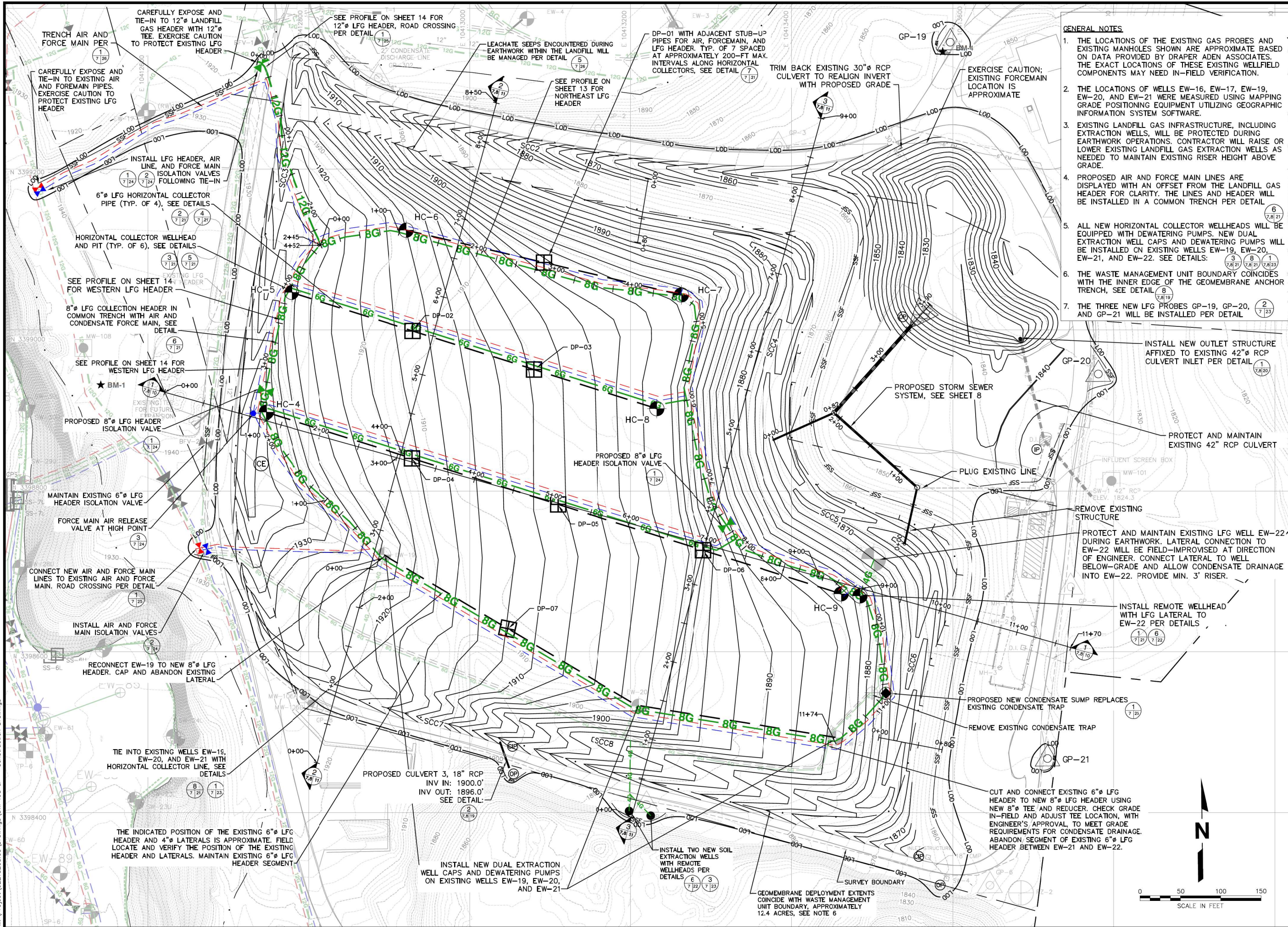


- GENERAL NOTES**
1. WITHIN THE SURVEY BOUNDARY LINE, EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AN SCS DRONE FLYOVER DATED MAY 11, 2023.
 2. OUTSIDE OF THE SURVEY BOUNDARY LINE, EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022.



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GENERAL NOTES

1. THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
2. THE LOCATIONS OF WELLS EW-16, EW-17, EW-19, EW-20, AND EW-21 WERE MEASURED USING MAPPING GRADE POSITIONING EQUIPMENT UTILIZING GEOGRAPHIC INFORMATION SYSTEM SOFTWARE.
3. EXISTING LANDFILL GAS INFRASTRUCTURE, INCLUDING EXTRACTION WELLS, WILL BE PROTECTED DURING EARTHWORK OPERATIONS. CONTRACTOR WILL RAISE OR LOWER EXISTING LANDFILL GAS EXTRACTION WELLS AS NEEDED TO MAINTAIN EXISTING RISER HEIGHT ABOVE GRADE.
4. PROPOSED AIR AND FORCE MAIN LINES ARE DISPLAYED WITH AN OFFSET FROM THE LANDFILL GAS HEADER FOR CLARITY. THE LINES AND HEADER WILL BE INSTALLED IN A COMMON TRENCH PER DETAIL.
5. ALL NEW HORIZONTAL COLLECTOR WELLHEADS WILL BE EQUIPPED WITH DEWATERING PUMPS. NEW DUAL EXTRACTION WELL CAPS AND DEWATERING PUMPS WILL BE INSTALLED ON EXISTING WELLS EW-19, EW-20, EW-21, AND EW-22. SEE DETAILS.
6. THE WASTE MANAGEMENT UNIT BOUNDARY COINCIDES WITH THE INNER EDGE OF THE GEOMEMBRANE ANCHOR TRENCH, SEE DETAIL.
7. THE THREE NEW LFG PROBES GP-19, GP-20, AND GP-21 WILL BE INSTALLED PER DETAIL.

COMMONWEALTH OF VIRGINIA
 CHARLES WARREN
 #053809
 8/18/23
 PROFESSIONAL ENGINEER

DATE	REVISION	DESCRIPTION

SHEET TITLE
LFG SYSTEM DESIGN AND MEMBRANE DEPLOYMENT GRADE

PROJECT TITLE
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

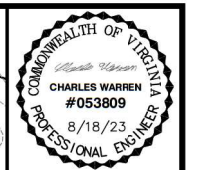
PROJECT NO.
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 2625 WILSON BLVD., SUITE 200
 BRISTOL, VA 24201
 PH: (803) 378-7460 FAX: (803) 378-7463

PROJ. NO.: 02218208.05
 DATE: 8/18/2023
 DRAWN BY: TRW
 CHECKED BY: C.W.J.
 APPR. BY: C.W.J.

CADD FILE: 02218208.05
DATE: 8/18/2023
SCALE: AS SHOWN
DRAWING NO.: 7 of 26



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FINAL COVER GRADE AND STORMWATER FEATURES

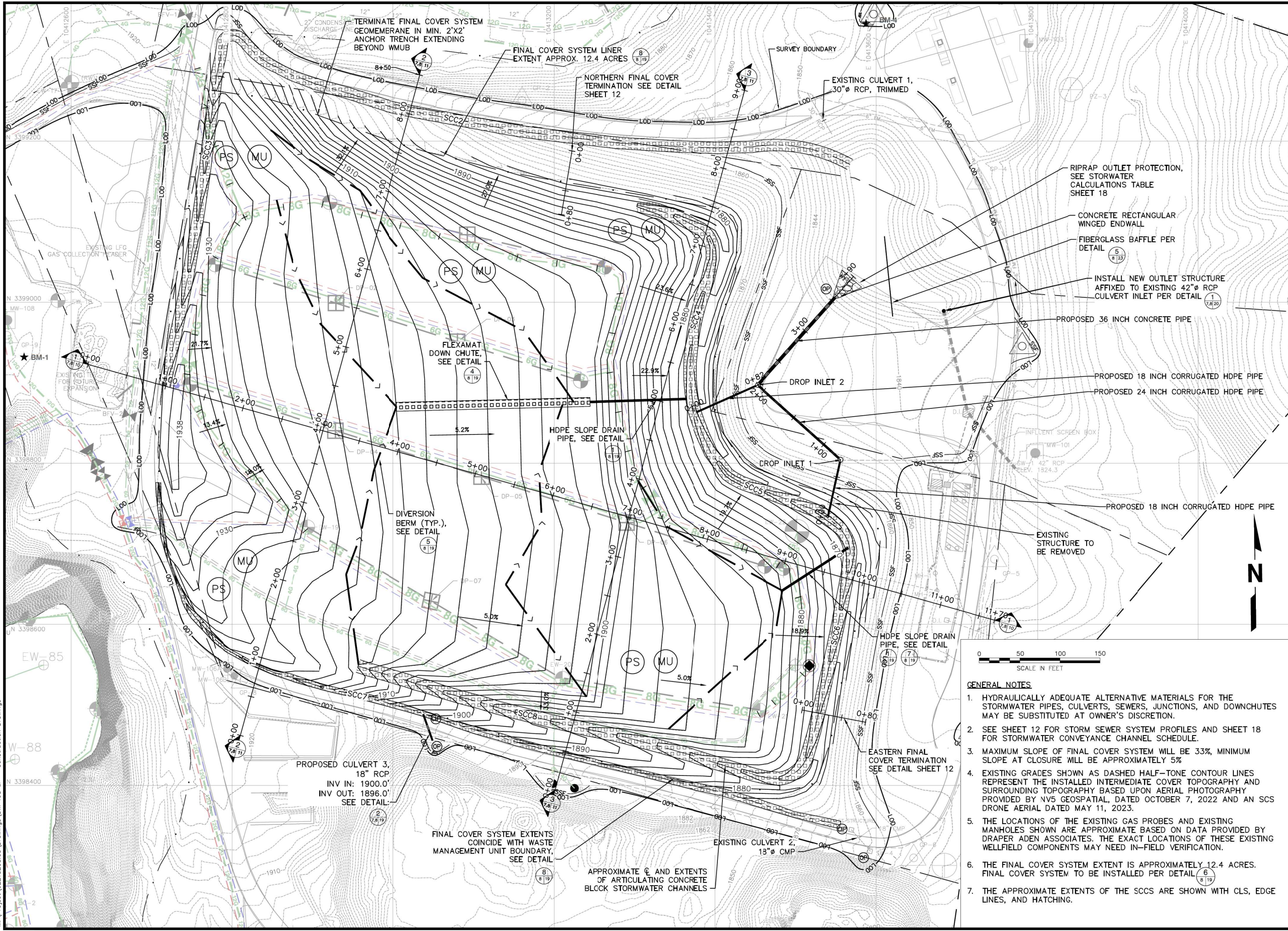
PROJECT TITLE
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
2622 WILSON ROAD, SUITE 200, BRISTOL, VA 24213
PH: (803) 376-7460 FAX: (803) 376-7463

PROJ. NO.: 02218208.05
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CHECKED BY: C.W.J./C.W.J.

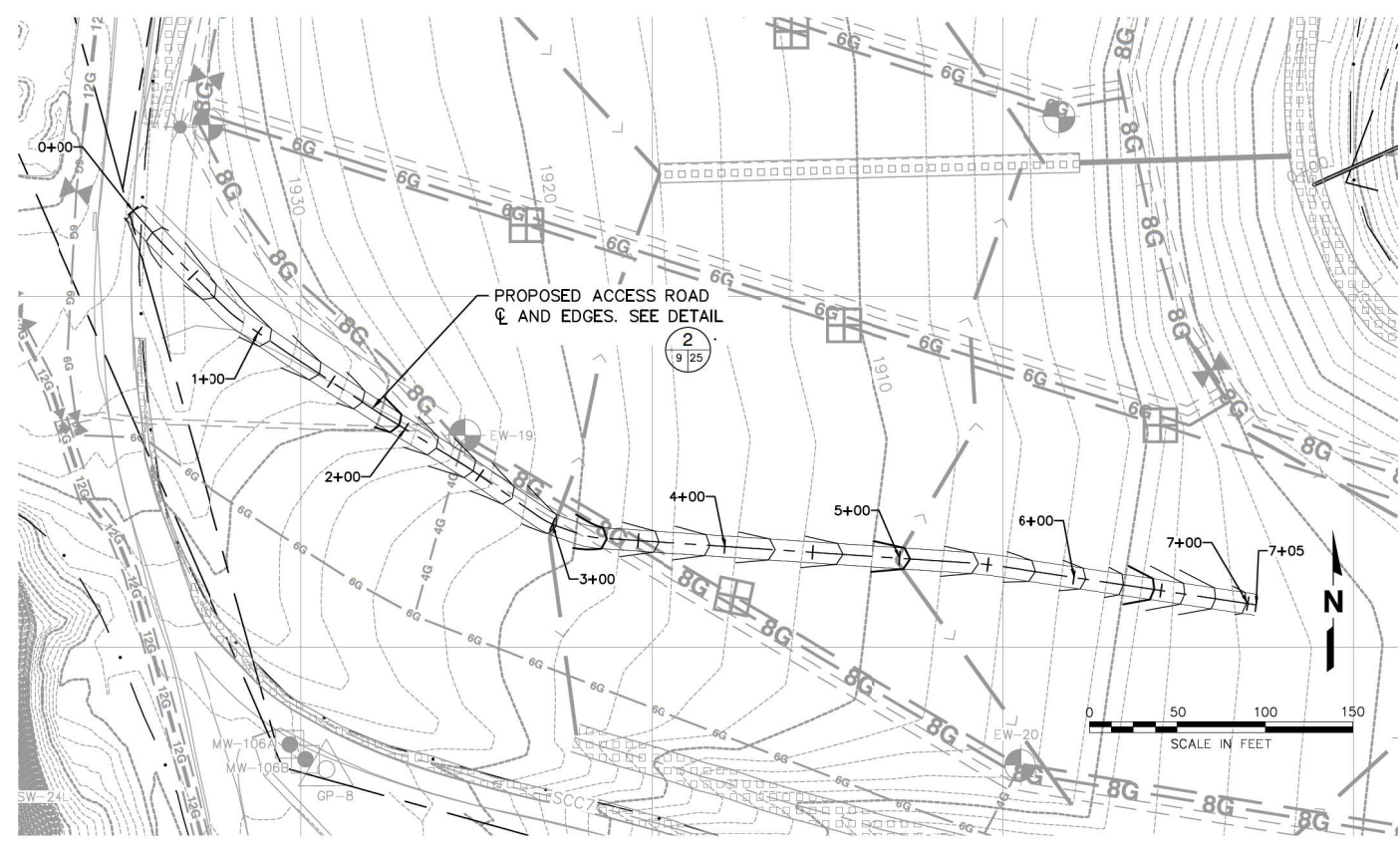
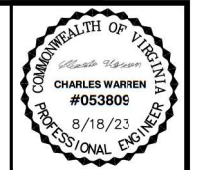
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GENERAL NOTES

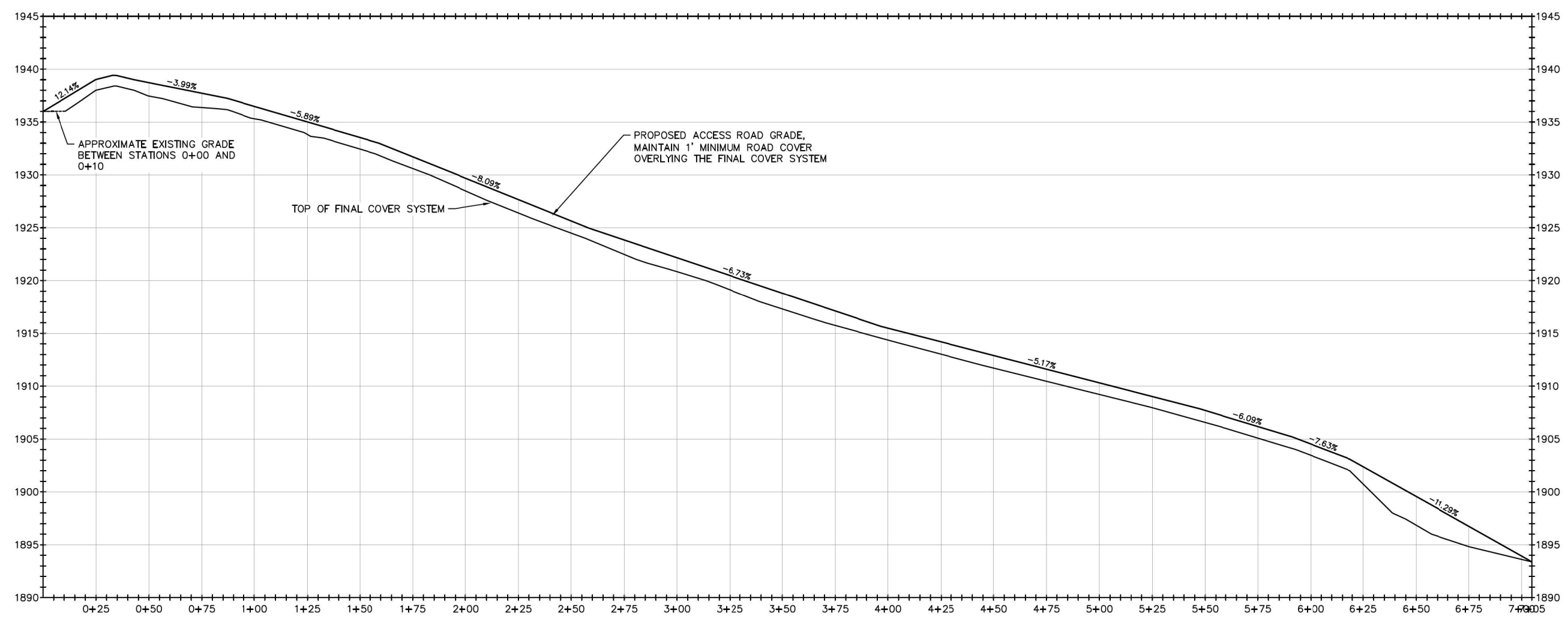
- HYDRAULICALLY ADEQUATE ALTERNATIVE MATERIALS FOR THE STORMWATER PIPES, CULVERTS, SEWERS, JUNCTIONS, AND DOWNCHUTES MAY BE SUBSTITUTED AT OWNER'S DISCRETION.
- SEE SHEET 12 FOR STORM SEWER SYSTEM PROFILES AND SHEET 18 FOR STORMWATER CONVEYANCE CHANNEL SCHEDULE.
- MAXIMUM SLOPE OF FINAL COVER SYSTEM WILL BE 33%, MINIMUM SLOPE AT CLOSURE WILL BE APPROXIMATELY 5%.
- EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE INSTALLED INTERMEDIATE COVER TOPOGRAPHY AND SURROUNDING TOPOGRAPHY BASED UPON AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022 AND AN SCS DRONE AERIAL DATED MAY 11, 2023.
- THE LOCATIONS OF THE EXISTING GAS PROBES AND EXISTING MANHOLES SHOWN ARE APPROXIMATE BASED ON DATA PROVIDED BY DRAPER ADEN ASSOCIATES. THE EXACT LOCATIONS OF THESE EXISTING WELLFIELD COMPONENTS MAY NEED IN-FIELD VERIFICATION.
- THE FINAL COVER SYSTEM EXTENT IS APPROXIMATELY 12.4 ACRES. FINAL COVER SYSTEM TO BE INSTALLED PER DETAIL (8/19).
- THE APPROXIMATE EXTENTS OF THE SCCS ARE SHOWN WITH CLS, EDGE LINES, AND HATCHING.

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GENERAL NOTES

1. THE DASHED HALF-TONE CONTOUR LINES REPRESENT THE INSTALLED FINAL COVER SYSTEM TOPOGRAPHY AND SURROUNDING TOPOGRAPHY BASED UPON AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022 AND AN SCS DRONE AERIAL DATED MAY 11, 2023.
2. THE FULL-TONE CONTINUOUS CONTOUR LINES SHOW THE PROPOSED ACCESS ROAD INSTALLATION GRADE.



PROPOSED ACCESS ROAD
 H: 1" = 25'
 V: 1" = 5'

NO.	REVISION	DATE
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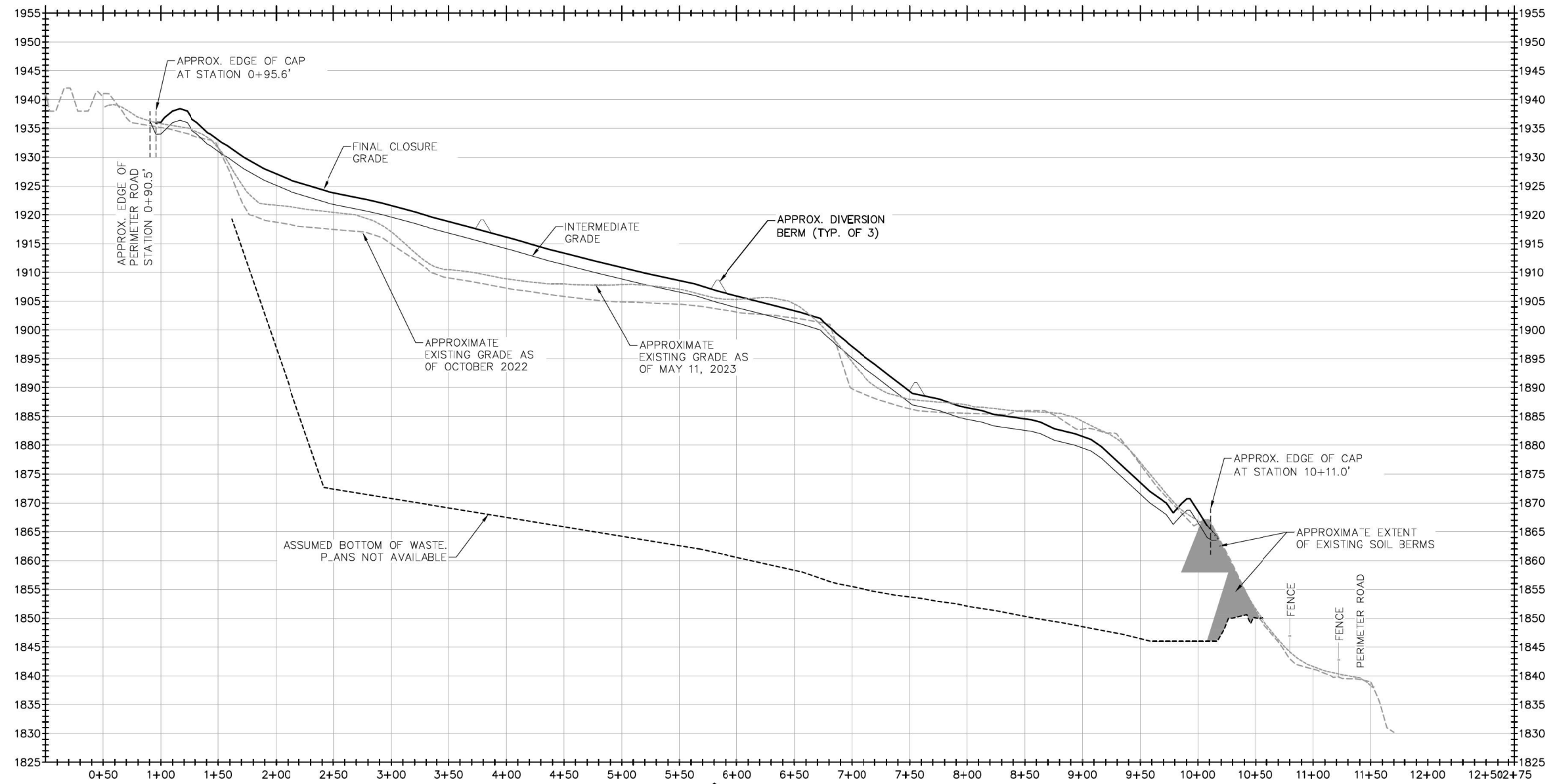
SHEET TITLE	ACCESS ROAD
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
 15821 MIDLOTHIAN TRPK. MIDLOTHIAN, VA 23113
 PH: (804) 378-7440 FAX: (804) 378-7483

PROJ. NO. 02218208.05
 DWN. BY: TRW/LLH
 C/K. BY: TRW
 C/A. BY: C/JW/DBK
 APP. BY: C/JW

CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN



SECTION 1
 H: 1" = 50'
 V: 1" = 10'

GENERAL NOTES

1. EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022.
2. EXISTING GRADES SHOWN AS DASHED FULL-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AN SCS ENGINEERS DRONE FLYOVER (DATE AS INDICATED).
3. THE ASSUMED BOTTOM OF WASTE PROFILE IS BASED UPON DRAWINGS PREPARED BY OTHERS. THE ORIGINAL PLANS ARE NOT AVAILABLE.
4. THE WRITTEN SCALES INDICATED UNDERNEATH THE PROFILE VIEW TITLES WILL VARY DEPENDING UPON PLOT SIZE. DRAWINGS ARE INTENDED TO BE PLOTTED ON 24" X 36" SHEETS.

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SHEET TITLE: **CROSS SECTIONS 1**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

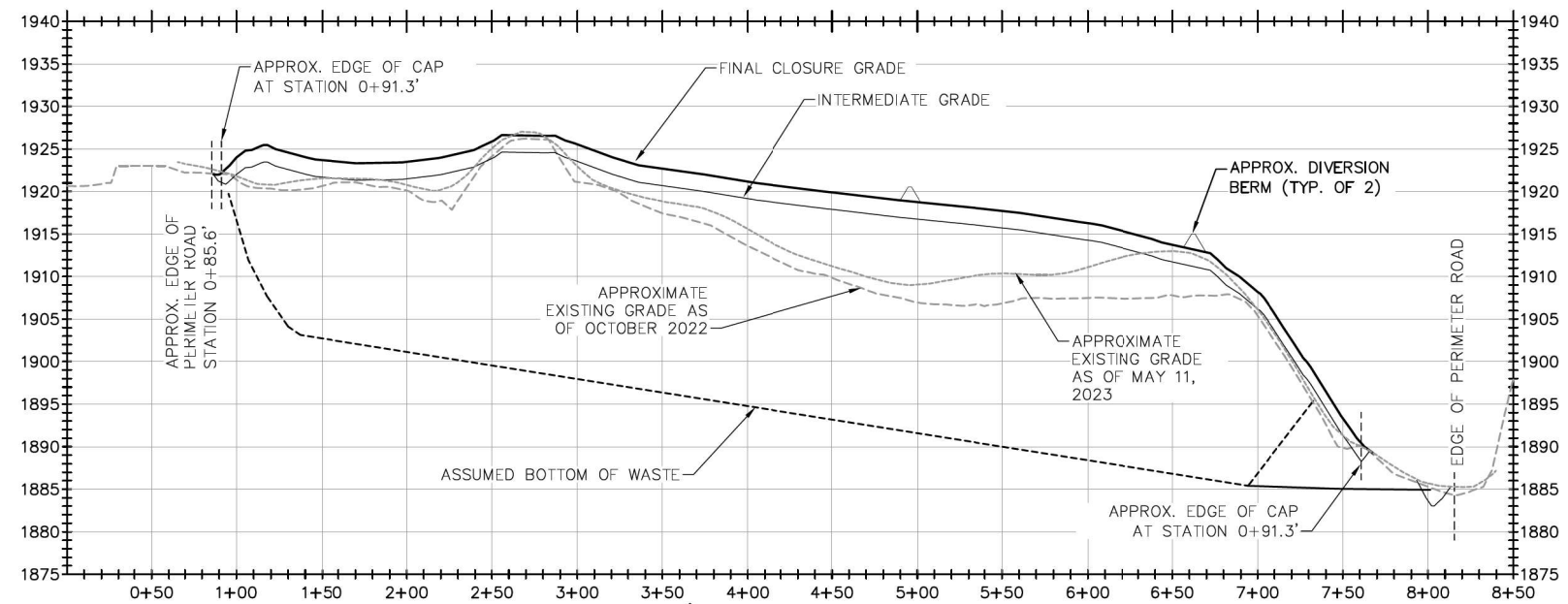
CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 1525 W. MAIN ST., SUITE 200
 PH: (803) 376-7440 FAX: (803) 376-7433

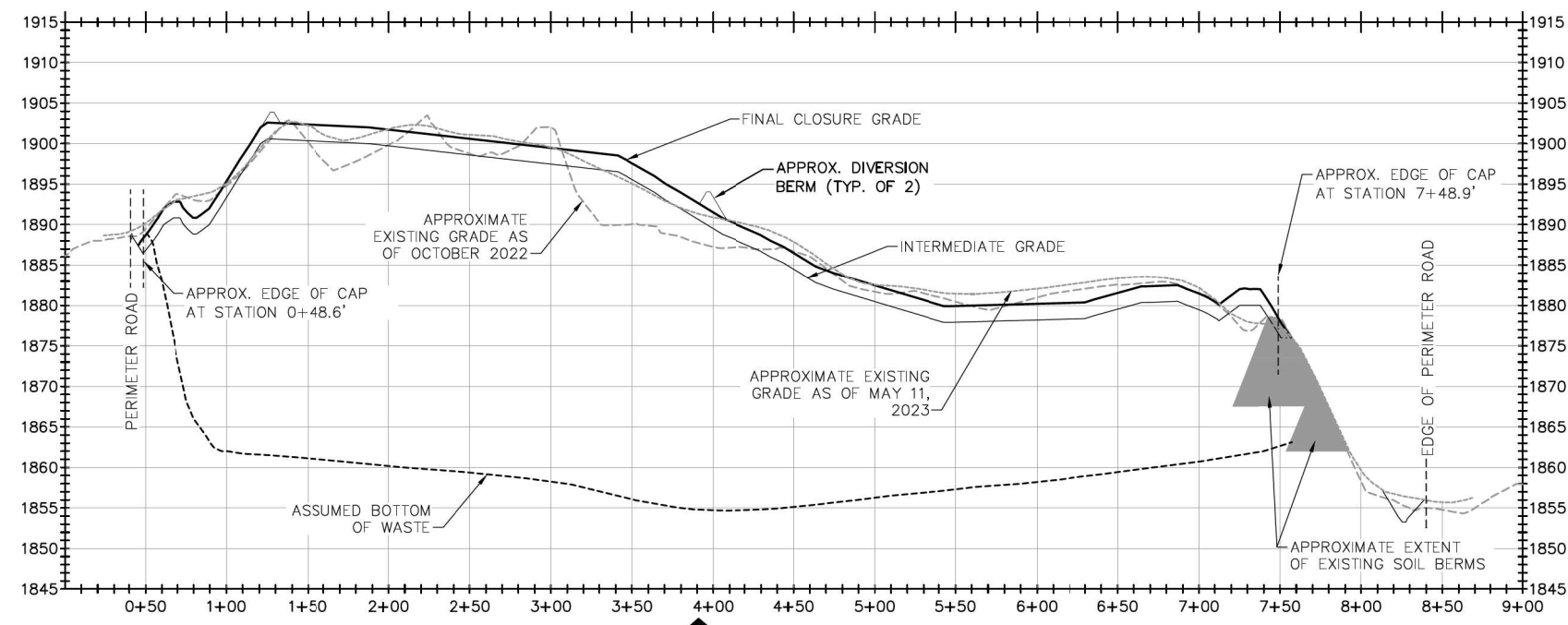
PROJ. NO.: 02218208.05
 DATE: 8/18/2023
 DWG. BY: TRW
 CHK. BY: C.J.W.
 APPR. BY: C.J.W.

CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO.

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SECTION 2
 H: 1" = 50'
 V: 1" = 10'



SECTION 3
 H: 1" = 50'
 V: 1" = 10'

GENERAL NOTES

- EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022.
- EXISTING GRADES SHOWN AS DASHED FULL-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AN SCS ENGINEERS DRONE FLYOVER (DATE AS INDICATED).
- THE ASSUMED BOTTOM OF WASTE PROFILE IS BASED UPON DRAWINGS PREPARED BY OTHERS. THE ORIGINAL PLANS ARE NOT AVAILABLE.
- THE WRITTEN SCALES INDICATED UNDERNEATH THE PROFILE VIEW TITLES WILL VARY DEPENDING UPON PLOT SIZE. DRAWINGS ARE INTENDED TO BE PLOTTED ON 24" X 36" SHEETS.

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SHEET TITLE: **CROSS SECTIONS 2**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 1525 W. MAIN ST., SUITE 200
 PH: (803) 378-7400 FAX: (803) 378-7433
 DWN: BFC
 TRW: TRW
 RW: RW
 LLH: LLH
 C/JW: C/JW
 DBK: DBK
 APP: APP
 C/JW: C/JW

CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO.

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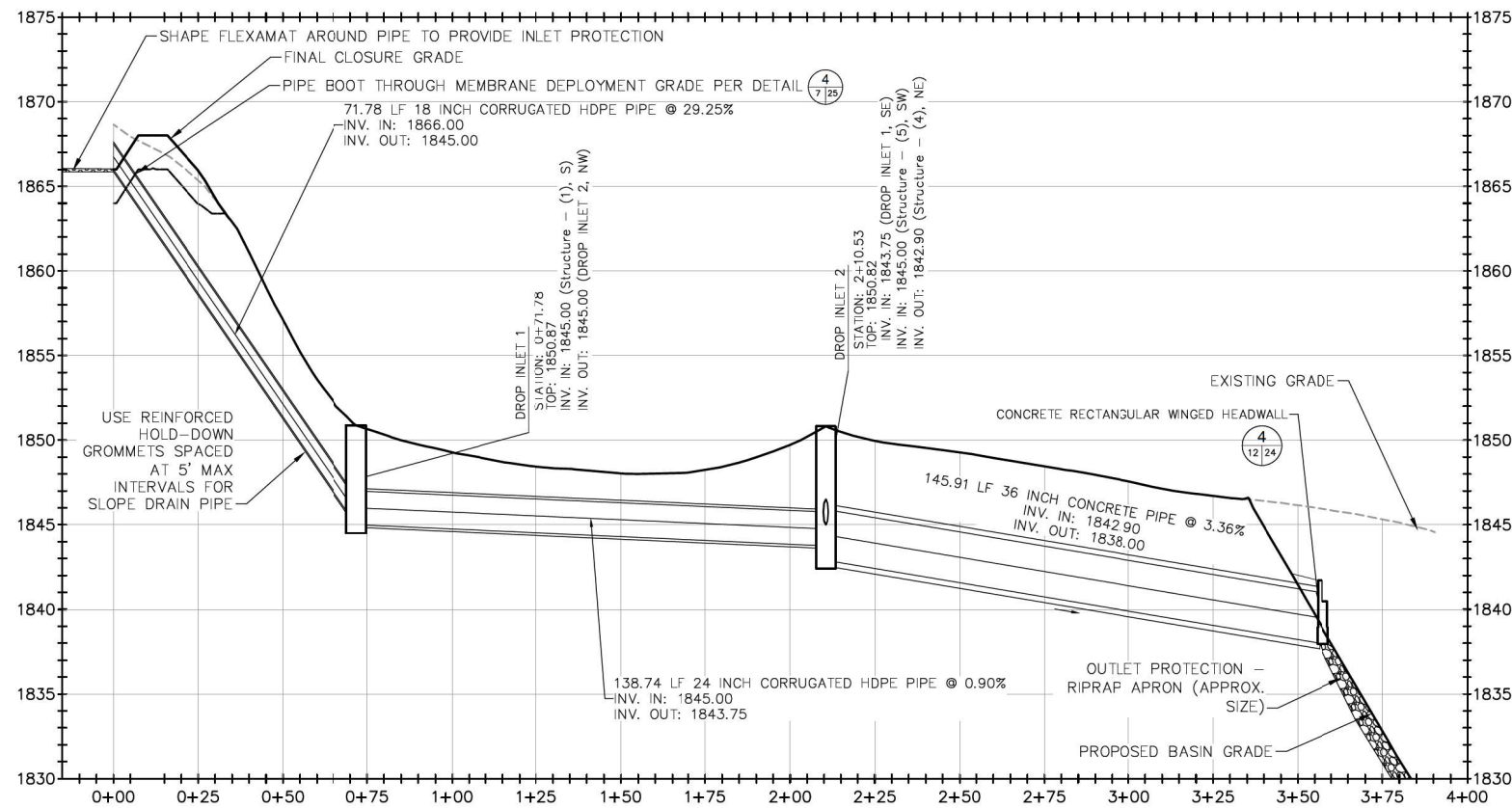
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 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

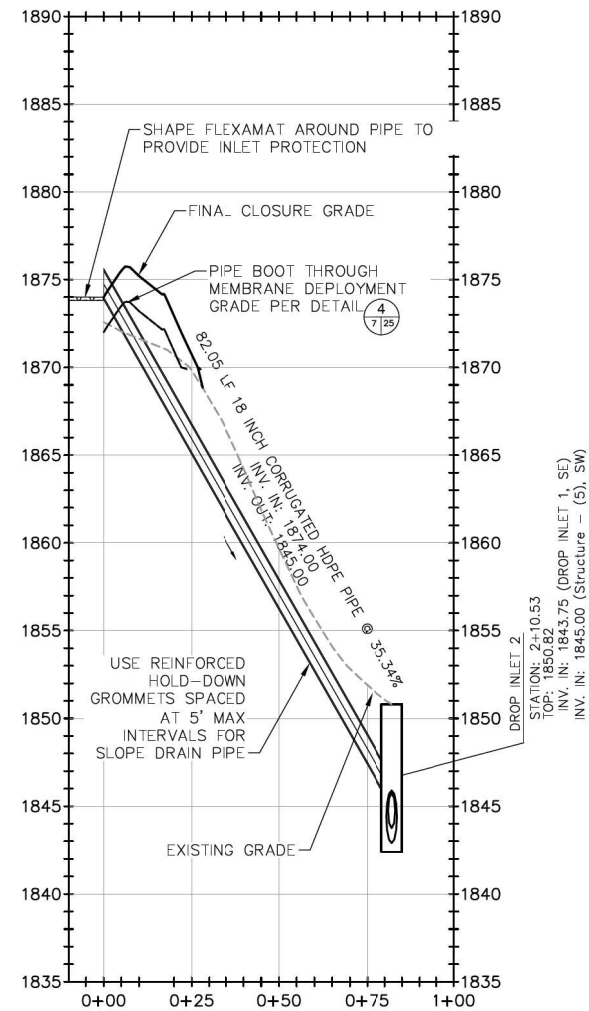
CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 10220 W. WOODBURN AVENUE, SUITE 200
 FARMINGTON, VA 24113
 PH: (803) 378-7440 FAX: (803) 378-7433
 PROJ. NO.: 02218208.05
 DATE: 02/18/2025
 DWG. BY: TRW
 CHK. BY: TRW
 APP. BY: C/JW
 DATE: 8/18/23
 SCALE: AS SHOWN
 DRAWING NO.

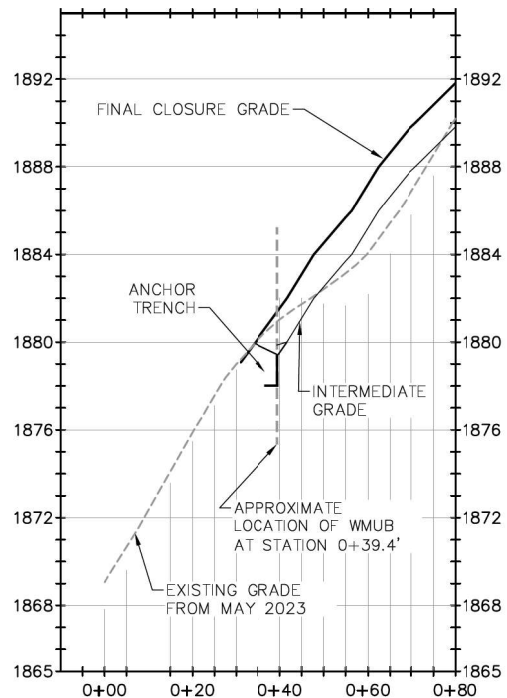
CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO.: **12** of 26



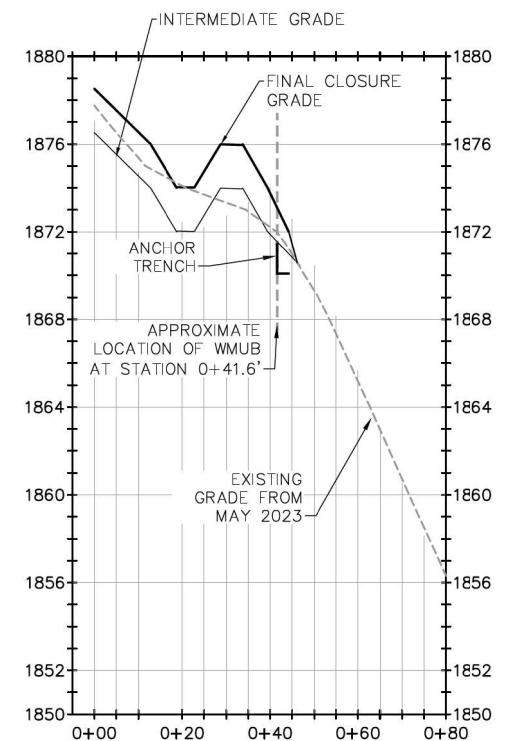
STORM SEWER 1
 H: 1" = 25'
 V: 1" = 5'



STORM SEWER 2
 H: 1" = 25'
 V: 1" = 5'



NORTH EDGE OF CAP DETAIL
 H: 1" = 20'
 V: 1" = 4'



EAST EDGE OF CAP DETAIL
 H: 1" = 20'
 V: 1" = 4'

GENERAL NOTES

- BURIED STORMWATER PIPES TO BE INSTALLED PER DETAIL (2/8/19) OR PER MANUFACTURER'S GUIDANCE WITH ENGINEER'S APPROVAL.
- HYDRAULICALLY ADEQUATE ALTERNATIVE MATERIALS FOR THE STORMWATER PIPES, CULVERTS, SEWERS, JUNCTIONS, AND DOWNCHUTES MAY BE SUBSTITUTED AT OWNER'S DISCRETION.
- EXISTING GRADES SHOWN AS DASHED HALF-TONE LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022 AND AN SCS DRONE AERIAL DATED MAY 11, 2023.
- THE ASSUMED BOTTOM OF WASTE PROFILE IS BASED UPON DRAWINGS PREPARED BY OTHERS. THE ORIGINAL PLANS ARE NOT AVAILABLE.
- THE WRITTEN SCALE INDICATED UNDERNEATH THE PROFILE VIEW TITLES WILL VARY DEPENDING UPON PLOT SIZE. DRAWINGS ARE INTENDED TO BE PLOTTED ON 24" X 36" SHEETS

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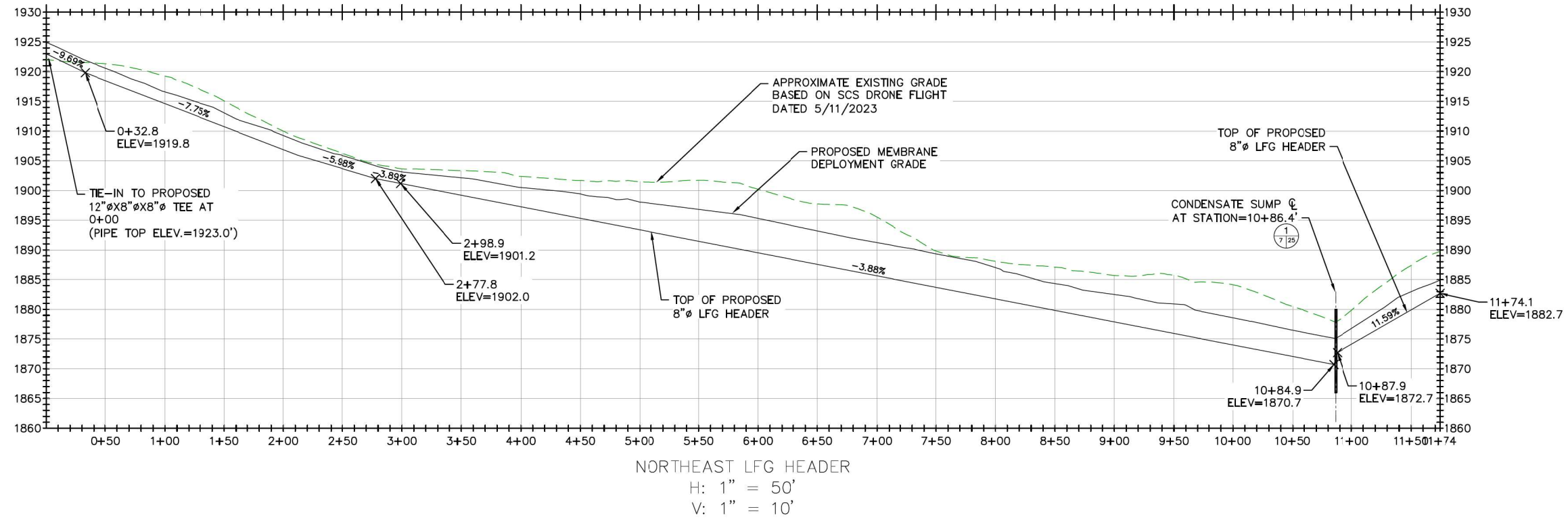
NO.	REVISION	DATE
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SHEET TITLE: **LFG PROFILES 1**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 1525 W. MAIN ST., SUITE 200
 PH: (803) 376-7440 FAX: (803) 376-7433
 PROJ. NO.: 02218208.05
 DATE: 08/18/2023
 DWG. BY: TRW/LLH
 CHK. BY: TRW
 APP. BY: C.J.W.

CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO.



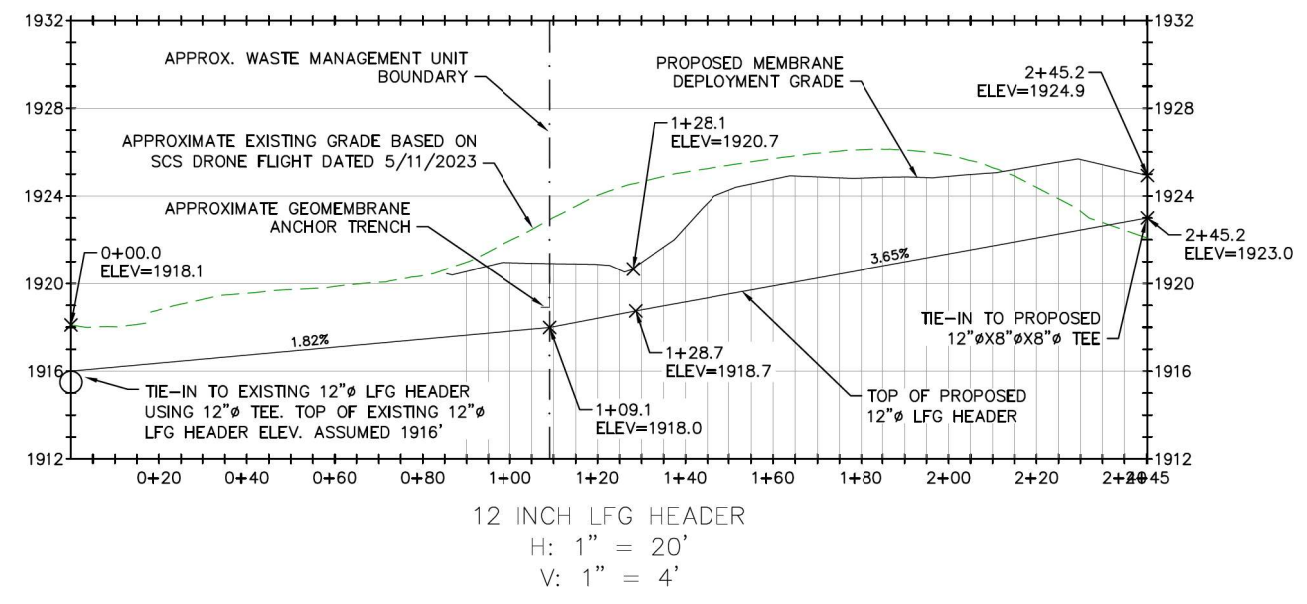
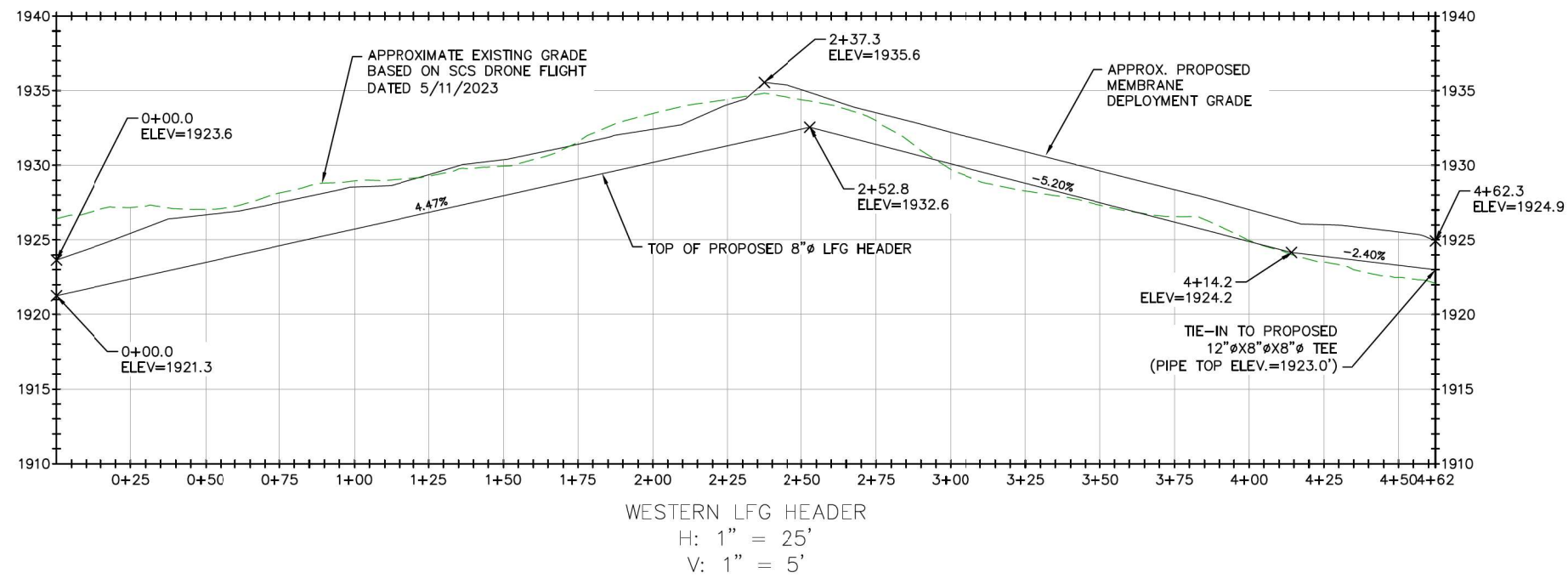
GENERAL NOTES

- EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022 AND AN SCS ENGINEERS DRONE FLYOVER DATED MAY 2023.
- THE ASSUMED BOTTOM OF WASTE PROFILE IS BASED UPON DRAWINGS PREPARED BY DRAPER ADEN ASSOCIATES. THE ORIGINAL PLANS ARE NOT AVAILABLE.
- THE WRITTEN SCALES INDICATED UNDERNEATH THE PROFILE VIEW TITLES WILL VARY DEPENDING UPON PLOT SIZE. DRAWINGS ARE INTENDED TO BE PLOTTED ON 24" X 36" SHEETS.

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GENERAL NOTES

- EXISTING GRADES SHOWN AS DASHED HALF-TONE CONTOUR LINES REPRESENT THE TOPOGRAPHY DEVELOPED FROM AERIAL PHOTOGRAPHY PROVIDED BY NV5 GEOSPATIAL, DATED OCTOBER 7, 2022 AND AN SCS ENGINEERS DRONE FLYOVER DATED MAY 2023.
- THE ASSUMED BOTTOM OF WASTE PROFILE IS BASED UPON DRAWINGS PREPARED BY DRAPER ADEN ASSOCIATES. THE ORIGINAL PLANS ARE NOT AVAILABLE.
- THE WRITTEN SCALES INDICATED UNDERNEATH THE PROFILE VIEW TITLES WILL VARY DEPENDING UPON PLOT SIZE. DRAWINGS ARE INTENDED TO BE PLOTTED ON 24" X 36" SHEETS.

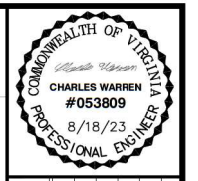
SHEET TITLE: **LFG PROFILES 2**
PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
1425 W. MAIN ST., SUITE 200
PH: (803) 378-7440 FAX: (803) 378-7433
PROJ. NO.: 02218208.05
DATE: 02/18/2025
DWG. BY: TRW
CHK. BY: TRW
APP. BY: C/JW
DATE: 8/18/23

CADD FILE: 02218208.05
DATE: 8/18/2023
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DRAWING NO.

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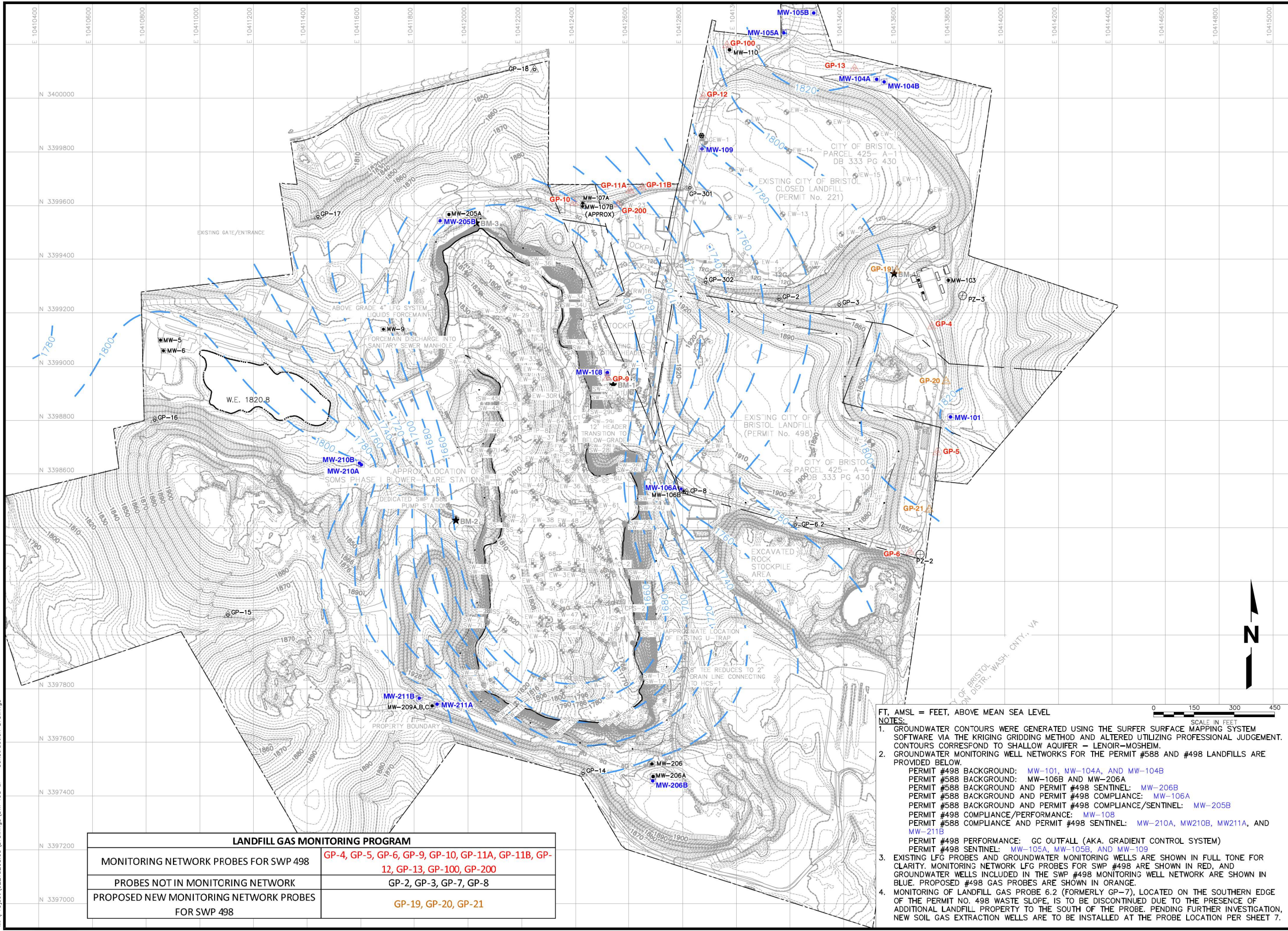


NO.	REVISION	DATE

SHEET TITLE	SITE MONITORING PLAN
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
	2655 VALLEY DRIVE BRISTOL, VA 24201

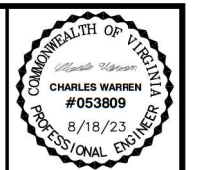
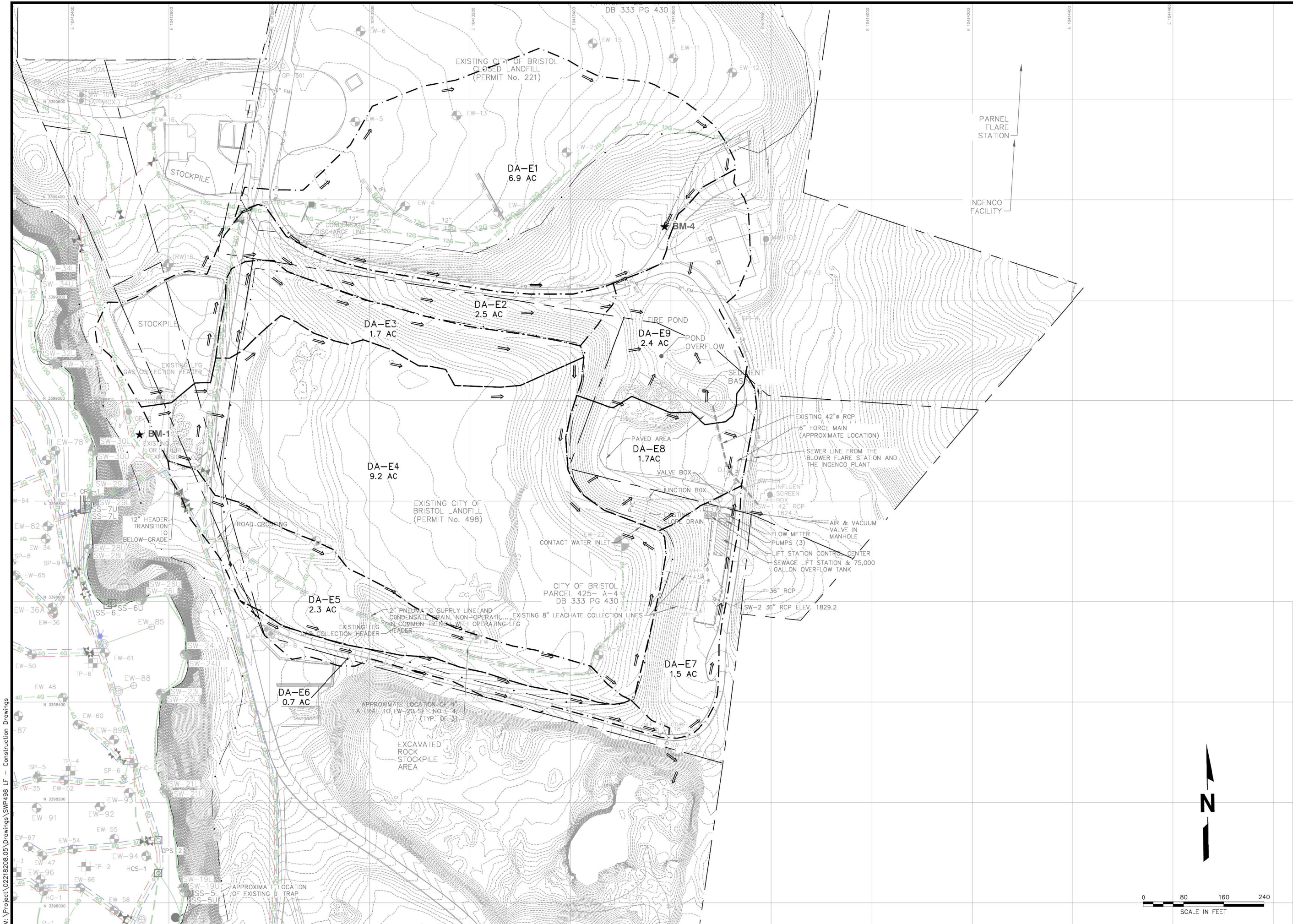
SCS ENGINEERS	STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
	2625 W. MARKET STREET, SUITE 200, BRISTOL, VA 24201 PH: (803) 376-7440 FAX: (803) 376-7483
PROJ. NO.	02218208.05
DWG. BY	TRW/LLH
CHECKED BY	TRW
DATE	8/18/2023
SCALE	AS SHOWN
DRAWING NO.	15 of 26



LANDFILL GAS MONITORING PROGRAM	
MONITORING NETWORK PROBES FOR SWP 498	GP-4, GP-5, GP-6, GP-9, GP-10, GP-11A, GP-11B, GP-12, GP-13, GP-100, GP-200
PROBES NOT IN MONITORING NETWORK	GP-2, GP-3, GP-7, GP-8
PROPOSED NEW MONITORING NETWORK PROBES FOR SWP 498	GP-19, GP-20, GP-21

- FT, AMSL = FEET, ABOVE MEAN SEA LEVEL
- NOTES:
- GROUNDWATER CONTOURS WERE GENERATED USING THE SURFER SURFACE MAPPING SYSTEM SOFTWARE VIA THE KRIGING GRIDING METHOD AND ALTERED UTILIZING PROFESSIONAL JUDGEMENT. CONTOURS CORRESPOND TO SHALLOW AQUIFER - LENOIR-MOSHEIM.
 - GROUNDWATER MONITORING WELL NETWORKS FOR THE PERMIT #588 AND #498 LANDFILLS ARE PROVIDED BELOW.
 - PERMIT #498 BACKGROUND: MW-101, MW-104A, AND MW-104B
 - PERMIT #588 BACKGROUND: MW-106B AND MW-206A
 - PERMIT #588 BACKGROUND AND PERMIT #498 SENTINEL: MW-206B
 - PERMIT #588 BACKGROUND AND PERMIT #498 COMPLIANCE: MW-106A
 - PERMIT #588 BACKGROUND AND PERMIT #498 COMPLIANCE/SENTINEL: MW-205B
 - PERMIT #498 COMPLIANCE/PERFORMANCE: MW-108
 - PERMIT #588 COMPLIANCE AND PERMIT #498 SENTINEL: MW-210A, MW210B, MW211A, AND MW-211B
 - PERMIT #498 PERFORMANCE: GC OUTFALL (AKA. GRADIENT CONTROL SYSTEM)
 - PERMIT #498 SENTINEL: MW-105A, MW-105B, AND MW-109
 - EXISTING LFG PROBES AND GROUNDWATER MONITORING WELLS ARE SHOWN IN FULL TONE FOR CLARITY. MONITORING NETWORK LFG PROBES FOR SWP #498 ARE SHOWN IN RED, AND GROUNDWATER WELLS INCLUDED IN THE SWP #498 MONITORING WELL NETWORK ARE SHOWN IN BLUE. PROPOSED #498 GAS PROBES ARE SHOWN IN ORANGE.
 - MONITORING OF LANDFILL GAS PROBE 6.2 (FORMERLY GP-7), LOCATED ON THE SOUTHERN EDGE OF THE PERMIT NO. 498 WASTE SLOPE, IS TO BE DISCONTINUED DUE TO THE PRESENCE OF ADDITIONAL LANDFILL PROPERTY TO THE SOUTH OF THE PROBE. PENDING FURTHER INVESTIGATION, NEW SOIL GAS EXTRACTION WELLS ARE TO BE INSTALLED AT THE PROBE LOCATION PER SHEET 7.

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NO.	REVISION	DATE
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SHEET TITLE
EXISTING DRAINAGE PLAN

PROJECT TITLE
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

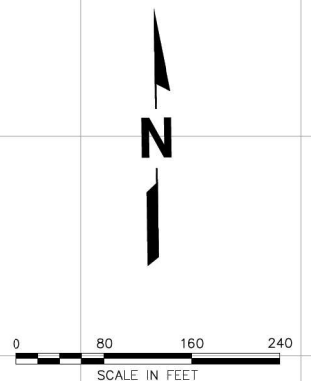
CLIENT
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
1000 W. MAIN ST., SUITE 200
BRISTOL, VA 24201
PH: (803) 378-7440 FAX: (803) 378-7433

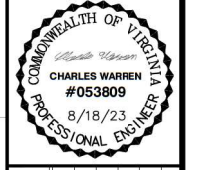
PROJ. NO. 02218208.05
DATE: 8/18/2023

DWG. BY: TRW/LLH
CHK. BY: TRW
APP. BY: C.W.

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DATE: 8/18/2023
SCALE: AS SHOWN
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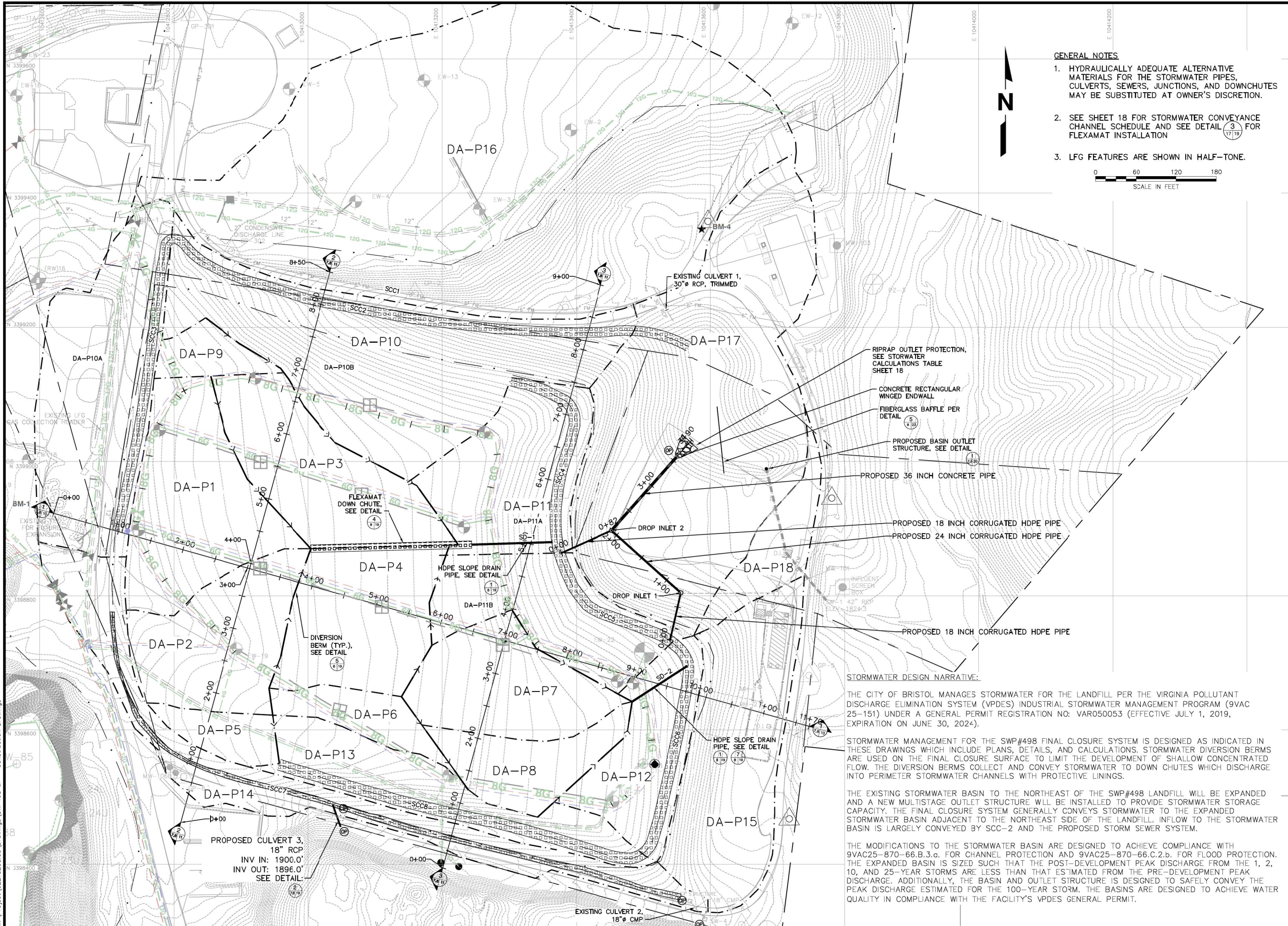


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GENERAL NOTES

1. HYDRAULICALLY ADEQUATE ALTERNATIVE MATERIALS FOR THE STORMWATER PIPES, CULVERTS, SEWERS, JUNCTIONS, AND DOWNCHUTES MAY BE SUBSTITUTED AT OWNER'S DISCRETION.
2. SEE SHEET 18 FOR STORMWATER CONVEYANCE CHANNEL SCHEDULE AND SEE DETAIL (3) FOR FLEXAMAT INSTALLATION
3. LFG FEATURES ARE SHOWN IN HALF-TONE.



RIPRAP OUTLET PROTECTION, SEE STORMWATER CALCULATIONS TABLE SHEET 18

CONCRETE RECTANGULAR WINGED ENDWALL
 FIBERGLASS BAFFLE PER DETAIL

PROPOSED BASIN OUTLET STRUCTURE, SEE DETAIL

PROPOSED 36 INCH CONCRETE PIPE

PROPOSED 18 INCH CORRUGATED HDPE PIPE
 PROPOSED 24 INCH CORRUGATED HDPE PIPE

PROPOSED 18 INCH CORRUGATED HDPE PIPE

STORMWATER DESIGN NARRATIVE:

THE CITY OF BRISTOL MANAGES STORMWATER FOR THE LANDFILL PER THE VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM (VPDES) INDUSTRIAL STORMWATER MANAGEMENT PROGRAM (9VAC 25-151) UNDER A GENERAL PERMIT REGISTRATION NO: VAR050053 (EFFECTIVE JULY 1, 2019, EXPIRATION ON JUNE 30, 2024).

STORMWATER MANAGEMENT FOR THE SWP#498 FINAL CLOSURE SYSTEM IS DESIGNED AS INDICATED IN THESE DRAWINGS WHICH INCLUDE PLANS, DETAILS, AND CALCULATIONS. STORMWATER DIVERSION BERMS ARE USED ON THE FINAL CLOSURE SURFACE TO LIMIT THE DEVELOPMENT OF SHALLOW CONCENTRATED FLOW. THE DIVERSION BERMS COLLECT AND CONVEY STORMWATER TO DOWN CHUTES WHICH DISCHARGE INTO PERIMETER STORMWATER CHANNELS WITH PROTECTIVE LININGS.

THE EXISTING STORMWATER BASIN TO THE NORTHEAST OF THE SWP#498 LANDFILL WILL BE EXPANDED AND A NEW MULTISTAGE OUTLET STRUCTURE WILL BE INSTALLED TO PROVIDE STORMWATER STORAGE CAPACITY. THE FINAL CLOSURE SYSTEM GENERALLY CONVEYS STORMWATER TO THE EXPANDED STORMWATER BASIN ADJACENT TO THE NORTHEAST SIDE OF THE LANDFILL. INFLOW TO THE STORMWATER BASIN IS LARGELY CONVEYED BY SCC-2 AND THE PROPOSED STORM SEWER SYSTEM.

THE MODIFICATIONS TO THE STORMWATER BASIN ARE DESIGNED TO ACHIEVE COMPLIANCE WITH 9VAC25-870-66.B.3.a. FOR CHANNEL PROTECTION AND 9VAC25-870-66.C.2.b. FOR FLOOD PROTECTION. THE EXPANDED BASIN IS SIZED SUCH THAT THE POST-DEVELOPMENT PEAK DISCHARGE FROM THE 1, 2, 10, AND 25-YEAR STORMS ARE LESS THAN THAT ESTIMATED FROM THE PRE-DEVELOPMENT PEAK DISCHARGE. ADDITIONALLY, THE BASIN AND OUTLET STRUCTURE IS DESIGNED TO SAFELY CONVEY THE PEAK DISCHARGE ESTIMATED FOR THE 100-YEAR STORM. THE BASINS ARE DESIGNED TO ACHIEVE WATER QUALITY IN COMPLIANCE WITH THE FACILITY'S VPDES GENERAL PERMIT.

NO.	REVISION	DATE

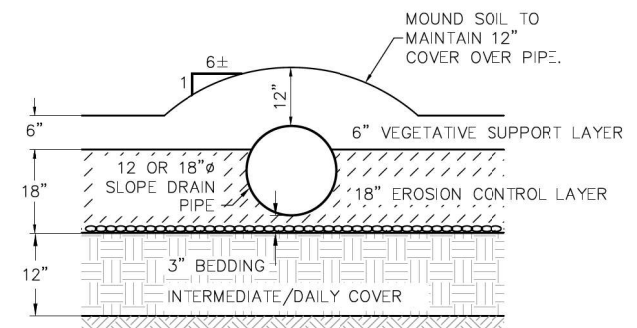
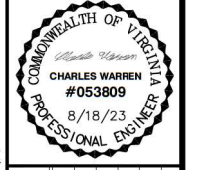
SHEET TITLE	STORMWATER MANAGEMENT PLAN
PROJECT TITLE	SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT	CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY 2655 VALLEY DRIVE BRISTOL, VA 24201
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CONTRACTOR	SCS ENGINEERS STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC. 102218208.05 PH: (803) 378-7460 FAX: (803) 378-7463
DRAWN BY	TRW
CHECKED BY	TRW
DATE	02/21/2025
SCALE	AS SHOWN

CADD FILE:	02218208.05
DATE:	8/18/2023
SCALE:	AS SHOWN
DRAWING NO.	17

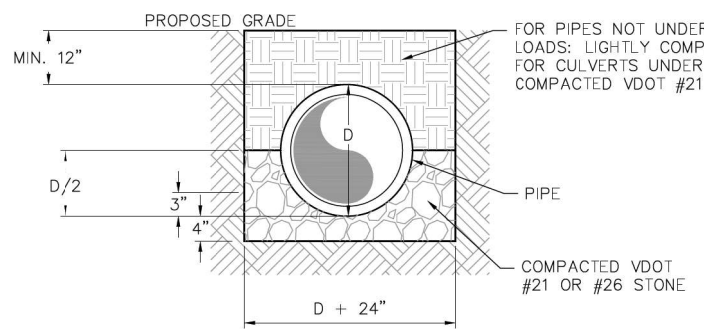
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- NOTES:**
1. ALL PIPE FITTINGS AND CONNECTIONS SHALL BE WATERTIGHT.
 2. PIPE ENTRANCES SHALL BE GRADED FOR A SMOOTH SWALE-TO-FLANGE TRANSITION.
 3. USE REINFORCED HOLD-DOWN GROMMETS SPACED AT 5' MAX INTERVALS FOR SLOPE DRAIN PIPE.

PERMANENT SLOPE DRAIN DETAIL
NOT TO SCALE

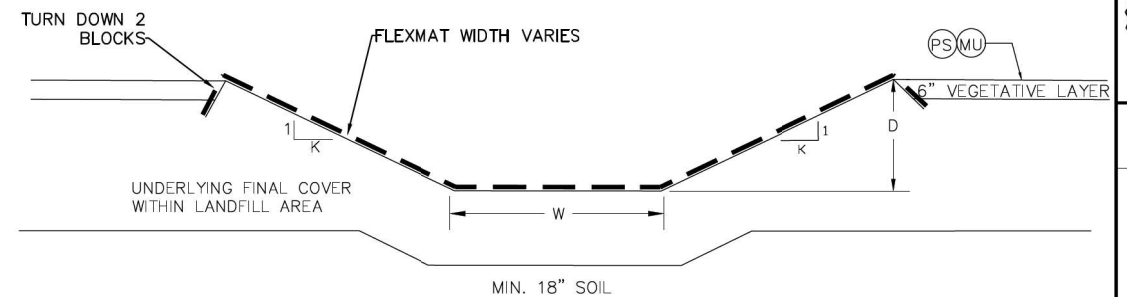
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- NOTES:**
1. SHOULD GROUNDWATER OR SATURATED SOILS BE EXPECTED, BEDDING SHALL BE VDOT #57 STONE IN LIEU OF VDOT #21 OR #26 STONE.

BURIED STORMWATER PIPE BEDDING AND BACKFILL
NOT TO SCALE

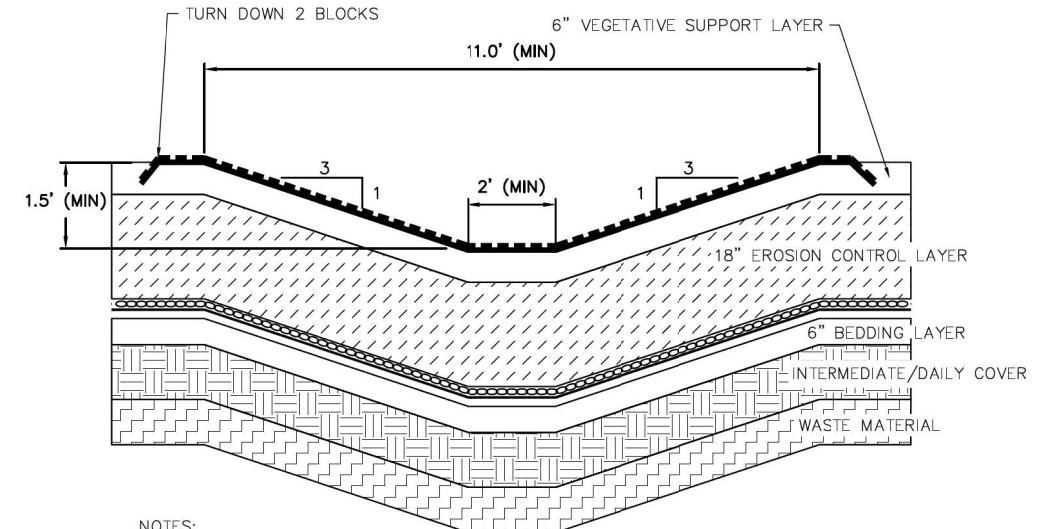
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- NOTE:**
1. FOR FLEXAMAT LINED STORMWATER CONVEYANCE CHANNELS (SCC), CHANNEL DIMENSIONS SHALL BE PER THE FINAL GRADING PLAN AND SCC SCHEDULE ON THE STORMWATER CALCULATIONS SHEET.

STORMWATER CONVEYANCE CHANNEL FLEXAMAT INSTALLATION DETAIL
NOT TO SCALE

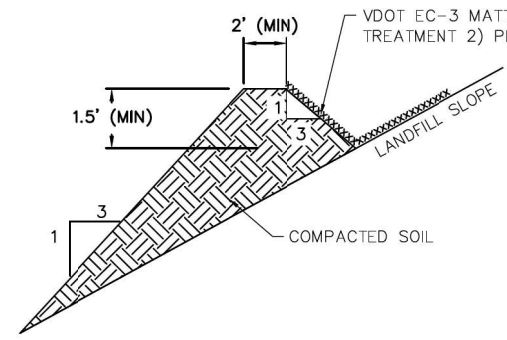
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- NOTES:**
1. WHERE DIVERSION BERMS ENTER INTO FLEXAMAT DOWN CHUTE, EXTEND FLEXAMAT 8 FEET INTO DIVERSION BERM TO CREATE TRANSITION.
 2. CHANNEL DIMENSIONS SHOWN FOR DOWN CHUTE ONLY. FOR FLEXAMAT LINED STORMWATER CONVEYANCE CHANNELS (SCC), SEE CHANNEL SCHEDULE AND FINAL GRADING PLAN.

FINAL COVER FLEXAMAT DOWNCHUTE INSTALLATION DETAIL
NOT TO SCALE

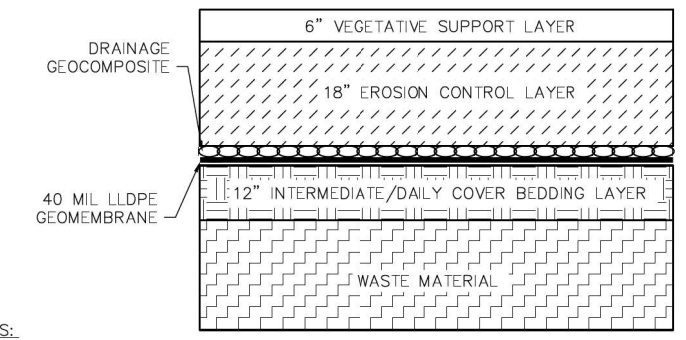
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- NOTES:**
1. FLOW SLOPE OF THE DIVERSION TO BE MIN. 2%
 2. SEE FINAL COVER DOWNCHUTE DETAIL FOR CONNECTION OF DIVERSION BERMS.

DIVERSION BERM DETAIL
NOT TO SCALE

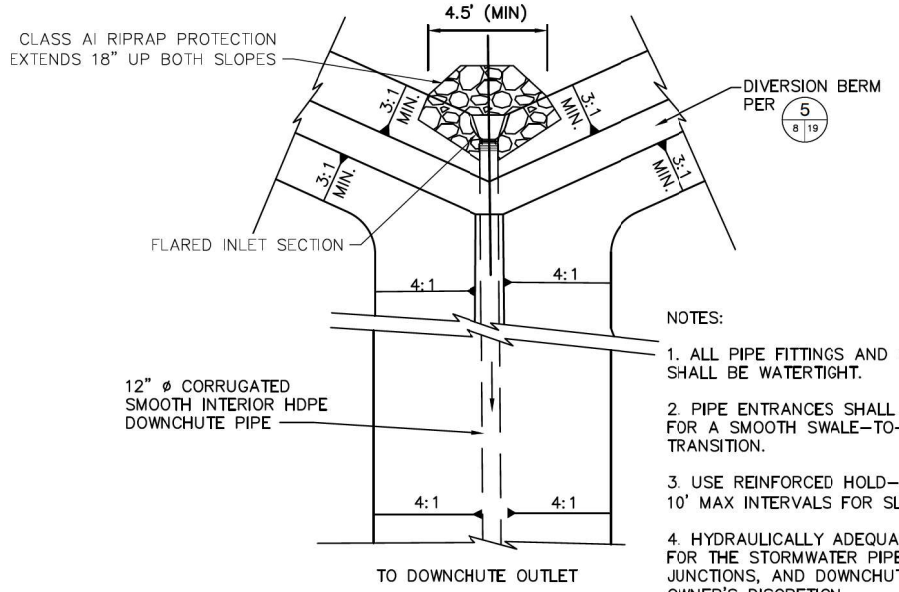
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- NOTES:**
1. THE TOP 6" OF INTERMEDIATE/DAILY COVER WILL FUNCTION AS A BEDDING LAYER. THE SURFACE SHALL BE SMOOTH AND FREE OF STICKS, ROCKS LARGER THAN 3/8 INCH, OR OTHER IRREGULARITIES WHICH COULD PUNCTURE THE SYNTHETIC CAP.
 2. THE SYNTHETIC CAP SHALL BE PLACED AS PER MANUFACTURER'S RECOMMENDATIONS. SEE CLOSURE SPECIFICATIONS FOR ALLOWABLE MATERIALS, INSTALLATION AND QUALITY CONTROL MEASURES.
 3. EROSION CONTROL LAYER SHALL BE PLACED IMMEDIATELY AFTER THE GEOCOMPOSITE. THE GEOCOMPOSITE MAY NOT BE EXPOSED TO SUNLIGHT FOR MORE THAN THE TIME LIMITED IN THE PROJECT SPECIFICATIONS.
 4. THE VEGETATIVE COVER SHALL BE PLACED AND SEEDING IMMEDIATELY AFTER INSTALLATION OF THE EROSION CONTROL LAYER. A TEMPORARY SEEDING MIXTURE MAY BE USED TO PROTECT THE AREA FROM EROSION. ONCE THE CLOSURE IS COMPLETED, FINAL SEEDING WILL OCCUR.
 5. THE GEOMEMBRANE DEPLOYMENT GRADE IS THE TOP OF THE BEDDING LAYER.

FINAL COVER SYSTEM DETAIL
NOT TO SCALE

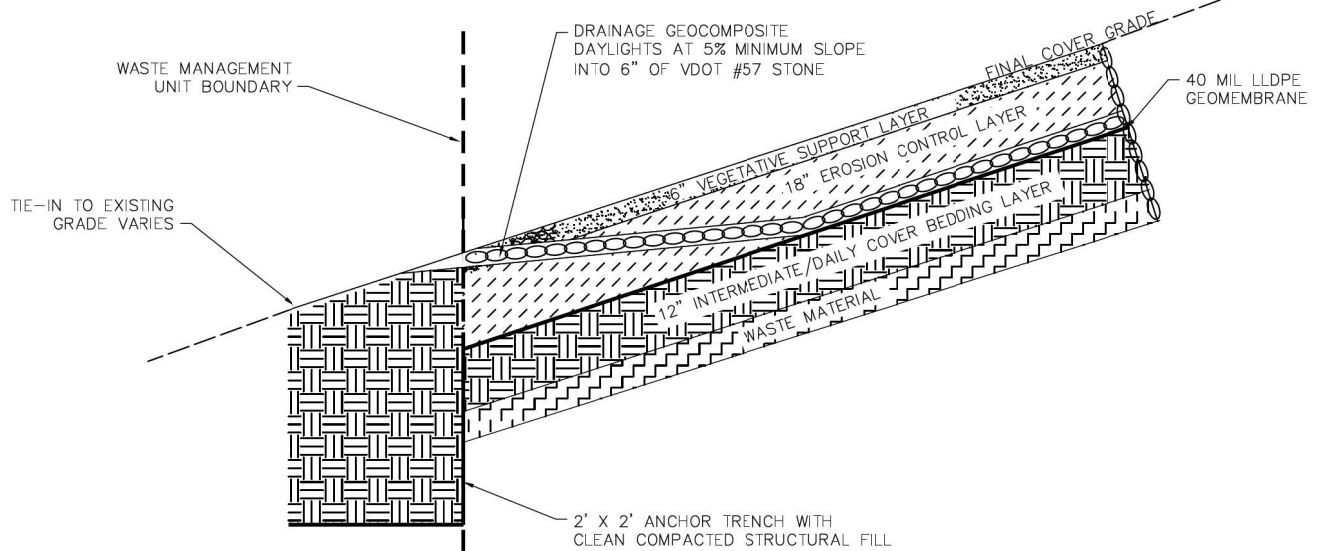
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- NOTES:**
1. ALL PIPE FITTINGS AND CONNECTIONS SHALL BE WATERTIGHT.
 2. PIPE ENTRANCES SHALL BE GRADED FOR A SMOOTH SWALE-TO-FLANGE TRANSITION.
 3. USE REINFORCED HOLD-DOWN GROMMETS SPACED AT 10' MAX INTERVALS FOR SLOPE DRAIN PIPE
 4. HYDRAULICALLY ADEQUATE ALTERNATIVE MATERIALS FOR THE STORMWATER PIPES, CULVERTS, SEWERS, JUNCTIONS, AND DOWNCHUTES MAY BE SUBSTITUTED AT OWNER'S DISCRETION.

HDPE DOWNCHUTE UPPER INLET WITH DIVERSION BERMS
NOT TO SCALE

7
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FINAL COVER SYSTEM ANCHOR TRENCH
NOT TO SCALE

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8 | 19

DATE	REVISION	NO.
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DETAILS 1
PROJECT TITLE
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
102218208.05
PH: (803) 376-7440 FAX: (803) 376-7433

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(PS) LIME AND FERTILIZER APPLICATION RATES
 IF POSSIBLE, DETERMINE BY SOILS TEST. WHERE NOT POSSIBLE TO OBTAIN A SOILS TEST, THE FOLLOWING SOIL AMENDMENTS WILL APPLY:

LIME

COASTAL PLAIN: 2 TONS

PIEDMONT AND APPALACHIAN REGION: 2 TONS/ACRE PULVERIZED AGRICULTURAL GRADE LIMESTONE (90 LBS./1000 FT.)

NOTE: AN AGRICULTURAL GRADE OF LIMESTONE SHOULD ALWAYS BE USED.

FERTILIZER

MIXED GRASSES AND LEGUMES: 1000 LBS./ACRE 10-20-10 OR EQUIVALENT NUTRIENTS (23 LBS./1000 FT.²).

LEGUME STANDS ONLY: 1000 LBS./ACRE 5-20-10 (23 LBS./1000 FT.²) IS PREFERRED; HOWEVER, 1000 LBS./ACRE OF 10-20-10 OR EQUIVALENT MAY BE USED.

GRASS STANDS ONLY: 1000 LBS./ACRE 10-20-10 OR EQUIVALENT NUTRIENTS, (23 LBS./1000 FT.²).

OTHER FERTILIZER FORMATIONS, INCLUDING SLOW-RELEASE SOURCES OF NITROGEN (PREFERRED FROM A WATER QUALITY STANDPOINT), MAY BE USED PROVIDED THEY CAN SUPPLY THE SAME AMOUNTS AND PROPORTIONS OF PLANT NUTRIENTS.

INCORPORATION - LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL FROM A WATER QUALITY STANDPOINT, MAY BE USED PROVIDED THEY CAN SUPPLY THE SAME AMOUNTS AND PROPORTIONS OF PLANT NUTRIENTS.

(MU) ORGANIC MULCH MATERIALS AND APPLICATION RATES			
MULCHES:	RATES:		NOTES:
	PER ACRE	PER 1000 SQ. FT.	
STRAW OR HAY	1 1/2 - 2 TONS (MINIMUM 2 TONS OF WINTER COVER)	70 - 90 LBS.	FREE FROM WEEDS AND COARSE MATER. MUST BE ANCHORED, SPREAD

PERMANENT SEEDING (PS)

VESCH STD & SPEC 3.32

**TABLE 3.32-C
 SITE SPECIFIC SEEDING MIXTURES
 FOR APPALACHIAN/MOUNTAIN AREA**

MINIMUM CARE LAWN

MINIMUM CARE LAWN	TOTAL LBS. PER ACRE
-COMMERCIAL OR RESIDENTIAL	200-250 LBS.
-KENTUCKY 31 OR TURF-TYPE TALL FESCUE	90-100%
-IMPROVED PERENNIAL RYEGRASS *	0-10%
-KENTUCKY BLUEGRASS	0-10%

HIGH-MAINTENANCE LAWN

MINIMUM OF THREE (3) UP TO FIVE (5) VARIETIES OF BLUEGRASS FROM APPROVED LIST FOR USE IN VIRGINIA

125 LBS.

GENERAL SLOPE (3:1 OR LESS)

- KENTUCKY 31 FESCUE	128 LBS.
- RED TOP GRASS	2 LBS.
- SEASONAL NURSE CROP **	<u>20 LBS.</u>
	150 LBS.

LOW-MAINTENANCE SLOPE (STEEPER THAN 3:1)

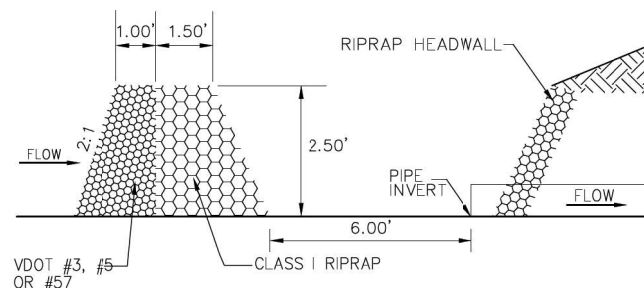
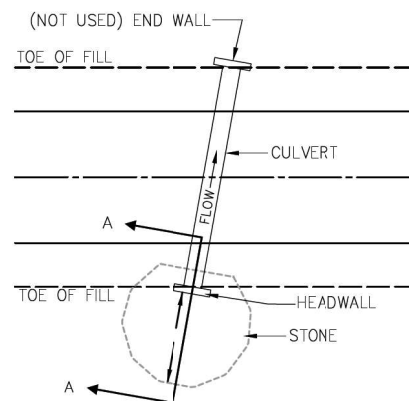
- KENTUCKY 31 FESCUE	108 LBS.
- RED TOP GRASS	2 LBS.
- SEASONAL NURSE CROP **	20 LBS.
- CROWN VETCH ***	<u>20 LBS.</u>
	150 LBS.

* PERENNIAL RYEGRASS WILL GERMINATE FASTER AND AT LOWER SOIL TEMPERATURES THAN FESCUE, THEREBY PROVIDING COVER AND EROSION RESISTANCE FOR SEEDBED.

** USE SEASONAL NURSE CROP IN ACCORDANCE WITH SEEDING DATES AS STATED BELOW:
 MARCH, APRIL THROUGH MAY 15TH ANNUAL RYE
 MAY 16TH THROUGH AUGUST 15TH FOXTAIL MILLET
 AUGUST 16TH THROUGH SEPTEMBER, OCTOBER ANNUAL RYE
 NOVEMBER THROUGH FEBRUARY WINTER RYE

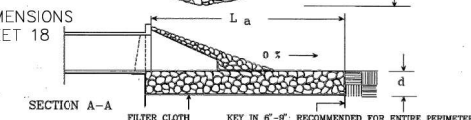
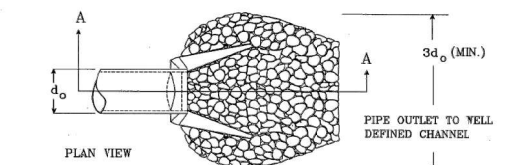
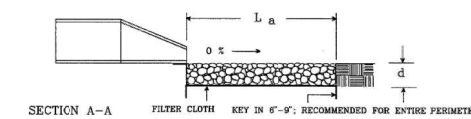
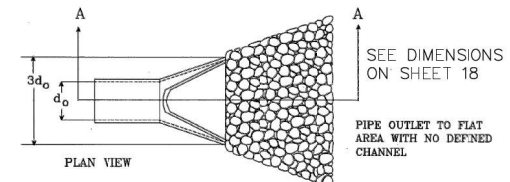
*** IF FLATPEA IS USED, INCREASE TO 30 LBS./ACRE. ALL LEGUME SEED MUST BE PROPERLY INOCULATED. WEEPING LOVEGRASS MAY ALSO BE INCLUDED IN ANY SLOPE OR LOW-MAINTENANCE MIXTURE DURING WARMER SEEDING PERIODS; ADD 10-20 LBS./ACRE IN MIXES.

III - 302



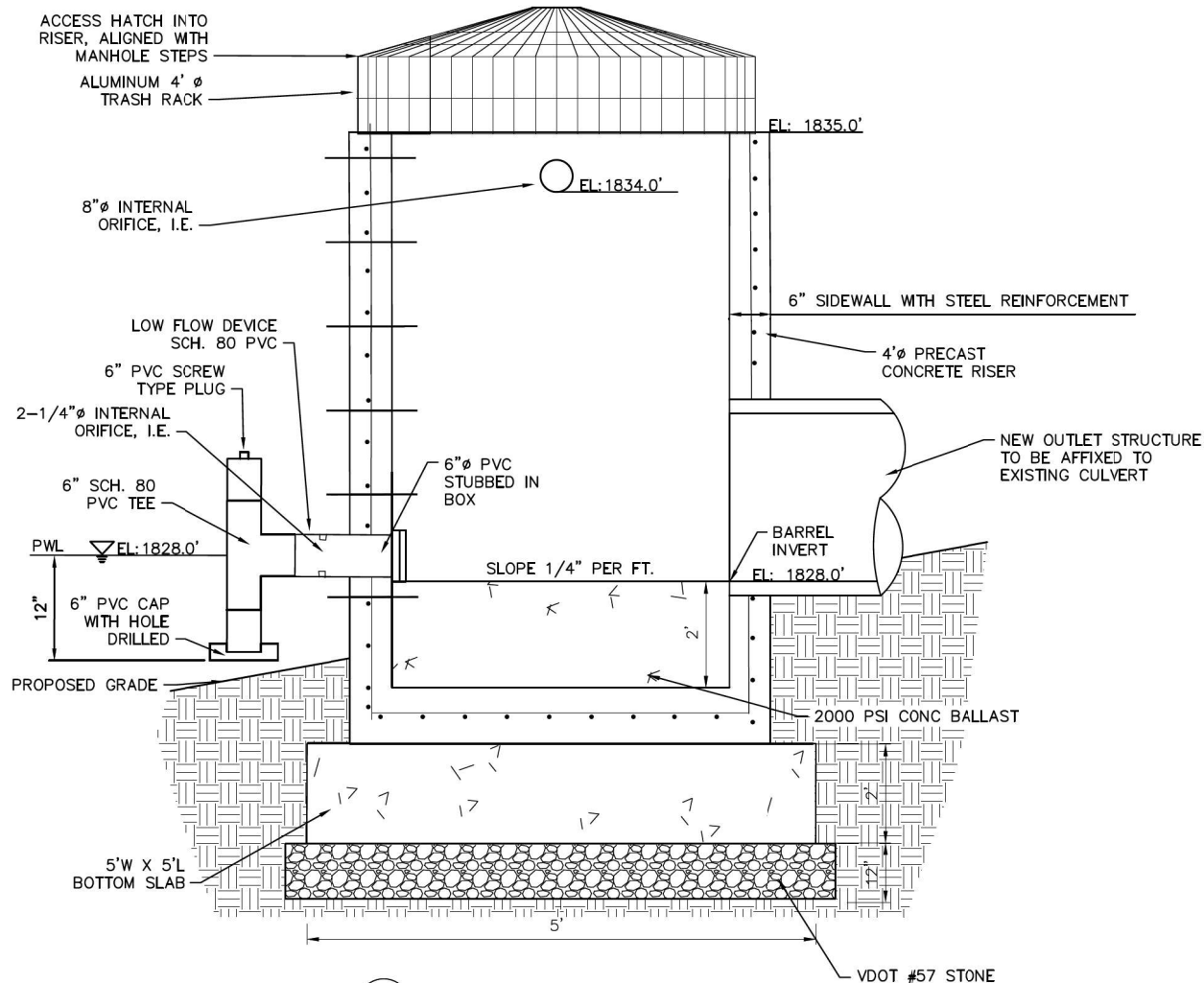
(CP) CULVERT INLET PROTECTION DETAIL
 NOT TO SCALE

PIPE OUTLET CONDITIONS

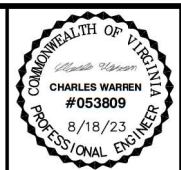


NOTES: 1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, GABION BASKET, OR CONCRETE.
 2. L_a IS THE LENGTH OF THE RIPRAP APRON AS CALCULATED USING PLATES 3.18-3 AND 3.18-4.
 3. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER, BUT NOT LESS THAN 6 INCHES.

(OP) OUTLET PROTECTION
 SOURCE: PLATE 3.18-1 VA ESCH
 NOT TO SCALE, SEE DIMENSIONS ON SHEET 18



1 BASIN OUTLET STRUCTURE
 7.8.20 NOT TO SCALE



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SHEET TITLE
 DETAILS 2

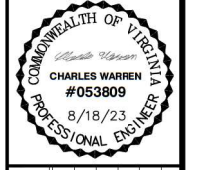
PROJECT TITLE
 SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CLIENT
 CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
 2625 W. WOODBURN AVENUE, SUITE 100
 PH: (803) 376-7400 FAX: (803) 376-7403

PROJ. NO. 02218208.05
 DATE 8/18/2023
 DRAWN BY TRW
 CHECKED BY TRW
 APPR. BY C.J.W.

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DETAILS 3

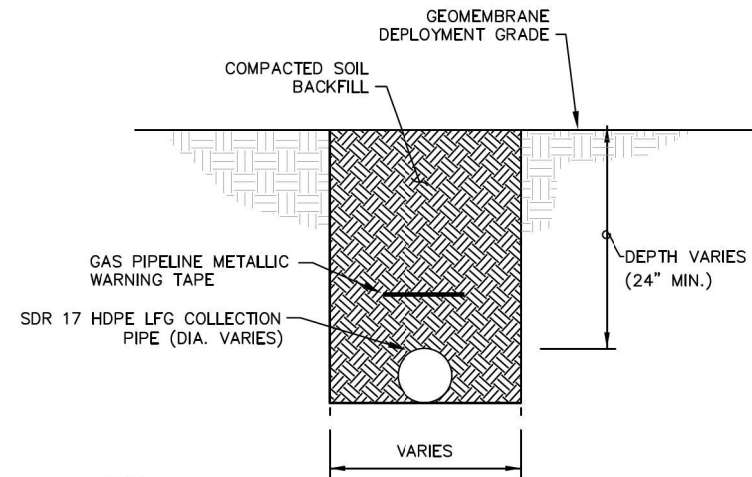
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
2655 VALLEY DRIVE
BRISTOL, VA 24201

CLIENT: CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY

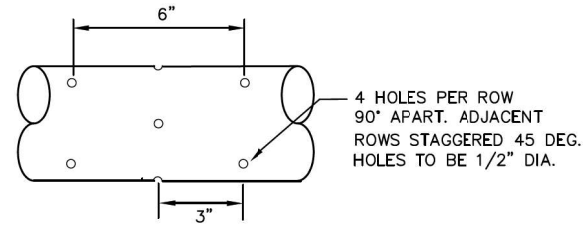
SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS, INC.
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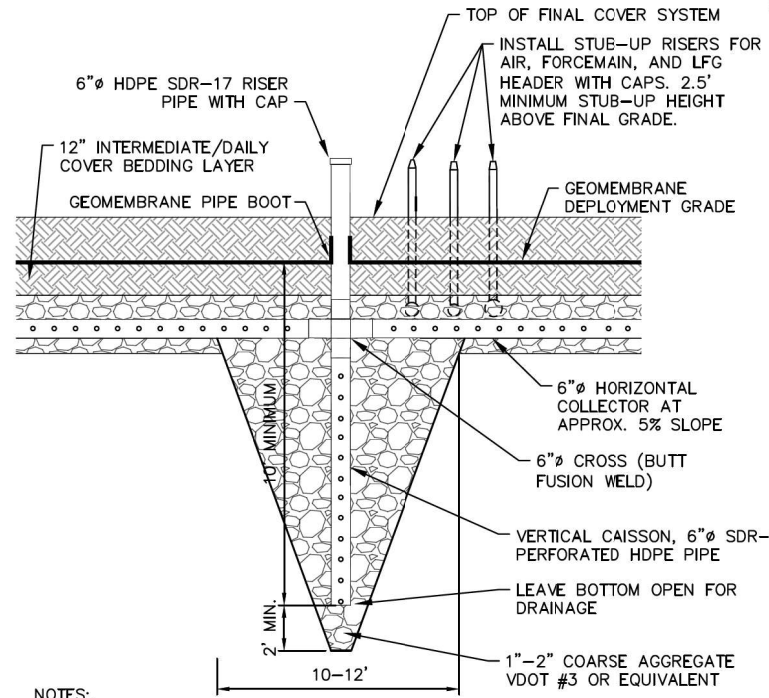


NOTE:
1. SEE LFG REQUIREMENTS ON SHEET 2

1 LFG COLLECTION PIPE TRENCH DETAIL
NOT TO SCALE

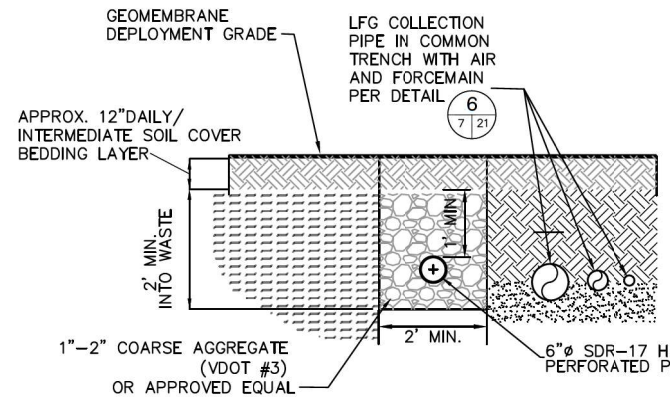


4 PERFORATED PIPE DETAIL
NOT TO SCALE



NOTES:
1. IF MINIMUM PIT DEPTH CANNOT BE REACHED, AN ALTERNATE DRAINAGE PIT LOCATION WILL BE SELECTED BY ENGINEER.

7 LFG DRAINAGE PIT WITH CROSS AND RISER
NOT TO SCALE



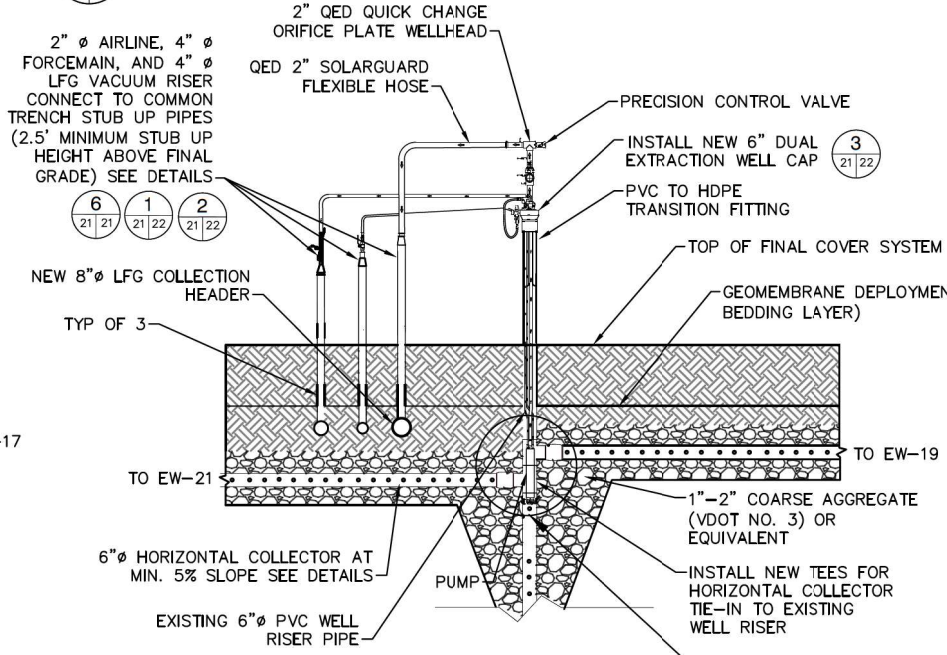
NOTE:
1. MAINTAIN 5% MINIMUM SLOPE ON COLLECTOR

2 HORIZONTAL COLLECTOR SECTION
NOT TO SCALE

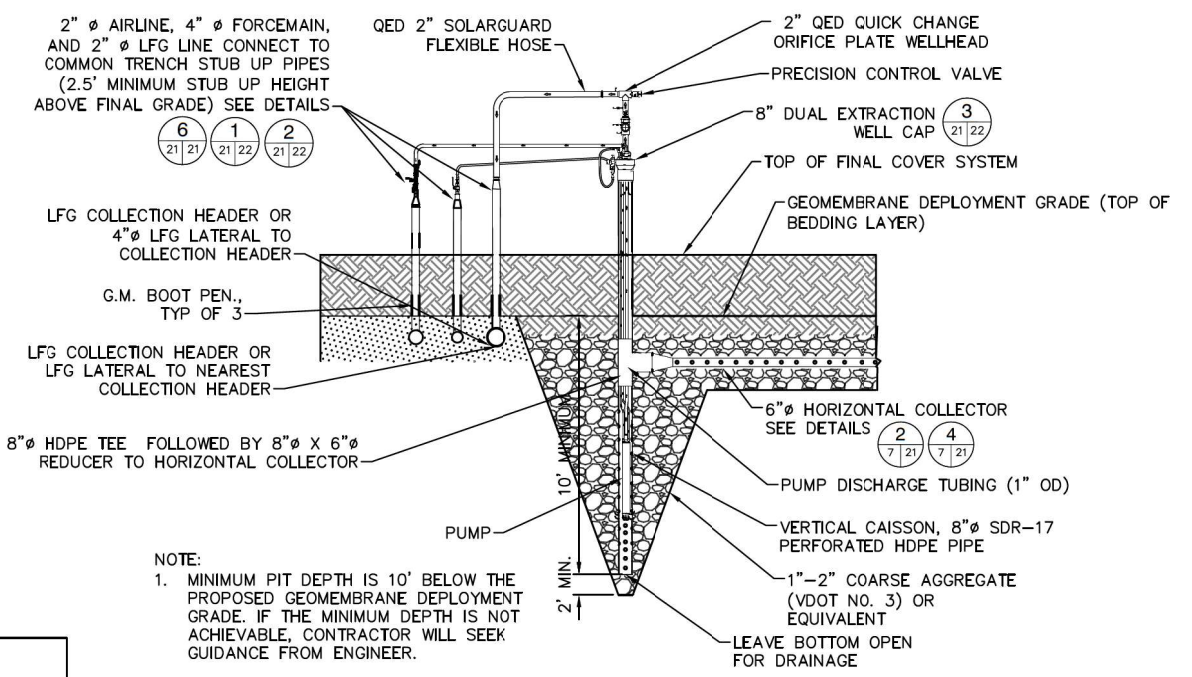
ID	NORTHING	EASTING	V.C. DIAMETER (IN)	MIN. V.C. DEPTH (FT)	MAX. PUMP DEPTH (FT)
HC-4	3398897.93	10412747.05	8	10	8
HC-5	3399041.94	10412793.83	8	10	8
HC-6	3399142.91	10412911.62	8	10	8
HC-7	3399043.70	10413262.99	8	10	8
HC-8	3398902.34	10413232.56	8	10	8
HC-9	3398672.22	10413461.70	8	10	8

NOTES:
1. CONTRACTOR SHALL SURVEY PROPOSED WELLHEAD LOCATIONS FOR ACTUAL GROUND ELEVATIONS BEFORE CONSTRUCTION.
2. CONTRACTOR SHALL SUBMIT SURVEY INFORMATION, INCLUDING NORTHING AND EASTING AND ACTUAL SURFACE ELEVATIONS, TO OWNER AND ENGINEER FOR POTENTIAL ADJUSTMENTS TO EXCAVATION DEPTHS. FOLLOWING REVIEW OF ADJUSTED WELL SCHEDULE, CONTRACTOR SHALL OBTAIN WRITTEN AUTHORIZATION FROM OWNER AND ENGINEER PRIOR TO EXCAVATION.
3. PNEUMATIC PUMPS SHALL BE PUMP ONE "ONE PUMP" PER ENGINEER'S DIRECTION
4. PUMPS TO BE INSTALLED IN PROPOSED HORIZONTAL COLLECTOR CAISSON WELLS. PUMP DEPTH VALUES PRESENTED ABOVE ARE ULTIMATE MAXIMUM DEPTHS FOR PURPOSE OF DEFINING LENGTHS OF HOSES AND PULL CABLE, AND ARE PRELIMINARY AND BASED ON WELL SCHEDULE FOR PROPOSED WELLS.
5. WELL DEPTH AND DEPTH TO BOTTOM OF PUMP MEASURED FROM GEOMEMBRANE DEPLOYMENT GRADE. INITIAL (AND FINAL) DEPTH TO PUMP BOTTOM IS VARIABLE BASED ON ACTUAL WELL DEPTH. THIS WILL BE DETERMINED PRIOR TO PUMP INSTALLATION.
6. V.C. = VERTICAL CAISSON

5 LANDFILL GAS HORIZONTAL COLLECTOR WELLHEAD SCHEDULE
NOT TO SCALE

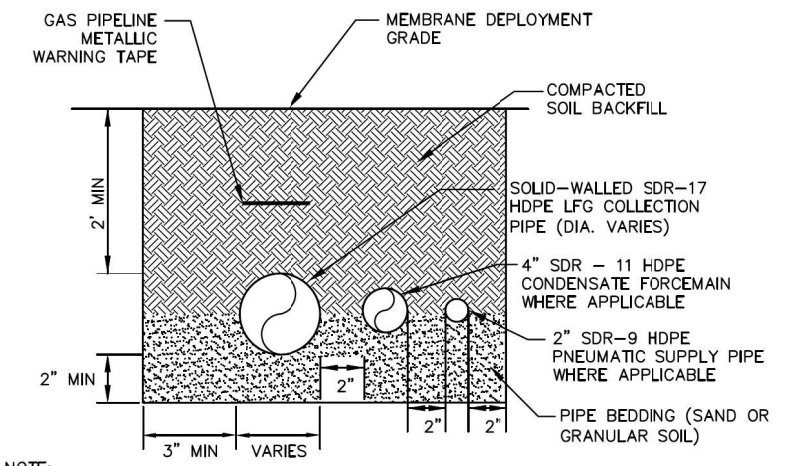


8 NEW HDPE HORIZONTAL COLLECTOR TIE-IN TO EXISTING EW-20
NOT TO SCALE



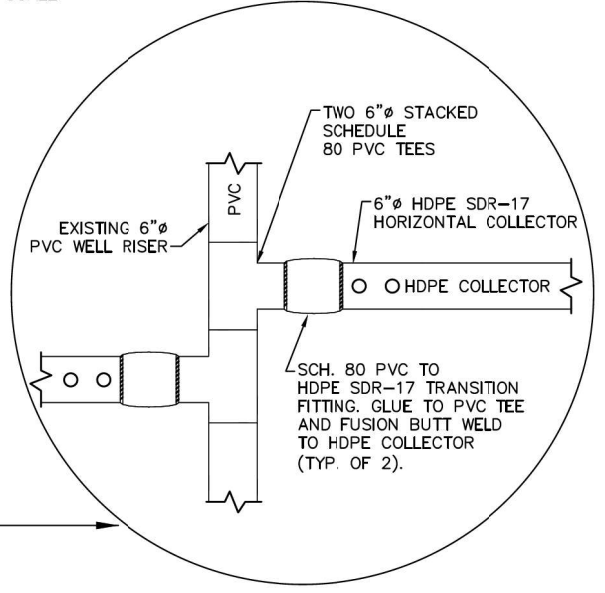
NOTE:
1. MINIMUM PIT DEPTH IS 10' BELOW THE PROPOSED GEOMEMBRANE DEPLOYMENT GRADE. IF THE MINIMUM DEPTH IS NOT ACHIEVABLE, CONTRACTOR WILL SEEK GUIDANCE FROM ENGINEER.

3 HORIZONTAL COLLECTOR TERMINUS WITH NEW VERTICAL CAISSON WELL AND DRAINAGE PIT
NOT TO SCALE



NOTE:
1. FOR AIR AND FORCEMAIN IN COMMON TRENCH WITHOUT LFG COLLECTION PIPE, FOLLOW GUIDANCE IN THIS DETAIL. INCLUDE WARNING TAPE CENTERED OVER AIR AND FORCEMAIN.

6 BURIED LFG COLLECTION PIPE IN COMMON TRENCH WITH AIR AND FORCEMAIN DETAIL
NOT TO SCALE



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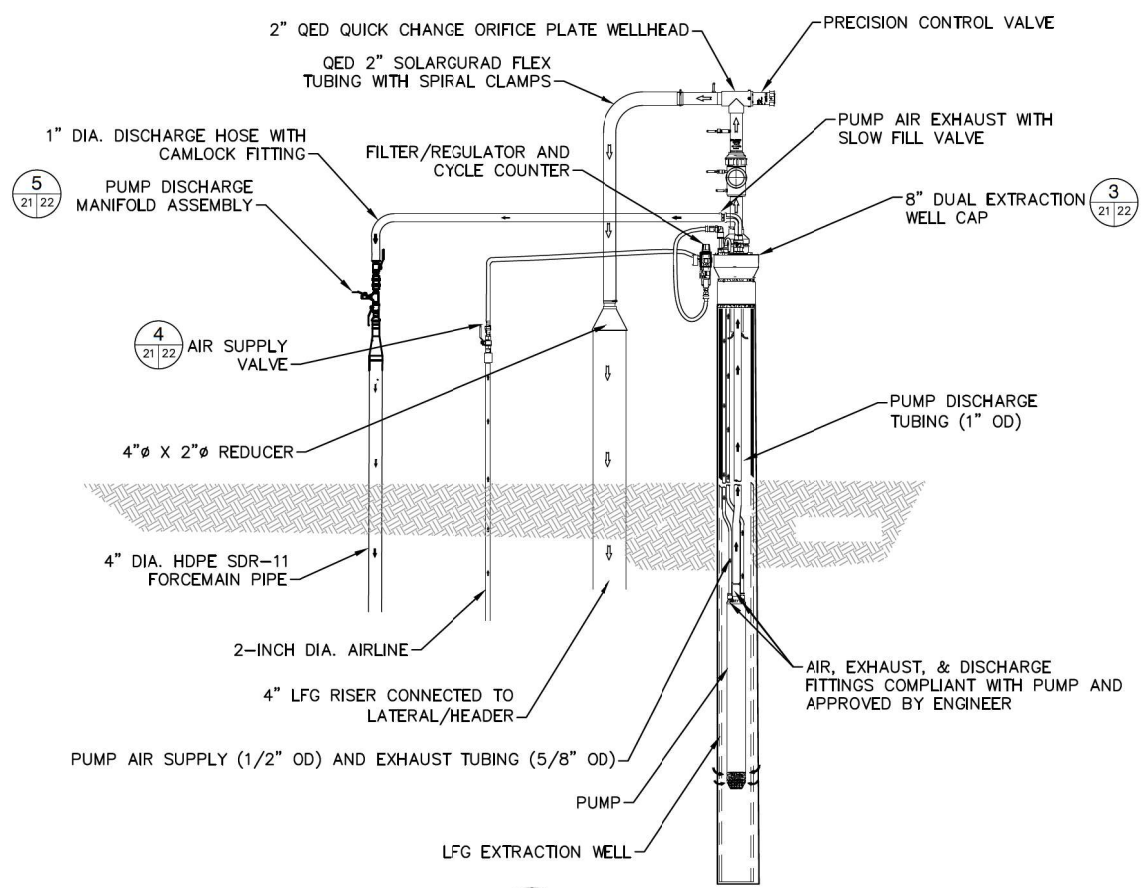
SHEET TITLE: **DETAILS 4**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

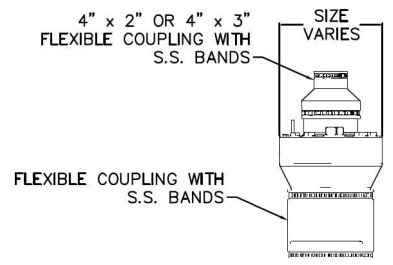
SCS ENGINEERS
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 10221 BROADWAY, SUITE 200
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DWG. BY: TRW/LLH
 CHK. BY: TRW
 DATE: 02/21/2023
 APP. BY: C.W.J.

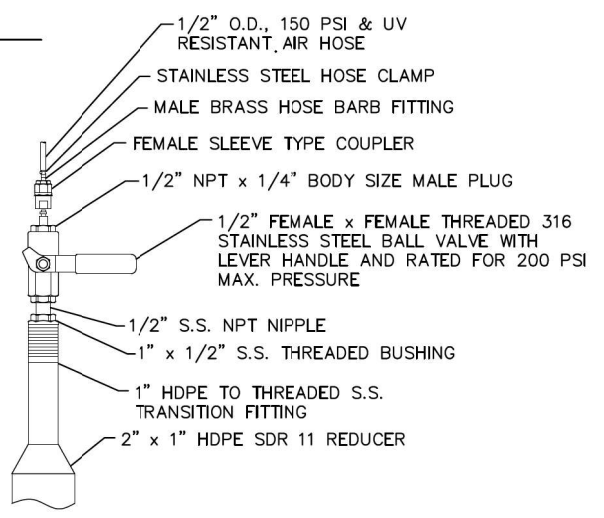
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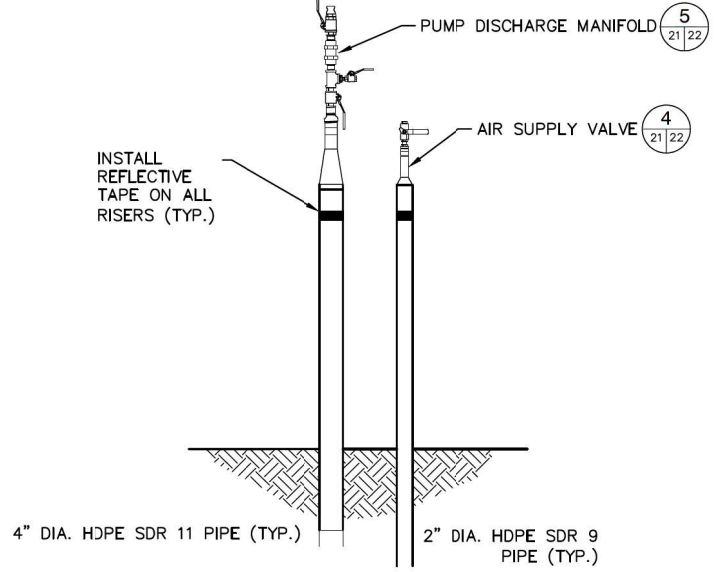
1 LFG WELL WITH PUMP DETAIL
 NOT TO SCALE



3 DUAL EXTRACTION WELL CAP
 NOT TO SCALE



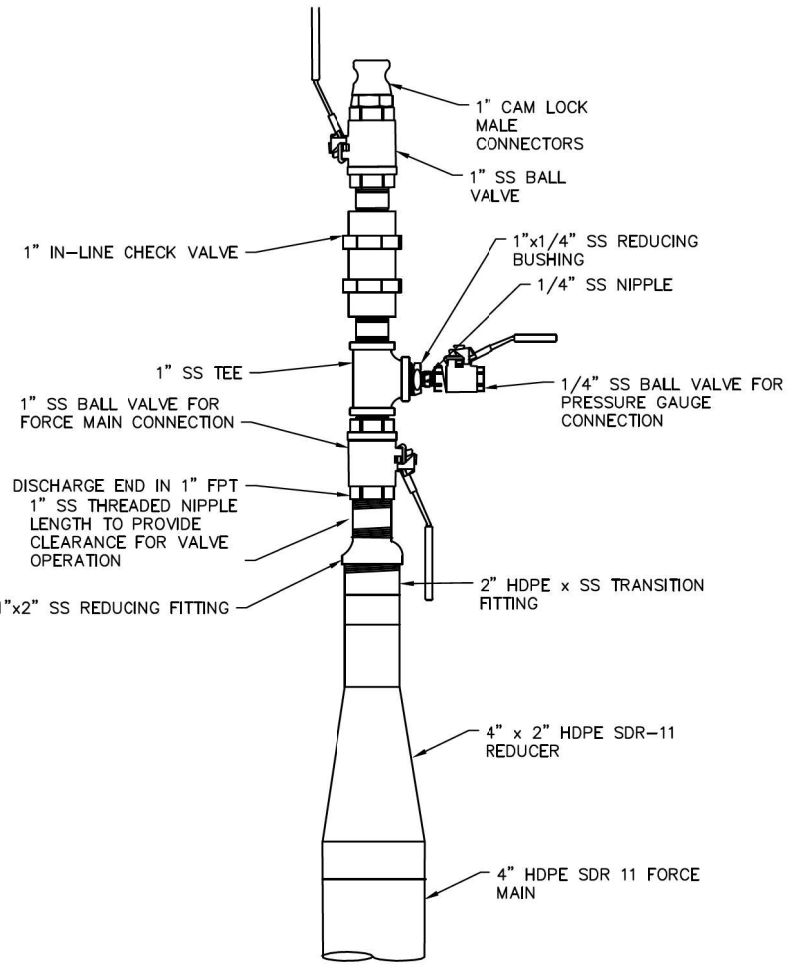
4 AIR SUPPLY VALVE DETAIL
 NOT TO SCALE



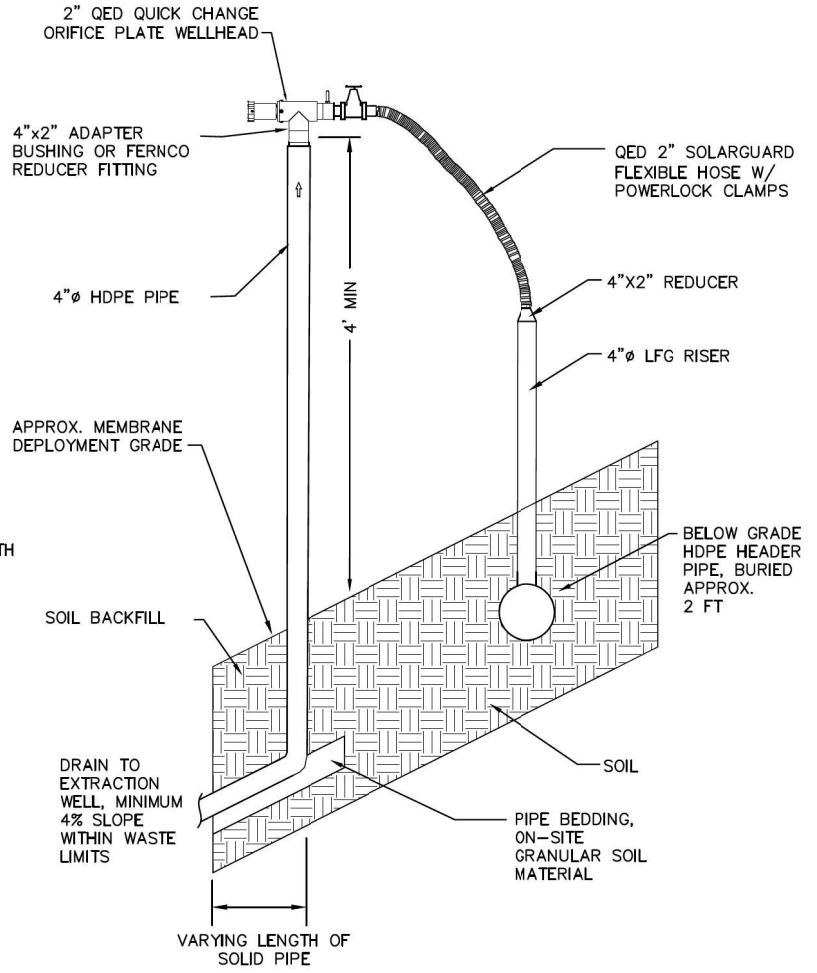
5 PUMP DISCHARGE MANIFOLD DETAIL
 NOT TO SCALE

NOTES:
 1. ALL 2" AND 4" PIPE AND FITTINGS SHALL BE BUTT WELDED.
 2. WHERE NEW AIRLINE AND FORCE MAIN PIPING IS INSTALLED TO AN EXISTING WELL WITH PUMP, THE OLD AIRLINE AND FORCE MAIN PIPING IS TO BE ABANDONED AND NEW PIPING CONNECTED TO THE DUAL EXTRACTION WELL.

2 STUB-UP FOR ABOVE GRADE AIR AND FORCEMAIN PIPING DETAIL
 NOT TO SCALE



6 REMOTE WELLHEAD
 NOT TO SCALE



GENERAL NOTES:
 1. PNEUMATIC PUMPS SHALL BE PUMP ONE "ONE PUMP" OR EQUIVALENT PER ENGINEER'S DIRECTION
 2. PUMPS TO BE INSTALLED IN PROPOSED WELLS. PUMP DEPTH VALUES PRESENTED ABOVE ARE ULTIMATE MAXIMUM DEPTHS FOR PURPOSE OF DEFINING LENGTHS OF HOSES AND PULL CABLE, AND ARE PRELIMINARY AND BASED ON WELL SCHEDULE FOR PROPOSED WELLS.
 3. WELL DEPTH AND DEPTH TO BOTTOM OF PUMP MEASURED FROM TOP OF CASING.
 4. 2.5' MINIMUM STUB UP HEIGHT ABOVE FINAL GRADE FOR AIR LINE, FORCEMAIN, AND LFG LINE.



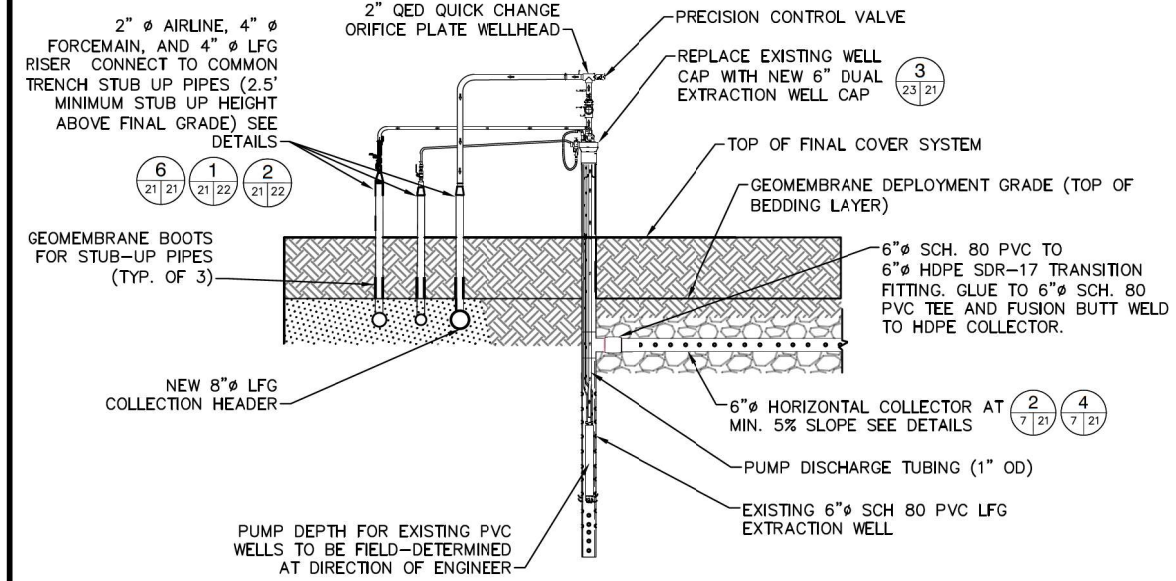
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DETAILS 5
SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

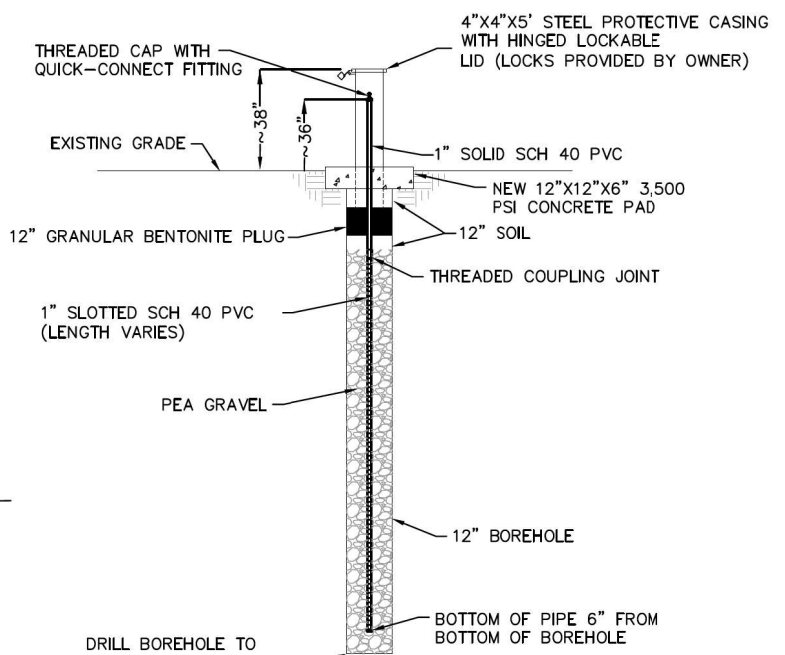
CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
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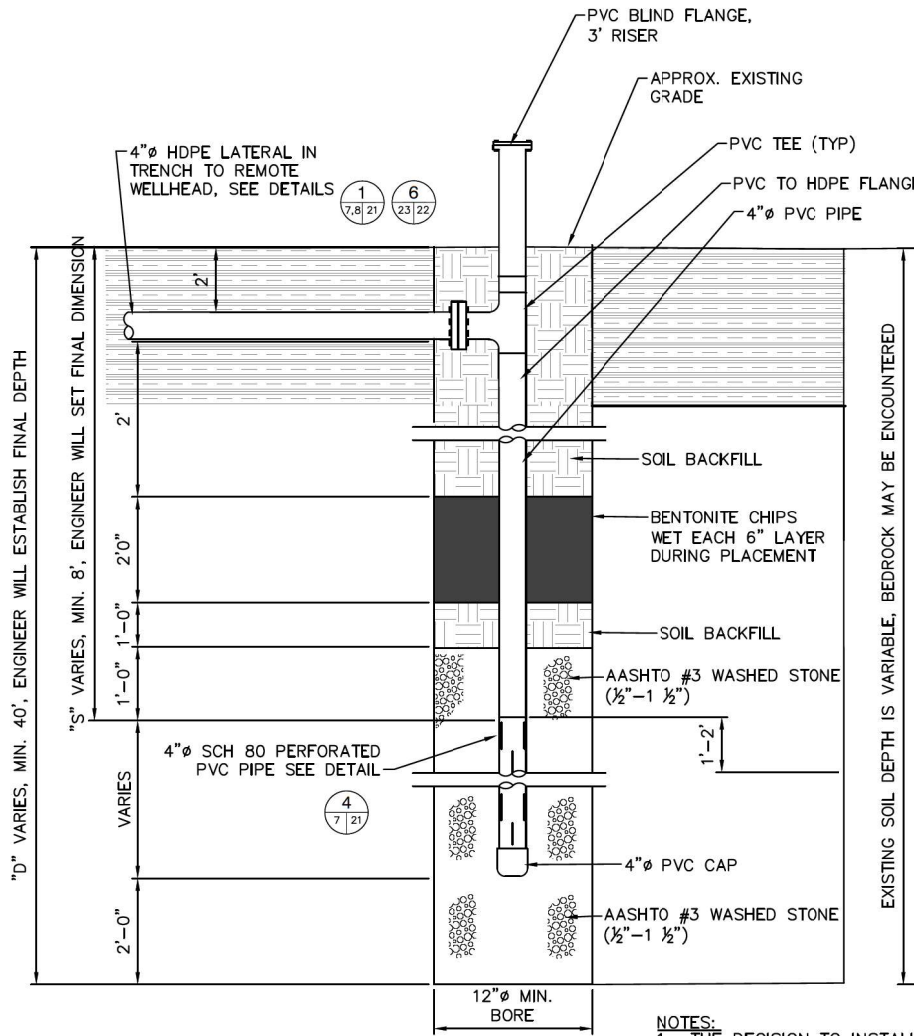
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1
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 HORIZONTAL COLLECTOR TERMINUS WITH EXISTING PVC WELL NOT TO SCALE

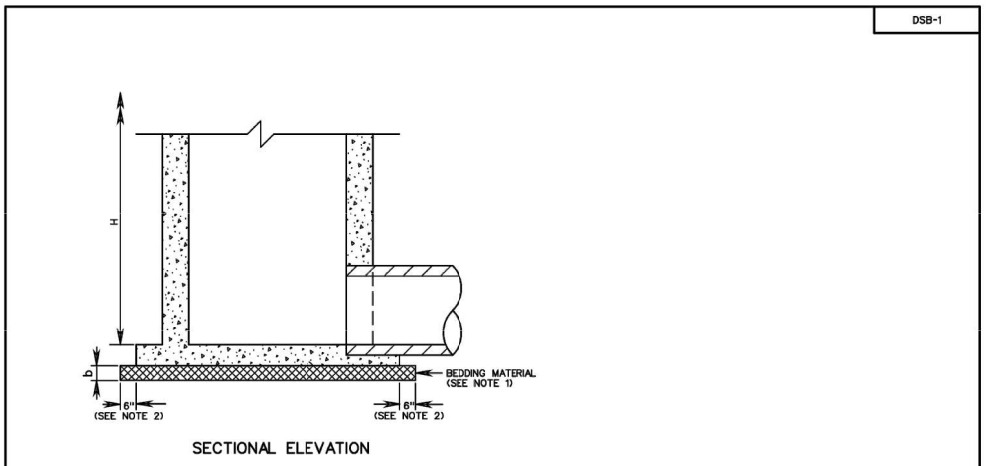


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 7 | 23
 LFG MONITORING PROBE NOT TO SCALE



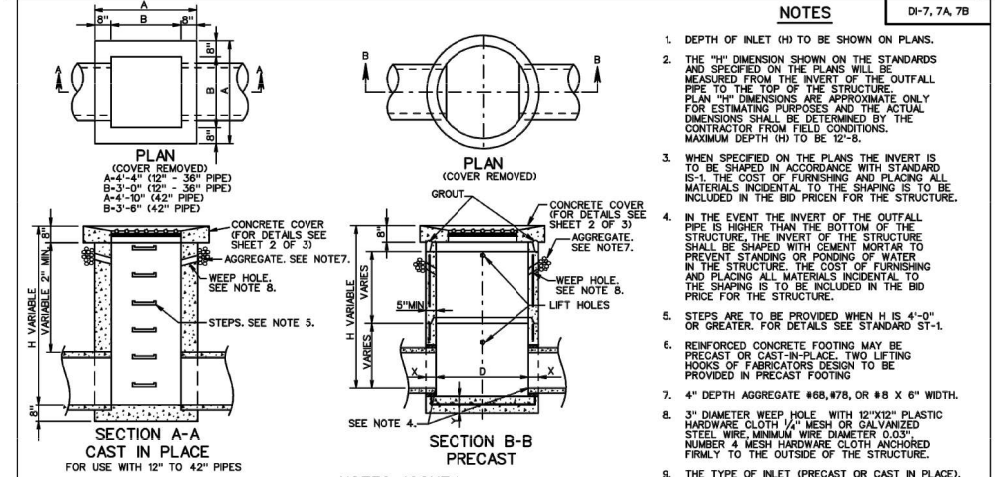
3
 7 | 23
 REMOTE SOIL EXTRACTION WELL DETAIL N.T.S.

- NOTES:**
- THE DECISION TO INSTALL THE SOIL GAS EXTRACTION WELLS IS PENDING PER FURTHER INVESTIGATION BY SCS.
 - INSTALL (1) MARKER POST AT EACH REMOTE WELL ADJACENT TO ACCESS BOX.
 - USE LARGEST DIAMETER BOREHOLE AVAILABLE FOR AIR ROTARY DRILL METHOD



NOTES

- DEPTH OF INLET (H) TO BE SHOWN ON PLANS.
- THE "H" DIMENSION SHOWN ON THE STANDARDS AND SPECIFIED ON THE PLANS WILL BE MEASURED FROM THE INVERT OF THE OUTFALL PIPE TO THE TOP OF THE STRUCTURE. PLAN DIMENSIONS ARE APPROXIMATE ONLY FOR ESTIMATING PURPOSES AND THE ACTUAL DIMENSIONS SHALL BE DETERMINED BY THE CONTRACTOR FROM FIELD CONDITIONS. MAXIMUM DEPTH (H) TO BE 12'-8".
- WHEN SPECIFIED ON THE PLANS THE INVERT IS TO BE SHAPED IN ACCORDANCE WITH STANDARD IS-1. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICES FOR THE STRUCTURE.
- IN THE EVENT THE INVERT OF THE OUTFALL PIPE IS HIGHER THAN THE BOTTOM OF THE STRUCTURE, THE INVERT OF THE STRUCTURE SHALL BE SHAPED WITH GEMENT MORTAR TO PREVENT STANDING OR PONDING OF WATER IN THE STRUCTURE. THE COST OF FURNISHING AND PLACING ALL MATERIALS INCIDENTAL TO THE SHAPING IS TO BE INCLUDED IN THE BID PRICE FOR THE STRUCTURE.
- STEPS ARE TO BE PROVIDED WHEN H IS 4'-0" OR GREATER. FOR DETAILS SEE STANDARD ST-1.
- REINFORCED CONCRETE FOOTING MAY BE PRECAST OR CAST-IN-PLACE. TWO LIFTING HOOPS OF FABRICATORS DESIGN TO BE PROVIDED IN PRECAST FOOTING.
- 4" DEPTH AGGREGATE #68, #78, OR #8 X 6" WIDTH.
- 3" DIAMETER WEEP HOLE WITH 12"X12" PLASTIC HARDWARE CLOTH 1/4" MESH OR GALVANIZED STEEL WIRE MINIMUM WIRE DIAMETER 0.03" NUMBER 4 MESH HARDWARE CLOTH ANCHORED FIRMLY TO THE OUTSIDE OF THE STRUCTURE.
- THE TYPE OF INLET (PRECAST OR CAST IN PLACE), DETAILED HEREON, TO BE CONSTRUCTED, WILL BE AT THE OPTION OF THE CONTRACTOR.
- FOR DETAILS OF CONCRETE COVER, COLLAR AND GRATE AND THE METHOD OF PLACING APPROACH GUTTER SEE SHEET 2 OF 3.
- CAST-IN PLACE CONCRETE IS TO BE CLASS A3 (3000 PSI). PRECAST CONCRETE IS TO BE 4000 PSI.
- CONCRETE QUANTITIES SHOWN ARE FOR INDICATED DEPTH (H) WITHOUT PIPES. THE AMOUNT DISPLACED BY PIPES MUST BE DEDUCTED TO OBTAIN TRUE QUANTITIES. FOR INLETS OF DIFFERENT DEPTHS ADD OR SUBTRACT THE APPROPRIATE CUBIC YARDS OF CONCRETE FOR EACH FOOT OF DEPTH.
- PAVED DITCHES ARE TO BE TRANSITIONED TO MEET INLET GUTTER AS SHOWN IN STANDARD PG-2A.
- PROVIDE SAFETY SLABS WHEN SPECIFIED ON THE PLANS.

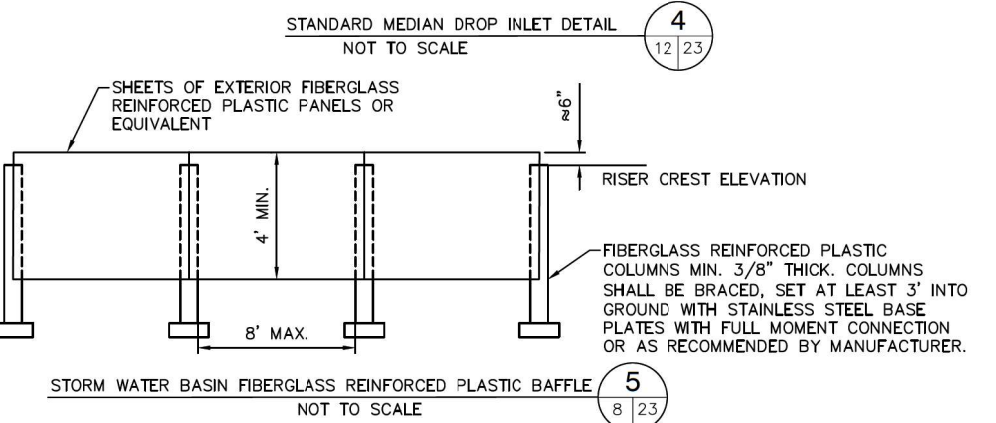


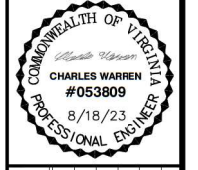
RECOMMENDED MINIMUM HEIGHT CHART

PIPE SIZE	CONC.	CORR. METAL
12"	2'-6"	2'-5"
15"	2'-9/4"	2'-8"
18"	3'-0/2"	2'-11"
21"	3'-3/4"	3'-2"
24"	3'-7"	3'-5"
27"	3'-10/4"	3'-8"
30"	4'-1/2"	3'-11"
33"	4'-4/4"	4'-2"
36"	4'-8"	4'-5"
42"	5'-2/2"	4'-11"

INCREMENT PER FOOT OF ADDITIONAL DEPTH (H) $\frac{1}{2}$ = 0.362 CU. YDS. (12" - 36" PIPE)
 $\frac{1}{2}$ = 0.410 CU. YDS. (42" PIPE)

STANDARD MEDIAN DROP INLET
 12" TO 42" PIPE
 VIRGINIA DEPARTMENT OF TRANSPORTATION





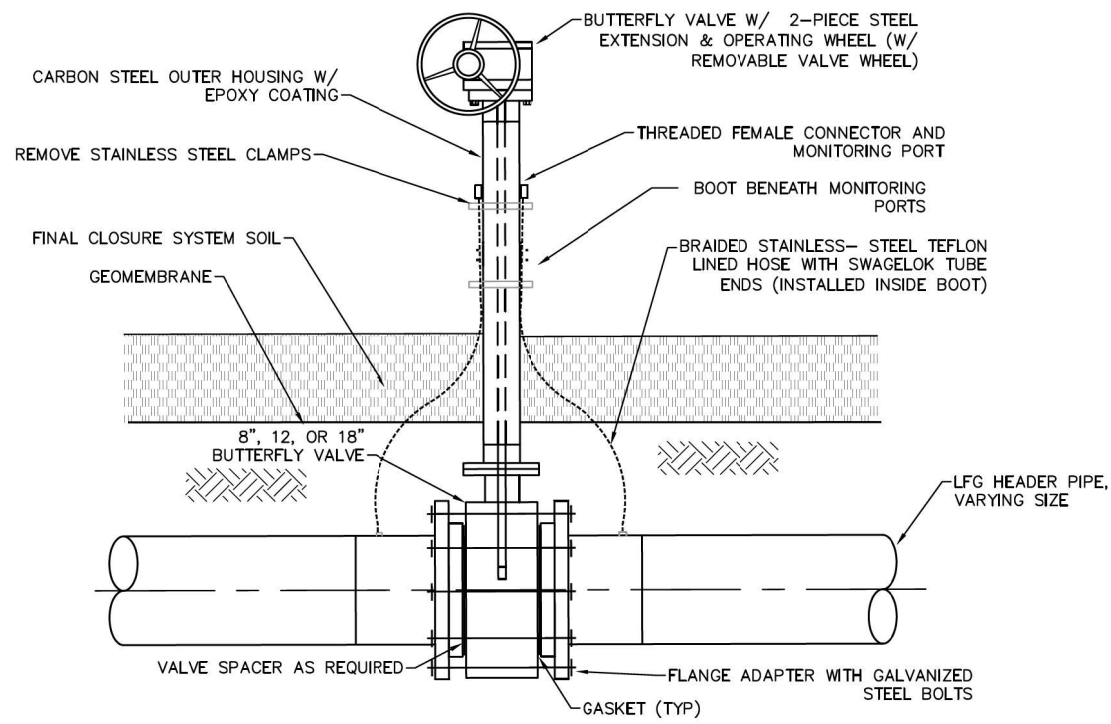
DATE	
REVISION	
NO.	1

SHEET TITLE: **DETAILS 6**
 PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

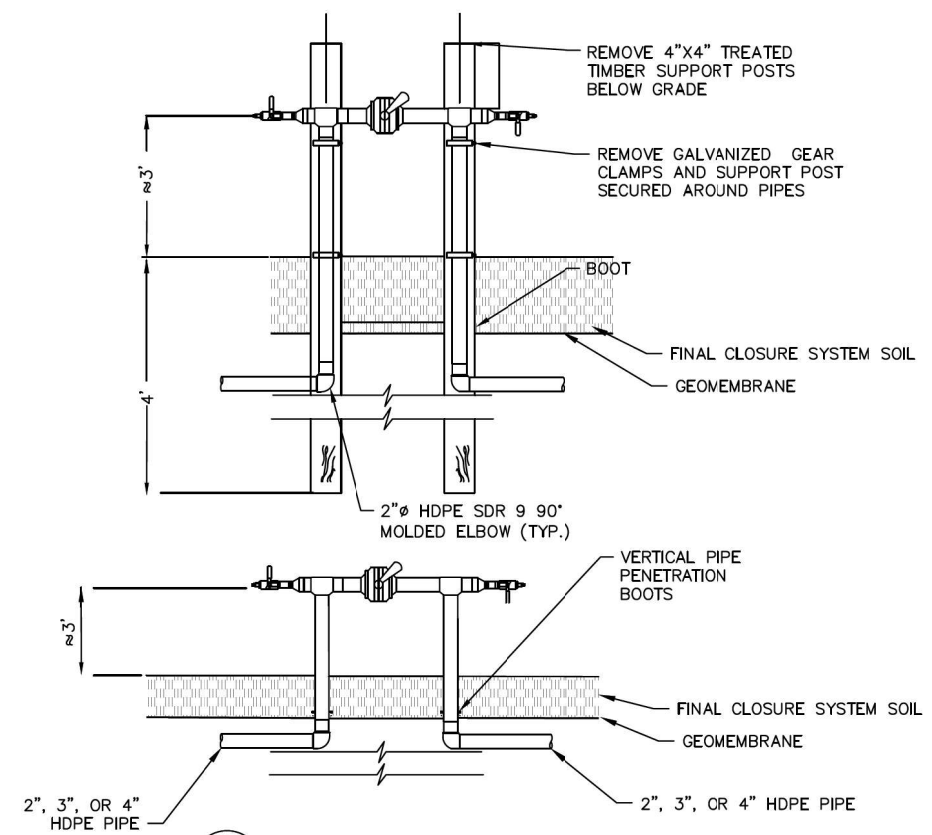
CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
 2655 VALLEY DRIVE
 BRISTOL, VA 24201

SCS ENGINEERS
 STEARNS, CONRAD AND SCHMIDT
 CONSULTING ENGINEERS, INC.
 1000 W. MAIN ST., SUITE 200
 BRISTOL, VA 24201
 PH: (803) 378-7400 FAX: (803) 378-7403

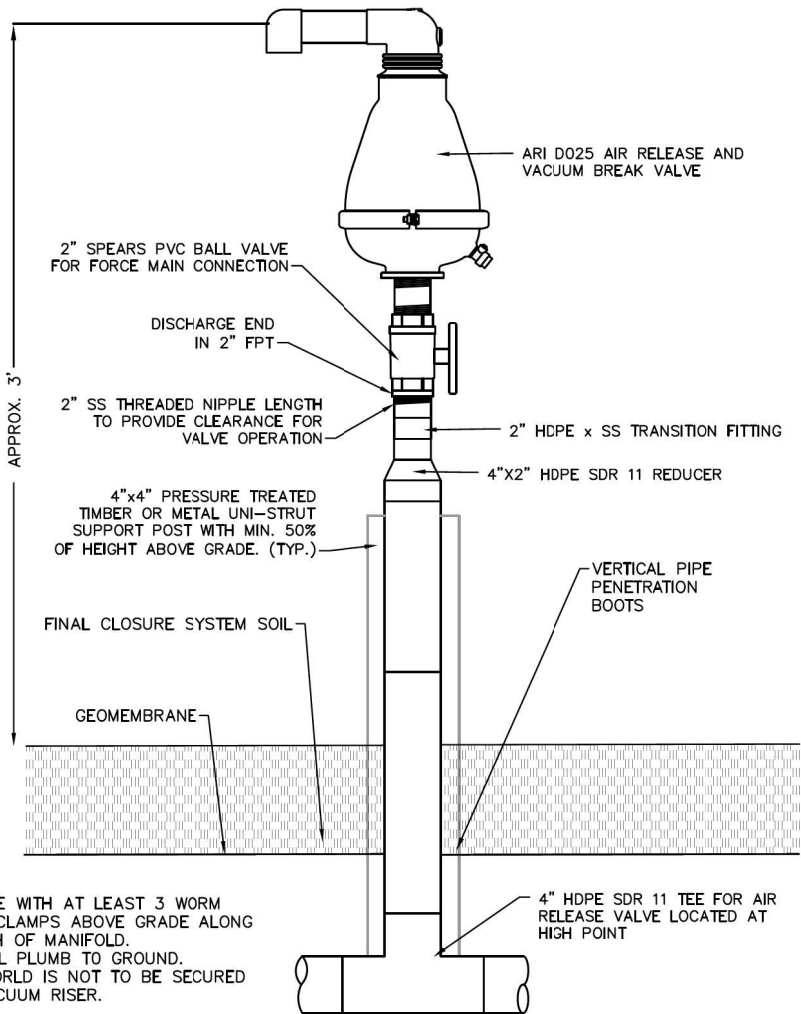
CADD FILE: 02218208.05
 DATE: 8/18/2023
 SCALE: AS SHOWN
 DRAWING NO.



1 BELOW GRADE LFG HEADER ISOLATION VALVE DETAIL
 7/24 NOT TO SCALE



2 AIRLINE/FORCEMAIN ISOLATION VALVE BOOT DETAIL
 7/24 NOT TO SCALE



- NOTES:
1. SECURE WITH AT LEAST 3 WORM GEAR CLAMPS ABOVE GRADE ALONG LENGTH OF MANIFOLD.
 2. INSTALL PLUMB TO GROUND. MANIFOLD IS NOT TO BE SECURED TO VACUUM RISER.

3 FORCE MAIN AIR RELEASE VALVE DETAIL
 7/24 NOT TO SCALE

2016 ROAD & BRIDGE STANDARDS

NOTES:

1. CONCRETE TO BE 4000 PSI MINIMUM COMPRESSIVE STRENGTH.
2. IF PIPE IS TO BE SKEWED THE OPENING WILL BE ADJUSTED TO ACCOMMODATE ANGLES UP TO 45°.
3. REINFORCING STEEL IN ACCORDANCE WITH ASTM A-615 (REINFORCING BARS).
4. PIPE OPENINGS IN PRECAST DRAINAGE UNITS SHALL NOT EXCEED 4 INCHES AT ANY GIVEN POINT BETWEEN THE PIPE AND THE PRECAST UNIT.
5. DIMENSIONS SHOWN ARE MINIMUM. ACTUAL MEASUREMENTS MAY VARY WITH MANUFACTURER'S TOLERANCE.
6. IN NO CASE SHALL TOP OF ENDWALL PROJECT ABOVE FILL SLOPE, DITCH SLOPE, OR SHOULDER.
7. HEADWALL TO BE BEVELED IN ALL AREAS EXCEPT WHERE A CONFLICT WITH INVERT OR WINGWALL OCCUR.
8. BEVEL EDGE IS REQUIRED ON THE HEADWALL AT THE INLET END OF THE CULVERT. HEADWALL AT OUTLET END MAY BE EITHER SQUARE EDGE OR BEVELED.
9. 3/4\" CHAMFER MAY BE PROVIDED ON ALL EDGES AT MANUFACTURER'S OPTION.

ENDWALL FOR CIRCULAR PIPE							ENDWALL FOR ELLIPTICAL PIPE								
DIAMETER OF PIPE CULVERT							SIZE OF ELLIPTICAL PIPE CULVERT (SPAN x RISE)								
D	12"	15"	18"	21" OR 24"	27" OR 30"	33" OR 36"	S x D	23" x 14"	30" x 19"	34" x 22"	38" x 24"	42" x 27"	45" x 29"	49" x 32"	53" x 34"
H	2'-0"	2'-3"	2'-6"	3'-2"	3'-10"	4'-4"	H	1'-10"	2'-4"	2'-7"	2'-9"	3'-1"	3'-3"	3'-6"	3'-8"
L	4'-0"	5'-0"	6'-0"	8'-0"	10'-0"	12'-0"	L	5'-5"	7'-2"	8'-6"	9'-2"	10'-2"	10'-11"	12'-1"	12'-11"
a	0'-1/4"	0'-1/4"	0'-2"	0'-2 1/2"	0'-3 1/4"	0'-3 3/4"	a	C-2 1/2"	0'-3 1/4"	0'-3 1/2"	0'-4"	0'-4 1/2"	0'-4 3/4"	0'-5"	0'-5 1/2"
b	0'-1"	0'-1 1/4"	0'-1 1/2"	0'-2"	0'-2 1/2"	0'-3"	b	0'-2"	0'-2 1/2"	0'-2 3/4"	0'-3"	0'-3 1/2"	0'-3 3/4"	0'-4"	0'-4 1/2"

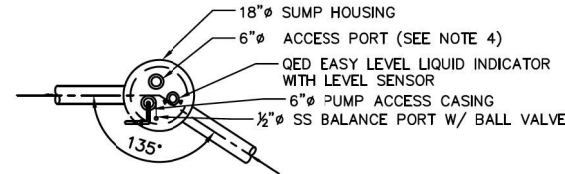
VDOT ROAD AND BRIDGE STANDARDS SHEET 101.02 REVISION DATE

PRECAST ENDWALL FOR PIPE CULVERTS
 12" - 36" CIRCULAR AND 23" x 14" - 53" x 34" ELLIPTICAL PIPES
 VIRGINIA DEPARTMENT OF TRANSPORTATION

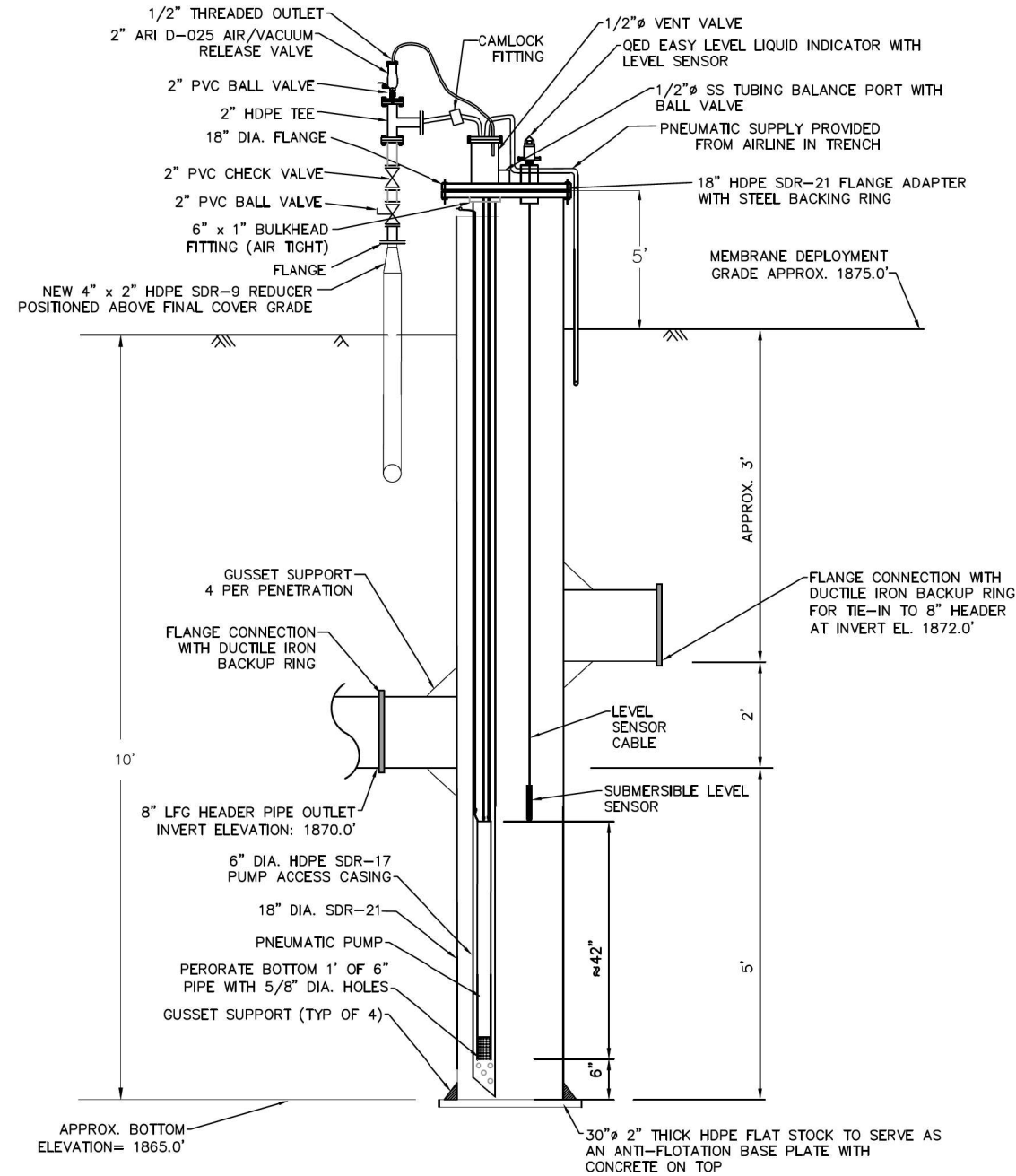
2016 ROAD & BRIDGE STANDARDS SPECIFICATION REFERENCE: 105 302

4 VDOT PRECAST CULVERT ENDWALL DETAIL
 12/24 NOT TO SCALE

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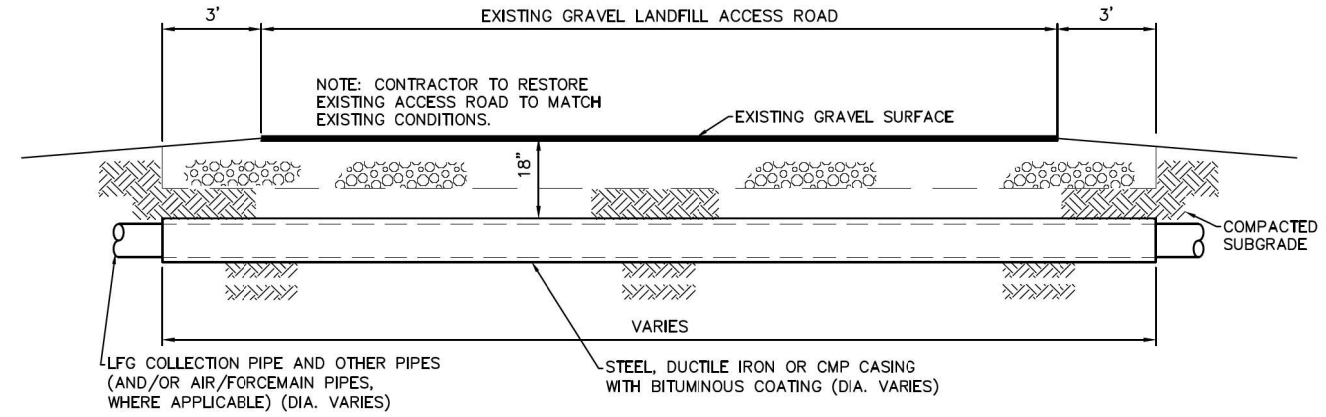


PLAN VIEW

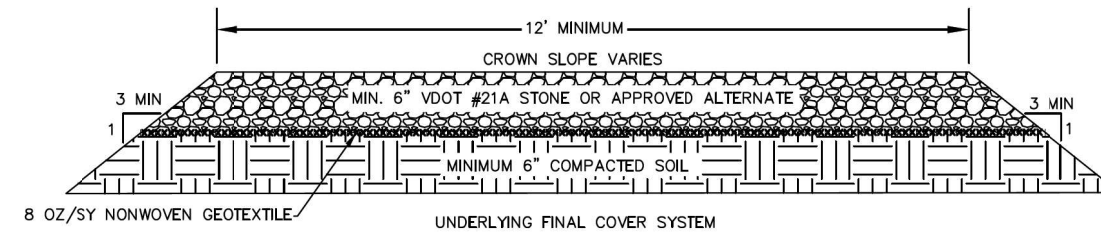


- NOTES:
1. LFG HEADER PIPE INLET AND OUTLET ORIENTED AT 135 DEGREES.
 2. SUPPLY INSULATION ON ALL ABOVEGRADE PUMP DISCHARGE HOSE AND EXPOSED FORCEMAIN PIPING.
 3. CONTRACTOR SHALL PLACE 1-FOOT THICK LAYER OF CONCRETE ONTO TOP OF ANTI-FLOTATION BASE PLATE TO COUNTERACT BUOYANCY POTENTIAL.
 4. SUMP LID SHALL INCLUDE A SECOND 6" ACCESS PORT INTO SUMP VESSEL.

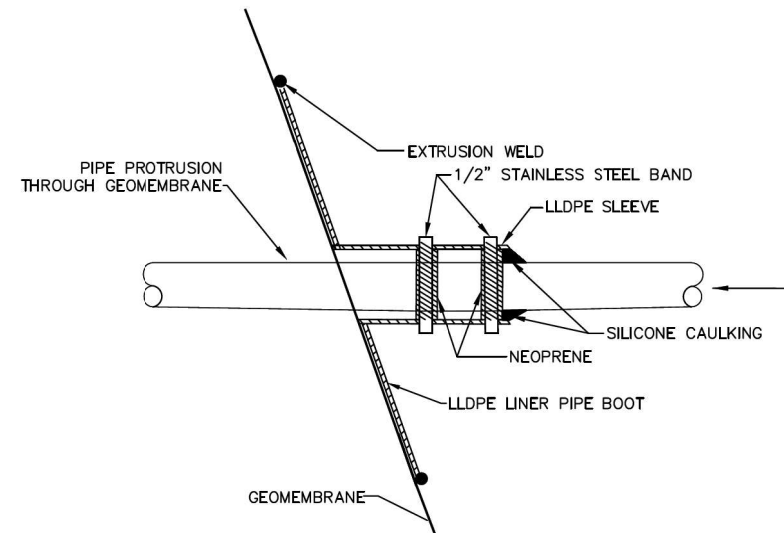
1 CONDENSATE SUMP (CS-1) DETAIL
7/25 NOT TO SCALE



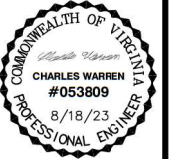
2 ROAD CROSSING DETAIL
7/25 NOT TO SCALE



3 ACCESS ROAD DETAIL
7/25 NOT TO SCALE



4 PIPE BOOT THROUGH GEOMEMBRANE
7/25 NOT TO SCALE



NO.	REVISION	DATE
1		
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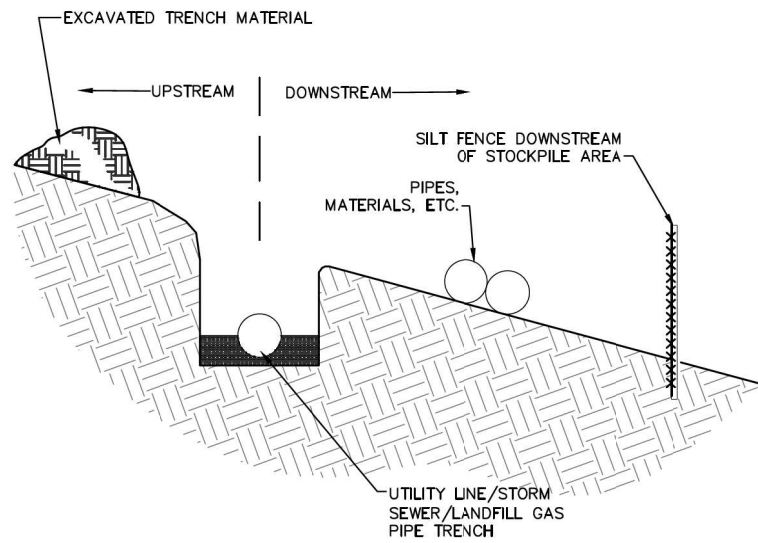
SHEET TITLE: **DETAILS 7**
PROJECT TITLE: **SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS**

CLIENT: **CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY**
2655 VALLEY DRIVE
BRISTOL, VA 24201

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS, INC.
1322 W. MAIN ST., SUITE 200
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DWN: BRW/LLH
CHK: BRW/LLH
APP: BRW/LLH
CJW

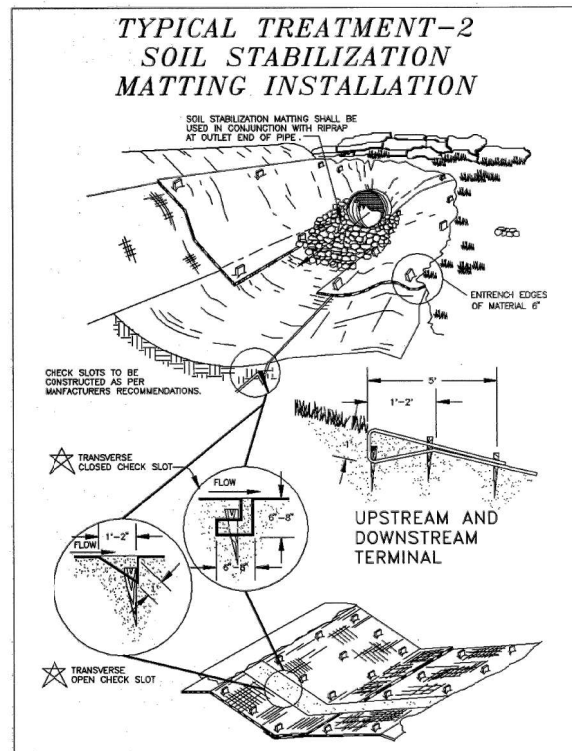
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DATE: 8/18/2023
SCALE: AS SHOWN
DRAWING NO.

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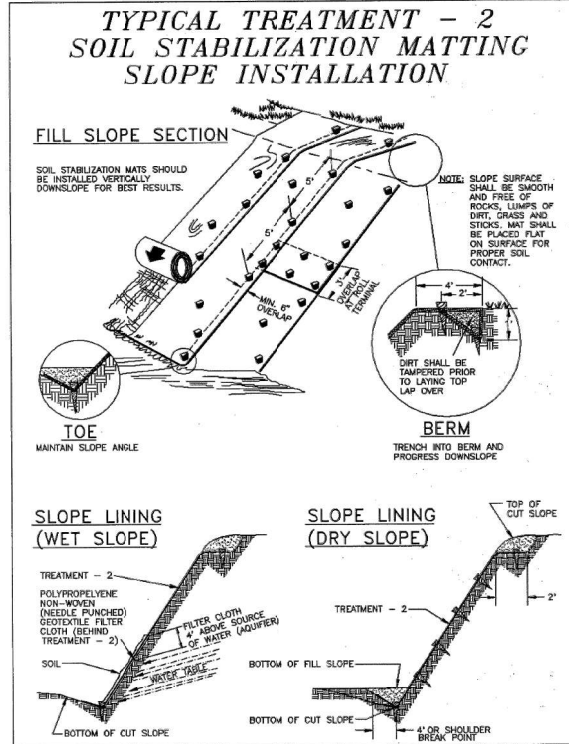


NOTES:
 1. EXCAVATED TRENCH MATERIAL MUST BE PUT ON THE UPHILL SIDE OF THE EXCAVATED TRENCH WHILE SILT FENCE AND STOCKPILED MATERIALS ARE PLACED ON THE DOWNSTREAM SIDE

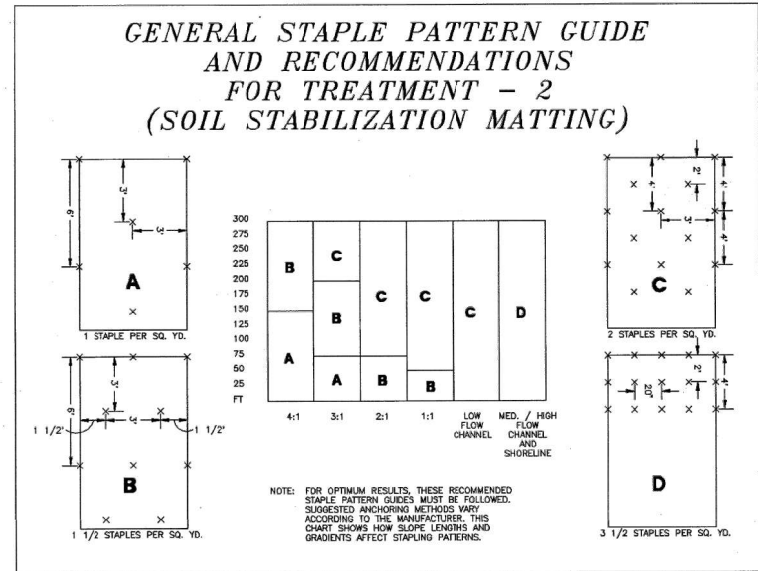
1
 7/26 TRENCH WITH SPOILS DETAIL
 NOT TO SCALE



Source: VDOT Road and Bridge Standards Plate 3.36-4



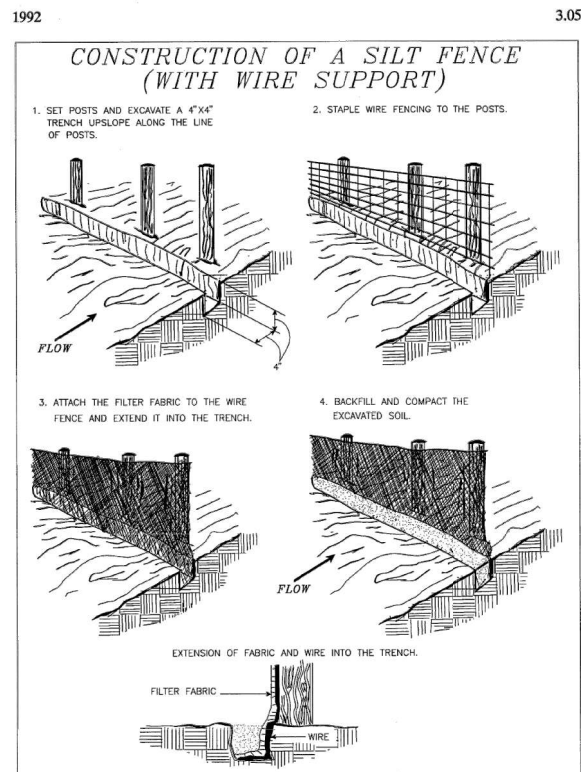
Source: VDOT Road and Bridge Standards Plate 3.36-5



Source: Product literature from North American Green

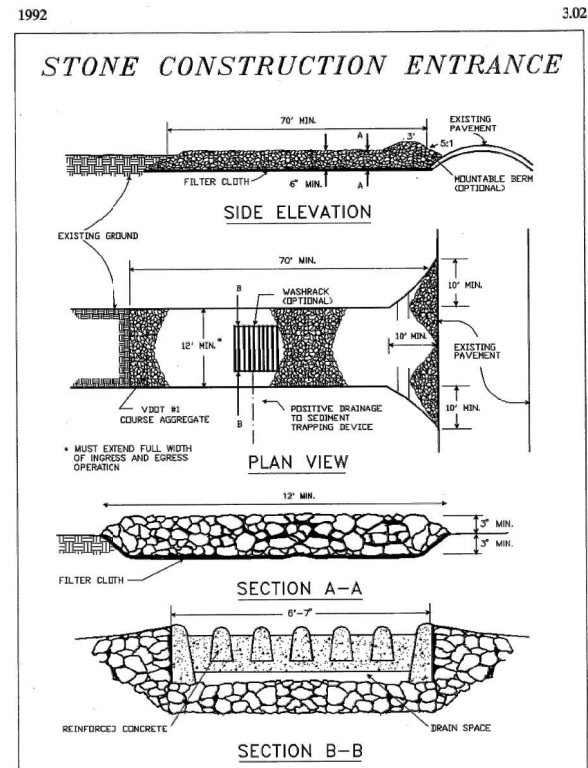
Plate 3.36-6

2
 8/26 SOIL STABILIZATION MATTING INSTALLATION
 NOT TO SCALE



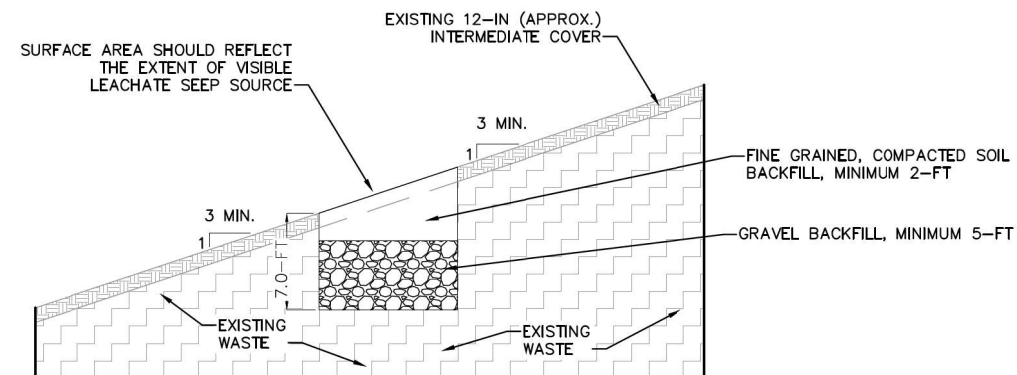
Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant Plate 3.05-1

III - 24



Source: Adapted from 1983 Maryland Standards for Soil Erosion and Sediment Control, and Va. DSWC Plate 3.02-1

III - 9



NOTES:
 1. IF A LEACHATE SEEP IS ENCOUNTERED DURING EARTHWORK WITHIN THE LANDFILL LIMITS, CONTRACTOR WILL EXCAVATE EXISTING INTERMEDIATE COVER AND UNDERLYING WASTE TO A TOTAL DEPTH OF APPROXIMATELY 7.0-FT OR AS NEEDED TO ENABLE DRAINAGE. CONTRACTOR SHALL BACKFILL WITH 5-FT GRAVEL AND AT LEAST 2-FT OF FILL SOIL, AS SHOWN. THE TRENCH WIDTH SHALL BE APPROXIMATELY 24-36 IN, OR AS WIDE AS THE EXCAVATOR BUCKET.

5
 7/26 LEACHATE SEEP MANAGEMENT
 NOT TO SCALE

3
 8/26 CONSTRUCTION OF A SILT FENCE
 NOT TO SCALE

4
 8/26 STONE CONSTRUCTION ENTRANCE
 NOT TO SCALE

DATE	REVISION	NO.

SHEET TITLE: DETAILS 8
 PROJECT TITLE: SWP #498 FINAL COVER SYSTEM CONSTRUCTION DRAWINGS

CITY OF BRISTOL INTEGRATED SOLID WASTE MANAGEMENT FACILITY
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 DATE: 8/18/2023
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