

Solid Waste Permit #498 Final Cover System Construction

Addendum #1

City of Bristol, Virginia
Integrated Solid Waste Management Facility
Solid Waste Permit #498 Landfill
2655 Valley Drive
Bristol, Virginia 24201
276-645-7380

SCS ENGINEERS

SCS Project #02218208.17 | September 15, 2023

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

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1 EXECUTIVE SUMMARY

This addendum has been prepared by SCS Engineers (SCS) for the City of Bristol, Virginia Integrated Solid Waste Management Facility for the SWP#498 Final Cover System Construction Project Landfill. The purpose of this addendum is to provide answers to questions received thus far and provide revised and additional information about the project. This addendum includes a revised drawing set and revised documents, listed below.

2 REVISED DOCUMENTS

00 11 16 INVITATION TO BID

Replace 00 11 16 with a revised document included as Appendix A of Addendum 1.

00 21 13 INSTRUCTIONS TO BIDDERS

Replace 00 21 13 with a revised document included as Appendix B of Addendum 1.

00 41 13 BID FORM

Replace 00 41 13 with a revised document included as Appendix C of Addendum 1.

00 70 00 TERMS AND CONDITIONS

Replace 00 70 00 with a revised document included as Appendix D of Addendum 1.

01 20 00 MEASUREMENT AND PAYMENT

Replace 01 20 00 with a revised document included as Appendix E of Addendum 1.

01 45 00 CONSTRUCTION QUALITY CONTROL

Replace 01 45 00 with a revised document included as Appendix F of Addendum 1.

31 00 00 EARTHWORK

Replace 31 00 00 with a revised document included as Appendix G of Addendum 1.

31 05 19.17 AGRU MICRODRAIN GEOMEMBRANE

Replace 31 05 19.17 with a revised document included as Appendix H of Addendum 1.

31 05 19.26 DRAINAGE GEOCOMPOSITE

Replace 31 05 19.26 with a revised document included as Appendix I of Addendum 1.

PRE-BID MEETING

Minutes

Pre-Bid Meeting minutes are included in Appendix J of Addendum 1.

Sign-In Sheet

Pre-Bid Meeting sign in sheet is included in Appendix K of Addendum 1.

3 DRAWINGS

CAD FILES

AutoCAD Civil 3D files are available upon request from the bidder. Requests should be directed to twilliams@scsengineers.com. The bidder will be required to sign an electronic file transfer agreement.

Bidders should be aware that differences may exist between the Electronic Files delivered and the data or hard copy files from which the Electronic Files are derived. It shall be the bidder's responsibility to determine the accuracy, correctness and completeness of the information contained in the Electronic Files and whether any conflicts exist with other data or records.

REVISIONS TO DRAWINGS

A revised drawing set is incorporated into this Addendum as an attachment. The revisions include, but are not limited to, the following:

- The inclusion and discussion of additional existing infrastructure in the project area, including overhead power lines, utility poles, and piping
- The position of GP-20 was adjusted
- A callout requiring the removal of the pavement from the vicinity of the new storm sewer system and basin grading
- Adjustments to the limits of disturbance and silt fence positioning along the south face of the site
- Various detail revisions
- A new detail describing the daylighting of the drainage geocomposite into stormwater channels

4 QUESTIONS

The following questions have been received to date and SCS' answers are shown below. Similar questions have been grouped together. Additional questions should be submitted to twilliams@scsengineers.com by 5:00 PM EST on Monday, September 18th, 2023.

Note: Similar questions have been grouped together. Questions may be edited for clarity.

Question 1: *Are the AutoCAD files available for the construction drawings?*

Answer: AutoCAD files (AutoCAD Civil 3D, 2020 version) are available upon request to TWilliams@scsengineers.com. Bidders will be asked to sign an electronic release agreement before receiving the files. Bidders should be aware that differences may exist between the electronic files delivered and the data or hard copy files from which the Electronic files are derived. It shall be the bidder's responsibility to determine the accuracy, correctness, and completeness of the information contained in the Electronic Files and whether any conflicts exist with other data or records.

Question 2: *What is the anticipated start date?*

Answer: The anticipated start date is approximately mid-October. An exact start date cannot be guaranteed.

Question 3: *Is there a potential for the completion date of 3-28-24 pushed back due to winter weather? What are the procedures/rules regarding weather delays? We have not seen a chart published that lists allowable weather impact days for this project. Is this forthcoming?*

Answer: Please see clause PP of the revised Terms and Conditions document (00 70 00) which addresses weather-related delays in the Contractor's Progress. As described in the revised document, it is the Contractor's responsibility to document and demonstrate on a monthly basis that any claimed weather delay affected the schedule's critical path. A table of foreseeable bad weather days per month is provided.

Question 4: *Does SCS or the City of Bristol have a recommended source for the off-site borrow needed to complete the closure?*

Answer: For a previous project at the Bristol ISWMF, the following contractors were used to supply off-site borrow material:

- Baker's Construction Services, Inc. — Clay material
- Summers-Taylor, Inc. — Intermediate cover soil and Topsoil

Question 5: *Is there a geotechnical report and any subsequent data associated with any geotechnical investigations? If no geotechnical report or information is available, please consider adding unit price line items to the bid form to account for potential rock excavation, on-site excavation and Import fill. Are there borings or test pit logs available?*

Answer: Neither a geotechnical report nor other subsurface data is available for the project area. Unit price line items will not be used for potential rock excavation, on-site excavation, nor imported fill. These factors will need to be accounted for in the bidder's lump sum price.

Question 6: *Is there confirmation that all excavated trash generated from the final subgrade preparation and LFG system will be relocated and placed within the footprint of the final closure? When grading to the grades shown on sheet 7 "Membrane Deployment Grade", if trash is encountered to reach proposed grades is it to remain within the cell or how is to be handled? If there*

is excess cut to reach grades shown on sheet 7, "Membrane Deployment Grade", that is not trash, is that excess cut material to be landfilled on site, hauled off site, or if suitable may it be used as final cover?

Answer: SCS estimates, but does not guarantee, the earthwork to establish the membrane deployment grade shown on sheet 7 of the construction drawings will require a net fill. This suggests that excavated waste from the earthwork operations may be repositioned within the footprint of the final cover system. Excavated waste must either be repositioned within the landfill or hauled and disposed of at an off-site active landfill facility. It is ultimately the bidder's responsibility to estimate earthwork quantities and evaluate if any off-site disposal of excess excavated waste will be required. Clean (uncontaminated by waste) soil obtained from required on-site excavation may be used as final cover material if the corresponding material requirements are satisfied. There is no active landfill disposal available at the facility, and there is no active soil borrow area.

Question 7: Can a unit price line item be used for potential leachate breakouts?

Answer: A unit price line item will not be added for the potential leachate breakouts. As noted in the revised Measurement and Payment specification (01 20 00), the cost of addressing leachate seeps should be included in the lump sum bid item #6 (Membrane Deployment Grade Earthwork).

Question 8: The typical thickness for intermediate/daily cover as indicated is 12 inches. The profiles indicate that areas of cut and fill will be required to achieve slopes and final subgrade below the geomembrane system. Is it the contractor's responsibility to provide this minimum thickness?

Answer: It is the contractor's responsibility to provide the minimum required 12 inch thickness for the intermediate/daily cover bedding layer in compliance with the drawings and specifications.

Question 9: Please confirm that an additional 6 inch bedding layer is required below the Flexamat downchute?

Answer: The Flexamat downchute detail (detail 4 on sheet 19) has been revised for clarity. The material below the Flexamat downchute will conform to the final cover system requirements described elsewhere in the drawings and specifications. No additional soil layer is required beyond those shown in the final cover system detail (detail 6 on sheet 19).

Question 10: Are the final certifying surveys for the Geomembrane system provided by the contractor or SCS?

Answer: SCS, on behalf of the Owner, will supply the Geomembrane record drawing. Please see the Surveying and Record Documents specification (02 21 00) for additional information.

Question 11: Is a full time third party CQC manager required to be on site during all phases of construction?

Answer: The Contractor is not required to use a third party CQC manager. Please refer to the revised Construction Quality Control specification (01 45 00) for requirements and information. The

Contractor may or may not elect to employ a third party firm to support construction quality control on the project. The Contractor's CQC system manager may have other responsibilities beyond those related to CQC. An alternate may be identified to serve in the event of the system manager's absence, in accordance with the specifications.

Question 12: *Is a full time safety manager required to be on site during all phases of construction?*

Answer: Please see the Health and Safety Plan specification (01 35 29) for requirements and information. The Contractor shall have a designated Health and Safety officer present at all times during site construction. The Health and Safety officer may have other site responsibilities and duties. The Contractor may elect to change the Health and Safety officer or designate an alternate if compliance is maintained with the health and safety plan requirements.

Question 13: *Is the intermediate layer 12" with a 6" bedding on top or is it 12" total?*

Answer: Referring to detail 6 on sheet 19, a minimum 12" soil layer is required between the bottom of the geomembrane and the top of waste. The drawings and specifications include additional requirements that specifically apply to the top 6" of soil within this layer.

Question 14: *To ensure we are able to put a proposal together can the bid date be extended to Friday the 29th?*

Answer: Yes, the bid due date has been extended to Friday the 29th

Question 15: *Ref. plan sheet 8, final cover grade: We are concerned about settlement during and after construction. Please confirm that it will be acceptable that the specified thickness of all soil layers can verified by potholing (test pit) method rather than survey method.*

Answer: Yes, the thicknesses of the soil layers may be verified using test pits in conformance with the specifications. See paragraph 3.2 in the Erosion Control and Vegetative Support Layers specification (31 05 13) and paragraph 3.9.1.2 in the Earthwork specification (31 00 00).

Question 16: *Ref. spec section 31 00 00 and 31 23 33: Compaction requirements of soil for the bedding layer below the geomembrane, LFG trench backfill and soil below the proposed access road may be difficult to achieve since compaction efforts on trash can yield excessively. Our question is: As long as the contractor is making a good faith effort to achieve compaction, will this be acceptable to the SCS?*

Answer: If it is observed to be an issue during construction, SCS will consider the effect of the yielding trash on compaction criteria. The acceptability of work will ultimately be determined during construction. Guarantees of acceptability cannot be made in advance.

Question 17: *If leachate is encountered during construction activities, where on site can it be disposed of?*

Answer: Leachate seeps should generally be treated by re-establishing leachate drainage back into the landfill waste mass. If excess leachate is encountered and disposal is needed, sanitary sewer lines are available on-site. The sewage pumping station adjacent to the east side of the landfill may be made accessible for disposal of leachate. Contractor will coordinate disposal of leachate with the City.

Question 18: Ref. plan sheet 7, LFG system and membrane deployment grade: If existing below ground or above ground utilities interfere with the installation of proposed LFG monitoring probes, remote extraction wells or storm drain lines, who is responsible for the relocation of these existing items?

Answer: If unknown utilities interfere with the installation of proposed features, Contractor will immediately contact and seek guidance from the Engineer. Engineer will provide direction for continuing the work. Existing features shown on the drawings will be protected or otherwise dealt with as indicated in the drawings.

Question 19: Ref spec section 31 05 13, Erosion control and vegetative support layers: There is a reference here for amending the vegetative support layer with suitable organic material (compost). Is this a requirement?

Answer: It is the Contractor's responsibility to perform soil testing for the vegetative support soil and apply soil amendments as required to successfully establish vegetation. Please also see the requirements described in the Seeding specification (32 92 19). The Contractor is required to establish a permanent vegetative cover with a 90% uniform stand of specified grasses in seeded areas.

Question 20: Ref. plan sheet 15, Site monitoring plan: Are there any requirements of the contractor to comply with this program other than the installation of new probes GP-19, 20, 21?

Answer: Sheet 15 is provided for site informational purposes. From this sheet, only the new landfill gas probes GP-19, GP-20, and GP-21 are required of the Contractor.

Question 21: Ref. Plan sheet 6, phase 1 erosion and sediment control, super silt fence is called out for installation. The detail on sheet 26 calls for fabric supported by wire backing. Is chain link fabric also a requirement?

Answer: Yes, a chain link type fabric shall be used. A note has been added to include the requirement.

Question 22: Ref. plan sheet 8 and 18, stormwater features and stormwater calculation: SCC 2 thru SCC 8 are shown on the plan sheet. However, in the stormwater calculation summary on sheet 18, SCC-1 and SCC-9 are called out, but not shown on the plans. Are these required? And if so, where are they located and what are the lengths?

Answer: The SCC-1 and SCC-9 designations were used for existing channels which do not require modification. No work is required for these channels.

Question 23: *Ref. plan sheet 19, detail 8, final cover system anchor trench: Are edge of liner markers required. If so, at what interval? There is a note stating that the drainage geocomposite daylighted at 5% minimum slope into 6" of VDOT No. 57 stone. What is the width of this 6" stone layer? And does it run the full perimeter of the anchor trench?*

Answer: Please see the revised detail 8 on sheet 19. Treated posts marking the edge of liner have been added at 100' maximum intervals. The width of the drainage stone shall be at least 2'. The stone runs the full perimeter of the anchor trench, except for where the waste management unit boundary coincides with a flexamat stormwater channel.

Question 24: *Ref. spec section 31 25 00: It is stated that the contractor is responsible for obtaining a land disturbance permit and payment of the associated erosion and sediment control bond. Where is this permit obtained and how much does it cost?*

Answer: The land disturbance permit will be obtained in coordination with the City of Bristol. Please contact Grayson Toler, the City Engineer, at 276-645-7360 concerning any associated cost.

Question 25: *Ref. spec section 01 45 00, Construction Quality Control: It is not clear whether the contractor is responsible for having third party representatives present during deployment of the 40 mil liner and drainage geocomposite. The specifications for the geomembrane system do reference CQA and liner installer CQC. Please clarify whether the general contractor is responsible for testing and oversight as well.*

Answer: The Contractor is not required to have a third party representative (separate from the liner installer's CQC personnel) present during geosynthetics installation. The Textured LLDPE Geomembrane Liner specification (31 05 19.16) describes the testing responsibilities during the geomembrane installation. Tests are the responsibility of the Contractor unless otherwise noted in the specification. Paragraphs 1.6.3, 1.8.1, 3.7, 3.8, and 3.9 of the Geomembrane specification describe some of the relevant testing responsibilities. Please contact the Engineer if any specific testing requirements remain unclear.

Question 26: *Is it correct that we are to submit 5 complete, separately sealed bid forms with required documents, one of those copies being redacted and with one copy including the bid security?*

Answer: 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 Friday the 29th 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.

Question 27: *Do you want titles or tabs on the separate sections?*

Answer: Titles or tabs on separate sections are not required.

Question 28: *If Engineer determines that bearing materials at required subgrade elevations are unsatisfactory, and excavation has to continue until satisfactory bearing materials are encountered per the engineer's direction will this excavation and replacement of unsuitable soils be paid for?*

Answer: It will be the Contractor's responsibility to excavate and replace unsuitable bearing materials or provide appropriate bridging material. The bidder should account for the possibility of replacing unsuitable materials.

Question 29: *Is test digging allowed in the proposed future pond area?*

Answer: Test digging is allowable, please coordinate with the City to make arrangements for the test digging.

Question 30: *Are there special requirements for draining the pond as far as keeping water on site in case of fire at the gas plant?*

Answer: The City has discussed the proposed changes with the fire department and obtained approval. If the associated water pipe risers present an obstacle during construction, the contractor is to remove the pipes (refer to the drawings, revised sheet 5).

Question 31: *Spec section 31 05 13 "Erosion Control and vegetative support layers" says that the soil for the Erosion Control layer and vegetative support layer shall come from either an on-site borrow area or an offsite borrow area provided by the contractor. Is the material available on site, if so where is it located? Can we bid assuming this material is available on site?*

Answer: No guarantees can be made about the availability of on-site material. The bidder must evaluate if imported material is required and bid accordingly. The bidder assumes all responsibility and risk to complete the work in accordance with the bid price. There is currently no available on-site borrow area.

Question 32: *Is the final cover grades shown on sheet 8 the top of the vegetative support layer?*

Answer: Yes, within the final cover system footprint, the final cover grade corresponds to the top of the vegetative support layer.

Appendix A

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 29, 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 Friday the 29th 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 or emailing mmartin@bristolva.org.

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 5:00 PM EST on Monday, September 18th, 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 B

SECTION 00 21 13ⁱ

INSTRUCTIONS TO BIDDERS

0.0 INTENT

The intent of this Bid request is to obtain an offer to perform work to complete the construction of the Final Cover System, in accordance with Contract Documents.

1.0 DEFINED TERMS

1.1 BIDDING DOCUMENTS

Contract Documents supplemented with Advertisement for Bids, Invitation to Bid, Instructions to Bidders, Information Available to Bidders, Bid Form, and bid securities, identified.

1.2 CONTRACT DOCUMENTS

Those items so designated in the Agreement, and which together comprise the Contract.

1.3 BID

Executed Bid Form and required attachments submitted in accordance with these Instructions to Bidders.

1.4 BID PRICE

Monetary sum identified by the Bidder in the Bid Form.

2.0 BIDDING DOCUMENTS

2.1

Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.2

Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.3

Electronic Bidding Documents may be obtained from the City'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 may view the Bid Documents at the office of the Owner or the office of the Engineer.

2.4 ELECTRONIC DOCUMENTS

2.4.1

When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.

2.4.1.1

Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 2017 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

2.4.1.2

Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.4.1.1 above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

3.0 BIDDER QUALIFICATIONS

To demonstrate qualification for performing the Work of this Contract, each Bidder shall submit written evidence including financial data, previous experience, present commitments, information on subcontractors (including firms providing construction quality control), suppliers or others, and other such data as is required by the Bidder's Qualification Statement. Each Bid must contain evidence that the Bidder has a Class A license to do contracting work issued by the Commonwealth of Virginia.

4.0 PRE BID CONFERENCE

4.1

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.

4.2

General contract and major subcontract Bidders and suppliers are invited to attend.

4.3

Representatives of the Owner and Engineer will be in attendance.

4.4

Summarized minutes of this meeting will be circulated to known Bidders. These minutes will not form part of Contract Documents.

4.5

Information relevant to Bidding Documents will be issued by Addendum.

5.0 SITE AND OTHER AREAS

5.1 Site and Other Areas

5.1.1

The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.2 EXISTING SITE CONDITIONS

5.2.1 Subsurface and Physical Conditions; Hazardous Environmental Conditions

5.3 OTHER SITE-RELATED DOCUMENTS

5.3.1

In addition to any documents regarding existing Site conditions referred to in section 5.2, the following other documents relating to conditions at or adjacent to the Site are known to Owner and made available to Bidders for reference:

- Sewerage System Extension Plans dated July 1994

Owner will make copies of these other Site-related documents available to any Bidder upon request.

5.3.2

Owner has not verified the contents of these other Site-related documents, and Bidder may not rely on the accuracy of any data or information in such documents. Bidder is responsible for any interpretation or conclusion Bidder draws from the other Site-related documents.

5.3.3

The other Site-related documents are not part of the Contract Documents.

5.3.4

Bidders are encouraged to review the other Site-related documents, but Bidders will not be held accountable for any data or information in such documents. The requirement to review and take responsibility for documentary Site information is limited to information in (1) the Contract Documents and (2) the Technical Data.

5.4 SITE VISIT AND TESTING BY BIDDERS

5.4.1

Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.

5.4.2

A Site visit is scheduled following the pre-bid conference.

5.4.3

Bidders visiting the Site are required to arrange their own transportation to the Site.

5.4.4

All access to the Site other than during a regularly scheduled Site visit must be coordinated through the following Owner contact for visiting the Site: Mike Martin. Bidder must conduct the required Site visit during normal working hours.

Currently occupied premises at Project site are open for examination by Bidders only during the following hours:

- 7:00 AM to 4:00 PM Monday through Friday

5.4.5

Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

5.4.6

On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

5.4.7

Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

5.4.8

Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.5 OWNER'S SAFETY PROGRAM

Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.6 OTHER WORK AT THE SITE

In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

6.0 BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.1

The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

6.2

If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

7.0 INTERPRETATIONS AND ADDENDA

7.1

Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.2

Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

Questions are to be submitted by Wednesday, September 13th, 2023.

7.3

Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than 13 days prior to the date for opening of Bids may not be answered.

7.4

Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

7.5

Bidders must notify Engineer in writing of all conflicts, errors, or discrepancies in the Contract Documents.

8.0 BID SECURITY

8.1

A Bid must be accompanied by Bid security made payable to Owner in an amount of **five** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of paragraph 8.1.1. Such Bid bond will be issued in the form included in the Bidding Documents.

8.1.1

Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

8.2

The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.3

The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

8.4

Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

9.0 CONTRACT TIMES

9.1 TIME IS OF THE ESSENCE

All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

9.2 CONTRACT TIMES

See Sections 00 11 16 and 00 70 00

9.3 MILESTONES

See Sections 00 11 16 and 00 70 00

10.0 SUBSTITUTE AND “OR EQUAL” ITEMS

10.1

The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or-equal” items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or “or-equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

10.2

All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

11.0 SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.1

The apparent Successful Bidder, and any other Bidder so requested, must submit to Owner a list of the Subcontractors or Suppliers proposed for the following portions of the Work within five days after Bid opening:

- Geosynthetics Supplier and Installer
- Erosion and Sediment Control Installer
- Soils and Geosynthetics Testing Firms
- Landfill gas installer

11.2

If requested by Owner, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.3

If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer.

12.0 PREPARATION OF BID

12.1

The Bid Form is included with the Bidding Documents.

12.1.1

All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment lump sum price item, and lump price item listed therein.

12.1.2

If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

12.2

If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.3

A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.4

A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.5

A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.6

A Bid by an individual must show the Bidder's name and official address.

12.7

A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.8

All names must be printed in ink below the signatures.

12.9

The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10

Postal and email addresses and telephone number for communications regarding the Bid must be shown.

12.11

The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12

If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

13.0 BASIS OF BID

13.1 LUMP SUM

13.1.1 Bid Items

Bidders must submit a Bid on a lump sum basis for each item of Work listed in the lump sum section of the Bid Form.

14.0 SUBMITTAL OF BID

14.1

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 Friday the 29th 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.

14.2

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.

14.3

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.

15.0 MODIFICATION AND WITHDRAWAL OF BID

15.1

An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.2

If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid and submit a new Bid prior to the date and time for the opening of Bids.

15.3

If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

16.0 OPENING OF BIDS

16.1

Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

17.0 BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

18.0 EVALUATION OF BIDS AND AWARD OF CONTRACT

18.1

Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.2

Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.3

If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.4

If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid based on the total price with base bid items, or if the alternative bid items are accepted, based on total price with alternative bid item.

18.5 EVALUATION OF BIDS

18.5.1

In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, lump sum prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

18.5.2

In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.5.3

Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

19.0 BONDS AND INSURANCE

19.1 PERFORMANCE BOND

A performance bond on the part of the contractor for 100 percent of the contract price. A “performance bond” is one executed in connection with a contract to secure fulfillment of all the contractor’s requirements under such contract.

19.2 PAYMENT BOND

A payment bond on the part of the contractor for 100 percent of the contract price. A “payment bond” is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

19.3 BID BOND

Paragraph 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

20.0 SIGNING OF AGREEMENT

When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents.

END OF SECTION 00 21 13

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Appendix C

SECTION 00 41 13

BID FORM

1.0 OWNER AND BIDDER

1.1

This Bid is submitted to: City of Bristol 300 Lee St, Bristol, VA 24201

1.2

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.0 ATTACHMENTS TO THIS BID

The following documents are submitted with and made a condition of this Bid:

- Required Bid security;
- List of Proposed Subcontractors;
- List of Proposed Suppliers;
- Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
- Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids; and
- Required Bidder Qualification Statement with supporting data.

3.0 BASIS OF BID—LUMP SUM PRICES

3.1 LUMP SUM PRICE BIDS

Bidders should submit lump sum prices for the construction of the SWP#498 landfill final cover system. Bids will be evaluated on the lowest total price. Payment applications will be submitted separately for each category and the City of Bristol may elect to make separate payments for each category.

3.1.1 Base Bid Lump Sum Price – 498 Final Closure System

#	Description	Unit ¹	Lump Sum Price
1	Mobilization/Demobilization	LS	
2	Health and Safety Planning and Accommodations	LS	
3	Clearing, Grubbing, and Stripping	LS	
4	Erosion and Sediment Control	LS	
5	Stormwater Basin Excavation	LS	
6	Membrane Deployment Grade Earthwork	LS	
7	Furnish LFG Horizontal Collector Materials	LS	
8	Install LFG Horizontal Collectors	LS	
9	Furnish LFG Header Materials	LS	
10	Install LFG Headers	LS	
11	Furnish Air and Force Main Materials	LS	
12	Install Air and Force Main	LS	
13	Furnish and Install LFG Drainage Pits	LS	
14	Furnish and Install Horizontal Collector Pit Wellheads with Pumps	LS	
15	Furnish and Install Horizontal Collector Tie in to Existing PVC Wells	LS	
16	Furnish and Install Remote LFG Wellhead and LFG Lateral tie-in to EW-22	LS	
17	Furnish and Install Stormwater Sewer System	LS	
18	Furnish and Install Stormwater Basin Outlet	LS	
19	Furnish 40 mil LLDPE Geomembrane	LS	
20	Install 40 mil LLDPE Geomembrane	LS	
21	Furnish Drainage Geocomposite	LS	
22	Install Drainage Geocomposite	LS	
23	Furnish Erosion Control Layer Material	LS	
24	Install Erosion Control Layer	LS	
25	Furnish Vegetative Support Layer Material	LS	
26	Install Vegetative Support Layer	LS	
27	Furnish and Install Access Road	LS	

¹ LS indicates lump sum price

#	Description	Unit ¹	Lump Sum Price
28	Furnish and Install Permanent Seeding	LS	
29	Furnish and Install Stormwater Conveyance Channels, Downchutes and Culverts	LS	
30	Furnish and Install Stormwater Diversion Berms	LS	
31	Furnish and Install Remote Soil Extraction Wells	LS	
32	Furnish LFG Monitoring Probes Materials	LS	
33	Install LFG Monitoring Probes	LS	
34	Furnish and Install LFG Condensate Sump	LS	

3.1.2 Alternative Bid Item – Lump Sum Price

As an alternative to the geomembrane and drainage geocomposite used in the final cover system (base bid items #19, #20, #21, and #22), the Contractor may elect to submit an alternative bid for the use of the AGRU Integrated Drainage System (IDS) with AGRU MicroDrain Liner (50 mil LLDPE) and the AT081 nonwoven geotextile or equivalent product.

#	Description	Unit ²	Lump Sum Price
Alt#1	Lump Sum Bid Price for 50 mil LLDPE AGRU MicroDrain Liner and AT081 nonwoven geotextile, Materials, Manufacturing Testing, Installation, Installation Testing	LS	

3.1.3 Total Lump Sum Bid Price

The Total Price 1 is the summation of the base bid items in section 3.1.1. The Total Price 2 is the summation of the base bid items in section 3.1.1 and the Alt#1 item in section 3.1.2, excluding base bid items #19, #20, #21 and #22 in section 3.1.1. The Contractor must provide a bid for Total Price 1. The Contractor may elect to provide a bid for Total Price 2.

Total Price 1	Total Price with Base Bid Items	\$
Total Price 2	Total Price with Alternative Bid Item (exclude Bid Items #19-22):	\$

4.0 TIME OF COMPLETION

4.1 TIME IS OF THE ESSENCE

Bidder agrees that the Work will be substantially complete and will be completed and ready for final

² LS indicates lump sum price

payment on or before the dates or within the number of calendar days indicated in the Agreement.

4.2 CONTRACT TIMES

Bidder agrees that the Work will be substantially complete within by March 1, 2024, and will be completed and ready for final payment by March 28, 2024.

4.3 LIQUIDATED DAMAGES

Bidder accepts the provisions of the Terms and Conditions as to liquidated damages.

5.0 BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.1 BID ACCEPTANCE PERIOD

This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.2 INSTRUCTIONS TO BIDDERS

Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.3 RECEIPT OF ADDENDA

Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date
Addendum 1	9/15/2023

6.0 BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.1 BIDDER'S REPRESENTATIONS

6.1.1

In submitting this Bid, Bidder represents the following:

6.1.1.1

Bidder has examined and carefully studied the Bidding Documents, including Addenda.

6.1.1.2

Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

6.1.1.3

Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

6.1.1.4

Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Bid Documents, with respect to the Technical Data in such reports and drawings.

6.1.1.5

Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Bid Documents, with respect to Technical Data in such reports and drawings.

6.1.1.6

Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.

6.1.1.7

Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

6.1.1.8

Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

6.1.1.9

Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

6.1.1.10

The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

6.1.1.11

The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.2 BIDDER'S CERTIFICATIONS

6.2.1

The Bidder certifies the following:

6.2.1.1

This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

6.2.1.2

Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

6.2.1.3

Bidder has not solicited or induced any individual or entity to refrain from bidding.

6.2.1.4

Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 6.2.1.4:

6.2.1.4.1

Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

6.2.1.4.2

Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

6.2.1.4.3

Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

6.2.1.4.4

Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices:

Bidder's Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

Bidder's Contractor License No.: (if applicable)

END OF SECTION 00 41 13

Appendix D

SECTION 00 70 00

TERMS AND CONDITIONS

The Agreement for Service ("Contract" or "Agreement") with the successful Offeror will contain the following Terms and Conditions. Offerors taking exception to these Terms and Conditions or intending to propose additional or alternative language must (a) identify with specificity the City Terms and Conditions to which they take exception or seek to amend or replace; and (b) include any additional or different language with their bid. Failure to both identify with specificity those terms and conditions Offeror takes exception to or seeks to amend or replace as well as to provide Offeror's additional or alternate terms and conditions may result in rejection of the bid.

A. Procedures

The extent and character of the services to be performed by the Offeror shall be subject to the general control and approval of the City and their authorized representative(s). Any change to the Contract must be approved in writing by the City.

B. Delays and Delivery Failures

The Offeror must keep the City advised at all times of services' status relative to the schedule as agreed upon by the parties. If delay is foreseen, the Offeror shall give immediate written notice to the Purchasing Department and include an expected resolution timeframe. Should the Offeror fail to deliver the proper item(s)/service(s) at the time and place(s) contracted for, or within the resolution timeframe submitted with the delay notification or should the Offeror fail to make a timely replacement of rejected items /services when so required, the City may purchase items/services of comparable quality and quantity in the open market to replace the undelivered or rejected items/services. The Offeror shall reimburse the City for all costs in excess of the Agreement price when purchases are made in the open market; or in the event that there is a balance the City owes to the Offeror from prior transactions, an amount equal to the additional expense incurred by the City as a result of the Offeror's nonperformance shall be deducted from the balance as payment.

C. Business, Professional, & Occupational License Requirement

All firms or individuals doing business in the City are required to be licensed in accordance with the City Code Section 18-28. - License Requirement.

Questions regarding licensing should be directed to the Office of Commissioner of Revenue, telephone (276) 645-7316.

D. Authorization to Conduct Business in the Commonwealth

A contractor organized as a stock or nonstock corporation, limited liability company, business trust, or limited partnership or registered as a registered limited liability partnership shall be authorized to transact business in the Commonwealth as a domestic or foreign business entity if so required by Title 13.1 or Title 50 of the Code of Virginia or as otherwise required by law. Any business entity described above that enters into a contract with a public body pursuant to the Virginia Public Procurement Act shall

not allow its existence to lapse or its certificate of authority or registration to transact business in the Commonwealth, if so required under Title 13.1 or Title 50, to be revoked or cancelled at any time during the term of the contract. A public body may void any contract with a business entity if the business entity fails to remain in compliance with the provisions of this section.

E. Insurance

1. The Offeror shall be responsible for its work and every part thereof, and for all materials, tools, equipment, appliances, and property of any and all description used in connection therewith. The Offeror assumes all risk of direct and indirect damage or injury to the property or persons used or employed on or in connection with the work contracted for, and of all damage or injury to any person or property wherever located, resulting from any action, omission, commission or operation under the Contract.
2. The Offeror and all sub-offerors shall, during the continuance of the work under the Contract, provide the following:
 - a. Workers' Compensation and Employer's Liability to protect the Offeror from any liability or damages for any injuries (including death and disability) to any and all of its employees, including any and all liability or damage which may arise by virtue of any statute or law in force within the Commonwealth of Virginia.
 - b. Comprehensive General Liability insurance to protect the Offeror, and the interest of the City, its officers, employees, and agents against any and all injuries to third parties, including bodily injury and personal injury, wherever located, resulting from any action or operation under the Contract or in connection with the contracted work. The General Liability insurance shall also include the Broad Form Property Damage endorsement, in addition to coverage for explosion, collapse, and underground hazards, where required.
 - c. Automobile Liability insurance, covering all owned, non-owned, borrowed, leased, or rented vehicles operated by the Offeror.
 - d. Professional Liability against any and all wrongful acts, errors, or omissions on the part of the Offeror resulting from any action or operation under the Contract or in connection with the contracted work.
3. The Offeror agrees to provide the above-referenced policies with the following limits. Liability insurance limits may be arranged by General, Automobile and Professional Liability policies for the full limits required, or by a combination of underlying policies for lesser limits with the remaining limits provided by an Excess or Umbrella Liability policy.
 - a. Workers' Compensation: Statutory requirements and benefits. Coverage is compulsory for employers of three or more employees, to include the employer.

- b. Employer's Liability:
 - i. Each Accident: \$1,000,000
 - ii. Disease, Each Employee: \$1,000,000
 - iii. Disease, Policy Limit: \$2,000,000
 - c. Commercial General Liability:
 - i. General Aggregate \$2,000,000
 - ii. Each Occurrence \$1,000,000
 - iii. Commercial General Liability shall include bodily injury and property damage, personal injury, advertising injury, products and completed operations coverage. General Aggregate limit shall apply separately to the project. Contractor's insurance coverage shall be primary and non-contributory.
 - d. Automobile Liability: Combined Single Limit of \$1,000,000
 - e. Professional Liability:
 - i. General Aggregate \$2,000,000
 - ii. Each Occurrence \$1,000,000
 - f. Umbrella Liability: \$2,000,000 per occurrence.
4. The following provisions shall be agreed to by the Offeror:
- a. No change, cancellation, or non-renewal shall be made in any insurance coverage without a forty-five (45) day written notice to the City. The Offeror shall furnish a new certificate prior to any change or cancellation date. The failure of the Offeror to deliver a new and valid certificate will result in suspension of all payments until the new certificate is furnished.
 - b. Liability Insurance "Claims Made" basis:

If the liability insurance purchased by the Offeror has been issued on a "claims made" basis, the Offeror must comply with the following additional conditions. The limits of liability and the extensions to be included as described previously in these provisions, remain the same. The Offeror must either:

 - i. Agree to provide, prior to commencing work under the Contract, certificates of insurance evidencing the above coverage for a period of two (2) years after final payment for the Contract for General Liability policies and five (5) years for Professional Liability policies. This certificate shall evidence a "retroactive date" no later than the beginning of the Offeror's work under this Contract,
or
 - ii. Purchase the extended reporting period endorsement for the policy or policies in force during the term of this Contract and evidence the purchase of this extended reporting period endorsement by means of a certificate of insurance or a copy of the endorsement itself.

- c. The Offeror must disclose the amount of deductible/self-insured retention applicable to the General Liability, Automobile Liability and Professional Liability policies, if any. The City reserves the right to request additional information to determine if the Offeror has the financial capacity to meet its obligations under a deductible /self-insured plan. If this provision is utilized, the Offeror will be permitted to provide evidence of its ability to fund the deductible /self-insured retention.
 - d. Origin of Insurance
 - i. The Offeror agrees to provide insurance issued by companies admitted within the Commonwealth of Virginia, with the Best's Key Rating of at least A:VII.
 - ii. European markets including those based in London, and the domestic surplus lines market that operate on a non-admitted basis are exempt from this requirement provided that the Offeror's broker can provide financial data to establish that a market's policyholder surpluses are equal to or exceed the surpluses that correspond to Best's A:VII Rating.
 - e. Required Certificates
 - i. The Offeror will provide an original signed Certificate of Insurance and such endorsements as prescribed herein.
 - ii. The Offeror will provide on request certified copies of all insurance coverage related to the Contract within ten (10) business days of request by the City. These certified copies will be sent to the City from the Offeror's insurance agent or representative. Any request made under this provision shall be deemed confidential and proprietary.
 - iii. Any certificates provided shall indicate the Contract name and number.
 - f. The City, its officers and employees shall be Endorsed to the Offeror's Automobile and General Liability policies as an "additional insured" with the provision that this coverage "is primary to all other coverage the City may possess." (Use "loss payee" where there is an insurable interest). A Certificate of Insurance evidencing the additional insured status must be presented to the City along with a copy of the Endorsement.
 - g. Compliance by the Offeror with the foregoing requirements as to carrying insurance shall not relieve the Offeror of their liabilities provisions of the Contract.
5. Contractual and other Liability insurance provided under this Contract shall not contain a supervision, inspection or engineering services exclusion that would preclude the City from supervising and/or inspecting the project as to the end result. The Offeror shall assume all on-the-job responsibilities as to the control of persons directly employed by it.
6. Precaution shall be exercised at all times for the protection of Persons (including employees) and property.

7. The Offeror is to comply with the Occupational Safety and Health Act of 1970, Public Law 91-956, as it may apply to this Contract.
8. If an "ACORD" Insurance Certificate form is used by the Offeror's insurance agent, the words "endeavor to" and ". . . but failure to mail such notice shall impose no obligation or liability of any kind upon the company" in the "Cancellation" paragraph of the form shall be deleted.
9. The Offeror agrees to waive all rights of subrogation against the City, its officers, employees, and agents.

F. Hold Harmless

The Offeror shall indemnify and hold harmless the City, including its officials and employees, from all liability, losses, costs, damages, claims, causes of action, and suits of any nature (specifically including reasonable attorney's fees and defense costs incurred with the defense of third party claims) incidental to or brought as a consequence of any negligent act, error, omission, or breach of the applicable professional standard of care by the Offeror and /or its subcontractors. The Offeror agrees that this clause shall include, but is not limited to, claims involving infringement of patent or copyright. This section shall survive completion of the Contract. The City is prohibited from indemnifying Offeror and/or any other third parties.

G. Safety

All Offerors and sub-offerors performing services for the City are required and shall comply with all Occupational Safety and Health Administration (OSHA), State and City Safety and Occupational Health Standards, and any other applicable rules and regulations. Also, all Offerors and sub-offerors shall be held responsible for the safety of their employees and any unsafe acts or conditions that may cause injury or damage to any persons or property within and around the work site area under this Contract.

H. Anti-Discrimination

The City of Bristol, VA in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

By submitting their bids, offerors certify to the City that they will conform to the provisions of the Federal Civil Rights Act of 1964, as amended, as well as the Virginia Fair Employment Contracting Act of 1975, as amended, where applicable, the Virginians With Disabilities Act, the Americans With Disabilities Act and § 2.2-4311 of the Virginia Public Procurement Act (VPPA). If the award is made to a faith-based organization, the organization shall not discriminate against any recipient of goods, services, or disbursements made pursuant to the contract on the basis of the recipient's religion, religious belief, refusal to participate in a religious practice, or on the basis of race, age, color, gender sexual orientation, gender identity, or national origin and shall be subject to the same rules as other organizations that contract with public bodies to account for

the use of the funds provided; however, if the faith-based organization segregates public funds into separate accounts, only the accounts and programs funded with public funds shall be subject to audit by the public body. (Code of Virginia, § 2.2-4343.1E).

In every contract over \$10,000, the provisions in 1. and 2. below apply:

1. During the performance of this contract, the contractor agrees as follows:
 - a. The contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, sexual orientation, gender identity, national origin, age, disability, or any other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
 - b. The contractor, in all solicitations or advertisements for employees placed by or on behalf of the contractor, will state that such contractor is an equal opportunity employer.
 - c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
 - d. If the contractor employs more than five employees, the contractor shall (i) provide annual training on the contractor's sexual harassment policy to all supervisors and employees providing services in the Commonwealth, except such supervisors or employees that are required to complete sexual harassment training provided by the Department of Human Resource Management, and (ii) post the contractor's sexual harassment policy in (a) a conspicuous public place in each building located in the Commonwealth that the contractor owns or leases for business purposes and (b) the contractor's employee handbook.
 - e. The requirements of these provisions 1. and 2. are a material part of the contract. If the Contractor violates one of these provisions, the City may terminate the affected part of this contract for breach, or at its option, the whole contract. Violation of one of these provisions may also result in debarment from State contracting regardless of whether the specific contract is terminated.
 - f. In accordance with Executive Order 61 (2017), a prohibition on discrimination by the contractor, in its employment practices, subcontracting practices, and delivery of goods or services, on the basis of race, sex, color, national origin, religion, sexual orientation, gender identity, age, political affiliation, disability, or veteran status, is hereby incorporated in this contract.
2. The contractor will include the provisions of 1. above in every subcontract or purchase order over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

I. Ethics in Public Contracting

The provisions contained in § 2.2-4367 through § 2.2-4377 of the Virginia Public Procurement Act as set forth in the 1950 Code of Virginia, as amended, shall be applicable to all Contracts solicited or entered into by the City. A copy of these provisions may be obtained from the Purchasing Department upon request.

The above-stated provisions supplement, but do not supersede, other provisions of law including, but not limited to, the Virginia State and Local Government Conflict of Interests Act (§ 2.2-3100 et seq.), the Virginia Governmental Frauds Act (§ 18.2-498.1 et seq.) and Articles 2 and 3 of Chapter 10 of Title 18.2. The provisions apply notwithstanding the fact that the conduct described may not constitute a violation of the Virginia Conflict of Interests Act.

J. Drug-free Workplace

Every Contract of over \$10,000 shall include the following provisions:

During the performance of this Contract, the Offeror agrees to (i) provide a drug-free workplace for the Offeror's employees; (ii) post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Offeror's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Offeror that the Offeror maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each sub-offeror or vendor.

For the purposes of this section, "drug-free workplace" means a site for the performance of work done in connection with a specific Contract awarded to an Offeror in accordance with this chapter, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of the Contract.

K. Immigration Reform and Control Act of 1986

By entering this Contract, the Offeror certifies that it does not and will not during the performance of this Contract violate the provisions of the Federal Immigration Reform and Control Act of 1986, which prohibits employment of illegal aliens.

L. Exemption from Taxes

Pursuant to Va. Code § 58.1-609.1, the City is exempt from Virginia State Sales or Use Taxes and Federal Excise Tax, therefore the Offeror shall not charge the City for Virginia State Sales or Use Taxes or Federal Excise Tax on the finished goods or products provided under the Contract. However, this exemption does not apply to the Offeror, and the Offeror shall be responsible for the payment of any sales, use, or excise tax it incurs in providing the goods required by the Contract, including, but not limited to, taxes on materials purchased by an Offeror for incorporation in or use on a construction project. Nothing in this section shall prohibit the Offeror from including its own sales tax expense in connection with the Contract in its Contract price.

M. Ordering, Invoicing and Payment

All work requested under this Contract shall be placed on a City issued Purchase Order. The Offeror shall not accept credit card orders or payments.

The Offeror shall submit invoices, at the completion of tasks and submission of deliverables; such statement to include a detailed breakdown of all charges for that deliverable.

Payments for services are to be requested as monthly billings submitted by Offeror by the end of the calendar month and payable by the City within 30 days of receipt.

All such invoices will be paid timely by the City unless any items thereon are questioned, in which event payment will be withheld pending verification of the amount claimed and the validity of the claim. The Offeror shall provide complete cooperation during any such investigation.

All invoices shall be forwarded to the following address:

Director of Public Works
City of Bristol, Virginia
2515 Valley Drive
Bristol, VA 24201

Individual Offerors shall provide their social security numbers and proprietorships, partnerships, and corporations shall provide their federal employer identification number on the pricing form.

Offeror shall provide a current Form W-9 – Request for Taxpayer Identification Number and Certification.

N. Payments to Subcontractors

Within seven (7) days after receipt of amounts paid by the City for work performed by a subcontractor under this Contract, the Offeror shall either:

1. Pay the subcontractor for the proportionate share of the total payment received from the City attributable to the work performed by the subcontractor under this Contract; or
2. Notify the City and subcontractor, in writing, of his/her intention to withhold all or a part of the subcontractor's payment and the reason for non-payment.

The Offeror shall pay interest to the subcontractor on all amounts owed that remain unpaid beyond the seven (7) day period except for amounts withheld as allowed in item 2 above.

Unless otherwise provided under the terms of this Contract interest shall accrue at the rate of one percent (1 %) per month.

The Offeror shall include in each of its subcontracts a provision requiring each subcontractor to include or otherwise be subject to the same payment and

interest requirements as set forth above with respect to each lower-tier subcontractor.

The Offeror's obligation to pay an interest charge to a subcontractor pursuant to this provision may not be construed to be an obligation of the City.

O. Substitutions

NO substitutions, additions or cancellations, including those of key personnel are permitted after Contract award without written approval by the Purchasing Department. Where specific employees are proposed by the Offeror for the work, those employees shall perform the work as long as that employee works for the Offeror, either as an employee or subcontractor unless the City agrees to the substitution. Requests for substitutions will be reviewed by the City and approval may be given by the City at its sole discretion. The City shall be notified immediately by the Offeror when the substitution of key personnel or those identified in the bid may be necessary. The substitution process shall be complete within 14 calendar days of the Offeror's notification to the City.

P. Assignment

The Agreement may not be assigned in whole or in part without the prior written consent of the Purchasing Department. The rights and obligations of the Offeror are personal and may be performed only by the Offeror. Any purported assignment that does not comply with this provision is void. This Agreement is binding upon and inures to the benefit of the parties and their respective permitted successors and assigns.

Q. Termination

Subject to the provisions below, the Contract may be terminated by the City upon thirty (30) days advance written notice to the Offeror; but if any work or service hereunder is in progress, but not completed as of the date of termination, then the Contract may be extended upon written approval of the City until said work or services are completed and accepted.

1. Termination for Convenience

The City may terminate this Contract for convenience at any time in which case the parties shall negotiate reasonable termination costs.

2. Termination for Cause

In the event of Termination for Cause, the thirty (30) days advance notice is waived and the Offeror shall not be entitled to termination costs.

3. Termination Due to Unavailability of Funds in Succeeding Fiscal Years

If funds are not appropriated or otherwise made available to support continuation of the performance of this Contract in a subsequent fiscal year, then the Contract shall be canceled and, to the extent permitted by law, the Offeror shall be reimbursed for the reasonable value of any non-recurring costs incurred but not amortized in the price of the supplies or services delivered under the Contract.

4. Availability of Funds

It is understood and agreed between the parties herein that the City of Bristol Virginia shall be bound hereunder only to the extent of the funds appropriated and available or which may hereafter become available for the purpose of this agreement.

R. Contractual Disputes

The Offeror shall give written notice to the City Manager of intent to file a claim for money or other relief within ten (10) calendar days of the occurrence giving rise to the claim or at the beginning of the work upon which the claim is to be based, whichever is earlier.

The Offeror shall submit its invoice for final payment within thirty (30) days after completion or delivery.

The claim, with supporting documentation, shall be submitted to the City Manager by US Mail, return receipt requested, courier, or overnight delivery service, no later than sixty (60) days after final payment. If the claim is not disposed of by agreement, the City Manager shall reduce his decision to writing and mail via U.S. mail or otherwise forward a copy thereof to the Offeror within thirty (30) days of the City's receipt of the claim.

The City Manager's decision shall be final unless the Offeror appeals within thirty (30) days by submitting a written letter of appeal to the City Manager, or his designee. The City Manager shall render a decision within sixty (60) days of receipt of the appeal.

No Offeror shall institute any legal action until all statutory requirements have been met. Each party shall bear its own costs and expenses resulting from any litigation, including attorney's fees.

S. Prime Offeror Responsibilities

The Offeror(s) shall be responsible for completely supervising and directing the work under the resulting Contract(s) and all subcontractors that they may utilize. Subcontractors who perform work under the resulting Contract shall be responsible to the prime Offeror. The Offeror agrees to be fully responsible for the acts and omissions of their subcontractors and of persons employed by them.

T. Ownership of Documents

Any reports, specifications, drawings, blueprints, negatives, electronic files or other documents prepared by the Offeror in the performance of its obligations under the Contract shall be the exclusive property of the City, and all such materials shall be returned to the City upon completion, termination, or cancellation of this Contract. The Offeror shall not use, willingly allow, or cause such materials to be used for any purpose other than performance of all Offeror's obligations under the resulting Contract without the prior written consent of the City. However, the Offeror may retain file copies which cannot be used without prior written consent of the City. The City agrees that the Offeror shall not be liable for damages, loss, or injury resulting from the future use of the provided documents for other than the project specified when the Offeror is not the firm of record.

U. Submissions

All Project correspondence, design/review documents, reports, etc., prepared by the Offeror shall be distributed to the City Manager for each major phase and sub phase of the Project in the quantities as directed. Within thirty (30) days of completion of each Project phase, submit a Project phase completion report with phase documents to the City Manager.

V. Responsibility for Claims and Liabilities

The City's review, approval, or acceptance of, or payment for, any services required shall not be construed to operate as a waiver by the City of any rights or of any cause of action arising out of the Contract. The Offeror shall be and remains liable to the City for the accuracy and competency of plans, specifications, or other documents or work and Offeror is responsible to the City for any costs incurred resulting from any errors, acts or omissions in the performance of any services furnished.

W. Severability

In the event that any provision shall be adjudged or decreed to be invalid, by a court of competent jurisdiction, such ruling shall not invalidate the entire Agreement but shall pertain only to the provision in question and the remaining provisions shall continue to be valid, binding and in full force and effect.

X. Governing Law /Forum

This Agreement shall be governed and construed in all respects by its terms and by the laws of the Commonwealth of Virginia, without giving effect to its conflicts of law's provisions. Any judicial action shall be filed in the Circuit Court for the City of Bristol, Virginia. Offeror expressly waives any objection to venue or jurisdiction of the Circuit Court for the City of Bristol, Virginia. Offeror expressly consents to waiver of service of process in an action pending in the Circuit Court for the City of Bristol, Virginia pursuant to Virginia Code § 8.01-286.1.

Y. Notices

All notices and other communications hereunder shall be deemed to have been given when made in writing and either (a) delivered in person, (b) delivered to an agent, such as an overnight or similar delivery service, or (c) deposited in the United States mail, postage prepaid, certified or registered, addressed as follows:

TO OFFEROR:
TBD

TO CITY OF BRISTOL VIRGINIA:
City of Bristol Virginia
Purchasing Department
Emily
300 Lee Street
Bristol, VA 24201

Notice is deemed to have been received: (i) on the date of delivery if delivered in person; (ii) on the first business day after the date of delivery if sent by same day or overnight courier service; or (iii) on the third business day after the date of mailing, if sent by

certified or registered United States Mail, return receipt requested, postage and charges prepaid.

Z. Counterparts

This Contract and any amendments or renewals hereto may be executed in a number of counterparts, and each counterpart signature, when taken with the other counterpart signatures, is treated as if executed upon one original of this Contract or any amendment or renewal. A signature by any party to this Contract provided by facsimile or electronic mail is binding upon that party as if it were the original.

AA. Force Majeure

A party is not liable for failure to perform the party's obligations if such failure is as a result of Acts of God (including fire, flood, earthquake, storm, hurricane or other natural disaster), war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, strikes at national level or industrial disputes at a national level, or strike or industrial disputes by labor not employed by the affected party, its subcontractors or its suppliers and which affect an essential portion of the contracted for works but excluding any industrial dispute which is specific to the performance of the works or this contract, interruption or failure of electricity or telephone service.

If a party asserts Force Majeure as an excuse for failure to perform the party's obligation, that party must immediately notify the other party giving full particulars of the event of force majeure and the reasons for the event of force majeure preventing that party from, or delaying that party in performing its obligations under this contract that party must use its reasonable efforts to mitigate the effect of the event of force majeure upon its or their performance of the contract and to fulfill its or their obligations under the contract.

An event of force majeure does not relieve a party from liability for an obligation which arose before the occurrence of that event, nor does that event affect the obligation to pay money in a timely manner which matured prior to the occurrence of that event.

The Offeror has no entitlement and City has no liability for: (1) any costs, losses, expenses, damages or the payment of any part of the contract price during an event of force majeure; and (2) any delay costs in any way incurred by the Offeror due to an event of force majeure.

BB. Survival of Terms

Upon discharge of this Agreement, Sections (Notice, Hold Harmless, Warranties, Governing Law/Forum, Contractual Disputes) of these Terms and Conditions continue and survive in full force and effect.

CC. Non-Waiver

No waiver of any provision of this Agreement shall constitute a waiver of any other provision nor shall any waiver of this Agreement constitute a continuing waiver unless otherwise expressly provided.

DD. Workmanship and Inspection

All services provided under this Contract shall be performed in a skillful, workmanlike and professional manner. The Offeror and its employees shall be professional and courteous at all times. The City may, in writing, require the Offeror to remove any employee from work for reasonable cause, as determined by the City. Further, the City may, from time to time, make inspections of the services performed under this Agreement. Any inspection by the City does not relieve the Offeror of any responsibility in meeting the Agreement requirements. Offeror employees that have been removed at the direction of the City shall be replaced within seven calendar days after City notification.

EE. Debarment Status

By participating in this procurement, the vendor certifies that they are not currently debarred by the Commonwealth of Virginia or Federal Government from submitting a response for the type of goods and/or services covered by this solicitation. Vendor further certifies that they are not debarred from filling any order or accepting any resulting order, or that they are an agent of any person or entity that is currently debarred by the Commonwealth of Virginia or Federal Government. If a vendor is created or used for the purpose of circumventing a debarment decision against another vendor, the non-debarred vendor will be debarred for the same time period as the debarred vendor.

FF. Supremacy Clause

Notwithstanding any provision in the bidder's/proposer's response to the contrary, the bidder/proposer agrees that the terms and conditions contained in the City of Bristol, Virginia's Invitation to Bid or Request for Proposal prevail over contrary terms and conditions contained in the bidder's/proposer's response.

GG. Equal Employment Opportunity

The offeror hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan, insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
4. The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The offeror further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, that if the offeror so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The offeror agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The offeror further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the offeror agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the offeror under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such offeror; and refer the case to the Department of Justice for appropriate legal proceedings.

HH. Antitrust

By entering into a contract, the contractor conveys, sells, assigns, and transfers to the City of Bristol Virginia all rights, title and interest in and to all causes of action it may now have or hereafter acquire under the antitrust laws of the United States and the Commonwealth of Virginia, relating to the particular goods or services purchased or acquired by the City of Bristol Virginia under said contract.

II. Liquidated Damages

If the Contractor fails to achieve Milestone #1 Completion of the Work within the Contract Time and as otherwise required by the Contract Documents, the Owner shall be entitled to retain or recover from the Contractor, as Step One Liquidated Damages and not as a penalty, the following per diem amount commencing upon the first day following expiration of the Contract Time and continuing until the actual date of Milestone #1 Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed Milestone #1 Completion of the Work:

One Thousand Dollars (\$1,000.00) per consecutive calendar day for up to 15 Calendar Days beyond expiration of the Contract Times; then,

Two Thousand Dollars (\$2,000.00) per consecutive calendar day after 15 Calendar Days beyond expiration of the Contract Times

If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time and as otherwise required by the Contract Documents, the Owner shall be entitled to retain or recover from the Contractor, as Step Two Liquidated Damages and not as a penalty, the following per diem amount commencing upon the first day following expiration of the Contract Time and continuing until the actual date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed Substantial Completion of the Work:

One Thousand Dollars (\$1,000.00) per consecutive calendar day for up to 15 Calendar Days beyond expiration of the Contract Times; then,

Two Thousand Dollars (\$2,000.00) per consecutive calendar day after 15 Calendar Days beyond expiration of the Contract Times

If the Contractor fails to achieve Final Completion of the Work within the Contract Time, as Step Three Liquidated Damages and not as a penalty, the following per diem amount commencing upon the first day following the actual date of Substantial Completion and continuing until the actual date of Final Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed Final Completion of the Work:

One Thousand Dollars (\$1,000.00) per consecutive calendar day for up to 15 Calendar Days beyond expiration of the Contract Times; then,

Two Thousand Dollars (\$2,000.00) per consecutive calendar day after 15 Calendar Days beyond expiration of the Contract Times

The Owner may deduct liquidated damages described above from any unpaid amounts then or thereafter due the Contractor under this Agreement. Should the amount of any liquidated damages exceed the amount due or to become due to the Contractor, then the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of any such excess.

JJ. Good Housekeeping

In accordance with the Clean Water Act, established by the Environmental Protection Agency (EPA) and enforced by the Virginia Department of Environmental Quality (DEQ), the City of Bristol Virginia is required to implement and enforce written procedures as part of the Municipal Separate Storm Sewer System (MS4) permit program requirements to prevent, to the maximum extent practicable, potential pollutants that will lead to a point discharge at a natural drainage way. The City of Bristol Virginia's written procedures are provided in the Good Housekeeping/Pollution Prevention (GH/PP) manual provided to the Contractor. The Contractor shall employ good housekeeping practices outlined in the GH/PP manual and as directed in response to City inspection reports on all City properties and immediately remediate all spills containing potential pollutants as directed in the manual. If, through an audit or inspection, the EPA or DEQ renders fines to the City on account of poor practices determined to be the fault of Contractor, the City reserves the right to collect compensation from the Contractor. Contractors applying pesticides and herbicides shall provide evidence of appropriate certification in accordance with Virginia Law.

By signing the Contract, the Contractor acknowledges receipt of the GH/PP manual and certifies Contractor's understanding of its roles, responsibilities and liabilities associated with the City's MS4 Program. If the Contractor has any questions during the term of this contract concerning the Good Housekeeping and Pollution Prevention Manual, the Contractor may contact the Landfill Environmental & Safety Compliance Officer.

KK. Contract Provisions for Non-Federal Entity Contracts Under Federal Awards

1. All contracts awarded in excess of \$100,000 that involve the employment of mechanics or laborers must include a provision for compliance with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations, 29 CFR Part 5. Each contractor must be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. No laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.
2. Contracts in excess of \$150,000 must contain a provision requiring compliance with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency.
3. A contract award will not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180.
4. Contractors that apply or bid for an award exceeding \$100,000 must file the required certification per the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352). The contractor certifies that it will not and has not used Federal appropriated

funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award will be disclosed.

5. As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cements, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award. For purposes of this section:
 - a. "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.
 - b. "Manufactured products" means items and construction materials composed in whole or in part of nonferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.
6. Contractor must comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximized energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

LL. Contract Times

1. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
2. The Work will be substantially complete March 1, 2024, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions by March 28, 2024.
3. Parts of the Work must be substantially completed on or before the following Milestone(s):
4. Final Cover System Completion - March 1st, 2024

MM. Modification of Contract

1. Pursuant to the statutory requirements of Section 2.2-4309 of the Code of Virginia, 1950, as amended, modifications to the contract which exceed the greater of \$50,000 or twenty-five percent of the contract require advance approval by Bristol, Virginia City Council. In no event may the amount of any contract, without adequate consideration, be increased for any purpose, including, but not limited to, relief of an offeror from the consequences of an error in its bid or offer. Nothing shall prevent a public body from placing greater restrictions on contract modifications.

NN. Contractor/Consultant/Supplier Agreement: U.S. DOT 1050.2A – Appendix A

1. Compliance with Regulations: The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
2. Nondiscrimination: The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.
4. Information and Reports: The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Non discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:
 - a. withholding payments to the contractor under the contract until the contractor complies; and/or

- b. cancelling, terminating, or suspending a contract, in whole or in part.
6. Incorporation of Provisions: The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

OO. Contractor/Consultant/Supplier Agreements: U.S. DOT 1050.2A – Appendix E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Nondiscrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq.*, 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 *et seq.*), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 *et seq.*), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 *et seq.*), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority

populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

PP. Weather-Related Delays in Contractor's Progress

Notwithstanding anything in the Contract Documents to the contrary, Contract Times extensions because of weather delays shall be based only on the following criteria and will be determined only as set forth below:

1. Even though a cause of delay meets any or all of the conditions stated herein, it shall in all cases be presumed that no extension, or further extension, of time is due unless Contractor shall demonstrate that the delay is justified and had an impact on the updated schedule's critical path for the delay period. To this end, Contractor shall maintain adequate records supporting any claim for an extension of time and shall submit such records, including a revised schedule showing the impact of the delay, with the claim. Claims due to weather shall be submitted on a monthly basis and within five days after the end of the month in which the delay is claimed to have occurred.
2. If abnormal weather conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
3. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - a) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **1.0 inch** of precipitation as rain equivalent. Two inches of sleet shall equal one inch of rain. See 3.e) in this subsection for snow.
 - ii) For earthwork operations, a daily high temperature of twenty degrees Fahrenheit (**20°F**) or less; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the one hundred degrees Fahrenheit (**100°F**).
 - iii) Regarding placement of the geosynthetic materials, the following conditions are considered justification for a "bad weather day": (1) a daily high temperature of thirty-three degrees Fahrenheit (**33°F**) or less, (2) a geosynthetic materials

temperature less than forty degrees Fahrenheit (40°F), or (3) wind speeds greater than 15 mph.

- b) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by the City of Bristol weather monitoring station located at the facility, near the scalehouse building.
- c) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the following table:

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) (1)
January	8
February	8
March	8
April	6
May	7
June	6
July	7
August	7
September	5
October	5
November	5
December	6

- d) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in the preceding table will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor’s then-current Progress Schedule’s critical path for the Project.
- e) Three inches (3”) or more of snow cover is considered to be justification for a one-day time extension for each day of 3” or more of snow coverage. However, only one application of this rule, mud or snow, per day is allowed.

ATTACHMENT A

Sample Contract

CONTRACT FOR

Contract Number:

This contract entered into this ____ day of _____ 2023, by _____ hereinafter called the “Contractor” and the City of Bristol Virginia, hereinafter called the “City”.

WITNESSETH that the Contractor and the City, in consideration of mutual covenants, promises and agreements herein contained, agree as follows:

SCOPE OF SERVICES: The Contractor shall provide the services to the City as set forth in the Invitation for Bid attached hereto.

CONTRACT PERIOD: The contract period is from _____.

COMPENSATION AND METHOD OF PAYMENT: The Contractor shall be paid in accordance with the Contract Documents in the amount of _____, subject to the Contract Document, Section 01 22 00 Measurement and Payment and Section 00 41 13 Bid Form. There shall be no addition(s) or deletion(s) to the Contract without the prior written approval of a Change Order issued by the City.

CONTRACT DOCUMENTS: The Contract Documents shall consist of the contract, Invitation for Bid and all attachments to the Invitation for Bid.

CONTRACTOR:

CITY OF BRISTOL VIRGINIA:

By: _____

By: _____

Title: _____

Title: _____

Date: _____

Date: _____

END OF SECTION 00 70 00

Appendix E

SECTION 01 20 00

MEASUREMENT AND PAYMENT

1.0 GENERAL

1.1 APPLICATIONS FOR PAYMENT

1.1.1 Payment Terms

Payments shall be made in accordance with the procedures in the Terms and Conditions.

1.1.2 Application Form

Submit three (3) paper copies or one (1) electronic copy of each application on EJCDC C-620-2018 (Section 00 62 76 of the Project Manual).

1.1.3 Content and Format

Utilize Bid Items for listing items in Application for Payment.

1.1.4 Payment Period

Submit at intervals stipulated in the Agreement.

1.1.5 Substantiating Data

When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:

1.1.5.1 Construction Quality Control Data

Current soil and geosynthetic quality control test results, data, and daily reports. Test results and product specifications should be provided for all stored materials.

1.1.5.2 Record Documents

Record documents as specified in the project specifications, for review by Owner which will be returned to Contractor.

2.0 PRODUCTS - NOT USED

3.0 EXECUTION

3.1 MEASUREMENT AND PAYMENT – LUMP SUM PAY ITEMS

3.1.1 MOBILIZATION AND DEMOBILIZATION

Measurement for Mobilization and Demobilization will not be made for payment and all items shall be included in the Contract Lump Sum Price. Mobilization shall be compensated as indicated on the bid form. Mobilization shall consist of the performance of construction preparatory operations, including the movement of personnel, equipment, supplies, and incidentals to the project site and for any other pre-construction expense necessary for the start of the work. Mobilization and Demobilization shall also include bonds (not included in another bid item); permits (not included in another bid item); utility services; placement of project identification signs, sanitary facilities; construction photographs; surveying; survey control, field measurements for payment, and record drawings. The CONTRACTOR will clean-up the site, remove all debris, and restore roads and stormwater controls to the pre-construction condition.

The basis of payment shall be as follows:

Total Original Contract Amount, Including Mobilization		Total Limit for Mobilization
More Than	To & Including	
\$0	\$100,000	10% of total contract amount
\$100,000	\$500,000	\$10,000 plus 3% of total contract over \$100,000
\$500,000	\$1,500,000	\$22,000 plus 2% of total contract over \$500,000
\$1,500,000	More	\$42,500 plus 1% of total contract over \$1,500,000

Partial payments shall be as follows:

- One-third of the amount established above as the total limit will be released to Contractor with the first progress payment.
- Remaining two-thirds (2/3) to be divided over the next five (5) progress payments on an equal basis.

No deductions will be made, nor will any increase be made, in the lump sum mobilization item amount regardless of decreases or increases in the final Contract Price or for any other cause.

3.1.2 Health and Safety Planning and Accommodations

Measurement for Health and Safety Planning and Accommodations will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Health and Safety Planning and Accommodations shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, equipment, and incidentals

required to provide a Health and Safety Plan that addresses respiratory protection procedure to adequately protect employees from site emissions as outlined in the Specifications; safe work procedures, including work procedures in the vicinity of overhead power lines; personal protective equipment; laboratory testing; field testing equipment; safety meetings; safety training;. This item includes preparing and implementing the program including documentation, testing, analysis, and safety equipment. The CONTRACTOR will maintain this program for the duration of the project, which should be included in the Lump Sum Price.

3.1.3 Clearing, Grubbing, and Stripping

Measurement for site Clearing, Grubbing, and Stripping will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for site clearing and grubbing shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, equipment, materials, and incidentals required for removal, including off-site disposal as needed, of surface debris, trees, shrubs, existing pavement, and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.4 Erosion and Sediment Control

Measurement for Erosion and Sediment Control will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Erosion and Sediment Control shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, equipment, and incidentals required to provide erosion and sediment control including temporary seeding, sediment traps, silt fence, erosion matting; all temporary erosion and sediment controls; and all other construction items complete and in-place. The cost of maintaining these controls for the duration of the project should be included in the Lump Sum Price. Also include the cost of obtaining a Land Disturbance Permit as the Responsible Land Disturber as required by the City of Bristol and posting the Erosion and Sediment Control Bond to the City.

3.1.5 Stormwater Basin Earthwork

Measurement for Stormwater Basin Earthwork will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Stormwater Basin Earthwork will be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, and earthwork necessary to achieve final grade for the stormwater basin. Includes the removal of existing items as noted in the drawings. All soil excavated will be placed in a designated stockpile area and/or used for structural fill, erosion control layer, or vegetative support layer.

3.1.6 Membrane Deployment Grade Earthwork

Measurement for all earthwork to establish and prepare the Membrane Deployment Grade will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for all earthwork to establish and prepare the Membrane Deployment Grade will be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, labor, equipment, testing, and incidentals required to excavate, fill, transport, stockpile, load, process, place, compact, and test to prepare the Membrane Deployment Grade as outlined in the plans and specifications. The Lump Sum Price and payment shall include the cost of any waste relocation activities, Bedding Layer preparation, and leachate seep management in accordance with the plans and specifications. The top of the Bedding Layer will conform to the Membrane Deployment Grade shown in the plans.

3.1.7 Furnish LFG Horizontal Collector Materials

Measurement for Furnishing LFG Horizontal Collector Materials shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing LFG Horizontal Collectors shall be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, transportation, equipment, testing, storing, and maintaining storage, incidentals, and all else as required by the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.8 Install LFG Horizontal Collectors

Measurement for Installing LFG Horizontal Collectors shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the Installing LFG Horizontal Collectors shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.9 Furnish LFG Header Materials

Measurement for Furnishing Landfill Gas Header Materials shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing Landfill Gas Header Materials shall be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, transportation, equipment, testing, storing, and maintaining storage, incidentals, and all else as required by the plans and specifications, including valves, fittings, and materials needed for tie-ins. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.10 Install LFG Header

Measurement for Installing Landfill Gas Headers shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Installing Landfill Gas Headers shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction, including road crossings, valves, and tie-ins; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.11 Furnish Air and Force Main Materials

Measurement for Furnishing Airline and Force Main Materials shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing Airline and Force Main Materials shall be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, transportation, equipment, testing, storing, and maintaining storage, incidentals and all else required by the plans and specifications, including valves, fittings, and materials needed for tie-ins.

3.1.12 Install Air and Force Main Lines

Measurement for Installing Airline and Force Main Lines shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the Installing Airline and Force Main Lines shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction including tie-in and valves; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.13 Furnish and Install LFG Drainage Pits

Measurement for Furnishing and Installing LFG Drainage Pits shall not be made for payment and all items shall be included in the contract Lump Sum Price

Payment for the construction of LFG Drainage Pits shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

The CONTRACTOR will exercise caution when excavating to protect bottom liner system and provide materials, labor, and incidentals to make necessary repairs.

3.1.14 Furnish and Install Horizontal Collector Pit Wellheads with Pumps

Measurement for Furnishing and Installing Horizontal Collector Pit Wellheads with Pumps shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Horizontal Collector Pit Wellheads with Pumps shall be made at the Contract Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.15 Furnish and Install Horizontal Collector Tie-in to Existing PVC Wells

Measurement to construct the Horizontal Collector Tie-in to Existing PVC Wells shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of LFG Horizontal Collector Tie-in to Existing PVC Wells shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.16 Furnish and Install Remote LFG Wellhead and LFG Lateral tie-in to EW-22

Measurement to construct the Remote LFG Wellhead with LFG lateral tie-in to the existing extraction well EW-22 shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Remote LFG Wellhead and LFG Lateral tie-in to EW-22 shall be made at the Contract Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.17 Furnish and Install Stormwater Sewer System

Measurement to construct Stormwater Sewer System shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Stormwater Sewer System shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications. This pay item includes disconnecting and removing existing pipe, removing existing drop inlet, and plugging the existing line as indicated in the plans. This pay item includes erosion and sediment control features associated with the stormwater sewer system.

3.1.18 Furnish and Install Stormwater Basin Outlet and Baffle

Measurement to construct Stormwater Basin Outlet and Baffle shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Stormwater Basin Outlet and Baffle shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction including connecting to existing culvert; and all other construction items complete and in-place in accordance with the plans and specifications. This pay item includes erosion and sediment control features associated with the stormwater basin outlet and baffle.

3.1.19 Furnish 40 mil LLDPE Geomembrane

Measurement for Furnishing the 40 mil LLDPE Geomembrane will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Furnishing 40 mil LLDPE Geomembrane shall be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, transportation, equipment, testing, storing, and maintaining storage, and all else required, including materials needed for tie-ins, overlaps, anchoring, and repairs, as required by the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.20 Install 40 mil LLDPE Geomembrane

Measurement to install the 40 mil LLDPE Geomembrane will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Installation of the 40 mil LLDPE Geomembrane shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for Installation including anchor trenches; and all other construction items complete and in-place in accordance with the plans and specifications. No additional payment will be made for replacement of rejected or damaged material, necessary and required overlaps, cutting rolls to size, seams, testing, material in anchor trenches, equipment breakdown, or protection of Work.

3.1.21 Furnish Drainage Geocomposite

Measurement for Furnishing Drainage Geocomposite will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Furnishing Drainage Geocomposite shall be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, transportation, equipment, testing, storing, and maintaining storage, and all else required, including materials needed for tie-ins, overlaps, anchoring, and repairs, as required by the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.22 Install Drainage Geocomposite

Measurement to install the Drainage Geocomposite will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Installation of the Drainage Geocomposite shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for Installation including anchor trenches; and all other construction items complete and in-place in accordance with the plans and specifications. No additional payment will be made for replacement of rejected or damaged material, necessary and required overlaps, cutting rolls to size, seams, testing, material in anchor trenches, equipment breakdown, or protection of Work.

3.1.23 Furnish Erosion Control Layer Material

Measurement to Furnish Erosion Control Layer material will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing Erosion Control Layer Material will be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, labor, transportation, equipment, testing, stockpiling, and maintaining stockpiles, and incidentals required as outlined in the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.24 Install Erosion Control Layer

Measurement to Install the Erosion Control Layer soil shall not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Installation of the Erosion Control Layer will be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, labor, equipment, testing, and incidentals required, including loading, hauling, processing, placing, grading, compacting and testing as outlined in the plans and specifications. No additional payment will be made for replacement of rejected material or testing.

3.1.25 Furnish Vegetative Support Layer Material

Measurement to Furnish the Vegetative Support Layer shall not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing Vegetative Support Layer materials will be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, labor, transportation, equipment, testing, stockpiling, and maintaining stockpiles, and incidentals required as outlined in the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.26 Install Vegetative Support Layer

Measurement to Install the Vegetative Support Layer shall not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for Installation of the Vegetative Support Layer will be made at the Lump Sum Price, which price and payment shall be full compensation for all materials, labor, equipment, testing, and incidentals required, including loading, hauling, processing, placing, grading, compacting and testing, as outlined in the plans and specifications. No additional payment will be made for replacement of rejected material or testing.

3.1.27 Furnish and Install Access Road

Measurement to construct the Permit 498 Access Road will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of the Access Road shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, equipment, materials, and incidentals required for construction, including loading, hauling, processing, placing, grading, compacting and testing, in accordance with the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.28 Furnish and Install Permanent Seeding

Measurement for permanent seeding of all areas will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for permanent seeding of all areas shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required to seed, mulch, and fertilize disturbed areas, water and maintain seeded areas including repairing erosion and re-seeding as necessary; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.29 Furnish and Install Stormwater Conveyance Channels, Downchutes, and Culverts

Measurement to Furnish and Install Stormwater Conveyance Channels, Downchutes, and Culverts will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of stormwater conveyance channels, downchutes, and culverts shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required to construct the channels, install linings, pipes, install new culverts, modify existing culverts, including loading, hauling, processing, placing, grading, compacting and testing, and all other associated construction items complete and in-place in accordance with the plans and specifications. This pay item includes permanent outlet protection for the stormwater conveyance channels, downchutes, and culverts as describes in the plans and specifications.

3.1.30 Furnish and Install Stormwater Diversion Berms

Measurement to construct Stormwater Diversion Berms will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Stormwater Diversion Berms shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

The CONTRACTOR will install the Stormwater Diversion Berms with the plans and specifications. The CONTRACTOR will furnish all labor, materials, equipment, and incidentals required for placement.

3.1.31 Furnish and Install Remote Soil Extraction Wells

Measurement to Furnish and Install Remote Soil Extraction Wells will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for the construction of Remote Soil Extraction Wells shall be made at the Contract Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction including fittings and connection to HDPE Lateral as shown on the Drawings; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.32 Furnish LFG Monitoring Probes

Measurement to Furnish LFG Monitoring Probes will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Furnishing LFG Monitoring Probes shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, transportation,

equipment, testing, storage/stockpiling, and maintaining storage/stockpiles, and incidentals required for furnishing materials as outlined in the plans and specifications. No additional payment will be made for replacement of rejected material, testing, or change in material supplier.

3.1.33 Install LFG Monitoring Probes

Measurement to Install LFG Monitoring Probes will not be made for payment and all items shall be included in the contract Lump Sum Price.

Payment for Installing LFG Monitoring Probes shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, installation of protective bollards, and incidentals required for construction, including waste removal and disposal; and all other construction items complete and in-place in accordance with the plans and specifications.

3.1.34 Furnish and Install LFG Condensate Sumps

Measurement for Furnishing and Installing LFG Condensate Sumps shall not be made for payment and all items shall be included in the contract Lump Sum Price

Payment for the construction of LFG Condensate Sumps shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, equipment, testing, and incidentals required for construction; and all other construction items complete and in-place in accordance with the plans and specifications.

The CONTRACTOR will exercise caution when excavating to protect bottom liner system and provide materials, labor, and incidentals to make necessary repairs.

3.1.35 Alternative Bid Item – Furnish and Install AGRU 50 mil LLDPE MicroDrain Liner with AT081 Nonwoven Geotextile

Measurement to Furnish and Install the AGRU 50 mil LLDPE MicroDrain Liner with overlying AT081 Nonwoven Geotextile will not be made for payment and all items shall be included in the contract Lump Sum Price. Measurement may be made by the ENGINEER to confirm compliance with the plans and specification, but no adjustment to the bid price will be made.

Payment for the Installation of AGRU 50 mil LLDPE MicroDrain Liner with AT081 Nonwoven Geotextile shall be made at the Lump Sum Price, which price and payment shall be full compensation for all labor, materials, transportation, equipment, testing, and incidentals required for placement and seaming. Compensation requires completion of all construction items with the material in-place in accordance with the plans and specifications. No additional payment will be made for replacement of rejected or damaged material, necessary and required overlaps, cutting rolls to size, seams, testing, material in anchor trenches, change in material supplier, equipment breakdown, or protection of Work. If the AGRU 50 mil LLDPE MicroDrain Liner with AT081 Nonwoven Geotextile is selected by the owner, this item will be paid instead of the Furnish 40 mil LLDPE Geomembrane, Install 40 mil LLDPE Geomembrane, Furnish Drainage Geocomposite, and Install Drainage Geocomposite drainage line items.

END OF SECTION 01 20 00

Appendix F

SECTION 01 45 00

CONSTRUCTION QUALITY CONTROL

1.0 GENERAL

1.1 SECTION INCLUDES

- Quality Control Requirements
- Tolerances.
- References.
- Labeling.
- Testing and inspection services.
- Examination.
- Preparation.

1.2 QUALITY CONTROL REQUIREMENTS

1.2.1 Construction Quality Control

The CONTRACTOR is responsible for construction quality control (CQC or QC) and shall establish and maintain an effective quality control system in compliance with the Contract Documents. The construction quality control system shall consist of plans, procedures, tests and observation, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction and manufacturing operations, both on-site and off-site, and shall be keyed to the proposed construction sequence.

Contractor will be required to provide, coordinate and oversee the following activities on the Project in accordance with the Specifications:

1.2.1.1 Materials Testing

Laboratory and field soil and geosynthetics testing in accordance with the project specifications.

1.2.1.2 Operational Testing

Laboratory and field soil and geosynthetics testing to guide construction operations.

1.2.1.3 Surveying

Field stake-out surveying and surveying to facilitate construction operations.

1.2.2 Construction Quality Assurance

The Owner is responsible for and will provide Construction Quality Assurance (CQA or QA), which will provide independent monitoring and verification of compliance with all construction and CQC requirements. The CQA Representative (also referred to as the Quality Assurance Officer or QAO) is the on-site project representative for CQA. The CQA Engineer (also referred to as the Quality Assurance Engineer) is in direct supervision of the CQA Representative (QAO).

Minimum testing requirements are included in applicable Specification sections. Owner will provide the following testing on the Project:

1.2.2.1 Materials Testing

Owner provides limited laboratory and field soil and geosynthetics testing as outlined in the project specifications.

All tests which fail to comply with the minimum requirements shall be retested at Contractor's expense using Owner's contracted representatives. Owner reserves the right to direct additional testing and sampling.

1.2.2.2 Surveying

Provision of construction quality assurance surveying.

1.2.2.3 Drawings

Record drawings.

Results of all analyses shall be submitted to Engineer as soon as they are available. Should any analyses show that the product or material tested does not comply with the Specification, Contractor shall remove, repair, or replace the product or material at no expense to Owner. Contractor may, at his option and expense, perform additional testing to substantiate the claim the product or material complies with the specification requirements.

1.3 MEASUREMENT AND PAYMENT

Separate payment will not be made for providing and maintaining an effective Construction Quality Control program, CONTRACTOR Quality Control (CQC) Plan and associated testing provisions during the progression of the work will not be paid for separately and shall be included within the applicable work item on the bid form.

1.4 QUALITY CONTROL AND CONTROL OF INSTALLATION

1.4.1

Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

1.4.2

Comply with manufacturers' instructions, including each step in sequence.

1.4.3

When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

1.4.4

Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.4.5

Perform Work by persons qualified to produce required and specified quality.

1.4.6

Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

1.4.7

Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.5 TOLERANCES

1.5.1

Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

1.5.2

Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

1.5.3

Adjust products to appropriate dimensions; position before securing products in place.

1.6 REFERENCES

1.6.1

For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

1.6.2

Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

1.6.3

Obtain copies of standards where required by product specification sections.

1.6.4

When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

1.6.5

Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.7 TESTING AND INSPECTION SERVICES**1.7.1**

The Contractor may employ a third party firm to support construction quality control on the project.

1.7.2

Employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing. Refer to Section 01 45 29 for laboratory requirements.

1.7.3

The independent firm will perform tests, inspections, and other services specified in individual specification sections and as required by Engineer.

1.7.4

Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Engineer.

1.7.5

Reports will be submitted by independent firm to Engineer and Contractor, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

1.7.6

Contractor shall cooperate with independent firm; furnish samples of materials, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1.7.6.1

Notify Engineer and independent firm 48 hours prior to expected time for operations requiring services.

1.7.6.2

Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

2.0 PRODUCTS

2.1 CONSTRUCTION QUALITY CONTROL PLAN

2.1.1 Content of the CQC Plan

The CQC plan shall include, as a minimum, the following to cover all construction and manufacturing operations, both on site and off site, including work by subcontractors, fabricators, suppliers and purchasing agents:

2.1.1.1 Organizational Chart

A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the Site Superintendent or someone higher in the CONTRACTOR's organization. Site Superintendent in this context shall mean the individual with responsibility for the overall management of the project including quality and production.

2.1.1.2 Resumes

A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC System Manager who shall report to the Site Superintendent or someone higher in the CONTRACTOR's organization. Site Superintendent in this context shall mean the individual with responsibility for the overall management of the project including quality and production.

2.1.1.3 Letter of Authorization

A copy of the letter to the CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager including authority to stop work which is not in compliance with the contract. The CQC System Manager shall issue letters of direction to all other various quality

control representatives outlining duties, authorities and responsibilities. Copies of these letters and documents will also be furnished to the Owner.

2.1.1.4 Testing

Control, verification and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, and person responsible for each test.

2.1.1.5 Inspection

Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

2.1.1.6 Deficiencies

Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

2.1.1.7 Daily Report and Monthly Report

Reporting procedures, including proposed reporting formats.

2.1.1.8 A list of the definable features of work.

A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the Pre-Construction Conference and subsequent progress meetings.

2.1.1.9 Samples

Samples of all daily report and inspection forms.

2.1.1.10 Laboratories

The name and address of all quality control laboratories.

2.1.2 Acceptance of Plan

Acceptance of the CONTRACTOR's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Owner reserves the right to require the CONTRACTOR to make changes in his CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

2.1.3 Notification of Changes

After acceptance of the CQC plan, the CONTRACTOR shall notify the ENGINEER in writing a minimum of seven (7) calendar days prior to any proposed change. Proposed changes are subject to acceptance by the ENGINEER and OWNER.

3.0 EXECUTION

3.1 CONSTRUCTION QUALITY CONTROL ORGANIZATION

3.1.1 CQC System Manager

The CONTRACTOR shall identify an individual within his organization at the site of the work who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the CONTRACTOR. This CQC System Manager shall be on the site at all times during construction and will be employed by the CONTRACTOR, except as noted in the following. An alternate for the CQC System Manager will be identified by the CQC System Manager in the plan to serve in the event of the system manager's absence. Periods of absence may not exceed 2 weeks at any one time, and not more than 15 workdays during a calendar year. The requirements for the alternate will be the same as for the designated CQC system manager.

3.1.2 CQC Organizational Staffing

The CONTRACTOR shall provide a CQC staff which shall be at the site of work at all times during progress of the work, with authority to take any action necessary to ensure compliance with the contract.

3.1.3 CQC Staff

Following are the minimum requirements for the CQC staff. These minimum requirements will not necessarily assure an adequate staff to meet the CQC requirements at all times during construction. The actual strength of the CQC staff may vary during any specific work period to cover the needs of the work period. When necessary for a proper CQC staffing on-site, the CONTRACTOR will add additional staff at no cost to the OWNER. This listing of minimum staff in no way relieves the CONTRACTOR of meeting the basic requirements of quality construction in accordance with contract requirements. All CQC staff members shall be subject to acceptance by the OWNER.

3.1.3.1 CQC System Manager:

The CQC System Manager shall demonstrate that they have a minimum of 2 years landfill construction experience on construction similar to this contract. The CQC System Manager shall be assigned as system manager but may also have duties as project superintendent in addition to quality control.

3.1.3.2 Supplemental Personnel

A staff shall be maintained under the direction of the CQC system manager to perform all QC activities. The staff must be of sufficient size to ensure adequate QC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties,

but must be fully qualified by experience and technical training to perform their assigned QC responsibilities and must be allowed sufficient time to carry out these responsibilities. The QC plan will clearly state the duties and responsibilities of each staff member.

3.1.4 Organizational Changes

The CONTRACTOR shall obtain OWNER acceptance before replacing any member of the CQC staff. Requests shall include the names, qualifications, duties, and responsibilities of each proposed replacement.

3.2 EXAMINATION

3.2.1 Existing Conditions

Verify existing site conditions are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

3.2.2 Specific Conditions

Examine and verify specific conditions described in individual specification sections.

3.3 CONTROL

3.3.1 Construction Quality Control

Construction Quality Control is the means by which the CONTRACTOR ensures that the construction, to include that of subcontractors and suppliers, complies with the requirements of the contract. The controls shall be adequate to cover all construction operations, including both on-site and offsite fabrication, and will be keyed to the proposed construction sequence. The controls shall be conducted by the CQC System Manager for all definable features of work, as follows:

3.3.1.1

A review of each paragraph of applicable specifications.

3.3.1.2

A review of the contract plans.

3.3.1.3

A check to assure that all materials and/or equipment to be used have been tested, submitted, and approved.

3.3.1.4

A check to assure that provisions have been made to provide required control inspection and testing.

3.3.1.5

Examination of the work area to assure that all required preliminary work has been completed and in compliance with the contract.

3.3.1.6

A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawing or submitted data, and are properly stored.

3.3.1.7

A review of the appropriate activity hazard analysis to assure safety requirements are met.

3.3.1.8

Discussion of procedures for constructing the work including repetitive deficiencies. Document construction tolerances and workmanship standards for the work.

3.3.1.9

A check to ensure that the portion of the plan for the work to be performed has been accepted by the ENGINEER.

3.3.1.10

A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.

3.3.1.11

Verification of full contract compliance. Verify required control inspection and testing.

3.3.1.12

Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels if appropriate.

3.3.1.13

Resolve all differences between parties.

3.3.1.14

Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.

3.3.1.15

The ENGINEER shall be notified at least 24 hours in advance of beginning any actions. A meeting shall be conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the above actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The CONTRACTOR shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.3.2 Follow-up

Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The CONTRACTOR shall not build upon or conceal non-conforming work.

3.3.3 Additional Requirements

Additional control may be required on the same definable features of work if the quality of ongoing work is unacceptable as determined by the ENGINEER; or if there are changes in the CQC staff or in the onsite production supervision or work crew; or if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.4 TESTS

3.4.1 Testing Procedure

The CONTRACTOR shall perform tests specified or required to verify that control measures are adequate to provide a product which conforms to contract requirements. Testing includes operation and/or acceptance tests when specified. The CONTRACTOR shall procure the services of an approved testing laboratory or establish an approved testing laboratory at the project site. Testing laboratories are subject to approval by the ENGINEER as specified in Section 01 45 29, Quality Control Testing Laboratories. A list of CQC tests to be performed shall be by the furnished by the CONTRACTOR as a part of the CQC plan. The list shall give the test name, frequency, specification paragraph containing the test requirements, the personnel and laboratory responsible for each type of test, and an estimate of the number of tests required. The CONTRACTOR shall perform the following activities and record and provide the following data:

3.4.1.1

Verify that testing procedures comply with contract requirements.

3.4.1.2

Verify that facilities and testing equipment are available and comply with testing standards.

3.4.1.3

Check test instrument calibration data against certified standards.

3.4.1.4

Verify that recording forms and the test identification control number system, including all of the test documentation requirements, have been prepared

3.4.1.5

Results of all tests performed, both passing and failing tests, will be recorded on the Quality Control report for the date performed. Tests shall be clearly labeled as passing or failing. Invitation for Bids/Project Manual paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the ENGINEER. Failure to submit timely test reports, as stated, may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.4.2 Testing Laboratories

3.4.2.1 Capability Check

The ENGINEER reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques.

3.4.2.2 On-Site Laboratory and Equipment

The OWNER reserves the right to utilize the CONTRACTORS quality control testing laboratory and equipment to check the CONTRACTOR'S testing procedures, techniques, and test results at no additional cost to the OWNER.

3.5 COMPLETION INSPECTION

At the completion of all work or any increment thereof established by a completion time stated in the Contract or stated elsewhere in the Project Manual, the CQC system manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved plans and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC system manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the ENGINEER. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

END OF SECTION 01 45 00

Appendix G

SECTION 31 00 00

EARTHWORK

1.0 GENERAL

1.1 DESCRIPTION

1.1.1

The work in this section includes all labor, materials, equipment, construction quality control (CQC) testing, and incidentals required to perform earthwork for the final cover system installation as shown on the Plans and as specified herein and in General Conditions.

1.1.1.1

Earthwork includes, but is not limited to excavation, filling, backfilling and compacting earthen materials to achieve base grades and final grades for the final cover system installation. This includes backfilling of trenches and anchor trenches; sheeting and shoring; dewatering; general backfilling and compacting, constructing diversion berms, and grading around structures; segregating, stockpiling, screening, and other material processing of excavated materials for on-site use; disposing of earth materials, as required to complete construction and associated features shown on the Plans.

1.1.2

The cost of all excavation shall be incorporated into the base bid. No distinction will be made insofar as payment between soil, rock and waste materials if encountered.

1.1.3

CONTRACTOR is responsible for all construction layout and staking.

1.1.4 Related Work Specified Elsewhere

- Section 31 10 00 Clearing, Grubbing, and Stripping
- Section 31 05 13 Erosion Control and Vegetative Support Layers
- Section 31 05 16 Aggregates
- Section 31 05 19.16 LLDPE Geomembrane
- Section 31 05 19.17 Agru MicroDrain Geomembrane
- Section 31 23 33 Trenching, Backfilling and Compacting

1.2 DEFINITIONS

1.2.1 Excavation

Excavation means the removal of soil, waste, rock, debris and other materials to the proposed grading limits indicated on the PLANS.

1.2.2 Unauthorized Excavation

Unauthorized excavations shall be backfilled and compacted as specified for authorized excavations at no additional cost to the OWNER.

1.2.3 Additional Excavation

When excavation has reached required subgrade elevations, notify the ENGINEER, who will make an inspection of conditions. If the ENGINEER determines that bearing materials at required subgrade elevations are unsatisfactory, continue excavation until satisfactory bearing materials are encountered. Replace excavated material with suitable fill material as directed by the ENGINEER.

1.2.4 Maximum Dry Density

Maximum dry weight in pounds per cubic foot (pcf) of a specific soil material as determined by ASTM D698.

1.2.5 Optimum Moisture Content

The moisture content at which the maximum dry density of a soil material is determined by ASTM D698.

1.2.6 Filled Areas

Filled areas are areas which have received trench backfill, structural fill or embankment materials, placed and compacted as specified herein.

1.2.7 Reference Standards

- ASTM D698 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
- ASTM D2434 Standard Test Method for Permeability of Granular Soils (Constant Head)
- ASTM D2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D4373 Standard Test Method for Calcium Carbonate Content of Soils

- ASTM D5084 Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
- ASTM D6913 Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
- ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- ASTM D7928 Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

1.3 SUBMITTALS

1.3.1

Refer to SECTION 01 33 00 – SUBMITTAL PROCEDURES for submittal requirements.

1.3.2

Sheeting, shoring and bracing shall be designed and signed by a registered professional ENGINEER and submitted for approval.

1.4 SAFETY

All excavation guidelines shall comply with CONTRACTOR'S Health and Safety Plan and the applicable requirements as stated in SECTION 01 35 29 – HEALTH AND SAFETY PLAN and the following:

- OSHA excavation safety standards 29 CFR, s.1926-650, Subpart P.
- State and County construction safety regulations.

1.4.1 Utility

Contact “Miss Utility” prior to any excavation.

1.5 PROJECT CONDITIONS

1.5.1 Site Information

The CONTRACTOR shall be responsible for having determined to his satisfaction, prior to the submission of his bid, the confirmation of the ground, the characteristics and quality of the substrata, the types and quantities of materials to be encountered, the nature of the groundwater conditions, the execution of the work, the general and local conditions and all other matters which can in any way affect the work under this Contract.

Additional test borings and other exploratory operations may be performed by CONTRACTOR, at the CONTRACTOR'S option; however, the OWNER will not pay for such additional exploration.

1.5.2 Existing Structures

Shown on the Plans are certain surface and underground structures adjacent and/or within the work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. The CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at his expense.

1.5.3 Protection of Persons and Property

1.5.3.1

Barricade open excavations or trenches occurring as part of this work and post warning signs or lights, as appropriate.

1.5.3.2

CONTRACTOR shall plan and conduct operations to prevent damage or disturbance to existing structures and utilities, buried utilities, existing monitoring wells, roads, signs, trees and bench marks.

1.5.3.3

Protect existing slopes, embankments, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

1.5.3.4

Failure of ENGINEER to order the use of bracing or sheeting or shoring shall not in any way or to any extent relieve the CONTRACTOR of any responsibility concerning the condition of excavations or of his obligations under this Contract.

1.5.3.5

Work is restricted to the area provided for CONTRACTOR'S use.

1.5.3.6

Side slopes shall be maintained in stable condition under all normal anticipated weather conditions for the period that the excavation will be open. The CONTRACTOR shall regrade side slopes to be a more stable configuration if so directed by ENGINEER.

1.5.4 Dust Control

The CONTRACTOR shall conduct operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize the creation and dispersion of dust to the satisfaction of the OWNER.

1.5.5 Traffic

Traffic inside and outside the site is anticipated. The CONTRACTOR shall coordinate with the OWNER regarding traffic control during construction. CONTRACTOR shall primarily utilize the access road on the eastern perimeter of the landfill.

1.6 QUALITY CONTROL

1.6.1 Regulations

All materials and labor furnished under this section shall comply with OSHA, ASTM, ANSI and other applicable Federal, State and County codes and regulations including revisions to the date of the Contract. Comply with the pertinent sections of the following standards:

Virginia Erosion and Sediment Control Handbook (VESCH), latest edition

Virginia Department of Transportation (VDOT) Road & Bridge Specifications, latest edition

1.6.2 Specifications

Provide Construction Quality Control (CQC) in accordance with Section 01 45 00 - CONSTRUCTION QUALITY CONTROL.

1.6.3 Workers

Use adequate number of skilled workers who are thoroughly trained and experienced in the specified requirements and the methods needed for proper performance of the work in this Section.

2.0 PRODUCTS

2.1 MATERIALS

2.1.1 General Fill Material

2.1.1.1 Availability On-Site

It is intended that on site soils from the stormwater basin excavation may be used as a portion of the fill material. Otherwise, general fill is not available on-site. No active borrow area is available for use. Imported material from off-site may be required.

2.1.1.2 Quality

General Fill shall be inorganic soil, that is not excessively wet or saturated, free of stone, rock or gravel larger than three (3) inches in any dimension, and free of debris, waste, frozen materials, vegetation, organic materials, roots, and other deleterious matter. The CONTRACTOR must provide preconstruction testing as required by the Specifications to demonstrate suitability. The suitable excavated soil materials shall be capable of maintaining its stability on all slopes. Excess or unsuitable material shall be removed and disposed as directed by the ENGINEER to the designated areas on-site stockpiles.

2.1.1.3 Off-site General Fill

If off-site soils are to be used, the CONTRACTOR shall identify the source a minimum of 3 weeks in advance of intent to import. The Owner's Quality Assurance personnel shall be given access to the site to obtain necessary samples for testing and proofing of the soil material.

2.1.1.4 Use of General Fill

General Fill shall be used for backfilling and filling as shown on the PLANS, and for areas as otherwise directed by the ENGINEER. Fill material is material used for trench backfill, structural fill and backfill and embankment.

2.1.2 Controlled Subgrade Material

Controlled subgrade material is the upper 12 inches of material prior to placement of the geomembrane within the final cover area. Controlled subgrade shall be inorganic soil free of roots, limbs, stone, rock or gravel larger than three (3) inches in any dimension trash, excessive organics, and deleterious material. The soil shall have a classification of SC, ML, CL, MH, or CH as defined in the Unified Soil Classification System (ASTM D 2487), or otherwise approved by the ENGINEER.

2.1.3 Bedding Layer

The top 6" of intermediate/daily cover will function as a Bedding Layer and is to be smooth and free of sticks, rocks larger than 1 inch, or other irregularities which could puncture the synthetic cap. Not more than 1 percent by weight of particles larger than 3/8-inch in diameter shall be allowed within the Bedding Layer. The surface of the Bedding Layer will contain no particles larger than 3/8 inches, and the surface will be free of sharp or angular stone that may puncture the geomembrane. Mechanical screening, raking or other methods to remove oversize particles shall be provided by CONTRACTOR as necessary. Hand grooming of the surface may be required.

2.1.3.1 Stability

The satisfactory excavated soil materials shall be capable of maintaining its stability on all slopes. Excess or unsatisfactory material shall be removed and disposed as directed by the ENGINEER to the designated areas on-site designated by the OWNER.

2.1.3.2 Protection of Subgrade

Bedding Layer material shall be protected from excessive heat and desiccation cracking, freezing, or softening by precipitation, after placement and compaction. If disturbed, Bedding Layer shall be recompacted or reworked to meet specifications.

2.1.4 Aggregates

Refer to SECTION 31 05 16 - AGGREGATES.

2.1.5 Trench Backfill

Refer to SECTION 31 23 33 – TRENCHING, BACKFILLING, AND COMPACTING for additional requirements

2.1.6 Embankments

Fill material for structural fill and embankments higher than four feet shall have a maximum density not less than 100 pounds per cubic foot as determined by ASTM D698, and shall contain no more than 25 percent rocks, none being larger than four inches in the greatest dimension. Liquid limit shall not exceed 25 and plasticity shall not exceed 6.

2.1.7 Bedding for Pipe and Pipe Structures

Bedding for Pipe and Pipe Structures shall be general fill free of stones larger than 2 inches, construction debris, refuse, muck, soft clay, loam, sponge material, vegetation/organic matter, or angular rock. Suitable excavation material may be used for backfilling around installed pipe, subject to approval by ENGINEER.

2.1.8 Sheeting and Shoring

Sheeting, shoring and bracing materials shall be timber or steel, designed to retain the earth around structures to prevent cave-in and settlements, and to fulfill all safety requirements.

2.1.9 Other Materials

All other materials, not specifically described, but required for proper completion of the work shall be selected by the CONTRACTOR and approved by the ENGINEER.

3.0 EXECUTION

3.1 PREPARATION

3.1.1 Dewatering

3.1.1.1

The CONTRACTOR shall at all times during construction provide and maintain proper equipment and facilities to remove all water entering excavations, and shall keep such excavations dry so as to obtain a satisfactory foundation condition until the fill, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels.

3.1.1.2

Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottom, and soil changes detrimental to stability of subgrades and foundations. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory for support of structure as a result of inadequate dewatering or other construction methods shall be removed and replaced by crushed

stone as required by the ENGINEER at the CONTRACTOR's expense. The bottom of excavations shall be rendered firm and without standing water before placing structures or pipes. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

3.1.1.3

Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or runoff areas. Do not use trench excavations as temporary drainage ditches.

3.1.1.4 Disposal of Water Removed by Dewatering System

Dispose of water in such a manner as to cause no inconvenience to the OWNER, the ENGINEER, or others involved in work about the site. Trench excavations shall not be used as temporary drainage ditches.

3.1.1.5 Construction Quality Assurance (By Others)

3.1.1.5.1

The CONTRACTOR shall coordinate his work with the OWNER's CQA Representative to allow testing and monitoring of all work components to proceed.

3.1.1.5.2

There shall be no additional compensations to the CONTRACTOR for any construction delays caused by the CONTRACTOR's failure to plan, coordinate, and schedule work to include all CQA activities.

3.1.1.6 Construction Quality Control

CONTRACTOR shall provide pre-construction material verification and Construction Quality Control testing of earth materials as indicated in Table 31 00 00 and Section 01 45 00 - CONSTRUCTION QUALITY CONTROL. General fill, backfill, controlled subgrade soil, and erosion control soil are subject to the relevant tests in Table 31 00 00 - 1. The erosion control soil will not be compacted.

Table 31 00 00 - 1 Soils and Aggregates Test Frequency

Test	ASTM Designation or Other Test Method	CQC Frequency	CQA Frequency
Pre-Construction/Stockpile Testing			
Classification	D2487	1 per 2,500 cy and changes in material	1 per project
Atterberg Limits	D4318	1 per 2,500 cy and changes in material	1 per project
Grain Size Analysis	D6913 and D1140	1 per 10,000 cy	1 per project

Natural Moisture Content	D2216	1 per 2,500 cy	1 per project
Moisture-Density Relationship (Standard Proctor)	D698	1 per 2,500 cy and changes in material	1 per project
Shear Strength	D2850 or D1557	1 per 10,000 cy	1 per project
During Construction Testing			
Compacted Density	D2922, D1556, or D2937	5 tests/acre/lift or 1 per 500 linear feet of trench	1 tests/acre/lift or 1 per 1,000 linear feet of trench
Compacted Moisture Content	D3017 or D2216	5 tests/acre/lift or 1 per 500 linear feet of trench	1 tests/acre/lift or 1 per 1,000 linear feet of trench
In-place Moisture Density Road Aggregates and Compacted Soil	D6938 or D2937	1 per 100 linear feet of road, a minimum of 1 test per lift of select fill	1 per 1000 linear feet of road, a minimum of 1 test per lift of select fill
Backfill Placement Depths and Extents	Observation, Field Measurement	Continuous observation	Survey Verification
Bedding Layer and Erosion Control/Vegetative Soil Thickness	Observation, Field Measurement	Continuous observation	Survey Verification (100 ft x 100 ft grid)

Notes:

- Every fifth sample tested with ASTM D6938 shall be verified by ASTM D1556, Sand Cone or ASTM D2937, Drive Cylinder unless Engineer specifies otherwise.
- Every fifth sample tested with ASTM D6938 shall be verified with ASTM D2216, Laboratory Determination of Water Content of Soil, Rock, and Soil-Aggregate Mixtures unless Engineer specifies otherwise.
- Test locations shall be identified by the Contractor by horizontal and vertical control and presented on drawing or sketch indicating dimensions.
- If a test fails to meet the required compaction level or moisture content, then the area represented by that test shall be reworked and retested at the Contractor's expense Corrective measures shall be documented in the Quality Control and Quality Assurance reports.

3.2 GENERAL

3.2.1

The CONTRACTOR shall perform excavations described in whatever substance encountered to dimensions and elevations shown on the Contract Drawings. Excavation shall be unclassified. The CONTRACTOR shall be responsible for verifying the grades and dimensions as shown.

3.2.2

Existing utilities, structures, and fencing shall be protected during the construction period, and if damaged or removed by the CONTRACTOR in his operations, shall be repaired or replaced by the CONTRACTOR at no additional cost to the Owner.

3.2.3

The Owner shall retain a Quality Assurance Officer (QAO) to monitor Earthwork included in this section for construction quality assurance (CQA). The QAO shall be present on site during subgrade approval and fill and backfill operations.

3.3 EXCAVATION

3.3.1 General

3.3.1.1

Excavation equipment operators and other concerned parties shall be familiar with subsurface obstructions as shown on the PLANS.

3.3.1.2

Excavation work shall be performed in a safe and proper manner with appropriate precautions being taken against hazards and in accordance with the Health and Safety Plan. Excavations shall provide adequate working space and clearances for the work to be performed therein. If walls of the excavation cannot be kept stable, the excavation shall be properly shored and braced.

3.3.1.3

Excavation shall be unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered. Well/boring/test pit logs performed on-site are available for information only to the CONTRACTOR.

3.3.1.4

If subgrade "pumping" is encountered during excavation, perform the following:

3.3.1.4.1

Excavate and remove the underlying unsuitable material for a minimum depth of 12 inches.

3.3.1.4.2

Proof-roll and compact by appropriate heavy equipment for at least 6 passes and approve by the ENGINEER.

3.3.1.4.3

Backfill with General Fill or Subbase material as directed by the ENGINEER and compact to a stable condition approved by the ENGINEER.

3.3.1.5

Excavation shall conform to the limits indicated on the PLANS and as specified herein. This work shall include shaping, sloping, grading and other work necessary in bringing the site to the required grade, alignment, and cross-section.

3.3.1.6

Unsatisfactory materials shall be removed to the required depth and replaced to the satisfaction of the ENGINEER with General Fill or Subbase material. Unsatisfactory materials shall be removed and disposed of in the designated areas on-site as directed by the ENGINEER.

3.3.1.7 Stockpiling of Excavated Materials

Satisfactory excavated materials shall be stockpiled in such a manner as to prevent nuisance conditions, including but not limited to endangering work areas or obstructing drive ways and natural water courses. Valve pit covers, valve boxes, or other utility controls shall be left unobstructed and accessible at all times. The CONTRACTOR shall limit operations to the project areas shown on the drawings unless otherwise approved by the ENGINEER. Surface drainage shall not be hindered.

3.4 TRENCH EXCAVATION FOR AIR, LANDFILL GAS AND FORCEMAIN PIPES, AND LIQUIDS MANAGEMENT STRUCTURES

See Section 31 23 33 (Trenching, Backfilling, and Compacting).

3.5 STABILITY OF EXCAVATIONS

3.5.1 General

Comply with local codes, ordinances, and requirements of agencies having jurisdiction.

3.5.2 Side Slopes

Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3.5.3 Shoring and Bracing

Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations during period excavations will be open. Extend shoring and bracing as excavation progresses.

3.6 STORAGE OF EXCAVATED AND BORROW MATERIALS

Stockpile excavated and borrow materials acceptable for General Fill and Bedding Layer where directed by the ENGINEER. Place, grade, and shape stockpiles for proper drainage.

Comply with all erosion and sediment control requirements by state and local authorities.

3.7 SUBGRADE APPROVAL

Prior to installation, subgrades to receive structures or fill shall be evaluated prior to fill placement by the QAO. Such evaluation may include the observation of subgrade performance during proof-rolling with a loaded tandem dump truck provided by the CONTRACTOR. At least three passes are to be made with a fully loaded tandem dump truck. Areas that are deemed unsuitable (rutting, pumping, etc.) for fill placement by the QAO shall be clearly identified in both horizontal and vertical extent with recommendations for improvements and submitted to the ENGINEER for further action.

3.8 BACKFILL AND FILL

3.8.1 General

Place soil material in layers to required elevations, for each area classification listed below, using materials specified in Part 2 of this Section.

3.8.1.1 General Site Grading

Use General Fill where indicated on the PLANS.

3.8.1.2 Aggregates

Use VDOT designated aggregates and other fill materials as indicated on the PLANS.

3.8.2 Timing of Backfill

Backfill excavations as promptly as work permits.

3.8.3 Depth And Mixing Of Fill Layers

Fill and backfill soil shall be placed in layers that when compacted shall not exceed six (6) inches. Each layer shall be spread evenly and shall be thoroughly bladed and mixed during the spreading to obtain uniformity of material in each layer.

3.8.4 Backfilling of Anchor Trench

The anchor trench shall be backfilled and compacted by CONTRACTOR, as approved by CQA engineer and quality assurance officer. Backfill material shall consist of clean structural fill. Trench backfill material shall be placed in 8 inch thick loose lifts and compacted by a method and equipment type approved by CQA Consultant. Material shall be compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D 698.

3.9 PLACEMENT AND COMPACTION

3.9.1 General

3.9.1.1 Ground Surface Preparation

Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Plow, strip, or scarify surfaces so that fill materials will bond with existing surfaces. Subgrade shall be approved by the QAO prior to material placement.

3.9.1.2 Bedding Layer

The in-place Bedding Layer shall be compacted to a minimum of 90% of the maximum dry density and $\pm 3\%$ of optimum moisture content, as determined by ASTM D698 (Standard Proctor). The surface shall be rolled smooth and be free of rocks or stones in excess of 3/8 inch prior to placement of the overlying geomembrane.

The thickness of the Bedding Layer will be a minimum of 6 inches, and the total thickness of soil under the geomembrane will be a minimum of 12 inches. The minimum 12 inch soil depth will be confirmed by CQA surveys on a 100-foot by 100-foot grid over the surface area, before and after the installation of the soil. Alternatively, the CONTRACTOR may verify the total soil thickness by excavating test pits on a 100-foot by 100-foot grid over the cap surface area under observation of the QAO. The test pits will be excavated by the CONTRACTOR, and the QAO will observe and measure the test pit depths. The CONTRACTOR will backfill test pits with bentonite clay.

The liner installer shall provide written acceptance of the subgrade before installing liner.

3.9.1.3 Synthetic Liner/Cap Protection

Surfaces to be lined/capped shall be smooth and free of all rocks, stones, sticks, roots, sharp objects or debris of any kind which could damage the synthetic liner/cap. The surface should provide a firm, unyielding foundation for the membrane with no sudden, sharp or abrupt changes or break in the grade. No standing water or excessive moisture shall be allowed. Final compaction of the Bedding Layer shall be completed with a smooth steel wheel roller. The liner/cap installation CONTRACTOR shall certify in writing that the surface on which the membrane is to be installed is acceptable before commencing work.

3.9.1.4 Moisture Content

General fill and backfill soil shall be compacted at a moisture content within a range of $\pm 3\%$ of the optimum moisture content, unless otherwise approved by the QAO. As required, general fill and backfill soil shall be dried by aerating with a scarifier, disc harrow, blade, or other equipment or by such other means as may be necessary. As required, fill and backfill soil shall be wetted by the use of water trucks or sprinklers. Dried or wetted fill or backfill soil shall be thoroughly mixed to provide a material of uniform moisture content. Do not place backfill or fill material on surfaces that are submerged soft, muddy, frozen, or unstable.

Where subgrade or fill material must be moisture conditioned before compaction:

- Uniformly apply water to surface of subgrade or fill material. Apply water as necessary to prevent free water from appearing on surface during or subsequent to compaction

operations. The CONTRACTOR shall process soil materials so that moisture is uniformly mixed into soils.

- Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density and moisture range. Stockpile or spread soil material that has been removed because it is too wet to permit compaction. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced uniformly to a satisfactory value.

3.9.1.5 Nonconforming Material

Re-compact areas or lifts if soil density and moisture tests indicate inadequate compaction and/or moisture. No additional compensation shall be given to the CONTRACTOR due to re-working of failed areas. The extent of area for repair shall be determined by the ENGINEER.

3.9.1.6 Filling Adjacent to Structures

Place backfill and fill materials evenly adjacent to structures or piping to required elevations. Prevent wedging action of backfill against structures or displacement of piping by carrying material uniformly around structure or piping to approximately same elevation in each lift.

3.9.1.7 Landfill Gas Pipe Aggregates

Aggregates surrounding perforated landfill gas collection pipe shall not be compacted, but shall be placed to achieve lines and grades as shown on the Plans.

3.10 COMPACTION OF FILL

Compact fill materials and aggregates not less than the following percentages of maximum dry density in accordance with ASTM D 698 or to a maximum obtainable density as follows:

3.10.1 Compaction

Compaction of each layer, unless otherwise specified, as shown on the Contract Drawings and determined in the field shall be continuous over its entire area and the compaction equipment shall make sufficient trips to verify that the required density has been obtained. After each layer has been placed, mixed and spread evenly, it shall be thoroughly compacted in six (6) inch maximum compacted thickness lifts. The minimum dry density of the soil shall be at least ninety percent (90) of the maximum dry density as determined by ASTM D698 (standard Proctor), unless otherwise shown on the Contract Drawings.

3.10.2 Compaction Equipment

Compaction equipment shall be of such design that it will be able to compact the fill to the specified density. Prior to placing the fill, at the preconstruction meeting or a minimum of 7 days prior to usage, the CONTRACTOR shall submit to the ENGINEER, for approval, a list of compaction equipment to be used. The ENGINEER shall have 7 days to approve or disapprove the list. The list shall include the type of equipment, manufacturer and size.

3.10.3 Equipment Certification

If, in the opinion of the ENGINEER, the compaction equipment is not acceptable, the CONTRACTOR may demonstrate the suitability of such equipment in a test area within the prepared fill site.

3.10.4 Fill Faces

Fill faces shall be compacted. Compacting operations shall be continued until the slope faces are stable but not too dense for planting and there is no appreciable amount of loose soil on the surface. Compaction efforts should be limited to "walking-in" slopes with a tracked dozer. Compacting of the slopes may be done progressively as the fill is brought to its total height or compacting of the slopes may be done after the fill is brought to its total height.

3.10.4.1 Erosion

CONTRACTOR shall maintain and prevent erosion of at all times during construction. Repair of damages to the Bedding Layer and other soil surfaces due to inadequate maintenance, and erosion shall be at the CONTRACTOR's own expense.

3.11 QUALITY CONTROL

CONTRACTOR to provide testing in accordance with Table 31 00 00-1 Testing Frequency Summary – Earth Material Construction Quality Control Testing.

3.12 GRADING

Uniformly grade all areas disturbed by the project, at trench locations, excavated and fill areas and adjacent transition areas so that finished surfaces are at the proposed grade or are approximately at preexisting grades, adjusted as required to provide positive drainage.

Fill and excavation areas shall be kept free of standing water with positive drainage maintained. Sloping of the fill surface and drainage ditches shall be provided to carry off water as it collects. Pumping shall be required to remove water from areas that cannot drain naturally.

3.13 SEASONAL LIMITS

No fill material shall be placed, spread or rolled while the ground is frozen or thawing, or during unfavorable weather conditions. When the work is interrupted by inclement weather, fill operations shall not be resumed until the moisture content and density of the previously placed fill are as specified. Fill surfaces exposed to inclement weather or standing water shall be scarified to a depth of 6 inches, compacted and tested prior to placing addition fill lifts.

3.14 INTEGRITY OF THE WORK

It shall be the CONTRACTOR's responsibility to maintain the integrity of the work. Work that is damaged by weather or construction activities shall be restored and retested at the CONTRACTOR's expense.

3.14.1 Protection of Graded Areas

Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

3.14.2 Repair

Repair and reestablish grades in settled, eroded, and rutted areas to specified tolerances.

3.14.3 Reconditioning Compacted Areas

Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, and compact to required density and moisture range prior to further construction.

3.14.4 Settling

Where settling is measurable or observable at excavated areas during project, remove surface (pavement, lawn, or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.15 FINISHING WORK

3.15.1 Bedding Layer

After the Bedding Layer has been installed, the CONTRACTOR shall maintain it free of ruts, depressions, and damage resulting from the hauling and handling of any material, equipment, tools, etc.

3.15.2 Drainage Structures

All drainage structures shall be constructed and maintained as necessary along the completed section.

3.15.3 Elevations

Unless otherwise specified by the ENGINEER, the elevation of all constructed grades shall be within 0.2 feet of those shown on the PLANS. The thicknesses of all Final Cover System components such as Erosion Control and Vegetative Layers are minimum values.

3.15.4 Finish Grading

After berms, ditches, swales, shoulders, and embankments are completed, the disturbed areas shall be finish graded. Any lumber, undesirable materials, and rocks larger than the 3 inches in size shall be removed from the surface immediately and the surface shall be prepared for final landscaping.

3.16 DISPOSAL OF EXCESS AND WASTE MATERIALS

The Bristol ISWMF does not have an active landfill waste placement operations (“working face”) area and is in the process of installing various remedial measures prior to closure. During this interim period, waste that is excavated during construction activities can be relocated and covered within the landfill. Waste relocation within the SWP #498 landfill will be required to establish the newly proposed intermediate/daily soil cover grade.

During the regrading of the intermediate/daily soil cover, the CONTRACTOR shall be responsible for stripping off the existing intermediate/daily soil cover, moving waste as needed to approach design grade, and replacing and restoring the Intermediate Soil Cover layer. CONTRACTOR shall minimize the open area of disturbed waste at any given time.

The CONTRACTOR shall place waste materials encountered during trenching activities in neat piles adjacent to the work area. Prior to the end of the working day, the CONTRACTOR shall haul the excavated waste materials to a designated area for waste relocation at the site, as directed by the OWNER. The CONTRACTOR shall be responsible for stripping off the existing Intermediate Soil Cover material, unloading and spreading the excavated waste, “tracking it in” with suitable equipment, and replacing and restoring the Intermediate/daily Soil Cover layer.

OWNER shall not require the CONTRACTOR to pay tipping fee for disposal of excavated waste materials encountered during work activities. If odors or emissions from the excavated waste become a nuisance as determined by the OWNER, CONTRACTOR shall increase the frequency of excavated waste removal as directed by the ENGINEER.

3.17 MANAGING LEACHATE SEEPS

During earthwork within the #498 landfill, leachate seeps may occur. The CONTRACTOR shall be responsible for addressing leachate seeps. If a leachate seep occurs, CONTRACTOR shall notify ENGINEER. CONTRACTOR shall address leachate seeps in accordance with the drawings (leachate seep management detail) unless otherwise directed by ENGINEER. If the proposed leachate seep management strategy is ineffective, CONTRACTOR will inform and seek guidance from ENGINEER.

END OF SECTION 31 00 00

Appendix H

SECTION 31 05 19.17

AGRU MICRODRAIN GEOMEMBRANE

1.0 GENERAL

1.1 SCOPE

The work covered in this Section includes the manufacturing, fabrication, testing, supply and installation of 50 mil Structured Linear Low-Density Polyethylene (LLDPE) geomembrane (MicroDrain®) for the final cover system. The CONTRACTOR shall furnish all labor, materials, transportation, handling, storage, supervision, tools, equipment and other incidentals necessary to install, test, and quality control the geomembrane as required by the Contract Documents.

1.1.1 Related Work Specified Elsewhere

- Section 01 45 00 Construction Quality Control
- Section 31 00 00 Earthwork (Bedding Layer requirements)
- Section 31 05 19.13 Geotextile Fabrics
- Section 31 05 19.16 Textured LLDPE Geomembrane Liner

1.2 DEFINITIONS

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 1.2.

1.3 QUALITY ASSURANCE AND CONTROL DURING INSTALLATION

The ENGINEER or OWNER third party Construction Quality Assurance (CQA) Consultant will observe geomembrane installation and construction and certify that construction is in accordance with Contract Documents. All tests and test frequencies specified in this section are Construction Quality Control (CQC) tests, and these tests are the responsibility of the CONTRACTOR or his representative unless otherwise noted.

1.4 REFERENCES

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 1.4.

1.5 SUBMITTALS

The CONTRACTOR or Geosynthetic INSTALLER shall submit the following information to the ENGINEER for approval at least 30 days (unless otherwise specified) prior to procurement of the geomembrane:

1.5.1 Proof of Manufacturer's Qualifications:

- The Manufacturer must have at least two (2) years documented experience in the manufacture of the geomembrane and/or documented experience totaling 10,000,000 ft² of the manufactured geomembrane for at least ten (10) completed facilities.

- **Manufacturer's Brochure:** Submit complete manufacturer's specifications, descriptive drawings, and literature for the geomembrane, including the product identification and supplier of the polymer resin and recommended method for handling and storage of all materials prior to installation. Include information on plant size, equipment, personnel, number of shifts per day and capacity per shift.
- **Manufacturer Quality Control (MQC) Program:** Submit a complete description of the geomembrane manufacturer's formal quality control programs for manufacturing, fabricating, testing, quality control, defects repair, handling, and shipping. The description shall include, but not be limited to, polymer resin supplier(s) and product identification, acceptance testing, production sampling and testing, installation testing, documentation of changes, alterations, repairs, retests, and acceptance.
- **Prior to purchasing material the following conformance testing is required:** Submit independent quality control laboratory test results demonstrating compliance with material properties listed herein, including *Table 31 05 19.17 - 2 Resin Properties (Without Carbon Black)* and *Table 31 05 19.16 - 3*. The independent laboratory tests are to be performed once by an approved laboratory independent of the manufacturer. In addition, the manufacturer must provide a certificate of compliance which states that the material to be installed will use the same resin type and formulation as that for which test results are submitted.

1.5.1.1 **Manufacturer Quality Control Certificates:**

The Geosynthetic Installer shall submit test reports to the ENGINEER prior to geomembrane shipment. The tests and frequencies are specified in Part 2 - "Manufacturer Quality Control Tests" and material properties.

The following information must be submitted for approval prior to shipping the material:

Resin:

- Origin (resin suppliers name, resin production plant), batch number, lot number, or identification number and production date(s).
- A certification by a qualified individual employed by the manufacturer that the quality of the resin used to manufacture the geomembrane rolls assigned to this project meets specified properties measured using test methods indicated in the specifications, or equivalent.
- Copy of quality control certificates issued by the Resin Supplier.
- Certified statement that no reclaimed polymer was added to the resin during the manufacture of the actual geomembrane to be used in this project. However, the use of polymer recycled during the manufacturing process may be permitted if done with appropriate cleanliness and if recycled polymer is the same LLDPE as the parent material and does not exceed ten (10) percent by weight.

Geomembrane:

- Roll numbers, production dates, and identification.

- A certification by a qualified individual employed by the manufacturer that the geomembrane roll assigned to this project meets specified properties measured using test methods indicated in the specifications, or equivalent.
- A list of quantities and descriptions of materials other than the base polymer which comprise the geomembrane.

Factory Visit:

At the request of the OWNER or the ENGINEER, submit contact names, telephone numbers, addresses, and production schedule information for purposes of scheduling an OWNER or ENGINEER'S plant visit during production.

1.5.2 Proof of Geosynthetic INSTALLER'S Qualifications:

- Show a minimum of two years continuous experience and list completed facilities for which the Geosynthetic Installer has installed geomembrane, totaling a minimum of 10,000,000 ft².
- The name or names of the field superintendents who will be proposed for the project and a list of completed facilities for which the field superintendent has installed the selected geomembrane totaling a minimum of 10,000,000 ft².
- The name or names of the Master Seamer(s) who will be proposed for the project and a list of completed facilities for which the Master Seamer(s) has installed the selected geomembrane totaling a minimum of 2,000,000 ft².
- Construction Quality Control Program: Submit a complete description of the Geosynthetic Installer's formal quality control programs for handling, installing, testing, quality control, and defect repair. The description shall include, but not be limited to installation testing, documentation of changes, alterations, repairs, retests, and acceptance. The document shall include a complete description of seaming by extrusion welding and hot wedge welding.
- Proposed schedule of installation showing the critical path of installation.
- Licensed Installer: The Geosynthetic Installer shall be approved and/or licensed by the geomembrane manufacturer.
- Warranty: Submit an advance (sample) copy of the warranty.

1.5.3 Instructions and Drawings:

1.5.3.1 Storage, Handling, Installation, and Seaming

The Contractor shall furnish complete written instructions to the Engineer for the storage, handling, installation, and seaming of the membrane in compliance with this specification and the condition of his warranty.

1.5.3.2 Repairs

The material supplier shall furnish complete written instructions for the repair of geomembrane material to the Engineer no less than 30 days prior to installation.

1.5.3.3 Layouts

The Contractor shall furnish panel layouts and seam details as required for the membrane installation. The goal of the plan will be to minimize the required number of seams. Care should be taken to reduce areas of stress concentration. Horizontal seams are not allowed unless the slope length exceeds roll lengths. In that event, the horizontal seam will be installed on a 45 degree diagonal across the slope. Details of placement around penetrations, if any, such as pipes shall be provided. The above details must be approved by the Engineer prior to liner installation. Material left outside shall not be exposed to sunlight for more than 30 days.

1.5.4 Shop Drawing Submittals

1.5.4.1 Samples and Specifications

In order to qualify as an approved lining material, the Contractor shall submit material samples and minimum specifications to the Engineer. The specification sheet shall give full details of minimum physical properties and test methods used, site seaming methods, and a certificate confirming compliance of the material with the minimum specifications. A list of similar projects completed in which the manufactured material has been successfully used shall be submitted.

1.5.4.2 Certification Delivery

Upon delivery of the rolls of geomembrane, provide a copy of the certification from the manufacturer certifying the batch delivered to the site meets the minimum specifications and was QC inspected. The certificate shall be signed by a person with authority to bind the manufacturer.

1.5.4.3 Test Results

The Contractor shall submit results of confirmation testing showing that the material lot of the resin used in the membrane supplied meets the material requirements for the resin. A description of the quality control steps used during manufacture shall also be provided.

1.5.5 During Construction Conformance Test Results:

Submit conformance test results to the ENGINEER for approval within 3 days of completed testings. See Part 1.5.C. for conformance testing requirements and frequency.

1.5.6 List of Personnel:

The CONTRACTOR or Geosynthetic Installer shall submit a list of proposed seaming personnel and their experience records. All personnel shall be approved by the ENGINEER before they perform seaming operations.

1.5.7 Submittals Required for Project Closeout

Record Drawings:

Submit geomembrane record drawings to the ENGINEER.

Geomembrane Warranty

Submit geomembrane warranty to the ENGINEER.

1.6 DELIVERY, STORAGE, AND HANDLING

1.6.1 Handling

The Geosynthetic Installer's personnel shall handle the material with care, shall use adequate equipment and shall take all precautions necessary to prevent damaging the geomembrane.

1.6.2 Inspection upon Delivery

Upon delivery at the site, the Geosynthetic Installer, in the presence of a CQA Representative, conduct a visual inspection of rolls or factory panels for defects and for damage. This inspection shall be conducted without unrolling rolls or unfolding factory panels unless, in the Geosynthetic Installer's or CQA Representative's opinion, defects or damages are found or suspected.

Defects or flaws in the materials shall be brought to the attention of the CQA Representative. Rolls, factory panels, or portions thereof, which have unacceptable flaws shall be recorded by the CQA Representatives and Geosynthetic Installer, rejected and shall be removed from the site.

Rejected materials shall be replaced by the CONTRACTOR at no additional cost to the OWNER. No time extension will be allowed in the case of rejected materials.

1.6.3 During Construction Conformance Testing

At the direction of the CQA Representative, the Geosynthetic INSTALLER shall take samples from the delivered lot and sent to the CQA Geosynthetic Laboratory for conformance testing. The cost for laboratory conformance testing shall be paid by the OWNER. The conformance tests and minimum frequency outlined in *Table 31 05 19.17 - 1* are required prior to installation. Results must meet property requirements in *Table 31 05.19.17 - 3*.

Table 31 05 19.17 - 1 Conformance Testing Requirements

Properties	Test Method	Testing Frequency (minimum)
Thickness (min. ave.) – mils <ul style="list-style-type: none"> • lowest individual for 8 out of 10 values - % • lowest individual for any of the 10 values - % 	D 5994	1 per 100,000 ft ²
Asperity Height (min. ave.) – mils	D 7466	
Formulated Density (max.) – g/cc	D 1505/ D 792	
Tensile Properties	D 6693	

Properties	Test Method	Testing Frequency (minimum)
<ul style="list-style-type: none"> break strength – lb/in. break elongation - % 	Type IV	
Puncture Resistance (min. ave.) - lb	D 4833	
Tear Resistance (min. ave.) - lb	D 1004	
Carbon Black Content (range)	D 4218	
Carbon Black Dispersion	D 5596	
Index Transmissivity, m ² /sec ⁽¹⁾	D 4716	

NOTES:

⁽¹⁾ Transmissivity at a temp of 21° C, gradient of 0.33, seating time of 15 min, 100-hr testing duration, MicroDrain and AT081 geotextile with Bedding layer and erosion control layer.

All conformance test results shall be reviewed and approved by the ENGINEER prior to any placement. If a conformance test result fails the specifications, at least two additional conformance tests shall be performed on samples taken immediately from adjacent numbered rolls. If both additional conformance test results pass the specifications, the entire lot shall be accepted except that roll from which the failed sample is taken. If any of the conformance test results fails for the two (minimum) additional samples, the entire lot shall be rejected by the ENGINEER.

1.6.4 Storage

The Geosynthetic Installer shall be responsible for ensuring that the stored materials are protected from rain, snow, ice, dirt, ultra violet light, shock, theft, vandalism, passage of vehicles, and other sources of damage. The CONTRACTOR is responsible for clearing, grubbing, and grading necessary to prepare the storage area. Provide for surface water control, access and storage area surfacing, and lighting necessary for adequate unloading of highway transport vehicles and access by construction equipment.

1.7 Warranty

Provide a twenty (20) year material warranty and workmanship defects for a period of one (1) year following the date of final completion of the work under this contract. The warranty required herein shall be provided in addition to any warranty required by the General Conditions.

1.8 INTERFACE SHEAR TESTING

1.8.1 Friction Angle Testing Method

Contractor shall conduct interface testing by direct shear in accordance with ASTM D5321 to confirm a minimum interface friction angle of 24 degrees (peak value), or equivalent shear strength when considering adhesion value, for the interfaces listed in 1.8.2. Soil samples will be prepared by compacting to 90% maximum dry density at ±3% of optimum moisture. Test samples shall be wetted at the soil and geosynthetic contact surface by spraying during shear box assembling. For capping, soil samples will be consolidated under normal loads, applied incrementally at least 24 hours prior to testing, of 200 psf, 400 psf, and 600 psf with a minimum displacement of 3 inches.

1.8.2 Interfaces

Test each interface individually to be used on this Project using representative samples of materials to be supplied under normal loads indicated and using test parameters as specified by Engineer. For capping, interfaces to be tested are (top layer against bottom layer):

- MicroDrain Liner against cap Bedding Layer
- AGRUTex Geotextile against the MicroDrain Liner
- Erosion Control Layer Soil against the AGRUTex Geotextile

1.9 GEOTEXTILE

The AGRU MicroDrain Liner will be used in conjunction with the AGRUTex AT081 geotextile as recommended by the manufacturer.

2.0 PRODUCTS

2.1 MANUFACTURING PLANT VISIT

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 2.1.

2.2 GEOMEMBRANES

2.2.1 Single Source

All geomembrane sheets and extrudate material for the construction of the project shall be obtained from a single material supplier and manufacturer. It must be certified and warranted that the sheets, extrudate, and pipe boots are compatible with one another. The Geosynthetic Installer shall provide manufacturer's warranties for the sheets, extrudate material, and pipe boots.

2.3 MATERIAL PROPERTIES

2.3.1 Geomembrane

The membrane shall have a minimum thickness required by the plans. The raw polymer shall meet or surpass the minimum standards as set forth in the Geosynthetic Research Institute's (GRI) Test Method GM17 "Test Methods, Test Properties, and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes" and GRI Test Method GM19 "Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes".

Geomembrane shall meet or exceed the requirements of *Table 31 05 19.17 - 2*. Equivalent test methods are subject to the approval of the ENGINEER.

Table 31 05 19.17 - 2

Resin Properties (without Carbon Black)

Property	Test Method	LLPE
Density (g/cc)	ASTM D792, Method B	≥0.915
Melt Flow Index (g/10 min)	ASTM D (190/2.16)	≤1.0

2.3.2 Extrudate

Extrudate shall be the same resin as the geomembrane. The manufacturer shall provide documentation and shall certify that the extrudate meets this requirement.

2.3.3 Material Composition

The geomembrane shall consist of new, first-quality products designed and manufactured specifically for the purpose of this project, as satisfactorily demonstrated by prior use. The geomembrane shall be unmodified containing no plasticizer, fillers, chemical additives, reclaimed polymers, or extenders. Approximately 2 percent carbon black shall be added to the resin for ultraviolet resistance. The only other allowable compound elements shall be anti-oxidants and heat stabilizers, of which up to 1.5 percent total, as required for manufacturing, may be added.

2.3.4 Structured Geomembrane Surface

The geomembrane shall be produced using a flat cast manufacturing process to create a structured geomembrane with integrated drainage layer.

2.3.5 Defects

The membrane material shall be so produced as to be free of holes, blisters, undispersed raw materials, or sign of contamination by foreign matter. Defects discovered in the field shall be repaired by cutting out the defect and welding a new piece of membrane material in its place. The weld shall be placed in accordance with the requirements for field welded seams. Seams for repairs shall be tested in accordance with the required field seam test procedures.

2.3.6 Labels

Labels on each roll shall identify the thickness, length, width, and manufacturer's mark number. The roll shall also indicate the date, lot, and batch number of the roll, the square feet in the roll, and the total roll weight as measured after manufacture. Should the total weight not meet the minimum weight based upon the minimum material density of 0.93 g/cc, the material thickness, and square footage provided, then the delivered material will be rejected for use.

2.3.7 Transportation, Handling, and Storage

Transportation, handling, and storage of the membrane shall be in accordance with written instructions from the manufacturer. These instructions shall be supplied prior to delivery of the material. In general, equipment used shall be adequate to handle the rolls of membrane without risk of damage to the material. Extreme care will be taken whenever handling the material. The rolls of membrane shall be stored on a surface free of sticks, rocks, roots, or other matter that may damage the material. Upon delivery, QC and QA personnel shall inspect each roll of material for damage. This inspection shall be recorded and included in the QA/QC reports.

2.3.8 Seams

There shall be no factory seams. Seams shall be welded in the field by factory trained technicians using a non-destructive hot-wedge fusion or extrusion process. Edges of rolled material shall be trimmed at the factory to remove non-conforming material. The first three feet of material on selected rolls shall be used for confirmation testing of the characteristics of the membrane material.

2.4 MANUFACTURER QUALITY CONTROL TESTS

2.4.1 Test Reports

Submit all test reports to the ENGINEER for review and approval.

2.4.2 Manufacturer Quality Control (MQC) Tests:

2.4.2.1 Resin

Resin shall be tested at a frequency of one test per resin batch. One batch is defined as one rail car load of resin. As a minimum perform tests for Density and Melt Index. Compliance with the Polymer Composition test requirement shall be established with a manufacturer's certificate of compliance. The finished rolls shall be identified by a roll number corresponding to the resin batch used.

2.4.2.2 Geomembrane

Geomembrane shall be tested for properties required by *Table 31 05 19.17 - 3*. The minimum test frequencies in *Table 31 05 19.17 - 3* shall be observed.

Table 31 05 19.17 - 3

AGRU LLDPE MicroDrain® Liner

Property	Test Method	Frequency	50 mil
Thickness, (Nominal) mil	ASTM D5994	Every Roll	50
Thickness, (average) mil			47.5
Lowest individual reading 8 of 10 (-10%)			45
Lowest Individual 2 of 10			42.5
Drainage Stud Height (min. ave.), mil	ASTM D7466	Second Roll	130
Friction Stud Height (min. ave.), mil	ASTM D7466	Second roll	20
Density, g/cm ³ – maximum	ASTM D792, Method B	200,000 lb	0.939
Tensile Properties (each direction)	ASTM D6693, Type IV Dumbell, 2 ipm G.L. 2.0 in (51 mm)	20,000 lb	
Strength at Break (min. ave.), lb/in-width			105
Elongation at Break (min. ave.), %			300
Tear Resistance, lb	ASTM D1004	45,000 lb	30
Puncture Resistance, lb	ASTM D4833	45,000 lb	55
Carbon Black Content, % (Range)	ASTM D4218	45,000 lb	2.0 - 3.0
Carbon Black Dispersion (Rating)	ASTM D5596	45,000 lb	Note ⁽¹⁾
Oxidative Induction Time, min. ave.	ASTM D3895, 200°C; O ₂ , 1 atm	200,000 lb	140

Property	Test Method	Frequency	50 mil
Stress Crack Resistance (NCTL), min. ave.	ASTM D5397	200,000 lb	500
Index Transmissivity, m ² /sec ⁽²⁾	ASTM D4716	100,000 SF	4 x 10 ⁻³
Index Transmissivity, m ² /sec ⁽³⁾	ASTM D4716	100,000 SF	5 x 10 ⁻⁴

NOTES:

- (1) Dispersion only applies to near spherical agglomerates. 10 views shall be Category 1 or 2.
(2) Transmissivity at a temp of 21° C, gradient of 0.1, seating time of 15 min, MicroDrain between steel plates
(3) Transmissivity at a temp of 21° C, gradient of 0.33, seating time of 15 min, 100-hr testing duration, MicroDrain and AT081 geotextile with Ottawa sand

3.0 INSTALLATION

3.1 GENERAL REQUIREMENTS

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.1.

3.2 INSTALLATION EQUIPMENT

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.2.

3.3 PREPARATION

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.3.

3.4 PANEL DEPLOYMENT

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.4.

3.5 FIELD STEAMING

3.5.1 Seam Strength

All field seams shall meet or exceed the requirements of *Table 31 05 19.17 - 4* for Geomembrane Seam Properties.

Table 31 05 19.17 - 4 LLDPE Geomembrane Seam Properties

Properties	Test Value ¹
Hot Wedge Seams ² <ul style="list-style-type: none"> • shear strength, lb/in. • shear elongation at break³, % • peel strength, lb/in. • peel separation, % 	75 50 63 25
Extrusion Fillet Seams <ul style="list-style-type: none"> • shear strength, lb/in. • shear elongation at break⁴, % • peel strength, lb/in. • peel separation, % 	75 50 57 25

3.5.2 Installation Rate

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.5.2.

3.5.3 Overlapping

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.5.3.

3.5.4 Weather Conditions for Seaming

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.5.4.

3.5.5 General Seaming Procedures

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.5.5.

3.6 PROTECTION

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.6.

3.7 FIELD QUALITY CONTROL TRIAL SEAMS

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.7.

3.8 FIELD NONDESTRUCTIVE SEAM TESTING

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.8.

¹ Test Values are provided for 50 mil LLDPE geomembrane. For all other material thicknesses refer to GRI-GM19a.

² Also for hot air and ultrasonic seaming methods.

³ Elongation measurements should be omitted for field testing

⁴ Elongation measurements should be omitted for field testing

3.9 FIELD DESTRUCTIVE SEAM TESTING

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.9.

3.10 DEFECTS AND REPAIRS

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.10.

3.11 PLACEMENT OF GEOTEXTILE AND VEGETATIVE COVER LAYER MATERIALS

3.11.1 Weather Conditions

Placement of the geotextile and overlying vegetative cover layer soils on the geomembrane shall not proceed at an ambient temperature below 40 °F (5 °C) nor above 95 °F (35 °C) unless otherwise approved by the CQA Representative.

3.11.2 Material Exposure

The geomembrane shall not be left exposed (uncovered) to the elements including UV light, for any period more than sixty (60) days.

3.11.3 Soils

All soils installed in direct contact with the geomembrane shall have a maximum particle size of 3/8 inches.

3.11.4 Equipment

All materials placed over geomembrane (and other geosynthetics) shall be installed without damaging the geosynthetics. Equipment used for placing soil shall not be driven directly on the geomembrane. A minimum thickness of one (1) foot of soil is required between a light dozer (such as a low ground pressure Caterpillar D-3 or lighter) and the geomembrane. Placement of material overlying the geosynthetics shall be in conformance with the guidelines for equipment ground pressure in

Table 31 05 19.16 - 5 Soil Thickness for Equipment Operating over Geomembrane

Equipment Ground Pressure (psi)	Minimum Soil Thickness (inches)
<4	12
4-6	15
6-8	18
8-11	24

3.11.5 Heavily Trafficked Areas

In heavily trafficked areas such as access ramps, soil cover thickness shall be at least three (3) feet.

3.12 DOCUMENTATION OF CONSTRUCTION

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.12.

3.13 LANDFILL GAS CONTROL DURING INSTALLATION

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.13.

3.14 SANDBAGS

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.14.

3.15 PAYMENT

See Section 31 05 19.16 Textured LLDPE Geomembrane Liner, Paragraph 3.15.

END OF SECTION 31 05 19.17

Appendix I

SECTION 31 05 19.26

DRAINAGE GEOCOMPOSITE

1.0 GENERAL

1.1 SUMMARY

The work covered in this Section includes the manufacture, fabrication, testing, supply and installation of the drainage geocomposite, which consists of a core geonet layer with geotextile bonded to both sides. The CONTRACTOR shall furnish all labor, materials, transportation, handling, storage, supervision, tools, incidentals and other equipment that may be necessary install and test the drainage geocomposite as specified by the Contract Documents. All testing specified in this section is quality control (QC) testing and is the CONTRACTOR's responsibility unless otherwise noted.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) STANDARD TEST METHODS/PRACTICE:

- ASTM D 792 Test Methods for Density and Specific Gravity of Plastics by Displacement
- ASTM D 1505 Density of Plastics by the Density-Gradient Technique
- ASTM D 1603 Carbon Black in Olefin Plastics
- ASTM D 4218 Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- ASTM D 4354 Practice for Sampling of Geosynthetics and Rolled Erosion Control (RECPs)
- ASTM D 4355 Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
- ASTM D 4491 Water Permeability of Geotextiles by Permittivity
- ASTM D 4533 Trapezoid Tearing Strength of Geotextiles
- ASTM D 4632 Grab Breaking Load and Elongation of Geotextiles
- ASTM D 4716 Constant Head Hydraulic Transmissivity (In-Plane Flow) of Geotextiles and Geotextile Related Products
- ASTM D 4751 Determining the Apparent Opening Size of a Geotextile
- ASTM D 4873 Guide for Identification, Storage and Handling of Geosynthetic Rolls and Samples
- ASTM D 5035 Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
- ASTM D 5199 Measuring Nominal Thickness of Geotextiles and Geomembranes

- ASTM D 5261 Measuring Mass per Unit Area of Geotextiles
- ASTM D 5321 Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
- ASTM D 6241 Standard Test Method for Static Puncture Strengths of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
- ASTM D 6364 Standard Test Method for Determining Short-Term Compression Behavior of Geosynthetics
- ASTM D 7005 Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposite
- ASTM D 7179 Standard Test Method for Determining Geonet Breaking Force
- ASTM D 7238 Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembranes Using Fluorescent UV Condensation Apparatus

Geosynthetic Research Institute Guide GC8 – Determination of Allowable Flow Rate of a Drainage Geocomposite.

1.3 SUBMITTALS

1.3.1 Product Information

The CONTRACTOR or drainage geocomposite installer shall submit the following product information to the ENGINEER for approval at least 30 days (unless otherwise specified) prior to procurement of the product:

1.3.1.1 Prequalification

Independent laboratory test results demonstrating compliance with the material properties listed in Table 31 05 19.26 - 2; Table 31 05 19.26 - 3; and Table 31 05 19.26 - 4. The independent laboratory tests are to be performed once for each material. In addition, the manufacturer must provide a certificate of compliance which states that the material to be installed will use the same manufacturing techniques, resin type, and formulation as that for which test results are submitted.

1.3.1.2 Roll Layout Drawings

As a minimum, include a roll layout drawing and installation details. The roll layout drawing shall be drawn to scale, and shall be coordinated with the geomembrane panel layout. Installation details shall include cross sections of toe drains, temporary anchorage, key trench and other terminations, and pipe penetrations.

1.3.1.3 Protection from Wind and Weather

Submit plans to protect the drainage geocomposite from wind, dirt, and direct sunlight.

1.3.1.4 Material Data

Complete manufacturer's specifications, descriptive drawings, and literature for the geocomposite, including the product identification and suppliers of the polymer resin and recommended methods for handling and storage of all materials prior to installation. Describe the manufacturer's methodology to comply with the requirements specified for manufacturing quality control.

1.3.1.5 Manufacturing Quality Control (MQC)

Complete description of the manufacturer's formal quality control/quality assurance programs for manufacturing, fabricating, handling, installing, and testing. The description shall include, but not be limited to, polymer resin supplier and product identification, acceptance testing, production testing, installation inspection, installation techniques, repairs, and acceptance. The document shall include a complete description of methods for both roll end and roll side joining.

1.3.1.6 Installation Instructions

Samples of the drainage geocomposite with a complete set of specifications, and manufacturer's complete written instructions for storage, handling, installation, and joining.

1.3.1.7 Qualifications

Manufacturer's qualifications for the drainage geocomposite, geotextile, and geocomposite.

1.3.1.8 Resin

The name of the resin supplier, the production plant, the brand name, and name of resin used to manufacture the product.

1.3.1.9 Factory Visit

Upon request, arrange with the geocomposite manufacturer to allow the OWNER or representative to visit to the manufacturing plant during the manufacture of material for this project, for the purpose of observing the manufacturing process and quality control procedures. Submit contact names, telephone numbers, addresses, and production schedule information.

1.3.1.10 Compatibility

Suppliers and/or manufacturers shall certify that geonet and geotextile are compatible with one another when bonded into the drainage geocomposite.

1.3.2 Manufacturing Quality Control

The CONTRACTOR shall submit quality control test reports within 48 hours of completion of tests. Submit the following manufacturing quality control information to the ENGINEER prior to material shipment:

1.3.2.1 Production Dates

Submit statement of production dates for the drainage geocomposite.

1.3.2.2 Test Reports

See Part 2 for tests and test frequencies.

1.3.3 Proof of INSTALLER'S Qualifications

The name or names of the field superintendents who will be proposed for the project and a list of completed facilities for which the field superintendent has installed drainage geocomposite totaling a minimum of 2,000,000 ft².

1.4 INTERFACE SHEAR TESTING

Refer to SECTION 31 05 19.16 – Textured LLDPE Geomembrane Liner for interface shear testing requirements.

2.0 PRODUCTS

2.1 MANUFACTURER'S QUALIFICATIONS

Manufacturer shall have manufactured a minimum of 5,000,000 ft² of drainage geocomposite. The manufacturer of the drainage material described hereunder shall have previously demonstrated his ability to produce this geonet by having successfully manufactured similar material for hydraulic conductance installations.

2.1.1 Single Source

All HDPE drainage net (geonet) used for construction of the drainage geocomposite must be obtained from a single material supplier or manufacturer. All nonwoven geotextile fused to the geonet and used for the construction must be obtained from a single material supplier. All fusion of HDPE drainage net to non-woven geotextile must be accomplished by a single material supplier or manufacturer. Suppliers and/or manufacturers shall certify that the geonet and geotextile will be compatible with one another.

2.2 HDPE DRAINAGE NET

The HDPE drainage net component of the drainage geocomposite shall be manufactured by extruding strands of material into a counter-rotating die to form a three dimensional structure to provide planar water flow.

2.2.1 Material Properties

HDPE drainage net shall meet the requirements of Table 31 05 19.26 - 2.

2.2.2 Material Composition

The HDPE drainage net shall consist of new, first-quality products designed and manufactured specifically for the intended purpose designated in this contract, as satisfactorily demonstrated by prior use. The drainage net shall contain stabilizers to prevent ultraviolet light degradation. The HDPE shall be unmodified HDPE containing no plasticizer, fillers, chemical additives, reclaimed polymers, or extenders. Carbon black shall be added to the resin for ultraviolet resistance. The only other allowable compound elements shall be anti-oxidants and heat stabilizers, of which up to one (1) percent total, as required for manufacturing, may be added.

2.2.3 Defects

The net strands shall be so produced as to be free of holes, blisters, undispersed raw materials, or sign of contamination by foreign matter. Defects discovered in the field shall be repaired by cutting out the defect and joining a new piece of net material in its place. The joint shall be placed in accordance with the requirements for field joints.

2.2.4 Labels

Labels on each roll shall identify the thickness, length, width, and manufacturer's mark number. The roll shall also indicate the date, lot and batch number of the roll, the square feet in the roll, and the total roll weight as measured after manufacture.

2.2.5 Joints

Joints shall be made in the field by factory-trained technicians using approved methods. Edges of rolled material shall be trimmed at the factory to remove nonconforming material.

2.2.6 Warranty

The net material shall meet the specification values according to the specification sheet for HDPE geonet. It shall have a warranty of a minimum 20 years relative to materials, and 1 year on installation.

2.3 GEOTEXTILE

2.3.1 General

Geotextile shall be of the type specified on the drawings or an approved equal. Manufacturer shall submit a certificate to the Engineer stating the name of the manufacturer, the chemical composition of the filaments or yarns, and other pertinent information so as to fully describe the geotextiles. At a minimum the other pertinent data shall include Grab Strength, Elongation, Puncture Strength, and Apparent Opening Size.

2.3.2 Material Properties

The geotextile component of the composite geonet shall meet the requirements of Table 31 05 19.26 - 3.

2.4 DRAINAGE GEOCOMPOSITE

The material shall meet the requirements of Table 31 05 19.26 - 4. It is comprised of three layers: a lower geotextile, a middle HDPE drainage net (geonet), and an upper geotextile. The lower and upper geotextiles shall be heat bonded to the middle HDPE drainage net.

2.4.1 Manufacture

The drainage geocomposite shall be fabricated by heat bonding the geotextile to both sides of the HDPE drainage net. Heat bonding shall prevent flattening of filter fabric and surface. Glues and adhesives shall not be permitted to bond materials. No burn through of geotextiles will be permitted. No glue or adhesive shall be permitted. The bond between the geotextile and the HDPE drainage net shall meet the requirements of Table 31 05 19.26 - 4.

2.4.2 Labels

Drainage geocomposite shall be supplied in rolls, marked or tagged with the following information:

- Manufacturer's name
- Product identification

- Lot number
- Roll number
- Roll dimensions

2.4.3 Certification

Contractor shall provide the manufacturer's certificate prior to delivery of the material. The manufacturer shall certify in writing that the material supplied meets the minimum specifications. The certificate shall be signed by a person with authority to bind the manufacturer and shall be notarized.

2.4.4 Roll Dimensions

The HDPE drainage net shall be supplied as a continuous sheet with no factory seams. During installation, the roll length shall be maximized to provide the largest manageable roll for the fewest field seams. Rolls shall be wound on a core which shall be stable enough to support the rolls during handling and shipping.

2.5 MANUFACTURING QUALITY CONTROL TESTING

All of the specified tests are the CONTRACTOR's responsibility. Testing during manufacturing shall be accomplished by the manufacturer's laboratory.

HDPE resin shall be tested at a frequency of one test per resin batch for compliance with Table 31 05 19.26 - 1, HDPE Drainage Net Properties. One batch is defined as one rail car load of resin. The finished rolls of the drainage net shall be identified by a roll number corresponding to the resin batch used. The following minimum test frequencies shall be observed:

Table 31 05 19.26 - 1 HDPE Drainage Net Resin Properties

Properties	Test Method	Test Value	Testing Frequency (minimum)
Minimum Polymer Density, g/cm ³	D 1505 / D 792 Method B	0.940	per batch
Maximum Polymer Melt Index, g/10 max	D 1238, Condition E	1.0	per batch

HDPE drainage net shall be tested during manufacturing for compliance with Table 31 05 19.26 - 2. The minimum test frequencies in Table 31 05 19.26 - 2 shall be observed.

Table 31 05 19.26 - 2 HDPE Drainage Net Properties (before lamination)

Properties	Test Method	Test Value	Testing Frequency (minimum)
Thickness, mils (min. ave.)	D 5199	270	50,000 lb.
Density ¹ , g/cc (min. ave.)	D 1505 / D 792 Method B	0.95	50,000 lb.

¹ Density is of the formulated material; the base resin will be slightly lower.

Properties	Test Method	Test Value	Testing Frequency (minimum)
Carbon Black Content, % (range)	D 1603 / D 4218	1.5 to 3.0	100,000 lb.
Tensile Strength ² , lb. (min. ave.)	D 7179	60	50,000 lb.
Compressive Strength ³ , lb/in. ² (min. ave.)	D 6364	120	100,000 lb.

Geotextile shall be tested during manufacturing for the compliance with Table 31 05 19.26 - 3. The minimum test frequencies in Table 31 05 19.26 - 3 shall be observed.

Table 31 05 19.26 - 3 Geotextile Properties (before lamination)

Properties	Test Method	Test Value	Testing Frequency (minimum)
Mass/Unit Area, oz/sy (MARV)	D 5261	8	200,000 lb.
Grab Strength, lb. (MARV)	D 4632	200	200,000 lb.
Grab Elongation, % (MARV)	D 4632	50	200,000 lb.
Tear Strength, lb. (MARV)	D 4533	80	200,000 lb.
Puncture Strength, lb. (MARV)	D 6241	430	200,000 lb.
Permittivity, sec ⁻¹ (MARV)	D 4491	0.2	200,000 lb.
AOS, mm (MaxARV)	D 4751	0.25	200,000 lb.
UV Stability, % ret. (500 hr.)	D 4355	50	200,000 lb.

Drainage geocomposite shall be tested during manufacturing for compliance with Table 31 05 19.26 - 4. The minimum test frequencies in Table 31 05 19.26 - 4 shall be observed:

Table 31 05 19.26 - 4 Geocomposite Properties

Properties	Test Method	Test Value	Testing Frequency (minimum)
Transmissivity ⁴ , m ² /sec (min.-ave.)	D 4716 (GRI-GC8)	4.5 x 10 ⁻⁴	200,000 lb.
Ply Adhesion ⁵ , lb./in. (min. ave.)	D 7005	1.0	100,000 lb.

² This is the average peak value for five equally spaced machine direction tests across the roll width.

³ Test to be conducted using the movable plate method.

⁴ Drainage geocomposite should be tested using flexible boundaries at a hydraulic gradient of 0.33; a pressure of 1,000 lb./ft², a seating dwell time of 15 min, and 100-hr testing duration. Test values are for machine direction only. Testing will include drainage geocomposite and representative soil (such as Ottawa sand) within the testing plates.

⁵ This is the average of five equally spaced machine direction tests across the roll width per side of the geocomposite.

The CONTRACTOR shall inspect every roll for bonding integrity between the HDPE drainage net and the geotextile. All poorly bonded and/or delaminated material shall be rejected.

2.6 SHOP DRAWINGS SUBMITALS

2.6.1 Material Properties

In order to qualify as an approved drainage material, the Contractor shall submit material samples, minimum specifications and warranty to the Engineer. The specification sheet shall give full details of minimum physical properties and test methods used, joining methods, and a certificate confirming compliance of the material with the minimum specifications. A list of similar projects completed in which the manufactured material has been successfully used shall be submitted to the Engineer.

2.6.2 Physical Requirements

The Contractor shall submit a certification from the manufacturer of the geonet, stating that the geonet meets physical property requirements for the intended application, and that the geonet meets the physical requirements for the manufacture and installation of HDPE landfill drainage media.

2.6.3 Minimum Specifications

At the time of delivery, the manufacturer shall certify in writing that the material supplied meets the minimum specifications. The certificate shall be signed by a person with authority to bind the manufacturer and shall be notarized.

2.6.4 Resin

The manufacturer shall submit results of confirmation testing showing that the material lot of the resin used in the geonet supplied meets the material requirements for the resin. A description of the quality control steps used during manufacture shall also be provided.

2.7 INSTRUCTIONS AND DRAWINGS REQUIRED AFTER CONTRACT AWARD

2.7.1 Storage, Handling, Installation, and Joining

The Contractor shall furnish complete written instructions for the storage, handling, installation, and joining of the net in compliance with this specification and the condition of his warranty.

2.7.2 Repair

The manufacturer shall furnish complete written instructions for the repair of HDPE geonet material.

2.7.3 Layouts

The manufacturer or his designated representative shall furnish layouts and details as required for the net installation. Details of placement around net penetrations such as pipes shall be provided as well. The above details must be approved by the CQA Engineer prior to net installation. Material left outside shall be covered to reduce accumulation of dust in the net and to protect it from ultraviolet light.

3.0 INSTALLATION

3.1 DURING CONSTRUCTION CONFORMANCE TESTING

At the direction of the CQA Representative, the Geosynthetic INSTALLER shall take samples from the delivered lot and sent to the CQA Geosynthetic Laboratory for conformance testing. The cost for laboratory conformance testing shall be paid by the OWNER. The conformance tests and minimum frequency outlined in *Table 31 05 19.16 - 5* are required prior to installation. Results must meet property requirements in *Tables 31 05.19.16 - 2 and 31 05.19.16 - 4*.

Table 31 05 19.16 - 5 Conformance Testing Requirements

Properties	Test Method	Testing Frequency (minimum)
Thickness, mils (min. ave.)	D 5199	1 per 100,000 ft ²
Transmissivity ⁶ , m ² /sec (min.-ave.)	D 4716 (GRI-GC8)	
Ply Adhesion ⁷ , lb./in. (min. ave.)	D 7005	

All conformance test results shall be reviewed and approved by the ENGINEER prior to any placement. If a conformance test result fails the specifications, at least two additional conformance tests shall be performed on samples taken immediately from adjacent numbered rolls. If both additional conformance test results pass the specifications, the entire lot shall be accepted except that roll from which the failed sample is taken. If any of the conformance test results fails for the two (minimum) additional samples, the entire lot shall be rejected by the ENGINEER.

3.2 STORAGE

3.2.1 Storage Area

Storage of the rolls shall be the responsibility of the installer. A dedicated storage area shall be selected at the job site that is away from high traffic areas and is level, dry, and well drained. The Owner shall approve the storage area.

3.2.2 Stability

Rolls shall be stored in a manner that prevents sliding or rolling from the stacks and may be accomplished by the use of chock blocks or by use of the dunnage shipped between rolls. Rolls shall

⁶ Drainage geocomposite should be tested using flexible boundaries at a hydraulic gradient of 0.33; a pressure of 1,000 lb./ft², a seating dwell time of 15 min, and 100-hr testing duration. Test values are for machine direction only. Testing will include drainage geocomposite and representative soil (such as Ottawa sand) within the testing plates.

⁷ This is the average of five equally spaced machine direction tests across the roll width per side of the geocomposite.

be stacked at a height no higher than that at which the lifting apparatus can be safely handled (typically no higher than four).

3.2.3 Protection

Stored materials must be off of the ground and be covered with a plastic sheet or tarpaulin until their installation.

3.2.4 Labels

The integrity and legibility of the labels shall be preserved during storage.

3.3 FIELD QUALITY CONTROL

3.3.1 Field Joining

The CONTRACTOR shall inspect all roll end joints and roll edges. The results of these inspections shall be documented in the daily reports. Field joints shall comply with the requirements of Table 31 05 19.26 - 5.

Table 31 05 19.26 - 5 Drainage Geocomposite Joining Methods

Location	Layer	Joining Method	Minimum Overlap	Tying Frequency
Roll End	Upper Geotextile	Machine Sewing	4"	N/A
	Geonet	Nylon Ties	12"	2' on Center
	Lower Geotextile	Overlap	6"	N/A
Roll Side	Upper Geotextile	Machine Sewing	4"	N/A
	Geonet	Nylon Ties	4"	5' on Center
	Lower Geotextile	Overlap	6"	N/A
Repair of Minor Damage ⁸	Upper Geotextile	Machine Sewing	4"	N/A
	Geonet	N/A	N/A	N/A

3.3.2 Quality Control Reporting Procedures

All information regarding the installation of the drainage geocomposite shall be recorded in the CONTRACTOR's daily report. This information shall include:

- Reference to product submittals, certifications, substitutions and approvals;
- Dates of installation;
- Location and quantity of materials installed;
- Statement whether materials were installed in accordance with the Technical Specifications;
- All product certifications, filed appropriately for future reference; and

⁸ Minor damage is defined in paragraph 123.6.2

- Additional information as required.

3.4 CLEANLINESS

Both drainage geocomposite and the underlying Geomembrane shall be clean, dry, and free of dirt and dust during installation. If dirt, dust, or water is present, the CONTRACTOR shall clean the work area. Drainage geocomposite which is wet, dirty or muddy shall be discarded and shall not be installed.

3.5 ROLL JOINING METHODS

Table 31 05 19.26 - 5 summarizes acceptable roll joining methods.

3.5.1 Lap Seams

The bottom layer of geotextile shall be lap seamed. Lap seaming is accomplished by overlapping adjacent geotextile a minimum of 6 inches.

3.5.2 Nylon Ties

The GDN material shall be overlapped and fastened with nylon ties. Nylon ties shall be yellow or white in color to facilitate inspection.

3.5.3 Machine Sewn Seams

Sewing shall be accomplished with a chain-stitching sewing machine. The thread shall be polymeric thread which complies with geotextile manufacturer's recommendations and is a color which contrasts with the color of the geotextile. The seam shall be placed a minimum of 4 inches from the geotextile edges. The finished seam shall be folded to one side ("J" seam) and be secured with a double row of stitches. There shall be no horizontal seams except at roll ends on slopes greater than 5 (horizontal) to 1 (vertical).

3.5.4 Roll Ends

At roll ends the material shall be overlapped a minimum of 1 foot. Roll ends shall be shingled; the uphill roll end shall be overlapped one foot over the downhill roll end. At roll ends, the drainage net shall be tied every 2 feet (on centers) at a minimum. The bottom layer of geotextile shall be overlapped a minimum of six (6) inches. The upper layer of geotextile shall be machine sewn.

3.5.5 Adjacent Roll Sides

At roll sides the material shall be overlapped a minimum of 4 inches. The bottom geotextile shall be lap seamed. The HDPE drainage net shall be overlapped and tied a minimum of 5 feet on center. The upper layer of geotextile shall be machine sewn.

3.6 INSTALLATION

The Drainage geocomposite shall be installed in accordance with the manufacturer's recommendations and as specified herein. In case of a conflict between requirements, the more stringent shall apply.

3.6.1 Methods

The installation of the HDPE geonet shall be done with labor and equipment provided by an approved Contractor. The manufacturer shall provide the proper cutting equipment for the installation. Only installation methods approved by the manufacturer and the Engineer in accordance with this specification shall be used.

3.6.2 Instructions

The drainage geocomposite shall be installed in accordance with manufacturer's instructions.

3.6.3 Cleanliness

Drainage geocomposite shall be free of dirt and dust when installed. If dirt or dust is present, the Contractor shall wash the geonet until clean as directed by the QAO.

3.6.4 Grading

Drainage geocomposite shall be unrolled and installed to the lines and grades shown on the Drawings.

3.6.5 Anchoring

Drainage geocomposite shall be anchored at the top of slopes in an anchor trench as shown on the drawings. Care shall be taken not to entrap small stones, from the anchor trench excavation, in the net channels.

3.6.6 Wrinkles

After being secured in the anchor trench, the drainage geocomposite shall be stretched to minimize wrinkle formation.

3.6.7 Orientation

Drainage geocomposite shall be rolled down the slope in such a manner as to continually keep the material in tension. If necessary, the material shall be positioned by hand after unrolling to minimize wrinkles. The material shall not be unrolled horizontally (i.e., across the slope).

3.6.8 Wind

The CONTRACTOR shall provide sufficient ballast and temporary anchorage to protect the material from wind damage or displacement. The CONTRACTOR is responsible for protecting the material from damage due to weather at all times.

3.6.9 Physical Damage

3.6.9.1 Personnel Traffic

Personnel walking on the material shall not engage in activities or wear footwear that could damage the material. Smoking shall not be permitted on or near the geosynthetics.

3.6.9.2 Vehicular Traffic

Vehicular traffic shall not be permitted on the geosynthetics. Equipment shall not damage the material by handling, trafficking, or leakage of hydrocarbons. The surface shall not be used as a work area for preparing patches, storing tools and supplies, or other uses.

3.6.10 Bridging

The material shall be installed to avoid bridging.

3.6.11 Corners

In corners, where overlaps between rolls are staggered, an extra roll shall be installed from the top to the bottom of the slope to provide a smooth, protected surface.

3.6.12 Weather Protection

Drainage geocomposite shall be protected from direct sunlight or precipitation prior to installation. After installation this material shall have minimal exposure to direct sunlight and shall be completely protected from direct sunlight within 30 days of installation. Material which is exposed to direct sunlight for 30 days or more shall be replaced at the CONTRACTOR's expense.

It is the CONTRACTOR's responsibility to provide all labor and materials for protection of the drainage geocomposite during the period of time prior to installation of overlying materials. The CONTRACTOR's protection method is subject to the approval of the ENGINEER.

3.7 REPAIRS

3.7.1 Limitations

Damaged, soiled, or delaminated drainage geocomposite shall be removed and discarded.

3.7.2 Minor Damage

Minor damage is defined as a defect or hole in the material that is smaller than 2 inches in its lesser dimension. Minor damage may be repaired by snipping out any protruding drainage net and machine sewing a geotextile patch over the hole. The patch shall be a minimum of 24 inches larger than the damaged area in all directions.

3.7.3 Major Damage

Major damage is defined as a defect or hole in the material that is 2 inches or larger in its lesser dimension. Major damage shall be repaired by replacing the entire drainage geocomposite panel width. Geotextile fabric shall be continuously sewn on large repairs.

3.8 FIELD DAMAGE

3.8.1 Protection

The Contractor shall take every precaution to protect the net from damage due to natural and field conditions. As the panels are placed, they shall be secured to limit excessive movement.

3.8.2 Wind Damage

Panels moved by the wind shall be inspected and, if damaged, shall be replaced or repaired as required in the judgment of the QAO. Similarly, panels that have developed excessive wrinkles, particularly at the toe of slopes shall be inspected and repaired or replaced as necessary.

3.9 PLACEMENT OF COVER MATERIAL

3.9.1 Protection

Cover material such as soil, stone, or geomembrane liners that is placed over geonets shall be placed in such a manner as to verify that the geonet is not damaged.

3.9.2 Slippage

Care shall be taken to minimize slippage of the geonet and to verify that no tensile stress is induced in the geonet.

3.10 RECORDS AND QUALITY ASSURANCE

3.10.1 Records

The installation of the geocomposite shall be monitored by QAO provided by the Owner. The purpose of the third-party monitoring shall be to document the installation of the geonet. The following records shall be kept by the installer as part of the installation process:

- Panel Placement Checklist
- Repair and Patching Checklist

3.10.2 Documentation of Defects

The geocomposite may not be covered until defects, patched, etc. have been properly logged.

3.10.3 Report Submission

The reports shall be turned over to the QAO for review on a daily basis. Reports shall be complete within 24 hours of the installation of the panel, joint, repair, etc.

3.10.4 Warranty

The manufacturer/installer shall provide a written warranty for materials for a period of no less than 10 years. A written warranty for 1 year shall also be provided for quality of workmanship.

END OF SECTION 31 05 19.26

Appendix J

PRE-BID MEETING MINUTES

SWP #498 Cover System
City of Bristol, VA

ITB# SW-24-001

Tuesday September 5, 2023
10:00 a.m.

PROJECT: SWP#498 Final Cover System Construction

OWNER: City of Bristol
2655 Valley Drive
Bristol, VA 24201
Mike Martin
423-571-7332, (office)

ENGINEER: SCS Engineers
Midlothian, VA 23113
804-378-7440 (office)
Charles Warren
Thomas Williams (twilliams@scsengineers.com)

LANDFILL OPERATIONS: Joey Lamie, Landfill Operations
276-469-9478

I. INTRODUCTION

- A. **Sign-In Sheet** (emails will be used for Addendum distribution)
- B. Key Personnel Onsite
- C. Brief Review of Project Scope of Work and Objectives

II. Bidding Requirements

- A. Due Date and Location were reviewed. See Contract documents. Bid due location is different than pre-bid meeting location.
- B. Required Bidder Information, qualifications required
- C. Bid Form, note the alternative bid item.
- D. Electronic Data – Available upon request and signing of electronic release form
- E. Bid Opening/Award



- F. Questions During Bid (See deadline in contract documents)

III. Contract Administration

- A. Schedule of Work. Substantial and Final Completion in March 2024.
- B. Bond Requirements
- C. Liquidated Damages
- D. Weather Delays. Addendum 1 will address weather delays.
- E. CQC/CQA Services. Contractor will be responsible for CQC.
- F. Surveying Responsibilities. See surveying specification

IV. Summary of Work

- A. General description of the project. Project includes earthwork, stormwater management, landfill gas installation, geosynthetics installation, etc.
- B. Attachments
- C. Sequence
- D. Final Stabilization
- E. Land Disturbance Permit

V. Issues Regarding Working at the Site

- A. Coordination with Landfill Operations
- B. Site Access; Working Hours (M-F 7am—4pm, coordinate with the City if extended hours are desired)
- C. Available Utilities are limited, coordinate with the City
- D. Location of Contractor's Facilities and Material Storage
- E. Health & Safety
- F. Waste Transport (No active landfill available on-site)
- G. Daily Cover Requirements (No exposed waste at day's end)
- H. Restoration
- I. Leachate (See bid item and drawing detail for leachate seep management)
- J. Soil Availability (No on-site borrow area available, some fill material will need to be imported to the site)

VI. Questions and Clarifications

- A. Questions Received to Date (no questions were received prior to pre-bid meeting)
- B. Additional Questions
- C. Answers to questions will be released in Addendum 1.

Appendix K

PRE-BID MEETING SIGN-IN SHEET

SWP # 498 Cover System
City of Bristol, VA

ITB# SW-24-001

Tuesday September 5, 2023
10:00 a.m.

Contractor Name, Name of employees on-site, and Emails

Contractor Name: MORGAN CORP. - BOB MINA

Employees on Site: 1

Emails: BMINA@MORGAN-CORP.COM

Contractor Name: TEK Construction Mike Giddens

Employees on Site: 1

Emails: mike@tekconstruction.com

Contractor Name: Thalle Construction

Employees on Site: 1

Emails: rrepp@thalle.com

Contractor Name: SCS Field Services Ted Blawins Thalle Construction, SCSENG, NEALS, CO

Employees on Site:

Emails: