

**ADDENDUM NO. 1**

**WALKER MOUNTAIN ROAD SITE 2 MSWLF - PHASE 8 CELL CONSTRUCTION**

**CITY OF ROME, GA**

*Bids to be received until 10:00 a.m., local time, October 22, 2019*

**ADDITIONAL INFORMATION DOCUMENTS**

The following documents:

- Pre-Proposal Meeting Minutes
- Questions and Responses No. 1

are being provided with this addendum for informational purposes only. The documents listed above are not, and will not, be considered as part of the Contract Documents.

**REQUEST FOR PROPOSAL**

Page 14, Section 4.02, delete paragraph in its entirety and replace with the following:

“The Proposer shall complete the affidavit (See Appendix A – Proposal Affidavit) and enclose under Tab I. Additionally, a Proposal Bond (See– Proposal Bond) shall be included under Tab I, duly executed by the Proposer as principal and having as surety thereon a surety company licensed to do business in the State of Georgia and listed in the current U.S. Treasury Circular 570, in the amount of ten percent of the Proposal amount. Additionally, the Proposer shall complete the following forms and enclose under Tab I as found in Appendix C and provided after Appendix D: Security and Immigration Compliance Affidavit of Prime Bidder, Security and Immigration Compliance Affidavit of Subcontractor, Partnership Certificate, Corporate Certificate, Non-Collusion Affidavit of Prime Bidder, Non-Collusion Affidavit of Subcontractor, Bidders Declaration, Certificate of Non-Discrimination, Drug-Free Workplace Certificate, State of Georgia Prompt Pay Affidavit, List of Local Contractors/Local Material Suppliers, Notice of Commencement SAVE Compliance Affidavit, and Request for Taxpayer Identification Number and Certification. The Proposer should include a copy of their current Utility Contractor’s license as issued by the State Licensing Board.”

Page Appendix D-1, Item 3 b., change “992 LF” to “1,619 LF”

Page Appendix D-1, Item 3 d., change “1,866 LF” to “2,148 SY”

Page Appendix D-1, Item 3 e., change “1,983 LF” to “1,738 SY”

Page Appendix D-1, Item 3 f, change “4,908 SY” to “7,120 SY”

Page Appendix D-1, Item 5 f, change “605,282 SF” to “580,500 SF”

Page Appendix D-2, Item 6 a, change “605,282 SF” to “610,240 SF”

Page Appendix D-2, Item 6 c, change “Temporary Anchor Trench” to “Temporary Liner Anchor Trench”

Page Appendix D-2, Item 6 f, delete item entirely.

Page Appendix D-2, Item 7 b, change “106 LF” to “136 LF”

Page Appendix D-3, delete the following statement: “In addition, a lump sum price for each of the following items is to be included should the City of Rome decide to add or to delete them from the Base Bid.” and replace with “In addition, pricing for each of the following items is to be included should the City of Rome decide to include them in the Base Bid.”

Page Appendix D-3, Item 14, change “ALTERNATE LINER BASE” to “OPTIONAL RECOMPACTED LINER BASE”

Page Appendix D-3, Item 15 a, change “605,282 SF” to “580,500 SF”

## **SPECIFICATIONS**

Page 01025-4, paragraph 1.04 Part N, delete in its entirety and replace with the following:

“N. Sediment Pond 4 Cleaning: All costs for sediment pond cleaning, including the necessary earthwork and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Sediment Pond 4 Cleaning.”

Page 01025-10, Section 1.07 Part E., delete in its entirety and replace with the following:

“E. Tie to Existing Liner: All costs for Tie to Existing Liner, including location, excavation, removal of waste, disposal of waste, removal of plywood or rub sheet, cleaning, welding liner, and removal of the temporary flap shall be included in the lump sum price bid for Tie to Existing Liner.”

Page 01025-10, Section 1.07 Part F., delete in its entirety and replace with the following:

“F. Temporary Leachate Berm: All costs for constructing the Temporary Leachate Berm, including earthwork, grading, installation, HDPE flap, Rock Toe Drain, HDPE rub sheet, backfill and maintenance, shall be included in the unit price bid for Temporary Leachate Berm.”

Page 01025-14, Section 1.11 Part A. 1., delete in its entirety and replace with the following:

- “1. All costs for constructing the Asphalt Pavement as shown on the drawings and as specified from the top of the compacted subgrade to the top of the asphalt concrete surface shall be included in the unit price bid for Asphalt Concrete Pavement. Limits eligible for payment shall be based on widths and lengths as shown on the Drawings. Measurement shall be made based on record drawing dimensions.”

Page 02200-4, Section 2.01 Part 5 e, delete in its entirety and replace with the following:

- “e. When compacted in accordance with the requirements of this Section, the compacted liner base shall be no more permeable than  $1 \times 10^{-7}$  cm/sec or  $1 \times 10^{-5}$  cm/sec, as applicable, when tested in accordance with the ASTM D 5084 using criterion supplied by the Engineer.”

Page 02200-4, Section 2.01 Part 6 d, delete in its entirety and replace with the following:

- “d. The leachate collection blanket shall have a minimum permeability of  $1 \times 10^{-3}$  cm/sec when used with the specified double sided geocomposite or  $1 \times 10^{-1}$  cm/sec when used with the specified geotextile when tested in accordance with ASTM D 2434.”

Page 02200-4, Table 1, add “or  $1 \times 10^{-5}$  cm/sec” to the Compacted Liner Base (Borrow Source) and Compacted Liner Base (Undisturbed Sample) rows.

Page 02200-4, Table 1, change Leachate Collection Blanket Permeability from “ $1 \times 10^{-2}$  cm/sec” to “ $1 \times 10^{-3}$  cm/sec”

Page 02775-2, Section 2.01, delete in its entirety and replace with the following:

“The stormwater diversion cover shall be a minimum of 20 mils thick, woven coated polyethylene as manufactured by Colorado Lining (WCPE), Owens Corning (RhinoSkin) or approved equal.”

Page 02775-2, Section 3.01 Part B, delete in its entirety and replace with the following:

- “B. The cover shall be weighted with tied together sandbags weighing approximately 30 pounds or other approved materials as recommended by the manufacturer. The materials used to weight the cover shall be anchored at the top of the slope to prevent slippage of the cover downslope. The Contractor shall provide necessary sand bags. If sandbags are used, sandbags shall be constructed of materials having ultraviolet resistance equal to or exceeding that of the cover, but not less than one year. Alternate ballast, if selected by Owner, shall be installed in accordance with the manufacturers recommendations.”

Pages 02775-2, 3, and 4, change header to “02775...Temporary Stormwater Cover”

Page 02775-3, Section 3.04 Part A 5, delete in its entirety.

Page 02776-15, Table 2, change Asperity Height of Textured HDPE Geomembrane from 10 to 16.

Add Section 02778 – Geotextiles

## **DRAWINGS**

Sheet C-101, Benchmark RBC #78 and NS #91 added to plan view.

Sheet C-101, Notes, Add Note 3 and 4,

- “3. CONTRACTOR MAY USE SOUTHWEST AREA OF EXISTING BORROW AREA FOR STAGING AND STOCK PILING EXCESS EARTHWORK, TOPSOIL, AND IMPORTED MATERIALS.
- “4. BENCHMARK HORIZONTAL DATUM IS NAD83/94 WITH VERTICAL DATUM BASED ON NGVD29.”

Sheet C-201, Call-Out, Change “STAGE SEPARATION BERM CONNECTION (SEE DETAIL SHEET C-701)” to “TEMPORARY STORMWATER DIVERSION BERM (SEE DETAIL SHEET C-703).

Sheet C-201, Call-Out, Change length of 24” CPP Temporary Downdrain to 347 Linear Feet.

Sheet C-201, Call-Out, Add “CONNECT TO EXISTING ASPHALT PAVEMENT (MATCH ELEVATION AT TIE-IN)”

Sheet C-201, Call-Out, Delete “6’x6’x4’ BOTTOMLESS PRECAST CONCRETE VAULT BOX WITH FOOTERS...” and replace with “6’ DIA. HDPE VAULT...”

Sheet C-201, Notes, delete Note 4, add replace with the following:

- “4. CONTRACTOR SHALL LOCATE AND SURVEY PHASE 6 & 7 EXISTING EDGE OF LINER. LINER ELEVATIONS SHALL BE SUBMITTED TO ENGINEER PRIOR TO BEGINNING SUBGRADE PREPARATION.

Sheet C-501, Added 627 LF Silt Fence

Sheet C-502 and C-503, Delete Rip-Rap shown crossing cell access road.

Sheet C-603, Replace Detention Pond Outfall Retrofit Detail

Sheet C-605, Sample Analysis Section, first paragraph: replace “17.1 ACRES” with “19.5 ACRES”

Sheet C-701, Perimeter Berm Anchor Trench Detail: Added ballast to lower end of the temporary stormwater diversion cover.

Sheet C-701, Revised Liner Base Detail, Liner and Leachate Collection System Detail, Optional Compacted Liner Base Detail and Optional Leachate Collection System Detail. Specified  $5 \times 10^{-9}$  cm/s GCL.

Sheet C-701, Connection to Existing Liner Detail: revised liner base intersection to show keyed connection.

Sheet C-701, Deleted Stage Separation Berm Detail.

Sheet C-702, Added note to Leachate Collection Line Detail.

Sheet C-702, Added dimensions to Valve Vault Plan view.

Sheet C-703, Removed steps and Note 2 from HDPE Gravity Sewer Manhole Detail.

Sheet C-703, Revised Weir Drop Inlet Detail to allow precast concrete structure and added weir elevation.

*Bidder Must Acknowledge Receipt of this Addendum on Proposal Affidavit Form*

October 4, 2019

Atlantic Coast Consulting, Inc.  
7 East Congress St, Suite 801  
Savannah, Georgia 31401  
912-236-3471



## MEETING MINUTES

**DATE:** October 4, 2019

**TO:** All Attendees (see attached sign-in sheet)

**FROM:** Marc Liverman (ACC)

**SUBJECT:** Walker Mountain Road Site 2 - Phase 8 Cell Construction  
Pre-Proposal Meeting – October 1, 2019

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Meeting started at 11:00 am at the landfill's scale house. The purpose of this meeting was to conduct a pre-proposal meeting with prospective bidders and the Owner. The attached agenda was prepared for the meeting. The following items were discussed:

- 1) City of Rome (CoR) purchasing department representative began the meeting by reviewing the upcoming proposal deadlines.
- 2) ACC continued with introductions and additional information required in the Request for Proposals (RFP). See attached Agenda. ACC also pointed out CoR's forms included after Appendix F.
- 3) ACC reviewed the overall scope of the project. The following items were discussed:
  - a. The project consists of constructing a municipal solid waste landfill cell with a lined area of approximately 14 acres.
  - b. A new perimeter asphalt road is included along with storm drainage components and connection to the existing leachate gravity line.
- 4) ACC noted that the plans are currently under review by the City for a Land Disturbance Permit (LDP). We expect the LDP to be issued prior to issuance of Notice to Proceed.
- 5) ACC explained that the bids will also include some potential add alternates that may be selected by the Owner depending on overall project costs. These include:
  - a. Alternate Liner Base that includes a GCL and  $1 \times 10^{-5}$  clay. ACC noted that this option is not currently part of the facilities D&O plan. If the City selects this option, ACC will submit a minor modification to EPD prior to beginning of construction.
  - b. Alternate Leachate Collection Blanket. This option is currently included in the facilities permit.
  - c. Temporary Stormwater Cover Ballast.
- 6) The following questions from bidders and responses by ACC and CoR are as follows:
  - a. Q: Is there any clay or sand on site that can be used for cell construction?  
R: No. These materials will have to be imported.
  - b. Q: What will be read aloud at the bid opening?  
R: Names of bidders and total bid amount. These will be posted to the City's website by the following day.

- c. Q: The geotextile section is missing from the RFP.  
R: It is included in Addendum No. 1.
  - d. Q: The bid tab does not include a line item for the leachate connection manhole.  
R: It is to be included in Item 7 g.
  - e. Q: What is to be included in Item 1.  
R: All costs not included in Items 2 through 17.
  - f. Q: Is the Valve Vault concrete of HDPE.  
R: It is HDPE.
  - g. Q: Can we use electrofusion couplings?  
R: No.
  - h. Q: Connecting to the existing leachate gravity line will be difficult. Are there options for making this connection.  
R: Strategy for connecting to the existing line may have to be adjusted depending on leachate discharge rate during construction.
- 7) Subsequent to the meeting, All Parties (AP's) conducted a site visit of the project area.
- 8) Site visit adjourned at 12:25 pm.



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## PRE-PROPOSAL CONFERENCE October 1, 2019

### AGENDA

#### WALKER MOUNTAIN MSWLF – PHASE 8 CELL CONSTRUCTION CITY OF ROME

- I. INTRODUCTIONS
- II. PROPOSAL DOCUMENTS
  - A. PROPOSAL DUE DATE – 10:00 am on October 22, 2019
  - B. SUBMITTAL DOCUMENTS – Defined in the RFP with City of Rome required forms provided between Appendix F and C-520.
  - C. ADDENDA – All questions shall be sent to the City of Rome via email in accordance with the RFP.
  - D. SELECTION PROCESS - Rankings are shown in the Section 3.03 of the RFP
  - E. SCHEDULE - projected timetable is shown in Section 3.02 of the RFP. Contract time is 210 calendar days from NTP.
  - F. LIQUIDATED DAMAGES – Defined in Section 01011.
  - G. CAD FILES – Release form required.
- III. NOTICE TO PROCEED - Target Date November 20, 2019 (dependent on contract execution)
- IV. TESTING
  - A. MATERIALS - Asphalt and concrete by 3<sup>rd</sup> party lab under Cash Allowance. Cell testing and inspection via CQA contractor.
  - B. WORKMANSHIP
  - C. NPDES MONITORING AND REPORTING
- V. SURVEYS – Defined in Section 01055. Pre-topo (after clearing & grubbing and topsoil stockpile), Subgrade, Unsuitables, Top of Clay, Rock (if applicable), Top of Leachate



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Collection Layer. Cash allowance is not for required surveys.

- VI. OWNER'S OPERATIONS - Coordinate with active areas and normal operations.
- VII. QUESTIONS FROM ATTENDEES
- VIII. SITE VISIT
- IX. ADJOURN

Bid Pkg 036-19  
Walker Mtn. Rd. Site 2 MSW  
Landfill - Phase 8 Construction

PRE-BID REGISTER  
BID PKG #036-19

PRE -BID OPENING  
October 1, 2019  
11:00 AM

NAME/TITLE	FIRM	ADDRESS:	PHONE:
Bjom Sundquist	BLE	6004 Pandora Ct, Gunnville 29615	702-296-7976
TITLE: Senior Engineer			E-MAIL: <a href="mailto:bjom-sundquist@blecorp.com">bjom-sundquist@blecorp.com</a>
Robbie Blanton	Oasis Consulting Services	45 Woodsford St Roswell GA 30075	678 488 6268
TITLE: sr. v.p.			E-MAIL: <a href="mailto:rblanton@oasis-cg.com">rblanton@oasis-cg.com</a>
Allan Brantley	Brantley Engineering LLC	13933 Tree Loop Rd. n. 1st. GA 30004	778-427-7533
TITLE: President			E-MAIL: <a href="mailto:abrantley@brantleyeng.com">abrantley@brantleyeng.com</a>
Joseph G Keone Jr	J.G. Keone Enterprise Inc	3540 Ball Ground Hwy Canton GA 30114	404-664-218
TITLE:			E-MAIL: <a href="mailto:john@jgkeone.com">john@jgkeone.com</a>
Lee Barnett	Cooper Barnett Payne	1928 Executive Park Statham GA. 30666	770-560-8037
TITLE:			E-MAIL: <a href="mailto:Lee.Barnett@CBPINC-ga.com">Lee.Barnett@CBPINC-ga.com</a>
Bruce Page	Cooper Barnett Payne	1928 Executive Park	770-725-4100
TITLE:			E-MAIL: <a href="mailto:Bruce.Page@CBPINC-ga.com">Bruce.Page@CBPINC-ga.com</a>
Ride Norville	Wright Brothers	1500 Handersdale Memorial Hwy. Charleston, TN 37310	423-584-9361
TITLE:			E-MAIL: <a href="mailto:rnorville@wbrcc.com">rnorville@wbrcc.com</a>
TITLE:			PHONE:
TITLE:			E-MAIL:

PLEASE PRINT ALL INFORMATION

Bid Pkg 036-19  
Walker Mtn. Rd. Site 2 MSW  
Landfill - Phase 8 Construction

PRE-BID REGISTER  
BID PKG #036-19

PRE -BID OPENING  
October 1, 2019  
11:00 AM

NAME/TITLE	FIRM	ADDRESS:	PHONE:	E-MAIL:
CHARLES LAWLER	PERD BROS INC	PO BOX 398 BUYER GA 31006	478-868-5938	charles@perdbros.com
Jim Sams	Stark Inc.	125 LAZER LIND CT FAREBURN GA 30213	770 876 1549	jim@starkinc.com
TITLE:		ADDRESS:	PHONE:	E-MAIL:
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PLEASE PRINT ALL INFORMATION

PRE - BID OPENING  
 October 1, 2019  
 11:00 AM

PRE-BID REGISTER  
 BID PKG #036-19

Bid Pkg 036-19  
 Walker Mtn. Rd. Site 2 MSW  
 Landfill - Phase 8 Construction

NAME/TITLE	FIRM	ADDRESS:	PHONE:	E-MAIL:
ARZON CORROLL TITLE:	CITY OF ROME		706-378-3846	
HUNTER ALSEA TITLE:	CITY OF ROME		700-378-3845	
LEE STONE TITLE:	City of Rome			
MIKE GIDDENS TITLE:	TEK Construction	835 County Rd 1242 VINEMONT AL.	256-734-6611	mike@tandkconstruction.com
Robert Dukes Srv. Inspector TITLE:	Shanrock Buv. Corp	6106 Corporate Park Drive Browns Summit NC	336-375-1989	bdukes@shanrockbuvid.com
Gandy L. Self TITLE:	City of Rome			
TITLE:				
TITLE:				

PLEASE PRINT ALL INFORMATION

## QUESTIONS AND RESPONSES NO. 1

Walker Mountain Road Site 2 MSWLF  
Phase 8 Cell Construction

### CITY OF ROME, GA

1. Q: Is the requirement for Atterberg testing correct in Table 1 from TS-02200 relative to the Compacted Clay liner? Atterberg is required on the compacted clay liner borrow source at 1/5,000 CYDS, it is then required on the field testing at 1/40,000 SF/Lift, and is then required on the Undisturbed sample at 1/40,000 SF/Lift.

R: *Yes. The frequencies stated for borrow source and placement are correct.*

2. Q: Additionally, the frequency table states in several places that testing is 1/10,000 SF/Lift or 1/lift/800 LF. Is the **or** correct, or should this be **and**?

R: *The different frequencies are related to different activities. Therefore, the **or** designation is correct.*

3. Q: Spec section 2510, 1.05 (Inspections and Testing) D1 requires the GAB to be density tested by means of ASTM D2167. Is use of the nuclear density gauge backscatter acceptable if the 8-inchs of GAB is placed in two 4-inch lifts and tested accordingly on each lift?

R: *Yes. That will be acceptable.*

4. Q: It appears the spec section 2778 is missing from the technical specifications. Can those be provided and I assume I can find answers to questions once they are uploaded to the website in the same location as the initial RFP?

R: *Specification Section 02778 is included with Addendum No.1.*

## **NOTICE**

**"All addenda items for Specifications and Drawings issued prior to the date of Bid opening have been incorporated into these Contract Documents."**

A **"(1)"** directly left of Specification Section number on the title page of a section indicates that section has been replaced or added by addendum.

A **"1"** in the text of a Specification Section indicates that an addendum item has been incorporated.

**Atlantic Coast Consulting, Inc.  
7 East Congress Street, Suite 801  
Savannah, Georgia 31401  
(912) 236-3471**

# REQUEST FOR PROPOSALS

Walker Mountain Road  
Site 2 MSWL  
Phase 8 Cell Construction  
Bid No: 036-19



City of Rome, Georgia



September 2019



# Request for Proposals

## Walker Mountain Road Site 2 MSWL

### Phase 8 Cell Construction

## Table of Contents

	<u>Page</u>
Section 1 - Introduction/Overview	3
1.01 Advertisement for Bids	3
1.02 Instructions to Bidders	4
1.03 Purpose/Objective/Background	7
1.04 Request for Proposal and Appendices	7
Section 2 - Proposal Instructions and Requirements	8
2.01 Submission of Proposals	8
2.02 Compliance with the RFP	8
2.03 Inquiries, Addenda, and Interpretations	8
2.04 Required Performance Outcomes/Functional Specifications	8
2.05 Ambiguity, Conflict or Other Errors in the RFP	9
2.06 Proposals and Presentation Costs	9
2.07 Rejection of Proposals	9
2.08 Acceptance of Proposals	9
2.09 Examination of RFP and Site	9
2.10 Validity of Proposals	10
2.11 Acknowledgment of Insurance Requirements	10
2.12 Proposer Responsibilities	10
2.13 Pre-Proposal Conference	10
2.14 Owner's Right to Research Proposer's Experience	10
2.15 Terms and Conditions of Construction Contract	11
Section 3 - Proposal Evaluation and Contractor Selection	11
3.01 Method of Contractor Selection	11
3.02 Projected Timetable	12
3.03 Proposal Evaluation Panel and Evaluation Factors	12
Section 4 - Proposal Format and Contents	13
4.01 General	14
4.02 Tab I - Proposal Affidavit	14
4.03 Tab II - Cost to the Owner	14
4.04 Tab III - Proposer's Team Experience and Organization	14
4.05 Tab IV - Similar Work Performed	14
4.06 Tab V - Schedule	15
4.07 Tab VI - Acceptance of Conditions	15
4.08 Tab VII - Appendices	15

### Appendices

- Appendix A - Proposal Affidavit
- Appendix B - Proposal Bond
- Appendix C - Certificates and Affidavits
- Appendix D - Proposal Cost/Bid Form

Appendix E – Project Reference Form  
Appendix F – Specifications and Drawings

**Walker Mountain Road Site 2 MSWL  
Phase 8 Cell Construction  
Bid No: 036-19**

**Section 1 Introduction/Overview**

**1.01 Advertisement for Bids**

Sealed Bids for construction of **“WALKER MOUNTAIN ROAD SITE 2 MSW LANDFILL – PHASE 8 CONSTRUCTION, Bid No. 036-19”**, will be received in the Purchasing Department in City Hall, located at 601 Broad Street, Rome, Georgia, 30161 until 10:00 am, October 22, 2019. Bids will be publicly opened and read aloud. No bid may be withdrawn after the closing time for the receipt of bids for a period of 30 days.

Work To Be Done: The work to be done consists of furnishing all labor, tools, equipment and materials necessary to construct the **WALKER MOUNTAIN ROAD SITE 2 MSW LANDFILL – PHASE 8 CONSTRUCTION, Bid No. 036-19”** project as per the drawings and specifications herein. The project shall consist of providing all labor, materials, tools, equipment, services, and incidentals and performing all Work required to construct complete in place and ready to operate a municipal solid waste landfill cell consisting of approximately 112,500 CY of excavation, 59,200 CY of structural fill; 605,282 SF of low permeability linear base, HDPE geomembrane and leachate collection layer material; 1,462 LF of leachate collection pipe; sediment pond cleaning; 4,901 square yards of all-weather access road, and erosion and sedimentation control items.

Contract time shall be **210** consecutive calendar days for completion of the work, to be computed from the date of the Notice to Proceed.

Plans, Specifications and Contract Documents: Specifications, and Contract Documents are on file in the office of the Rome Engineering Services Department, P.O. Box 1433, 200 Vaughn Rd., and the City of Rome Purchasing Department, 601 Broad Street, Rome, Georgia 30161-1433. Copies may be obtained online at the City of Rome, Georgia website [www.romefloyd.com/rfps](http://www.romefloyd.com/rfps). Interested parties may download all drawings, specifications and contract documents necessary from the website free of charge. The drawings are compiled at 24” X 36” sheet size and may be downloaded and printed provided the interested firm has large sheet print capability. Copies can otherwise be obtained in person at the Engineering Services Department or via phone 706-378-3846. Documents and Drawings are \$200.00 per set (non-refundable). Checks should be made payable to the “City of Rome, Georgia”. Interested parties must provide the company name, contact person, address, phone number and e-mail address when purchasing plans. It shall be the full and complete responsibility of interested parties choosing to download the documents from the City of Rome website to check said website on a frequent basis to insure discovery of any addenda that may be issued. Any bid that does not include all addenda issued may be considered incomplete and may be rejected.

**Bonds:** All Bids must be accompanied by the Bidder's Declaration, Non-Collusion Affidavit, Certificate of Non-Discrimination, Bid Bond, SAVE, etc. and all other contract documents included within the Contract Documents required for bidding the project. The bid bond accompanying the bid must be in an amount of not less than 10% of the total amount of the bid. The successful bidder, if awarded the project, will be required to furnish a Performance Bond and Materials Payment Bond, each in the amount of 100% of the contract amount for any contract exceeding \$100,000.00 dollars. The successful bidder, if awarded the contract shall be required to provide a Certificate of Insurance in the amount of (two) \$2,000,000.00 million dollars Workers Compensation as required by the State of Georgia with the City of Rome listed as the additionally insured before a "Notice to Proceed" will be issued for any contract exceeding \$100,000.00 dollars.

The City of Rome Georgia reserves the right to reject any or all bids, to waive informalities, and to re-advertise if necessary.

By: City of Rome, Georgia  
Johnna M. Allen  
Director of Purchasing

## 1.02 Instructions to Bidders

1. **Intent:** It is intended that the Instructions to Proposers, General Conditions, Detailed Specifications and the Contract Drawings shall define and describe the complete work to which they relate.
2. **Definitions:** Where the following words or the pronouns used in their stead occur herein, they shall have the following meaning:

"Owner" shall mean the City of Rome, Georgia, or its authorized and legal representative.

"Director" shall mean Public Works Director for the City of Rome, Georgia, or his authorized and legal representatives.

"Engineer" shall mean the Director of Engineering Services Department of Rome, Georgia, or his authorized and legal representative.

"Contractor" shall mean the party of the second part to the Contract Agreement or the authorized and legal representative of such party.

"Contract Time" shall mean **210** consecutive calendar days for completion of the work, to be computed from the date of the Final Notice to Proceed.

"Liquidated Damages" shall mean the sum defined in Section C-520 Part 4.04 of these documents which the Bidder agrees to pay for each consecutive calendar day beyond the Contract Time required to complete the work.

"Products" shall mean materials or equipment permanently incorporated into the work.

"Provide" shall mean to furnish and install.

"Anticipated Start Date" shall mean the date on which the contractor anticipates that he will be able to be mobilized and begin construction on this project.

3. Work to Be Done: The work to be done consists of furnishing all products and performing all labor necessary to construct "**WALKER MOUNTAIN ROAD SITE 2 MSW LANDFILL – PHASE 8 CONSTRUCTION, Bid No. 036-19**", including, but not limited to, clearing, grading, drainage improvements, landfill cell construction, leachate conveyance, paving, and erosion control.
4. Addenda and Interpretations: No interpretation of the meaning of the drawings, specifications or other pre-bid documents will be made to any bidder orally. All questions should be submitted simultaneously to [jallen@romea.us](mailto:jallen@romea.us), [acarroll@romea.us](mailto:acarroll@romea.us), [cjenkins@romea.us](mailto:cjenkins@romea.us), via Email. All questions and answers will be posted on the website – [www.romefloyd.com/rfps](http://www.romefloyd.com/rfps). In order for a request for an interpretation to be given consideration, it must be received prior to the end of the inquiry period as identified in the table in paragraph 3.02 of the Request for Proposals

Any and all such interpretations and any supplemental instructions will be in the form of written Addenda to the Specifications which shall be posted on the City of Rome Web Site not later than three days prior to the date affixed for the opening of the bids. Failure of a bidder to retrieve any Addendum shall not relieve him of any obligation under his bid. It shall be the full and complete responsibility of interested parties to check the website on a frequent basis to insure discovery of any addenda that may be issued. Any bid received that does not include all addenda issued may be considered incomplete and may be rejected.

5. Substitutions: Whenever the design is based on a specific product of a particular manufacturer, that manufacturer will be shown on the Drawings and/or provided in the list of approved manufacturers in the specifications. Any item other than those so designated shall be considered a substitution.

Approval of substitutions will be made under the following provisions:

- (a) If the manufacturer is named in the Drawings and/or Detailed Specifications as an approved manufacturer, products of the manufacturer meeting all specification requirements are acceptable.
- (b) If the term "EQUAL TO" precedes the names of approved manufacturers in the Specifications, the Contractor may, after receiving the Notice to Proceed, submit shop drawings on the substitute product for the approval of the Engineer.

Any bidder intending to furnish substitute products is cautioned to verify that the item being furnished will perform the same functions and have the same capabilities as the item specified. The Bidder should include in his bid the cost

of accessory items which may be required by the substitute product and the cost of any architectural, structural, mechanical, piping, electrical, or other modifications required to accommodate the substitution.

Approval of the Engineer is dependent on his determination that the product offered is essentially equal in function, performance, quality of manufacture, ease of maintenance, reliability, and service life to the product on which the design is based, and will require no other major modifications to the project design.

6. Site Examination: The Bidder is required to visit the site as required in Section 2 – Proposal Instructions and Requirements.
7. Bids: All Bids must be made on the Bid forms contained herein. The Bids shall be enclosed in a sealed envelope, addressed to the City of Rome, P.O. Box 1433, Rome, Georgia, 30162-1433, and labeled “**WALKER MOUNTAIN ROAD SITE 2 MSW LANDFILL – PHASE 8 CONSTRUCTION, Bid No. 036-19**”. The Bid package shall bear the name of Contractor thereon.
8. Bid and Contract Security: Each Bid must be accompanied by the Bid Bond provided in the Contract Documents, complete and executed, for an amount equal to at least ten percent (10%) of the amount bid. The Bid Bond may be removed from the bid book to facilitate its execution, but must be reattached for submittal of the "Bid". Security may be provided in the form of a certified check, cashier's check, or cash deposit check. No other check type will be acceptable.

No Bid shall be read aloud or considered complete unless the Bid Bond accompanies the Bid (O.C.G.A. 36-91-41(d)). If for any reason whatsoever the Bidder withdraws from the competition after opening the bids, or if he refuses to execute the Contract, the Owner will proceed on the Bid Bond.

The Surety of the Bid Bond, Performance Bond, and Payment Bond shall be a surety company authorized to do business in the State of Georgia, shall be listed in the Department of the Treasury Circular 570, and shall have an underwriting limitation in excess of 100% of the bid amount. The Bonds and Surety shall be subject to approval by the Attorney for the Owner. Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

9. Right to Reject Bids: The Owner reserves the right to reject any or all bids and to waive informalities. No bids will be received after the time set for opening Bids. Any unauthorized conditions, limitations or provisions attached to the Bid, except as provided herein, will render it informal and may cause its rejection. Unbalanced bids will be subject to rejection. Any bidder may withdraw his bid, either personally, by facsimile, or written request, at any time prior to the scheduled closing time for receipt of bids. Facsimile or written request for withdrawal must be in the possession of the Owner prior to the closing time for receipt of bids.

10. Bid Opening: Bids will be opened in public and read aloud. All bidders are welcome to be present at the opening.

11. Determination of Successful Bidder: Bids will be evaluated not only on Bid amount, but will be also be given consideration related to life expectancy of the Bid option compared with Bid amount to provide the overall best value for the project. The Contract will be awarded to the overall best responsive, responsible bidder, if awarded.

(a) Responsibility: The determination of the bidder's responsibility will be made by the Owner based on whether the bidder:

- (1) maintains a permanent place of business,
- (2) has the appropriate technical experience,
- (3) has adequate plant and equipment to do the work properly and expeditiously, and
- (4) has suitable financial means to meet obligations incidental to the work.

The bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, the bidder fails to satisfy the Owner that he is properly qualified to carry out the obligations of the Contract.

(b) Responsiveness: The determination of responsiveness will be made by the Owner based on a consideration of whether the bidder has submitted a complete Bid form without irregularities, excisions, special conditions, or alternative bids for any item unless specifically requested in the Bid form.

### 1.03 Purpose / Objective/ Background

The City of Rome, Georgia (Owner) is soliciting proposals from Proposers to provide the Work associated with the construction of the Walker Mountain Road Site 2 MSWL, Phase 8 Cell Construction as designed by Atlantic Coast Consulting, Inc. (Engineer).

The Project consists of construction of approximately 112,781 CY of excavation, 59,324 CY of structural fill; 605,282 SF of low permeability linear base, HDPE geomembrane and leachate collection layer material; 1,462 LF of leachate collection pipe; sediment pond cleaning; 4,901 square yards of all-weather asphalt access road, and erosion and sedimentation control items.

### 1.04 Request For Proposal and Appendices

Each prospective Proposer will be furnished:

- Request For Proposal (RFP)
- Appendix A – Proposal Affidavit
- Appendix B – Proposal Bond
- Appendix C – Certificates and Affidavits
- Appendix D – Proposal Cost/Bid Form
- Appendix E – Project Reference Form
- Appendix F – Specifications and Drawings

## **Section 2 Proposal Instructions and Requirements**

### **2.01 Submission of Proposals**

All proposals will be received until 10:00 am, local time, on October 22, 2019, by the Owner at the City of Rome Purchasing Department, Attention: Johnna M. Allen, Director of Purchasing, 601 Broad Street, Rome, Georgia 30161.

The Owner will not accept any proposals received after 10:00 am and shall return such late proposals to the Proposer unopened. Proposers shall submit one original and four copies of the proposal.

Proposals shall be enclosed in a sealed envelope or box. If the Proposal is sent through the mail or other delivery system, the sealed envelope or box shall be enclosed with the notation "PROPOSAL ENCLOSED" on the face of it. The outside of the box containing the PROPOSAL must be plainly marked with the following information:

- Proposal for Walker Mountain Road Site 2 MSWL  
Phase 8 Cell Construction Bid No: 036-19
- Proposer's correct name and address
- Proposer's Georgia Utility Contractor's License Number

Proposals will be opened publicly in a manner to avoid public disclosure of contents. Only the names of Proposers will be read aloud.

### **2.02 Compliance with the RFP**

Proposals must be in strict compliance with this RFP. Failure to comply with all provisions of the RFP may result in rejection of Proposal.

### **2.03 Inquiries, Addenda, and Interpretations**

- A. No interpretation of the meaning of the Request for Proposal, Drawings, Specifications or other pre-proposal documents will be made to any Proposer orally.
- B. Failure of Proposers to receive or acknowledge any Addendum shall not relieve them of any obligation under the Proposal. All Addenda shall become part of the Contract Documents.

### **2.04 Required Performance Outcomes/Functional Specifications**

The Proposer, as a minimum, must achieve and maintain the performance outcomes shown in the referenced Drawings and Specifications, consistent with performance standards agreed to by the Owner through a contract resulting from this RFP.

#### **2.05 Ambiguity, Conflict or Other Errors in the RFP**

If a Proposer discovers any ambiguity, conflict, discrepancy, omission, or other error in the RFP or any document attached to, incorporated into or referenced by the RFP, they shall immediately notify the Engineer of such error in writing and request modification or clarification of the document as outlined in Paragraph 2.03 above. The Owner will make modifications by issuing a written addendum and will give written notice to all parties who have received this RFP from the Owner.

#### **2.06 Proposals and Presentation Costs**

The Owner will not be liable in any way for any costs incurred by any Proposer in the preparation of its proposal in response to this RFP, nor for the presentation of its proposal and/or participation in any discussions or negotiations.

#### **2.07 Rejection of Proposals**

The Owner reserves the right to accept or reject any or all proposals submitted. Reasons for which Proposers may be disqualified and their Proposals not considered include, but are not limited to:

- The Owner determines that the Proposer's proposal is not responsive to the RFP.
- The Owner determines that the Proposer is not responsible. This may be due to the failure of the Proposer to promptly supply information in connection with an evaluation of responsibility.
- The Proposer fails to complete the Proposal in its entirety.
- Reasonable grounds exist for believing that any Proposer has a proprietary or pecuniary interest in more than one Proposal, or that collusion exists among the Proposers.
- Failure of the Proposer to satisfy any requirements of the RFP.

#### **2.08 Acceptance of Proposals**

The Owner may accept proposals that are submitted properly and are not rejected for any reason. However, the Owner reserves the right to request clarifications or corrections to proposals.

#### **2.09 Examination of RFP and Site**

It is the responsibility of each Proposer before submitting a Proposal:

- To examine thoroughly the RFP and other related data identified in the Proposal Documents.
- To visit the site and to become familiar with and satisfy Proposer as to the general, local and site conditions that may affect cost, progress, performance or furnishing of labor for the Work.

#### **2.10 Validity of Proposals**

All proposals shall be valid for a period of 30 days from date due.

#### **2.11 Acknowledgment of Insurance Requirements**

By submitting its proposal to the Owner the Proposer acknowledges that it has read and understands the insurance requirements for the Proposal. The insurance requirements are detailed in Sections 00700 and 00800 as included in Appendix F.

#### **2.12 Proposer Responsibilities**

The Proposer will be required to follow contract requirements in accordance with all conditions of the Construction Contract, provide a responsible on-site superintendent, assign qualified persons to the work, provide the equipment required to do the assigned task or accomplish the work, maintain records of expenditures, deliverables and progress, submit required reports on schedule, and maintain a clear line of communication for prompt resolution of problems.

#### **2.13 Pre-Proposal Conference**

A mandatory Pre-Proposal Conference will be held for all Proposers at 11:00 am, local time, on October 1, 2019 at the Landfill Scale House, 433 Walker Mountain Road, Rome, Georgia 30161. All proposers must attend all of the Pre-Proposal Conference. Any proposer that does not attend the Pre-Proposal Conference will be disqualified from proposing and their submittal will not be accepted.

#### **2.14 Owner's Right to Research Proposer's Experience**

The Owner prior to or after receipt of the Proposer's proposal, shall have the right to research work performed by the Proposer. This research effort will be conducted by Owner personnel, and their representatives as deemed appropriate by the Owner, which may include site visits and interviews with anyone involved with such projects.

The Owner reserves the right to contact any and all references (including those project references not furnished by the Proposer in their proposal) to obtain, without limitation for the purpose of evaluating the Proposers qualifications, the following minimum information regardless of Proposer's performance on the listed jobs:

1. Was Proposer cooperative during the submittal process (e.g., schedule, shop drawings, etc.)?
2. Was the Owner satisfied with daily operations on the project?
3. Did Proposer effectively address problems that arose during the project?
4. Did Proposer minimize the effect of its activities on nearby operations and activities?
5. Did the Owner consider the number and validity of Proposer - generated change orders and Requests for Information, if any, appropriate?
6. Did Proposer manage its subcontractors well?
7. Would the Owner rate the Proposer's safety record on the project as being adequate?
8. Did Proposer timely address warranty and punch list items?
9. Were Proposer's project foreman and other key personnel competent and professional?
10. Was the Owner satisfied with the finished product?
11. Would the Owner look forward to hiring Proposer for another construction project?
12. Did the subcontractors selected by the Proposer perform well on the project?

#### **2.15 Terms and Conditions of Construction Contract**

A contract resulting from this RFP shall be subject to the conditions set forth in the Contract Documents, including Sections 00520, 00700 and 00800 of Appendix F.

### **Section 3 Proposal Evaluation and Contractor Selection**

#### **3.01 Method of Contractor Selection**

The Owner is using the Competitive Sealed Proposals method of Contractor selection, as authorized by State Law. Proposals will be evaluated using the criteria stated in the RFP. Once the evaluation is complete, all responsive Proposers will be ranked from most advantageous to least advantageous to the Owner, considering the evaluation factors stated in the RFP. Short-listing, interviews and site visits may be a part of this evaluation and ranking process. The Owner will then execute a contract with the highest ranked Proposer. If a satisfactory contract cannot be agreed upon, negotiations may be conducted, in the sole discretion of the Owner, with the second, and then the third, and so on, ranked Proposers. If the Owner is unsuccessful in its first round of

negotiations, it may reopen negotiations with any Proposer with whom it previously negotiated. The scope of the work may be changed during this negotiation process at the discretion of the Owner in an effort to reduce the cost and/or to benefit the project in any manner.

An award, if made, will be made to the responsible and responsive Proposer whose proposal is most advantageous to the Owner, taking into consideration the evaluation factors set forth in this RFP. The proposals are to be based upon this RFP and the referenced documents that are attached and hereby made a part of this solicitation. The attached documents include specifications and drawings; when these documents are reviewed with other referenced documents and information, the Proposer acknowledges he has been provided sufficient detail to understand and respond to the design intent and Scope of Work to be provided by the Proposer to satisfactorily complete the Walker Mountain Road Site 2 MSWL Phase 8 Cell Construction.

### 3.02 Projected Timetable

The following projected timetable should be used as a working guide for planning purposes. The Owner reserves the right to adjust this timetable as required during the course of the RFP process.

Event	Date
Issuance of RFP Documents	9/20/2019
Pre-Proposal Conference (11:00 A.M., Local Time)	10/01/2019
Inquiry Period Ends	10/11/2019
Proposal Due (10:00 A.M., Local Time)	10/22/2019
Completion of Evaluation & Ranking of Proposals	11/08/2019
Notice to Proceed Target Date	11/20/2019
Project Substantial Completion Date	06/07/2020
Project Final Completion Date	06/17/2020

### 3.03 Proposal Evaluation Panel and Evaluation Factors

A panel appointed by the Owner will evaluate proposals and negotiate a contract. Other agencies and consultants of the Owner may, at the sole discretion of the Owner, evaluate the proposals and/or Proposers. The factors to be considered by the panel in the evaluation of proposals and the negotiation of a contract are listed below.

The Owner will consider responses to the following items in its evaluation of proposals and Proposers. While the Owner considers all these items important, they are ranked as follows.

Evaluation Factors	Percentage
Cost to the Owner	20%
Proposer's Team Experience and Capacity	30%
Client References for Similar Work Performed	30%
Schedule	10%
Acceptance of Conditions	10%

## **Section 4 Proposal Format and Contents**

### **4.01 General**

The information listed below shall be submitted with each proposal and should be submitted in the order shown. Each section should be clearly labeled, with pages numbered and separated by tabs. Failure by a Proposer to include all listed items may result in the rejection of the proposal.

An outline of the required submittal is provided for clarification as follows:

#### **Tab I**

- Proposal Affidavit
- Proposal Bond
- Partnership Certificate or Corporate Certificate
- Non-Collusion Affidavit of Prime Bidder
- Non-Collusion Affidavit of Subcontractor
- Security and Immigration Affidavit - Contractor
- Security and Immigration Affidavit - Subcontractor
- Utility Contractor License

#### **Tab II**

- Proposal Cost Form

#### **Tab III**

- Qualifications including ability, capacity, skills and number of years experience
- Experience with proposed key subconsultants (if any)
- Licensing Information
- Current Project Matrix – projects currently under construction including value and expected completion dates for each
- Upcoming Project Matrix – projects upcoming including value and expected completion dates for each
- Resumes

#### **Tab IV**

- Project Reference Forms

#### **Tab V**

- Detailed Schedule

#### **Tab VI**

- Exceptions
- Certification Statement Letter

#### **Tab VII**

- Additional Information

#### **4.02 Tab I - Proposal Affidavit & Certificates**

The Proposer shall complete the affidavit (See Appendix A – Proposal Affidavit) and enclose under Tab I. Additionally, a Proposal Bond (See– Proposal Bond) shall be included under Tab I, duly executed by the Proposer as principal and having as surety thereon a surety company licensed to do business in the State of Georgia and listed in the current U.S. Treasury Circular 570, in the amount of ten percent of the Proposal amount. Additionally, the Proposer shall complete the following forms and enclose under Tab I as found in Appendix C: Security and Immigration Compliance Affidavit of Prime Bidder, Security and Immigration Compliance Affidavit of Subcontractor, Partnership Certificate, Corporate Certificate, Non-Collusion Affidavit of Prime Bidder, and Non-Collusion Affidavit of Subcontractor. The Proposer should include a copy of their current Utility Contractor’s license as issued by the State Licensing Board.

#### **4.03 Tab II - Cost to the Owner**

Complete the PROPOSAL COST FORM (Appendix D) in its entirety. Pricing submitted indicates that the Proposer has a full understanding of the scope of work based upon a review of all information furnished with this RFP, including the Drawings and Specifications. The price entered reflects the scope of work depicted by the Drawings and Specifications and supplemental information furnished with the RFP. The items of work will be reviewed during the negotiation session solely to confirm that the Proposer’s understanding is in agreement with the design intent.

#### **4.04 Tab III - Proposer’s Team Experience and Organization**

Provide information that documents the firm's and selected subcontractors' qualifications to produce the required outcomes, including its ability, capacity, skill, and number of years of experience in providing the required services.

Describe the various team members' successful experience working with one another on previous projects. Include evidence of business licensing and similar information and documentation. A matrix listing of all projects presently under construction and those projects that are booked and or pending Notice to Proceed shall be prepared identifying project construction value, and remaining project duration.

Include resumes of all key individuals who will be committed to the project providing the required work.

#### **4.05 Tab IV - Similar Work Performed**

It is the goal of the Owner that all Proposers have had experience completing at least three municipal solid waste landfills in Georgia since January 1, 2014. Each should consist of at least 200,000 square feet of composite liner system consisting of a low permeability subbase underlying a high density polyethylene geomembrane liner. Information for each project shall be provided on the Project Reference Form (Appendix E) provided with this proposal or a

reasonable facsimile. The Proposer shall make additional copies of the form as required. Only one project shall be listed on each form. All information requested in the form shall be provided in the order requested.

**4.06 Tab V - Schedule**

Provide a detailed schedule for completion of the project in sufficient detail to reflect work in the various project areas. The schedule should reflect:

- Completion of all project work no later than 210 consecutive days after the Notice to Proceed has been issued.

**4.07 Tab VI - Acceptance of Conditions**

Indicate any requested exceptions to the requirements listed in the RFP, General Conditions and form of Agreement in the attached Specifications (reference Appendix F) and any other requirements or documents of the RFP and the Project. The Proposer should provide a written certification statement on their company letterhead that the total proposed cost represents the total costs required to provide a complete and functional Project.

**4.08 Tab VII - Appendices**

The content of this tab is left to the Proposer's discretion. However, the Proposer should limit materials included here to those that will be helpful to the Owner in understanding the Proposal. Proposer may present potential value added project enhancements in this tab. If included, each potential enhancement should be clearly described including scope and costs.

## APPENDIX A

### Proposal Affidavit

TO: City of Rome, Georgia

FROM: \_\_\_\_\_  
(Proposer's Name)

FOR: WALKER MOUNTAIN ROAD SITE 2 MSWL PHASE 8 CELL CONSTRUCTION

Submitted: \_\_\_\_\_

The undersigned Proposer, in compliance with your Request for Proposal for the construction of this Project, having examined the Request for Proposal Documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to construct the Project in accordance with the said Documents.

The Proposer proposes and agrees, if this Proposal is accepted, to contract with City of Rome in the form of Contract Agreement specified, to furnish all necessary products, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the Work in full and complete accordance with the reasonably intended requirements of the Contract Documents to the full and entire satisfaction of the Walker Mountain Road Site 2 MSWL Phase 8 Cell Construction with a definite understanding that no money will be allowed for extra work except as set forth in the Contract Documents.

The Proposer agrees hereby to commence Work under this Contract, with adequate personnel and equipment, on a date to be specified in a written order of the Engineer, and to fully complete all Work under this Contract within 210 consecutive calendar days from and including said date. Proposer further agrees to pay as liquidated damages in accordance with Section 01011 of these specifications for each calendar day thereafter required to complete all work as provided in the Contract Documents.

The Proposer declares an understanding that the quantities shown for unit price items are subject to either increase or decrease, and that should the quantities of any of the items of Work be increased, the Proposer proposes to do the additional Work at the unit prices stated herein; and should the quantities be decreased, the Proposer also understands that payment will be made on the basis of actual quantities at the unit price proposed and will make no claim for additional costs or anticipated profits for any decrease in quantities; and that actual quantities will be determined upon completion of Work, at which time adjustment will be made to the Contract amount by direct increase or decrease.

In case of discrepancies between the figures shown in the unit prices and the totals, the unit prices shall apply and the totals shall be corrected to agree with the unit prices. In case of discrepancies between written amounts and figures, written amounts shall take precedence over figures and the sum of all Proposal extensions (of unit prices) plus lump sum items shall take precedence over PROPOSAL TOTAL.

The Proposer furthermore agrees that, in the case of a failure to execute the Contract Agreement and Bonds within ten days after receipt of conformed Contract Documents for execution, the attached Proposal Bond accompanying this Proposal and the monies payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure.

Attached hereto is a Proposal Bond for the sum of ten percent of amount bid.

Proposer acknowledges receipt of the Following Addenda:

Addendum No. 1, dated: \_\_\_\_\_ Addendum No. 5, dated: \_\_\_\_\_

Addendum No. 2, dated: \_\_\_\_\_ Addendum No. 6, dated: \_\_\_\_\_

Addendum No. 3, dated: \_\_\_\_\_ Addendum No. 7, dated: \_\_\_\_\_

Addendum No. 4, dated: \_\_\_\_\_ Addendum No. 8, dated: \_\_\_\_\_

PROPOSER: \_\_\_\_\_

By: \_\_\_\_\_

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

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Attest: \_\_\_\_\_

*(Signature)*

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

Note: Attest for a corporation must be by the corporate secretary; for a partnership by another partner; for an individual by a notary.

Note: If the Proposer is a corporation, the Proposal shall be signed by an officer of the corporation; if a partnership, it shall be signed by a partner. If signed by others, authority for signature shall be attached.

**APPENDIX B**  
**Proposal Bond**

<p><b>Bidder</b> Name: Address <i>(principal place of business)</i>:</p>	<p><b>Surety</b> Name: Address <i>(principal place of business)</i>:</p>
<p><b>Owner</b> Name: <b>City of Rome, Georgia</b> Address <i>(principal place of business)</i>: <b>601 Broad Street</b> <b>Rome, Georgia 30162-1433</b></p>	<p><b>Bid</b> Project <i>(name and location)</i>: <b>Walker Mountain Road Site 2</b> <b>MSWL Phase 8 Cell Construction</b> <b>Bid No: 036-19</b> <b>433 Walker Mountain Rd SW, Rome, GA 30161</b> Bid Due Date: <b>October 22, 2019</b></p>
<p><b>Bond</b> Penal Sum: Date of Bond:</p>	
<p>Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.</p>	
Bidder	Surety
<i>(Full formal name of Bidder)</i>	<i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature) (Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<p><i>Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.</i></p>	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
  - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
  - 3.2. All Bids are rejected by Owner, or
  - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

**APPENDIX C**  
**Certificates and Affidavits**

**C-1 Partnership Certificate**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 2019, before me personally appeared \_\_\_\_\_ known to me to be the person who executed the above instrument, who, being by me first duly sworn, did depose and say that he or she is a general partner in the firm of \_\_\_\_\_ and that said firm consists of himself or herself and \_\_\_\_\_ and that he or she executed the foregoing instrument on behalf of said firm for the uses and purposes stated therein, and that no one except the above named members of the firm have any financial interest whatsoever in said proposed Contract.

\_\_\_\_\_  
Partner Partner

\_\_\_\_\_  
Partner Partner

Subscribed and sworn to before me, this \_\_\_\_\_ day of \_\_\_\_\_, 2019.

\_\_\_\_\_  
Notary Public

My Commission Expires:

\_\_\_\_\_  
(Date)

(SEAL)

NOTE: If only one partner signs, a Power of Attorney executed by all other partners authorizing him or her to act in the name of the company must be attached; otherwise, all partners must sign.

## C-2 Corporate Certificate

I, \_\_\_\_\_ certify that I am the Secretary of the corporation named as Contractor in the foregoing proposal; that \_\_\_\_\_ who signed said proposal on behalf of the Contractor was then \_\_\_\_\_ of said corporation; that said proposal was duly signed for and in behalf of said corporation by authority of its Board of Directors, and is within the scope of its corporate powers; that said corporation is organized under the laws of the State of \_\_\_\_\_.

This \_\_\_\_\_ day of \_\_\_\_\_, 2019

\_\_\_\_\_

Corporate  
Secretary:

\_\_\_\_\_  
(name signed)

\_\_\_\_\_  
(name printed or typed)

(SEAL)

**C-3 Non-Collusion Affidavit of Prime Bidder**

STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_

I, \_\_\_\_\_, being first duly sworn, deposes and says that:

He or she is \_\_\_\_\_

*(Owner, Partner, Officer, Representative or Agent)*

of \_\_\_\_\_, the Bidder that has submitted the attached Bid;

He or she is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

Such Bid is genuine and is not a collusive or sham Bid;

Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this Affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Rome or any person interested in the proposed Contract; and

The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this Affiant.

BIDDER: \_\_\_\_\_

By: \_\_\_\_\_

*(name signed)*

\_\_\_\_\_  
*(name printed or typed)*

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

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

Subscribed and sworn to me this \_\_\_ day of \_\_\_\_\_, 2019.

NOTARY PUBLIC: \_\_\_\_\_

*(name signed)*

\_\_\_\_\_  
*(name printed or typed)*

Commission Expires: \_\_\_\_\_

(SEAL)

**C-4 Non-Collusion Affidavit of Subcontractor**

State of \_\_\_\_\_

County of \_\_\_\_\_

\_\_\_\_\_ being first duly sworn, deposes and says that:

(1) He or she is \_\_\_\_\_  
*(Owner, Partner, Officer, Representative, or Agent)*

of \_\_\_\_\_, hereinafter referred to as the "Subcontractor";

(2) He or she is fully informed respecting the preparation and contents of the Subcontractor's Proposal submitted by the Subcontractor to \_\_\_\_\_.

the Contractor for certain work in connection with the \_\_\_\_\_ Contract pertaining to the Project in \_\_\_\_\_

(3) Such Subcontractor's Proposal is genuine and is not a collusive or sham Proposal;

(4) Neither the Subcontractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Proposal in connection with such Contract or to refrain from submitting a Proposal in connection with such Contract, or has in any manner, directly or indirectly, sought by unlawful agreement or connivance with any other Bidder, firm or person to fix the price or prices in said Subcontractor's Proposal, or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the City of Rome or any person interested in the proposed Contract; and

(5) The price or prices quoted in the Subcontractor's Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

By: \_\_\_\_\_  
*(name signed)*

\_\_\_\_\_  
*(name printed or typed)*

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

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

Subscribed and sworn to me this \_\_\_ day of \_\_\_\_\_, 2019.

NOTARY PUBLIC: \_\_\_\_\_  
*(name signed)*

\_\_\_\_\_  
*(name printed or typed)*

Commission Expires: \_\_\_\_\_

## C-5 Contractor E-Verify Affidavit

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is proposing to engage in the physical performance of services on behalf of the City of Rome has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicability provisions and deadlines established in O.C.G.A 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Contractor

Walker Mountain Road Site 2 MSWL- Phase 8 Cell Construction  
Name of Project

City of Rome-, Georgia  
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on \_\_\_\_\_, \_\_\_\_\_, 2019 in \_\_\_\_\_, \_\_\_\_\_  
(City) (State)

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
(Title of Authorized Officer or Agent of Contractor)

\_\_\_\_\_  
(Printed Name of Authorized Officer or Agent)

Subscribed and sworn to me this \_\_\_\_ day of \_\_\_\_\_, 2019.

NOTARY PUBLIC:

\_\_\_\_\_  
(name signed)

\_\_\_\_\_  
(name printed or typed)

Commission Expires: \_\_\_\_\_

## C-6 Subcontractor E-Verify Affidavit

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A 13-10-91, stating affirmatively that the individual, firm, or corporation which is engaged in the physical performance of service under a proposed contract with \_\_\_\_\_ on behalf of the City of Rome has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicability provisions and deadlines established in O.C.G.A 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

\_\_\_\_\_  
Federal Work Authorization User Identification Number

\_\_\_\_\_  
Date of Authorization

\_\_\_\_\_  
Name of Subcontractor

Walker Mountain Road Site 2 MSWL- Phase 8 Cell Construction  
Name of Project

City of Rome, Georgia  
Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on \_\_\_\_\_, \_\_\_\_\_, 2019 in \_\_\_\_\_, \_\_\_\_\_  
(City) (State)

\_\_\_\_\_  
Signature of Authorized Officer or Agent

\_\_\_\_\_  
(Title of Authorized Officer or Agent of Contractor)

\_\_\_\_\_  
(Printed Name of Authorized Officer or Agent)

Subscribed and sworn to me this \_\_\_\_ day of \_\_\_\_\_, 2019.

NOTARY PUBLIC: \_\_\_\_\_  
*(name signed)*

\_\_\_\_\_  
*(name printed or typed)*

Commission Expires: \_\_\_\_\_

## APPENDIX D Proposal Cost Form

ITEM 1 – For furnishing all materials and performing all labor necessary to complete “**WALKER MOUNTAIN ROAD SITE 2 MSW LANDFILL – PHASE 8 CONSTRUCTION, Bid No. 036-19**”, including all work shown and/or specified and **NOT** included in Items 2 through 13 below, the amount of:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

### ITEM 2 – MOBILIZATION

a. Lump Sum Mobilization \$ \_\_\_\_\_

### ITEM 3 – EROSION AND SEDIMENTATION CONTROL<sup>1</sup>

a. 1 EA Construction Exit \$ \_\_\_\_\_/EA \$ \_\_\_\_\_

b. 1,619 LF Silt Fence – Type NS \$ \_\_\_\_\_/LF \$ \_\_\_\_\_

c. 11 EA Stone Check Dams \$ \_\_\_\_\_/EA \$ \_\_\_\_\_

d. 2,148 SY Rip Rap Lined Ditch \$ \_\_\_\_\_/SY \$ \_\_\_\_\_

e. 1,738 SY Grass Ditch with Turf Reinforcement Matting \$ \_\_\_\_\_/SY \$ \_\_\_\_\_

f. 7,120 SY Slope Stabilization Matting \$ \_\_\_\_\_/SY \$ \_\_\_\_\_

g. 3 EA Storm Drain Inlet Protection \$ \_\_\_\_\_/EA \$ \_\_\_\_\_

h. 1 EA Outfall Retrofit with Skimmer \$ \_\_\_\_\_/EA \$ \_\_\_\_\_

i. 119 SY Storm Drain Outlet Protection \$ \_\_\_\_\_/SY \$ \_\_\_\_\_

j. 824 LF Temporary Stormwater Diversion Berm \$ \_\_\_\_\_/LF \$ \_\_\_\_\_

k. 347 LF CPP Temporary Downdrain \$ \_\_\_\_\_/LF \$ \_\_\_\_\_

l. 5 AC Permanent Grassing \$ \_\_\_\_\_/AC \$ \_\_\_\_\_

m. 3,600 CY Sediment Pond 4 Cleaning \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

n. Lump Sum NPDES Monitoring and Reporting \$ \_\_\_\_\_

### ITEM 4 – SITE PREPARATION

a. Lump Sum Clearing and Grubbing \$ \_\_\_\_\_

b. Lump Sum Stripping and Stockpiling Topsoil \$ \_\_\_\_\_

### ITEM 5 – EARTHWORK & ROADWAY<sup>1</sup>

a. Lump Sum Topsoil Placement \$ \_\_\_\_\_

b. 112,500 CY Excavation – On-Site Materials \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

c. 59,200 CY Structural Fill – On-Site Materials \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

d. 605,282 SF Liner Base - 18-Inch Select Backfill \$ \_\_\_\_\_/SF \$ \_\_\_\_\_

e. 605,282 SF Liner Base - 6-Inch Subbase \$ \_\_\_\_\_/SF \$ \_\_\_\_\_

f. 580,500 SF 24-Inch Leachate Collection Blanket \$ \_\_\_\_\_/SF \$ \_\_\_\_\_

(1 x10<sup>-3</sup> cm/sec) with Double Sided  
Geocomposite

g.	Lump Sum	Liner Base Test Strip	\$ _____	
h.	1,015 SY	8-Inch Gravel Pavement	\$ _____/SY	\$ _____
i.	4,901 SY	Asphalt Pavement	\$ _____/SY	\$ _____

ITEM 6 – LEACHATE CONTAINMENT SYSTEM

a.	610,240 SF	60 Mil HDPE Textured Geomembrane	\$ _____/SF	\$ _____
b.	1,644 LF	Perimeter Berm & Permanent Anchor Trench	\$ _____/LF	\$ _____
c.	809 LF	Temporary Liner Anchor Trench	\$ _____/LF	\$ _____
d.	1,010 LF	Tie to Existing Liner	\$ _____/LF	\$ _____
e.	109 LF	Temporary Leachate Berm	\$ _____/LF	\$ _____

ITEM 7 – LEACHATE COLLECTION SYSTEM

a.	1,462 LF	Perforated 6-Inch Leachate Collection Line	\$ _____/LF	\$ _____
b.	136 LF	Solid 6-Inch Leachate Collection Line	\$ _____/LF	\$ _____
c.	1 EA	Leachate Sump with Liner Penetration	\$ _____/EA	\$ _____
d.	1 EA	6-Inch Leachate Cleanout	\$ _____/EA	\$ _____
e.	1,568 LF	Cleanup and Testing	\$ _____/LF	\$ _____
f.	1 EA	HDPE Valve Vault Assembly	\$ _____/EA	\$ _____
g.	1 EA	Tie to Existing Leachate Gravity Sewer	\$ _____/EA	\$ _____
h.	2 EA	Leachate Collection Line Connections	\$ _____/EA	\$ _____

ITEM 8 – STORM DRAINAGE SYSTEM

a.	87 LF	36-Inch Dia. RCP Storm Drain	\$ _____/LF	\$ _____
b.	45 LF	18-Inch Dia. RCP Storm Drain	\$ _____/LF	\$ _____
c.	1 EA	36-Inch Dia. Concrete Headwall	\$ _____/EA	\$ _____
d.	2 EA	18-Inch Dia. Concrete Headwall	\$ _____/EA	\$ _____
e.	1 EA	Concrete Weir Drop Inlet	\$ _____/EA	\$ _____
f.	24,550 SY	Temporary Stormwater Cover	\$ _____/SY	\$ _____
g.	Lump Sum	Temporary Stormwater Cover Ballast		\$ _____

ITEM 9 – MARKERS

a.	6 EA	Temporary Liner Edge Marker	\$ _____/EA	\$ _____
b.	5 EA	Permanent Liner Edge Marker	\$ _____/EA	\$ _____
c.	4 EA	Concrete Bollard	\$ _____/EA	\$ _____

ITEM 10 – CASH ALLOWANCES

- a. CONSTRUCTION VERIFICATION SURVEYING \$ 10,000
- b. MATERIALS TESTING \$ 15,000

\* \* \* ADDITIONAL WORK IF ORDERED BY THE ENGINEER \* \* \*

ITEM 11 - REMOVAL OF UNSUITABLE MATERIAL & REPLACEMENT WITH

- a. 20,000 CY Suitable Earth Material \$ \_\_\_\_\_/CY \$ \_\_\_\_\_
- b. 2,500 CY Crushed Stone \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

ITEM 12 - TRENCH FOUNDATION AND STABILIZATION

- a. 500 CY In Addition to Specified Bedding \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

ITEM 13 - ROCK EXCAVATION

- a. 5,000 CY Rock Excavation \$ \_\_\_\_\_/CY \$ \_\_\_\_\_
- b. 200 CY Trench Rock \$ \_\_\_\_\_/CY \$ \_\_\_\_\_

PROPOSAL TOTAL, ITEMS 1 THROUGH 13, INCLUSIVE, THE AMOUNT OF: \_\_\_\_\_

\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_).

In addition, pricing for each of the following items is to be included should the City of Rome decide to include them in the Base Bid.

\*\*\* ALTERNATE NO. 1\*\*\*

ITEM 14 - OPTIONAL RECOMPACTED LINER BASE

- a. 605,282 SF Liner Base -18-Inch Select Backfill \$ \_\_\_\_\_/SF \$ \_\_\_\_\_  
(1 x10<sup>-5</sup> cm/sec)
- b. 605,282 SF Liner Base - 6-Inch Subbase \$ \_\_\_\_\_/SF \$ \_\_\_\_\_  
(1 x10<sup>-5</sup> cm/sec) with Geosynthetic Clay  
Liner (GCL)(5 x10<sup>-9</sup> cm/sec)

\*\*\* ALTERNATE NO. 2\*\*\*

ITEM 15 - ALTERNATIVE LEACHATE COLLECTION BLANKET

- a. 580.500 SF 24-Inch Leachate Collection Blanket \$ \_\_\_\_\_/SF \$ \_\_\_\_\_  
(1 x10<sup>-1</sup> cm/sec) with 10 oz Geotextile

\*\*\* ALTERNATE NO. 3\*\*\*

ITEM 16 - TEMPORARY STORMWATER COVER BALLAST

- a. 24,550 SY Wind Defender HD System \$ \_\_\_\_\_/SY \$ \_\_\_\_\_

\*\*\* ALTERNATE NO. 4\*\*\*

ITEM 17 - TEMPORARY STORMWATER CONTROLS

a.	650	LF	Temporary Stormwater Berm	\$ _____/LF	\$ _____
b.	1	EA	Temporary Stormwater Valve Assembly	\$ _____/EA	\$ _____
c.	1	EA	Temporary Stormwater Sump	\$ _____/EA	\$ _____

## APPENDIX E

### Project Reference Form

Project Name:	
Owner's Name:	
Owner's Phone Number:	
Owner's Contact Name & Title:	
Engineer/Architect/ Construction Manager's Name & Title:	
Engineer/Architect/ Construction Manager's Phone Number:	
Original Contract Value of Project:	
Final Contract Value of Project:	
Project Description:	
Original Project Duration:	
Original Project Completion Date:	
Actual Project Completion Date:	
Explanation for later project completion date, if applicable:	
List Major Subcontractor's; names, contact phone numbers (If work self-performed by General Contractor – indicate as such) Subcontractor #1:  Subcontractor #2:  Subcontractor #3:	
List Major Material Suppliers' names, contact phone numbers:	
Additional Comments:	

## APPENDIX F

### Specifications and Drawings

<u>Section</u>	<u>Title</u>
	Bidders Declaration
	Certification of Non-Discrimination
	Drug Free Workplace
	Georgia Prompt Pay Act Affidavit
	List of Contractors
	Notice of Commencement
	SAVE Compliance Affidavit
	Tax Payer ID
Division C/O – Contract Requirements	
C-520	Contract Agreement
00550	Pre-Award Oath
C-610	Performance Bond
C-615	Payment Bond
C-700	General Conditions
C-800	Supplementary Conditions
Division 1 - General Requirements	
01010	Summary of Work
01011	Unique Requirements
01025	Measurement and Payment
01041	Coordination of Work
01051	Grades, Lines and Levels
01055	Construction Staking
01060	Regulatory Requirements
01091	Codes and Standards
01200	Project Meetings
01310	Construction Schedules
01320	Construction Videos and Photographs
01340	Shop Drawings, Product Data and Samples
01410	Testing Laboratory Services
01510	Temporary Facilities
01540	Job Site Security
01562	Dust Control
01569	Safety in Landfill Works
01590	Field Offices
01610	Transportation and Handling
01611	Storage and Protection
01630	Substitutions and Product Options
01710	Cleaning
01720	Record Documents
01740	Warranties and Bonds

Division 2 - Sitework

02110	Clearing and Grubbing
02125	Erosion and Sedimentation Control
02140	Dewatering
02200	Earthwork
02225	Trench Excavation and Backfill
02510	Asphaltic Concrete Pavement
02601	Testing Piping Systems
02700	Landfill Piping Systems
02720	Storm Sewers and Pipe Culverts
02748	HDPE Fabrication
02775	Temporary Stormwater Diversion Cover
02776	Geomembranes
02777	Geosynthetic Clay Liner
02778	Geotextile
02779	Geosynthetic Drainage Nets and Composites
02930	Grassing

Drawings

<u>SHEET NO.</u>	<u>SHEET TITLE</u>
-	COVER
C-101	OVERALL SITE PLAN, GENERAL NOTES AND LEGEND
C-102	EXISTING CONDITIONS PLAN
C-201	TOP OF CLAY LINER GRADING PLAN
C-401	STORM DRAIN AND LEACHATE GRAVITY SEWER PROFILES
C-501	EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN - PHASE I
C-502	EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN PHASE II
C-503	EROSION, SEDIMENTATION & POLLUTION CONTROL PLAN - PHASE III
C-601	EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES
C-602	EROSION, SEDIMENTATION & POLLUTION CONTROL NOTES & DETAILS
C-603	EROSION, SEDIMENTATION & POLLUTION CONTROL DETAILS
C-604	NPDES NOTES
C-605	NPDES SAMPLING & INSPECTION NOTES
C-701	CONSTRUCTION DETAILS
C-702	CONSTRUCTION DETAILS
C-703	CONSTRUCTION DETAILS
C-704	CONSTRUCTION DETAILS

## Part 1 General

### 1.01 Scope

- A. The Proposal lists each item of the Project for which payment will be made. No payment will be made for any items other than those listed in the Proposal.
- B. Required items of work and incidentals necessary for the satisfactory completion of the work which are not specifically listed in the Proposal, and which are not specified in this Section to be measured or to be included in one of the items listed in the Proposal, shall be considered as incidental to the work. All costs thereof, including Contractor's overhead costs and profit, shall be considered as included in the lump sum or unit prices proposed for the various Proposal items. The Contractor shall prepare the Proposal accordingly.
- C. Work includes furnishing all plant, labor, equipment, tools and materials, which are not furnished by the Owner and performing all operations required to complete the work satisfactorily, in place, as specified and as indicated on the Drawings.

### 1.02 Descriptions

- A. Measurement of an item of work will be by the unit indicated in the Proposal.
- B. Final payment quantities shall be determined from the record drawings. The record drawing lengths, dimensions, quantities, etc. shall be determined by a survey after the completion of all required work. Said survey shall conform to Sections 01055 and 01720 of these Specifications. The precision of final payment quantities shall match the precision shown for that item in the Proposal.
- C. Payment will include all necessary and incidental related work not specified to be included in any other item of work listed in the Proposal.
- D. Unless otherwise stated in individual sections of the Specifications or in the Proposal, no separate payment will be made for any item of work, materials, parts, equipment, supplies or related items required to perform and complete the work. The costs for all such items required shall be included in the price proposed for item of which it is a part.
- E. Payment will be made by extending unit prices multiplied by quantities provided and then summing the extended prices to reflect actual work. Such price and payment shall constitute full compensation to the Contractor for furnishing all plant, labor, equipment, tools and materials not furnished by the Owner and for performing all operations required to provide to the Owner the entire Project, complete in place, as specified and as indicated on the Drawings.

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Measurement and Payment

- F. "Products" shall mean materials or equipment permanently incorporated into the work.

### 1.03 Mobilization

The lump sum amount for Mobilization will be eligible for payment upon the completion of all related preparatory work and after transportation of the materials and equipment necessary for the first 30 days of the Contract Time.

### 1.04 Erosion and Sedimentation Control

#### A. General

1. No separate payment shall be made for temporary and/or permanent erosion and sedimentation controls, except as noted below. All other temporary and/or permanent erosion and sedimentation control costs shall be included in the unit price for the item to which it pertains.
2. No payment will be made for any portion of the Project for which temporary erosion and sedimentation controls are not properly maintained.
3. Quantities for payment shall be based upon actual quantity constructed and authorized by the Engineer.

B. Construction Exits: All costs for construction exits, including installation, maintenance, repair, and removal, shall be included in the unit price for Construction Exits.

C. Silt Fence: All costs for silt fence (whichever type is indicated), including installation, maintenance, repair, replacement, and removal, shall be included in the unit price for Silt Fence.

D. Stone Check Dams: All costs for stone check dams, including stone, necessary earthwork, periodic maintenance and repair, and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price for Stone Check Dams.

E. Rip Rap Lined Ditch: All costs for rip rap lined ditch, including stone, geotextile, necessary earthwork, installation, and periodic maintenance and repair shall be included in the unit price for Rip Rap Lined Ditch.

F. Grass Ditch with Turf Reinforcement Matting: All costs for grass-lined ditch with turf reinforcement matting, including material, necessary earthwork, installation, and periodic maintenance and repair shall be included in the unit price bid for Grass Ditch with Turf Reinforcement Matting.

- G. Slope Stabilization Matting: All costs for slope stabilization matting including material, necessary earthwork, installation, periodic maintenance and repair, and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Slope Stabilization Matting.
- H. Storm Drain Inlet Protection: All costs for storm drain inlet protection, including gravel, fabric, materials, installation, necessary earthwork, periodic maintenance and repair, and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Storm Drain Inlet Protection.
- I. Outfall Retrofit: All costs for outfall retrofit, including stone, materials, installation, necessary earthwork, periodic maintenance and repair, and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Outfall Retrofit.
- J. Storm Drain Outlet Protection: All costs for storm drain outlet protection, including stone, installation, necessary earthwork, periodic maintenance and repair, and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Storm Drain Outlet Protection.
- K. Temporary Stormwater Diversion Berm: All costs for constructing the temporary stormwater diversion berm, including the necessary earthwork, grading, and maintenance shall be included in the unit price bid for Temporary Stormwater Diversion Berm.
- L. CPP Temporary Downdrain
  - 1. Measurement and payment at the unit price for Temporary Downdrain piping shall be made for the quantity provided. Measurement for temporary downdrain pipe shall be made from centerline of structure to centerline of structure.
  - 2. The cost of pipe inlets, fittings and bends shall be included in the unit price bid for the appropriate pipe.
  - 3. No additional payment will be made for replacement of defective materials.
- M. Permanent Grassing
  - 1. No separate payment will be made for temporary grassing.
  - 2. Payment shall be made only for the final permanent perennial grassing. All costs for grassing, including seeding, fertilizing, mulching as well as temporary measures, shall be included in the unit price for Permanent Grassing.

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Measurement and Payment

- N. Sediment Pond 4 Cleaning: All costs for sediment pond cleaning, including the necessary earthwork and removal of sediment following establishment of permanent erosion control measures shall be included in the unit price bid for Sediment Pond 4 Cleaning.
- O. NPDES Monitoring and Reporting: All costs associated with NPDES monitoring and reporting in accordance with Georgia EPD requirements and these Contract documents shall be included in the lump sum price bid for this item. This includes, but is not limited to, preparation and submission of all inspections, record keeping, sampling and reporting as required under the permit. Additionally, this shall include preparation and submission of the project NOT to the Georgia EPD as well as EPD acceptance of the NOT. The NOI shall be the responsibility of the Owner.

### 1.05 Site Preparation

- A. Clearing and Grubbing: Payment for clearing and grubbing of the Project site shall be made at the lump sum price for Clearing and Grubbing. No payment shall be made if proper erosion control devices are not constructed and maintained. Partial payments will be made based on the estimated percentage of the amount of clearing and grubbing which is complete at the time of the payment request. No additional payment will be made for disposal of clearing debris.
- B. Stripping and Stockpiling Topsoil: All cost of stripping and stockpiling of all topsoil for the Project site shall be included in the lump sum price for Stripping and Stockpiling Topsoil. No separate payment will be made for stripping and stockpiling of topsoil for areas not on the Project site. Partial payments will be made based on the estimated percentage of the amount of stripping and stockpiling which is complete at the time of the payment request.

### 1.06 Earthwork

- A. Topsoil Placement: All costs for placement of topsoil on the perimeter berms and other areas to be grassed shall be included in the lump sum price for Topsoil Placement. Partial payment will be made based on the estimated percentage of the amount of topsoil placement which is complete at the time of the payment request.
- B. Excavation - On-Site Soil Materials
  - 1. Excavation of on-site soil materials shall include all work associated with excavation of soils within the waste cell and general site work on the Project. Excavation and backfill of liner anchor trenches and pipelines, stockpile work, liner base borrow area, leachate collection layer borrow area, earthwork associated with structures and unsuitable materials are not excavation and will not be included in quantities for payment as excavation.
  - 2. Payment will be made at the unit price for Excavation - On Site Soil Materials. Quantities shall be determined from the analysis of the total cut

for the Project, based on field surveys in accordance with Sections 01055 and 01720 performed before and after the work was performed. The Contractor shall calculate the quantities and submit them to the Engineer with each request for payment.

C. Structural Fill - On-Site Materials

1. Structural fill - on-site materials shall include all work associated with the placement of structural fill in waste cell and general site work on the Project. Excavation and backfill of liner anchor trenches and pipelines, topsoil, stockpile work, 24-inch protective cover layer, unsuitable materials, 18-inch select backfill and 6-inch subbase are not structural fill and will not be included in quantities for payment as structural fill.
2. Payment will be made at the unit price for Structural Fill – On Site Materials. Quantities shall be determined from the analysis of the total fill for the Project, based on field surveys in accordance with Sections 01055 and 01720 performed before and after the work was performed. The Contractor shall calculate the quantities and submit them to the Engineer with each request for payment.

D. Unsuitable Materials

1. Payment for removal and replacement of soft or excessively wet material which is ordered by the Engineer which is not shown on the Drawings or specified shall be made at the unit price for REMOVAL OF UNSUITABLE MATERIAL AND REPLACEMENT WITH Suitable Earth Material or Crushed Stone. No measurement for payment will be made unless all dewatering as specified in Section 02140 has been successfully accomplished.
2. Additional costs of corrective work made necessary by unauthorized excavation shall be borne by the Contractor.

E. Sheeting, Bracing, and Timbering: No separate payment will be made for providing sheeting, bracing and timbering.

F. Rock Excavation:

1. Definition of Rock: Any material which cannot be excavated with a single tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (comparable to Caterpillar D 8K or comparable to Caterpillar 977 front end loader, and occupying an original volume of at least one cubic yard). The Engineer shall be the sole determinant as to the limits to which the material is classified as rock.

G. Dewatering: No separate payment will be made for dewatering required to accomplish the work.

- H. Backfilling: No separate payment will be made for backfilling or excavation, hauling and placement of borrow material. The cost of all such work and all costs incidental thereto shall be included in the unit price for the item to which the work pertains.
- I. Liner Base
1. 18-Inch Select Backfill: All costs for providing the select backfill, including additional excavation of earth material from either an on-site borrow area or from an off-site borrow area selected and secured by the Contractor, removing and disposing of any contaminants in the earth material, and subsequent placement of the earth material, shall be included in the unit price for 18-inch Select Backfill. No additional payment will be made for the addition of bentonite or other processing, should the Contractor elect to do so. No additional payment will be made for any site preparation or erosion and sedimentation controls required to develop either an on-site or off-site borrow area.
  2. 6-Inch Subbase: All costs for providing the subbase, including additional excavation of the earth material from either an on-site borrow area or from an off-site borrow area selected and secured by the Contractor, removing and disposing of any contaminants in the subbase material, and subsequent placement of the material, shall be included in the unit price bid for 6-Inch Subbase. No additional payment will be made for the addition of bentonite or other processing, should the Contractor elect to do so. No additional payment will be made for any site preparation or erosion and sedimentation controls required to develop either an on-site or off-site borrow area.
  3. Quantities shall be based on the total surface area covered with the specified material. Quantities for payment shall be determined from a field run topographic/planimetric survey in accordance with Section 01055. The Contractor shall calculate the quantities and submit the calculations to the Engineer with each request for payment.
  4. No payment will be made for any area until the full specified thickness has been obtained for the area for which payment is requested. No payment will be made for any quantities which are not accompanied by a certification by the registered Land Surveyor that the quantities for which payment is requested have the required absolute minimum thickness. No payment will be made for any area which does not meet the requirements of these Specifications.
  5. Payment will be made for liner base material as stored material, only if imported from off-site and stockpiled on-site.

- J. Optional Compacted Liner Base ( $1 \times 10^{-5}$  cm/sec with GCL)
1. 18-Inch Select Backfill: All costs for providing the select backfill, including additional excavation of earth material from either an on-site borrow area or from an off-site borrow area selected and secured by the Contractor, removing and disposing of any contaminants in the earth material, and subsequent placement of the earth material shall be included in the unit price for 18-inch Select Backfill. No additional payment will be made for the addition of bentonite or other processing, should the Contractor elect to do so. No additional payment will be made for any site preparation or erosion and sedimentation controls required to develop either an on-site or off-site borrow area.
  2. 6-Inch Subbase with Geosynthetic Clay Liner (GCL): All costs for providing the subbase and geosynthetic clay liner, including additional excavation of the earth material from either an on-site borrow area or from an off-site borrow area selected and secured by the Contractor, removing and disposing of any contaminants in the subbase material, and subsequent placement of the material and geosynthetic clay liner, shall be included in the unit price bid for 6 Inch Subbase. No additional payment will be made for the addition of bentonite or other processing, should the Contractor elect to do so. No additional payment will be made for any site preparation or erosion and sedimentation controls required to develop either an on-site or off-site borrow area. Measurement for payment of the GCL surface area will be determined by the Engineer from survey certification provided by the Contractor. The area for payment will include the covered area to the top of the vertical turndown at the anchor trench plus the minimum amount of required membrane in the anchor trench as shown on the Drawings. Payment quantities shall be the actual geomembrane surface area, but shall not include overlaps, patches, repairs or extension of material beyond the required limits. Costs for pre-shipping sheet testing shall be considered incidental work and included in the appropriate unit price.
  3. Quantities shall be based on the total surface area covered with the specified material. Quantities for payment shall be determined from a field run topographic/planimetric survey in accordance with Section 01055. The Contractor shall calculate the quantities and submit the calculations to the Engineer with each request for payment.
  4. No payment will be made for any area until the full specified thickness has been obtained for the area for which payment is requested. No payment will be made for any quantities which are not accompanied by a certification by the registered Land Surveyor that the quantities for which payment is requested have the required absolute minimum thickness. No payment will be made for any area which does not meet the requirements of these Specifications.

5. Payment will be made for liner base material as stored material, only if imported from off-site and stockpiled on-site.
- K. 24-Inch Leachate Collection Blanket ( $1 \times 10^{-3}$  cm/sec) with Double Sided Geocomposite
1. All costs for providing the 24-Inch Leachate Collection Blanket, including the double sided geocomposite layer, additional excavation from an on-site borrow area or obtaining the leachate collection material from an off-site borrow area selected and secured by the Contractor, and removing and disposing of any contaminants in the leachate collection material shall be included in the unit price for 24-Inch Leachate Collection Blanket ( $1 \times 10^{-3}$  cm/sec) with Double Sided Geocomposite. No additional payment will be made for any site preparation or erosion and sedimentation controls required to develop either an on-site or off-site borrow area.
  2. Quantities shall be based on the total surface area covered with the specified 24-inch thick layer and double sided geocomposite. Quantities for payment shall be determined from a field run topographic/planimetric survey in accordance with Section 01055. The Contractor shall calculate the quantities and submit the calculations to the Engineer with each request for payment. Cost for pre-shipping geocomposite, testing, excavation, compaction and backfill of the anchor trench shall be considered incidental work and included in the appropriate unit price bid.
  3. No payment will be made for any area until the full specified thickness has been obtained for the area for which payment is requested. No payment shall be made for any quantities which are not accompanied by a certification by the registered Land Surveyor that the quantities for which payment is requested have the required absolute minimum thickness. No payment will be made for any area which does not meet the requirements of these Specifications.
  4. Payment for the geocomposite may be processed on partial payment request, but only after receipt of all testing results for that area for which payment is requested. .
- L. Alternate - 24-Inch Leachate Collection Blanket ( $1 \times 10^{-1}$  cm/sec) with 10 oz Geotextile
1. All costs for providing the alternate leachate collection blanket, including the geotextile, additional excavation from an on-site borrow area or obtaining the alternate leachate collection material from an off-site borrow area selected and secured by the Contractor, and removing and disposing of any contaminants in the leachate collection material shall be included in the unit price bid 24-inch Leachate Collection Blanket ( $1 \times 10^{-1}$  cm/sec) with 10oz Geotextile. No additional payment will be made for any site preparation or

erosion and sedimentation controls required to develop either an on-site or off-site borrow area.

2. Quantities shall be based on the total surface area covered with the with 24-inch Protective Soil Layer. Quantities for payment shall be determined from a field run topographic/planimetric survey. The Contractor shall calculate the quantities and submit the calculations to the Engineer with each request for payment. Costs for pre-shipping geotextile, testing, excavation, and compaction and backfill of the anchor trench shall be considered incidental work and included in the appropriate unit price bid.
  3. No payment will be made for any area until the full specified thickness has been obtained for the area for which payment is requested. No payment shall be made for any quantities which are not accompanied by a certification by the registered Land Surveyor that the quantities for which payment is requested have the required absolute minimum thickness. No payment will be made for any area which does not meet the requirements of these Specifications.
- M. Liner Base Test Strip: All costs for constructing the liner base test strip shall be included in the lump sum price bid. No payment will be made for the test strip until such strip has passed all testing requirements.

## 1.07 Leachate Containment System

- A. 60 Mil HDPE Textured Geomembrane: Measurement for payment of 60 mil HDPE textured geomembrane surface area will be determined by the Engineer from survey certification provided by the Contractor. The area for payment will include the covered area to the top of the vertical turndown at the anchor trench plus the minimum amount of required membrane in the anchor trench as shown on the Drawings. Payment quantities shall be the actual geomembrane surface area, but shall not include overlaps, patches, repairs or extension of material beyond the required limits. Costs for pre-shipping sheet testing shall be considered incidental work and included in the appropriate unit price.
- B. Payment for the 60-mil HDPE textured geomembrane will be processed on partial payment requests, but only after receipt of all testing results for that area for which payment is requested.
- C. Permanent Berm Anchor Trench: All costs for constructing the Permanent Anchor Trench, including excavation, grading, maintenance, and earthen backfill over the liner, shall be included in the unit price bid for Permanent Anchor Trench.
- D. Temporary Liner Anchor Trench: All costs for constructing the Temporary Anchor Trench, including excavation, grading, maintenance, and earthen backfill over the liner, shall be included in the unit price bid for Temporary Anchor Trench.

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Measurement and Payment

- E. Tie to Existing Liner: All costs for Tie to Existing Liner, including location, excavation, removal of waste, disposal of waste, removal of plywood or rub sheet, cleaning, welding liner, and removal of the temporary flap shall be included in the lump sum price bid for Tie to Existing Liner.
- F. Temporary Leachate Berm: All costs for constructing the Temporary Leachate Berm, including earthwork, grading, installation, HDPE flap, Rock Toe Drain, HDPE rub sheet, backfill and maintenance, shall be included in the unit price bid for Temporary Leachate Berm.

### 1.08 Trench Foundation and Stabilization, Excavation, and Backfill

- A. No separate or additional payment will be made for any special or unique method, means, techniques or equipment necessary for the Contractor's compliance with these Specifications, regulatory requirements, permits, laws or regulations which govern this Project.
- B. Trench Excavation: No separate payment will be made for trench excavation. All costs shall be included in the unit price for the item to which it pertains at the appropriate depth.
- C. Sheeting, Bracing and Shoring: No separate payment will be made for providing any sheeting, bracing and shoring.
- D. Trench Foundation and Stabilization
  - 1. No payment for trench stabilization shall be authorized until after the trench has been dewatered. If the pipe is installed in an inadequately prepared trench bottom, the Engineer shall notify the Contractor in writing of the deficiency and will not authorize payment for that portion of that length of pipe which was improperly installed.
  - 2. Payment for trench stabilization shall be made on the basis of the amount authorized and the unit price for Trench Foundation and Stabilization. Payment shall include all costs for the removal and disposal of the unsuitable material and replacement with crushed stone. No additional payment will be made for material required for specified bedding.
- E. Bedding and Haunching
  - 1. The unit price for pipe for leachate lines and forcemains shall include excavation of the trench to the depth below the pipe necessary to provide specified bedding and to lay the sewer to grade.
  - 2. No additional payment will be made for additional trench depth.
  - 3. No separate payment will be made for material used to provide specified

bedding. The cost of all bedding materials shall be included in the unit price for the item to which it relates, except for trench stabilization.

4. No additional payment will be made for improved bedding required to compensate for over excavation of the trench.

#### F. Initial Backfill

1. No separate payment shall be made for initial backfill.
2. No separate payment shall be made for drying out the initial backfill material in order to meet the compaction requirements.
3. No separate payment shall be made for the adding of moisture to the initial backfill materials in order to meet the compaction requirements.
4. No separate payment shall be made for providing select material if the in-situ material cannot meet the compaction requirements.

#### G. Final Backfilling

1. No additional payment will be made for additional material when excavated materials are used.
2. No separate payment shall be made for drying out the final backfill material in order to meet the compaction requirements.
3. No separate payment shall be made for the adding of moisture to the final backfill materials in order to meet the compaction requirements.
4. No additional payment will be made for providing select material if the in-situ material cannot meet the compaction requirements.

#### H. Rock Excavation

1. Rock excavation shall be paid for as an extra in addition to payment for pipe provided for elsewhere in these Specifications. Payment will be made for the measured quantity of rock excavated, at the unit price bid for TRENCH ROCK.
2. The unit price for TRENCH ROCK excavation shall include the cost of rock excavation, the cost of additional bedding, and backfill material as specified and all costs incidental thereto.
3. The maximum allowable volume of rock excavation for payment shall be based on a trench width equal to the outside diameter of the pipe barrel plus 18 inches, but not less than 36 inches, and depth of rock on the pipe centerline, from the top of the rock to the bottom of the rock or the specified

bottom of the trench, whichever has the higher elevation.

4. The Engineer must be given reasonable notice to measure all rock.
5. No allowance shall be made for excavating to extra widths for construction of manholes or other appurtenances, for excavating to sloping sides, or for excavations made necessary by the physical limitations of the Contractor's equipment. Cost of such additional rock excavation shall be included in the unit price bid for rock excavation.

### 1.09 Leachate Collection System

- A. Existing Utilities and Obstructions – Horizontal and Vertical Conflict: Payments for conflicts with existing utilities shall be made only where additional manholes and/or additional lengths of sewer are approved by the Engineer. Said payment shall be made at the unit prices in the Bid. No other payment will be made for any delay or extra cost encountered by the Contractor due to protection, avoidance or relocation of existing utilities, mains or services or changing the horizontal alignment of the sewer.
- B. No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, bench marks, limits of right-of-way or easement, including the restoration, as well as centerline or baseline points.
- C. Pipe and Accessories
  1. Measurement and payment at the unit price for LEACHATE COLLECTION LINE shall be made for the quantity provided. Measurement for solid pipe shall be from centerline of manhole to centerline of manhole or edge of leachate sump assembly and from cleanout to start of perforated pipe. Measurement for perforated pipe shall be from end of solid pipe to outfall side of leachate sump assembly. Quantities for payment shall be determined from a field run survey in accordance with Section 01055.
  2. The unit prices for Perforated Leachate Collection Line shall include fabric and gravel.
  3. The cost of fittings and bends shall be included in the unit price for the appropriate line.
  4. No additional payment will be made for replacement of defective materials.
- D. Leachate Sump with Liner Penetration: All costs for constructing the Leachate Sump with Liner Penetration, including HDPE base plate, 36" Diameter HDPE perforated sump riser, pipe boot, and all fabrication shall be included in the unit price for Leachate Sump with Liner Penetration.

- E. 6-Inch Leachate Cleanout: All cost for providing the leachate cleanouts including, but not limited to, equipment, material, steel casing, locking cap, concrete pad, installation, marker post and blind flange shall be included in the unit price for 6-Inch Leachate Cleanout.
- F. Cleanup and Testing: Payment for cleanup and testing of gravity mains and forcemains shall be made at the unit price shown for Cleanup and Testing. Payment will only be approved after both cleanup and testing are completed and approved by the Engineer.
- G. HDPE Valve Vault Assembly: All costs for constructing the concrete vault assembly, including, but not limited to, HDPE vault, valves, miscellaneous grading, and all fabrication shall be included in the unit price for HDPE Valve Vault Assembly.
- H. Tie to Existing Leachate Gravity Sewer: The unit price bid for Tie to Existing Leachate Gravity Sewer shall include all costs to construct the connection including, but not limited to, locating and cleaning the existing pipe, removing existing gravel and geotextile fabric, miscellaneous grading, HDPE manhole, and joining to existing pipe.

## 1.10 Storm Drainage System

### A. Existing Utilities and Obstructions

Horizontal Conflict: Payments for conflicts with existing utilities shall be made only where additional manholes and/or additional lengths of pipe are approved by the Engineer. Said payment shall be made at the unit prices in the Bid. No other payment will be made for any delay or extra cost encountered by the Contractor due to protection, avoidance or relocation of existing utilities, mains or services or changing the horizontal alignment of the sewer.

### B. Location and Grade

1. No separate payment shall be made for survey work performed by or for the Contractor in the establishment of reference points, bench marks, cut sheets, limits of right-of-way or easement, including their restoration, as well as centerline or baseline points.
2. The "construction verification surveying" cash allowance is solely for the use of the Engineer for verification of the Contractor's reference points, centerlines and work performed. The presence of this cash allowance in no way relieves the Contractor of the responsibility of installing reference points, centerlines, temporary bench marks or verifying that the work has been performed accurately.

- C. No separate payment shall be made for traffic control or maintaining highways, streets, roadways and driveways.

## D. Laying and Jointing Pipe and Accessories

1. Measurement for payment at the unit price for Storm Drain shall be made from centerline of structure to centerline of structure or from headwall to headwall. Quantities for payment shall be determined from a field run survey in accordance with Section 01055.
2. No additional payment will be made for replacement of defective materials.
3. No additional payment will be made for maintaining flow while placing the new sewer in service.
4. No payment will be made for cutting and beveling pipe.

E. Concrete Headwall: All costs for constructing the headwalls including but not limited to the excavation, materials, sealing connection, and backfill, shall be included in the unit price bid for the Concrete Headwall.

F. Concrete Weir Drop Inlet: All costs for constructing the concrete weir drop inlets including but not limited to excavation, materials, sealing pipe connection, inverts, frame and cover, and backfill, shall be included in the unit price bid for the Concrete Weir Drop Inlet.

G. Temporary Stormwater Cover: The unit price for Temporary Stormwater Cover shall include costs for furnishing and installing the cover materials, including seaming, and placement of the edge in the anchor trench.

H. Temporary Stormwater Cover Sand Bag Ballast: The unit price for Temporary Stormwater Cover Sand Bag Ballast shall include costs for furnishing and installing the sand bags spaced on a 50 ft by 50 ft grid , including filling and closing bags, and placement over the exposed area of the Temporary Stormwater Cover.

## 1.11 Roadways

## A. Asphalt Concrete Pavement

1. All costs for constructing the Asphalt Pavement as shown on the drawings and as specified from the bottom of the compacted subgrade to the top of the asphalt concrete surface shall be included in the unit price bid for Asphalt Concrete Pavement. Limits eligible for payment shall be based on widths and lengths as shown on the Drawings. Measurement shall be made based on record drawing dimensions.
2. No separate payment will be made for thickness beyond that specified on the Drawings

3. No additional payment will be made for preparation of the subgrade.
  4. No additional payment will be made for repair to existing pavements to remain as damaged by the Contractor. No additional payment will be made for traffic control measures. No additional payment will be made for replacement of work as deemed by the Engineer to be not consistent with the requirements of the drawings and specifications.
  5. Payment for materials testing shall be made from the appropriate item in the cash allowance. No payments shall be made for tests that fail to verify required results.
- B. 8-Inch GAB Pavement: All costs for providing the 8-inch GAB pavement including graded aggregate base, surface preparation, placement, grading, and compaction shall be included in the unit price bid for 8-inch GAB Pavement. No partial payments will be made for section of paving that are not full thickness.
- C. No additional payment will be made for repair as required for damaged adjacent pavement.
- D. No additional payment will be made for replacement of defective materials.
- E. Payment for soils testing shall be made from the materials testing cash allowance. No payment shall be made for tests that fail to verify required results.
- F. No separate payment will be made for traffic control and temporary measures for maintaining traffic.

### 1.12 Markers

All costs for providing the markers as detailed on the Drawings shall be included in the unit price for Liner Edge Markers (Permanent and Temporary) and Concrete Bollards.

### 1.13 Cash Allowances

- A. General
1. The Contractor shall include in the Proposal Total all allowances stated in the Contract Documents. These allowances shall cover the net cost of the services provided by a firm selected by the Owner. The Contractor's handling costs, labor, overhead, profit and other expenses contemplated for the original allowance shall be included in the items to which they pertain and not in allowances.
  2. No payment will be made for nonproductive time on the part of testing personnel due to the Contractor's failure to properly coordinate testing

activities with the work schedule or the Contractor's problems with maintaining equipment in good working condition. The Contractor shall make all necessary excavations and shall supply any samples of materials necessary for conducting compaction and density tests.

3. No payment shall be provided for services that fail to verify required results.
- B. Should the net cost be more or less than the specified amount of the allowance, the Contract will be adjusted accordingly by change order. The amount of change order will not recognize any changes in handling costs at the site, labor, overhead, profit and other expenses caused by the adjustment to the allowance.
- C. Documentation
1. Submit copies of the invoices with each periodic payment request from the firm providing the services.
  2. Submit results of services provided which verify required results.
- D. Schedule of Cash Allowances
1. Construction Verification Surveying
    - a. Allow the amount provided in the Proposal for construction surveying by an independent surveying firm, selected by the Owner, to perform horizontal and vertical alignment checks at the discretion of the Engineer.
    - b. This allowance is solely for the use of the Engineer for verification of the Contractor's reference points, centerlines and work performed. The presence of this cash allowance in no way relieves the Contractor of the responsibility of installing reference points, centerlines, temporary bench marks or verifying that the work has been performed accurately.
  2. Materials Testing: Allow the amount provided in the Bid for the services of an engineering firm and testing laboratory for the testing of soils, concrete cylinders for poured in place concrete and other testing as required.
  3. Construction Quality Assurance: Allow the amount provided in the Bid for construction quality assurance services provided by the Engineer.

#### 1.14 Alternate No. 3 – Wind Defender HD System

- A. All costs for stormwater diversion cover, including but not limited to ancillary grading and backfill, materials, geotextile, placement, seaming, anchoring, sandbags and placement at edge of the anchor trench shall be included in the unit price bid for Wind Defender HD System.

### 1.15 Alternate No. 4 – Temporary Stormwater Controls

- A. Stage Separation Berm: All costs for constructing the stage separation berm, including earthwork, plywood, grading, HDPE flap, installation, backfill and maintenance, shall be included in the unit price bid for Stage Separation Berm.
- B. Temporary Stormwater Berm: All costs for constructing the temporary stormwater berm, including earthwork, grading, installation, HDPE flap, backfill and maintenance, shall be included in the unit price bid for Temporary Stormwater Berm.
- C. Temporary Stormwater Sump: All costs for constructing the temporary stormwater sump, including earthwork, grading, maintenance, HDPE liner boot, liner flap penetration, valves, installation and backfill, shall be included in the unit price bid for Temporary Stormwater Sump.

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## Part 1 General

### 1.01 Scope

- A. This Section includes earthwork and related operations, including, but not limited to, dewatering, excavating all classes of material encountered, pumping, draining and handling of water encountered in the excavations, handling, storage, transportation and disposal of all excavated and unsuitable material, construction of fills and embankments, backfilling around structures and pipe, backfilling all trenches and pits, compacting, all sheeting, shoring and bracing, preparation of subgrades, surfacing and grading, and any other similar, incidental, or appurtenant earthwork operations which may be necessary to properly complete the work.
- B. The Contractor shall provide all services, labor, materials and equipment required for all earthwork and related operations necessary or convenient to the Contractor for furnishing complete work as shown on the Drawings or specified in these Contract Documents and in accordance with the Construction Quality Assurance (CQA) Plan).

### 1.02 General

- A. The elevations shown on the Drawings as existing are taken from the existing data available and are intended to give reasonably accurate information about the existing elevations. They are not precise and the Contractor shall become satisfied as to the exact quantities of excavation and fill required.
- B. Earthwork operations shall be performed in a safe and proper manner with appropriate precautions being taken against all hazards.
- C. All excavated and filled areas for structures, trenches, fills, topsoil areas, embankments, and channels shall be maintained by the Contractor in good condition at all times until final acceptance by the Owner. All damage caused by erosion, or other construction operations shall be repaired by the Contractor using material of the same type as the damaged material.
- D. Earthwork within the rights-of-way of the Department of Transportation, the County and/ or Cities shall be done in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of these Specifications.
- E. The Contractor shall control grading in a manner to prevent surface water from running into excavations. Obstruction of surface drainage shall be avoided and

means shall be provided whereby storm water can be uninterrupted or rerouted through temporary drains. Free access must be provided to all fire hydrants, water valves, and meters.

- F. Excavation work shall include the removal and subsequent handling of all materials excavated or otherwise removed in performance of the work, regardless of the type, character, composition or condition of the material.
- G. Tests for earthwork compliance shall be conducted by the Engineer or by an independent testing laboratory selected by the Owner. Costs of tests performed by an independent testing laboratory shall be paid directly by the Owner and not as a part of this Contract. The Contractor shall make all necessary excavations and shall supply any samples of materials necessary for conducting soils tests. The cost of all retests made necessary by the failure of materials to conform to the requirements of these Contract Documents shall be paid by the Contractor.
  - 1. Contractor's duties relative to testing include:
    - a. Notifying laboratory of conditions requiring testing.
    - b. Coordinating with laboratory for field testing and required observations.
    - c. Providing representative soil samples to the laboratory for test purposes.
  - 2. See Table 1 for a listing of all soil material testing requirements.
- H. All earthwork operations shall comply with the requirements of OSHA Construction Standards, Part 1926, Subpart P, Excavations, Trenching, and Shoring, and Subpart O, Motor Vehicles, Mechanized Equipment, and Marine Operations, and shall be conducted in a manner acceptable to the Engineer.
- I. It is understood and agreed that the Contractor has made a thorough investigation of the surface and subsurface conditions of the site and any special construction problems which might arise as a result of nearby watercourses and floodplains, particularly in areas where construction activities may encounter water-bearing sands and gravels or limestone solution channels. The Contractor shall be responsible for providing all services, labor, equipment and materials necessary or convenient to the Contractor for completing the work within the time specified in these Contract Documents.

## Part 2 Products

### 2.01 Materials and Construction

- A. Earthwork Materials
  - 1. Fill Material, General

- a. Approval Required: All fill material shall be subject to the approval of the Engineer.
  - b. Notification: For approval of imported fill material, notify the Engineer and testing laboratory at least one week in advance of intention to import material, designate the proposed borrow area and permit testing as necessary to prove the quality of the material.
  - c. All fill material shall be soil exclusive of organic matter, frozen lumps or other deleterious substances. It shall contain no rocks or lumps over 3-inches maximum in dimension.
  - d. Suitable fill materials should have a standard Proctor maximum dry density (ASTM D 698) of at least 80 pcf.
2. Coarse Aggregate or Crushed Stone: Coarse aggregate or crushed stone shall conform to the Georgia Department of Transportation Standard Specifications for Construction of Road and Bridges, 800.2.01, Group II, Size No. 57.
3. Leachate Collection Gravel:
- a. Gravel shall meet the requirements of Section 800, Group II of the Georgia Department of Transportation Standard Specifications for Construction of Road and Bridges.
  - b. Material used shall be crushed aggregate or naturally rounded smooth aggregate as shown on the drawings.
  - c. Leachate Collection Gravel shall be washed, substantially non-carbonate aggregate, Size #4 per Georgia Department of Transportation Standard Specifications for Construction of Road and Bridges, Table 800.1.
  - d. The leachate collection gravel calcium carbonate content shall be less than 5 percent by weight.
4. Top Soil: Dark organic weed free loam, free of muck.
5. Compacted Liner Base
- a. Material used to construct the compacted liner base shall meet all requirements of Article 2.01 A.1, as well as the requirements of this Article.

- b. Material used to construct the compacted liner base shall have a classification of MH, CL, or ML in accordance with ASTM D2487.
  - c. The six (6) inches of compacted liner base immediately beneath the geomembrane is also referred to as subbase and, in addition to meeting all fill requirements, shall not contain any particles with a maximum dimension exceeding 1/4-inch.
  - d. The eighteen (18) inches of compacted liner base underlying the subbase is also referred to as select backfill.
  - e. When compacted in accordance with the requirements of this Section, the compacted liner base shall be no more permeable than  $1 \times 10^{-7}$  cm/sec or  $1 \times 10^{-5}$  cm/sec, as applicable, when tested in accordance with the ASTM D 5084 using criterion supplied by the Engineer.<sup>1</sup>
  - f. Compacted liner base material may consist of fill material modified by the addition of powdered bentonite in sufficient quantity to meet the Specifications. If a bentonite admixture is used, the admixture procedure shall be approved by the Engineer and submitted to EPD prior to construction.
6. Leachate collection blanket
- a. Material used to construct the leachate collection blanket shall meet all requirements of Article 2.01A.1, as well as the requirements of this Article.
  - b. Material for use in the leachate collection blanket shall consist of clean earth material, natural or manufactured, that contains no aggregate, rocks, debris, plant material, or other solid material larger than 1/2-inch in diameter.
  - c. The leachate collection blanket material shall have a calcium carbonate content no greater than five percent.
  - d. The leachate collection blanket shall have a minimum permeability of  $1 \times 10^{-3}$  cm/sec when used with the specified double sided geocomposite or  $1 \times 10^{-1}$  cm/sec when used with the specified geotextile when tested in accordance with ASTM D 2434.<sup>1</sup>
7. Geomembrane Anchor Trench Backfill:
- a. Material used as anchor trench backfill shall meet all requirements of Article 2.01A.1, as well as the requirements of this Article.

- b. Material used as anchor trench backfill shall be approved by the Engineer and shall have a classification of SC, SM, ML, or CL in accordance with ASTM D2487. Leachate collection material shall not be used.
    - c. The anchor trench backfill shall not contain any particles with a maximum dimension exceeding 1/2-inch.
- B. Sheeting, Bracing and Timbering: The Contractor shall furnish, place, and maintain all sheeting, bracing, and timbering required to properly support trenches and other excavations in open cut, and to prevent all movement of the soil, pavement, structures, or utilities outside of the trench or pit.
  - 1. General
    - a. Cofferdams and bracing design, including computations, shall be prepared before commencing construction operations. Drawings and design computations shall be signed and sealed by a professional engineer registered in the State of Georgia. The drawings and design computations shall not be submitted to the Engineer.
    - b. Sheeting, bracing and timbering shall be so placed as to allow the work to be constructed to the lines and grades shown on the Drawings and as ordered by the Engineer.
    - c. If at any time the method being used by the Contractor for supporting any material or structure in or adjacent to any excavation is not reasonably safe, the Contractor shall provide additional bracing and support necessary to furnish the added degree of safety.
    - d. All sheeting in contact with the concrete or masonry shall be cut off as directed by the Engineer and left in place.
  - 2. Timber: Timber may be substituted for steel sheet piling, when approved by the Engineer. Timber for shoring, sheeting, or bracing shall be sound, and free of large or loose knots, and in good condition. Size and spacing shall be in accordance with OSHA regulations.
  - 3. Steel Sheet Piling: Steel sheet piling shall be the continuous interlock type. The weight, depth, and section modulus of the sheet piling shall be sufficient to restrain the loads of earth pressure and surcharge from existing foundations and/or live loads. The procedure for installation and bracing shall be so scheduled and coordinated with the removal of the earth that the ground under existing structures shall be protected against lateral movement

at all times. The Contractor shall provide closure and sealing between sheet piling and existing facilities. Steel piling within three feet of an existing building, structure or pipeline shall remain in place, unless otherwise directed by the Engineer.

4. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the structures and adjacent property. Leave sheeting in place when, in the opinion of the Engineer, it cannot be safely removed. Cut off sheeting left in place at least two feet below the surface.
- C. Other Materials: All other materials not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to the approval of the Engineer.
- D. Stockpile Areas: The stockpile areas shown on the Drawings, or as directed by the Engineer, shall be used to stockpile soil earthwork materials to be utilized for this project and to stockpile topsoil as needed.
- E. Filter Fabric - Woven Type
1. Filter fabric associated with backfill outside of the cell limits shall be a polypropylene woven fabric. The fabric shall be a high modulus type with good separation capabilities. The fabric shall be inert to biological degradation and naturally occurring chemicals, alkalies and acids.
  2. The fabric shall also conform to the minimum property values listed in the following table:

Fabric Property	Unit	Test Method	Minimum Value
Grab Tensile Strength	lbs.	ASTM D 4632	315
Trapezoid Tear Strength	lbs.	ASTM D 4533	112
CBR Puncture Strength	lbs.	ASTM D 6241	630
Permittivity	sec <sup>-1</sup>	ASTM D 4491	0.02
Apparent Opening Size	in.	ASTM D 4751	0.024
Ultraviolet Stability	% ret @ 500 hrs	ASTM D 4355	50

### Part 3 Execution

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### 3.01 General

- A. Safety: Comply with local regulations and with the provisions of the “Manual of Accident Prevention in Construction” of the Associated General Contractors of America, Inc., Occupational Safety and Health Act, and all other applicable safety regulations.
- B. Topsoil
  - 1. Remove all topsoil to a depth at which subsoil is encountered, from all areas under buildings, pavements, and from all areas which are to be cut to lower grades or filled.
  - 2. With the Engineer's approval, topsoil to be used for finish grading may be stockpiled on the site, at a location designated by the Owner.
  - 3. Other topsoil may be used for fill in non-critical areas with approval of the Engineer.
  - 4. Excess topsoil shall be left stockpiled with the Engineer's approval at a location designated by the Owner.
- C. Bracing and Sheeting
  - 1. Furnish, put in place, and maintain all sheeting, bracing, and shoring as may be required to properly support the sides of all excavations and to prevent all movement of earth which could in any way injure the work, adjacent property or workers.
  - 2. Properly support all excavations in locations indicated on the Drawings and where necessary to conform to all pertinent rules and regulations, and these Specifications, even though such locations are not indicated on the Drawings.
  - 3. Exercise care in the removal of sheeting, shoring, bracing, and timbering to prevent collapse or caving of the excavation faces being supported and damage to the work and adjacent property.
  - 4. Do not leave any sheeting or bracing in the trench or excavation after completion of the work, unless approved by the Engineer.
- D. Obstructions
  - 1. Remove and dispose of all trees, stumps, roots, boulders, pavement, pipes, and the like, as required for the performance of the work.

2. Exercise care in excavating around catch basins, inlets, manholes, pipe, pavement and other structures to remain so as to not disturb or damage these structures.
3. Avoid removing or loosening castings, or pushing dirt into catch basins, inlets and manholes.
4. Damaged or displaced structures or casting shall be repaired, replaced, and dirt entering the structures during the performance of the work shall be removed at no additional cost to the Owner.

E. Utilities to be Abandoned

1. When pipes, conduits, sewers, or other structures are removed from the trench leaving dead ends in the ground, such ends shall be fully plugged or sealed with brick and non-shrink grout.
2. Abandoned structures, such as manholes or chambers shall be entirely removed unless otherwise specified or indicated on the Drawings.
3. All materials from abandoned utilities, which can be readily salvaged, shall be removed from the excavation and stored on the site at a location as directed by the Owner.
4. All salvageable materials will remain the property of the Owner, unless otherwise indicated by the Owner.

F. Extra Earth Excavation:

1. In case soft or excessively wet material which, in the opinion of the Engineer, is not suitable, is encountered below the final subgrade elevation of an excavation or underneath a proposed structure, the Engineer may order the removal of this material and its replacement with crushed stone or other suitable material in order to make a suitable foundation for the construction of the structure.
2. In the opinion of the Engineer, should all the unsuitable material not practically be able to be removed, the Contractor shall remove a specified amount and install a bridge lift. The depth of the unsuitable materials required to be removed should be specified by the Engineer and based on test excavations by the contractor. The bridge lift shall be a minimum of three feet deep and allow for at least three subsequent lifts of structural fill to be placed to reach subgrade elevations. A woven geotextile fabric shall be placed beneath the bridge lift as directed by the Engineer.

3. All extra excavation made at the order of the Engineer will be paid for on the basis of the actual volume of the stockpiled unsuitables as measured by the Engineer. No measurement for payment shall be made until all dewatering as specified in Section 02140 has been successfully accomplished.

G. Cutting Paved Surfaces and Similar Improvements

1. Remove existing pavement as necessary for installing pipe utilities and appurtenances or as otherwise shown on the Drawings.
2. Before removing any pavement, mark the pavement neatly, paralleling pipe lines and existing street lines. Space the marks the width of the trench.
3. Cut asphalt or concrete pavement along the marks a minimum of 4 inches deep using rotary saw and breaking below the score by the use of jack hammers or other suitable tools.
4. Do not pull pavement with machines until completely broken and separated from pavement to remain.
5. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement. No additional payment will be made for removing and replacing damaged adjacent pavement.

### 3.02 Excavation

A. Method

1. All excavation shall be by open cut from the surface, except as indicated on the Drawings.
2. All excavations for pipe appurtenances and structures shall be made in such a manner, and to such depth and width, as will give ample room for building the structures and for bracing, sheeting, and supporting the sides of the excavation, for pumping and draining groundwater which may be encountered, and for the removal from the excavation of all materials excavated.
3. Take special care so that the soil below the bottom of the structure to be built is left undisturbed.

- B. Grades: Excavate to grades indicated on the Drawings. Where excavation grades are not indicated on the Drawings, excavate as required to accommodate

installation.

C. Disposal of Excavated Material

1. Remove and properly dispose of all excavated material not needed to complete filling, backfilling, and grading.
2. Dispose of excess excavated material at locations on-site designated by the Owner, and in accordance with all requirements of federal, state, county, and municipal regulations. No debris of any kind shall be deposited in any stream or body of water, or on any street, or alley. No debris shall be deposited on any private property, except by written consent of the property owner. In no case shall any material be shoved onto abutting private properties, or be buried in embankments or trenches on the Project.

### 3.03 Excavating for Structures

A. Earth Excavation

1. Earth excavation shall include all substances to be excavated other than rock. Earth excavation for structures shall be to limits not less than two feet outside footing lines, to allow for formwork and inspection, and further as necessary to permit the trades to install their work. All materials loosened or disturbed by excavation shall be removed from surfaces to receive concrete or crushed stone.
2. No separate payment will be made for earth excavation. The cost of such work and all costs incidental thereto shall be included in the price bid for the item to which the work pertains.

B. Rock Excavation

1. Definition of Rock: Any material which cannot be excavated with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (comparable to Caterpillar D 8K or comparable to Caterpillar 977 front-end loader, and occupying an original volume of at least one cubic yard). The Engineer shall be the sole determinant as to the limits to which the material is classified as rock.
2. Excavation: Where rock is encountered within excavation for structures or landfill cell floor, it may only be excavated to the lines and grades indicated on the Drawings or as otherwise directed by the Engineer. If blasting is approved by the Georgia Environmental Protection Division (EPD), the Contractor shall be responsible for obtaining any blasting permits required.

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- C. Excavation for Foundations: Footings, slabs on grade, and landfill cells, shall rest on undisturbed earth, rock or compacted materials to insure proper bearing. Landfill cells constructed over rock shall maintain a minimum separation of five (5) feet to the bottom of the liner system.
1. Unsuitable Foundation Material
    - a. Any material in the opinion of the Engineer which is unsuitable for foundation shall be removed and replaced with compacted coarse aggregate, or with compacted fill material as directed by the Engineer.
    - b. No determination of unsuitability will be made until all requirements for dewatering are satisfactorily met.
  2. Unauthorized Excavation
    - a. Care shall be taken that excavation does not extend below bottom levels of footings or slabs on earth or rock. Should the excavation, through carelessness or neglect, be carried below such levels, the Contractor shall fill in the resulting excess excavation with concrete under footings and compacted coarse aggregate or other approved material under slabs. Should excavation be carried beyond outside lines of footings such excess excavation shall be filled with concrete, or formwork shall be provided, as directed by the Engineer.
    - b. Additional costs of corrective work, made necessary by unauthorized excavation of earth or rock, shall be borne by the Contractor.
- D. Unsuitable Bearing: If suitable bearings for foundations or landfill cells are not encountered at the elevations indicated on the Drawings, immediately notify the Engineer. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.

### 3.04 Fill

- A. Controlled Fill
1. The fill for landfill cells, pond embankments, roadways and structures shall be controlled fill.
  2. After the excavated area has been examined by the Engineer, all holes and other irregularities shall be filled and compacted before the main fill is placed.

3. The fill shall be placed in even layers not exceeding 8-inches loose thickness in depth, and shall be thoroughly compacted as herein specified.
4. If an analysis of the soil being placed shows a marked difference from one location to another, the fill being placed shall not be made up of a mixture of these materials. Each different type of material shall be handled continuously so that field control of moisture and density may be based upon a known type of material.
5. No fill shall be placed following a heavy rain without first making certain on isolated test areas that compaction can be obtained without damage to the already compacted fill.

B. Proofrolling

1. All areas where landfill liner, roadways and structures are to be constructed on cut areas, compacted fill, and other areas where indicated on the Drawings, shall be proofrolled to detect soft spots prior to the placement of fill material and after placement of fill, which shall be construction of foundations.
2. Proofrolling shall consist of the moving a 20-30 ton loaded tandem axle dump truck or other pneumatic tire roller over the subgrade before the subgrade is shaped. Proofrolling shall be witnessed by the Engineer.
3. Pneumatic-tired rollers shall have not fewer than four pneumatic tired wheels which shall be of such size and ply that tire pressures can be maintained between 80 and 100 pounds per square inch for 25,000 pound wheel load during rolling operations. Unless otherwise required, rolling shall be done with tires inflated to 90 psi. The roller wheels shall be located abreast in a rigid steel frame. Each wheel shall be loaded with an individual weight box so that each wheel will bear an equal load when traversing uneven ground. The weight boxes shall be suitable for ballast loading such that the load per wheel shall be 25,000 pounds. The spacing of the wheels shall insure that the distance between the nearest edges of adjacent tires shall be not greater than one-half of the tire width of a single tire at the operating pressure for a 25,000 pound wheel load. The roller shall be operated no faster than 10 miles per hour.
4. Subgrade shall be proofrolled with six passes of the truck or roller. Depressions that develop during the proofrolling operation shall be filled with suitable material and those filled areas shall be proofrolled with six passes of the roller. If, after having been filled and proofrolled, the subgrade still contains depressions, the area shall be undercut to the full depth of the soft material, or five feet, whichever is less, backfilled, recompacted, and rolled to

achieve a subgrade acceptable to the Engineer.

5. Pavement, sidewalk, building slab or compacted liner base installation areas: After the proofrolled surface has been accepted by the Engineer, the area shall be finish rolled with a smooth steel wheel roller weighing not less than 10 tons. Finished surface shall be within a tolerance as specified in Article 3.06 A of this Section. Localized depressions, including roller marks, shall not be deeper than 1/4-inch.
6. Conduits, pipes, culverts and underdrains shall be neither disturbed nor damaged by proofrolling operations.

C. Placement of Fill

1. Prior to placement of any material in embankments, the area within embankment limits shall be stripped of topsoil and all unsuitable materials removed in accordance with this Section. The area shall then be scarified to a depth of at least 6-inches.
2. Fill materials shall be placed in continuous approximately horizontal layers extending the full width of the embankment cross-section and the full dimension of the excavation where practical and having a net compacted thickness of not over 6-inches.
3. Fill materials shall be placed at optimum moisture content within limits (shown on Table 1 of this section). Optimum moisture shall be maintained by watering the layers as placed or by allowing materials to dry before placement.

D. Liner Test Pad

1. A clay liner test pad will be constructed using the same construction methods, equipment and material proposed to be used for the Liner Base. The test pad shall be at least as wide as the compaction equipment and a minimum of 25 feet long. The test pad shall be built to the same thickness as the liner base in lifts as required by this section. The test fill construction will be completed prior to, or will coincide with the beginning of placement of the Liner Base.
2. Construction equipment and methods shall be reviewed by the Engineer prior to test pad placement. At a minimum, the compaction equipment shall include a CAT 815, or equivalent, or a tamping foot roller as described in this Section.

3. Construction methods including number of equipment passes, type of materials used and moisture adjustments made shall be documented by the Engineer. Sampling and testing, including in-situ permeability testing, will be as specified by the Engineer.
4. Test results that meet the requirements of the liner base shall be required to complete the test pad. Should results not pass, the test pad shall be re-worked. A separate test pad may be required by the Engineer for each change in liner base material.

#### E. Compaction

1. Fill materials supporting landfill cells, pond embankments, roadways, structures, and backfill around structures shall be compacted to a minimum of 95 percent of the ASTM D698 maximum dry density. The top 12-inches of fill material supporting roadways and structures shall be compacted to a minimum of 98 percent of the ASTM D698 maximum dry density. Fill placed for all other areas shall be compacted to 90 percent of the maximum dry density.
2. Compacted liner base materials shall be compacted to the minimum requirements as determined by the permeability tests (remolded samples and previously tested undisturbed samples per ASTM 5084). However, clay liner compaction shall not be less than stipulated for general fill below lined areas.
  - a. Clay liner compaction shall be performed with an appropriately heavy, properly ballasted, penetrating foot compactor.
  - b. The daily work area should extend to such a distance necessary to minimize desiccation and crusting of the lift surface. The finished surface should be smooth rolled at the end of the day to promote precipitation runoff.
  - c. If desiccation, crusting, or sealing by rolling of the lift surface occurs prior to placement of the next lift, the area shall be scarified to a minimum depth of one inch or until sufficiently moist materials are encountered, whichever is greater. Also, the addition of water to surfaces prior to placement of additional clay may be utilized when necessary to maintain uniformly moist soil conditions.
3. Compaction of embankments shall be by smoothwheel, pneumatic or sheeps foot rollers.
  - a. Smooth wheel rollers shall provide 100 percent coverage under the

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- wheel with ground contact pressure of at least 50 psi.
- b. Pneumatic rollers shall be as previously described in this Section.
  - c. Sheeps foot rollers shall provide at least 35 percent coverage under the wheel and include staggered, uniformly spaced knobs and suitable cleaning devices. The projected area of each knob and the number and spacing of the knobs shall be such that the contact pressure of the rollers be at least 250 psi. Placement and compaction of materials shall extend beyond the final contours sufficiently to insure compaction of the material at the resulting final surface. Final contours shall then be achieved by a tracked bulldozer shaping the face of the embankment.
4. Compaction of backfill around structures shall be accomplished by heavy power tamping equipment.
  5. If tests indicate that density of fill is less than that specified, the area shall be either recompact or undercut, filled, and compacted until specified density is achieved.
- E. Final Grading: Upon completion of construction operations, the area shall be graded to finish contour elevations and grades shown on the Drawings. Graded areas shall be made to blend into conformation with remaining ground surfaces. All surfaces shall be left smooth and free to drain.
- F. Placement of Leachate collection blanket
1. The leachate collection blanket shall be placed directly on top of the geocomposite or geomembrane as shown on the Drawings.
  2. Personnel working on the membrane shall not smoke, wear damaging shoes, or engage in any activity which may damage the geomembrane or geocomposite.
  3. The leachate collection blanket shall be placed by light, wide tracked equipment in such a manner that it will be continuously spread in a two foot thick layer in front of the dozer. Only nominal compaction need be applied to the drainage layer. Over compaction due to equipment traffic must be avoided. Care must be exercised to eliminate any possibility of damage to the geosynthetics during sand blanket placement. Wrinkles noted in the geosynthetics during drainage layer placement should be relaxed and corrected in accordance with the liner manufacturer's recommendations. Drainage material shall not be placed down the slopes. If the Contractor chooses to truck material into the cell, roadways utilized within the cell

should be a minimum of four feet off the liner elevation.

4. After installation of the leachate collection blanket is complete, motorized traffic will not be allowed unless approved by the Engineer.
5. The Contractor shall use all means necessary to protect all prior work and leachate collection blanket. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary, to the approval of the Engineer and at no additional cost to the Owner.
6. The thickness of the leachate collection blanket shall be verified in accordance with Section 01055 of these Specifications as well as random test excavations. The Contractor is required to hand dig test holes to confirm the thickness as directed by the Engineer. Contractor is also required to re-fill the holes after the testing is completed.

G. Placement of Leachate Collection Gravel

1. The leachate collection gravel shall be placed directly on top of the geocomposite or geotextile as shown on the Drawings. No gravel shall be allowed to free-fall greater than 2 feet.
2. Personnel working on the membrane shall not smoke, wear damaging shoes, or engage in any activity which may damage the geomembrane, geocomposite or geotextile.
3. The initial lift of gravel shall be placed to provide uniform and adequate longitudinal support under the pipe. The Contractor shall place material under the pipe haunch to provide adequate side support to the pipe while avoiding both vertical and lateral displacement of the pipe from proper alignment. The gravel material shall be placed up to the pipe spring line to confirm proper support before placement of the remainder of the material.
4. The gravel material may be installed using an excavator. The equipment shall operate only over previously placed gravel or protective cover layer. The Contractor shall not operate equipment directly on the waste cell liner/geocomposite.
5. The Contractor shall use all means necessary to protect all prior work and the leachate collection trench. In the event of damage, the Contractor shall immediately make all repairs and replacements necessary, to the approval of the Engineer and at no additional cost to the Owner.

- H. Excess Material: Any excess earth excavation and unsuitable materials shall be placed on the site as directed by the Engineer at a location acceptable to the

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Owner. Surfaces and slopes of waste fills shall be left smooth and free to drain.

I. Moisture

1. General fill materials shall be placed at optimum moisture content within practicable limits, but not more or less than two percent from optimum. Optimum moisture shall be maintained by watering the layers as placed or by drying materials before placement.
2. If fill material is too wet, provide and operate approved means to assist the drying of the fill until suitable for compaction.
3. If fill material is too dry, provide and operate approved means to add moisture to the fill layers.
4. Compacted liner base material shall be placed at a moisture content as identified in the permeability test results but shall be no less than that required by general fill.

3.05 Backfilling

- A. Backfill carefully to restore the ground surface to its original condition. Dispose of surplus material.
- B. Compact backfill underlying roadways, and structures to 95 percent of the maximum dry density.
- C. Backfilling around Structures
  1. General
    - a. Remove debris from excavations before backfilling.
    - b. Do not backfill against foundation walls until so directed by the Engineer and until all indicated perimeter insulation and/or waterproofing is in place.
    - c. Protect such insulation and/or waterproofing during filling operations.
    - d. Wherever possible, backfilling shall be simultaneous on both sides of walls to equalize lateral pressures.
    - e. Do not backfill against walls until all permanent construction is in place to furnish lateral support on both top and bottom of wall.

- f. Backfilling against walls is to take place after all the concrete in the affected members has attained the specified strengths.
2. Materials: Backfill material placed against structures built or encountered during the work of this Section shall be suitable fill material. No broken concrete, bricks or similar materials will be permitted as backfill.
- D. Geomembrane Anchor Trench Backfill: The geomembrane anchor trench backfill is as shown on the drawings. It consists of the material placed over the geomembrane or geocomposite near the outside edge of the liner.
1. The anchor trench will be backfilled and compacted by the Contractor to at least 95 percent of the Standard Proctor maximum dry density (ASTM D 698).
  2. Care should be taken when backfilling the trench to prevent any damage to the geomembrane. Backfill shall be placed in intimate contact with the geomembrane. The top corners of anchor trenches shall be rounded, not sharp. No loose dirt, soil clods or water are permitted in the anchor trenches prior to backfilling.

### 3.06 Grading

- A. General: Perform all rough and finish grading required to attain the elevations indicated on the Drawings. Perform finish grading to an accuracy of +/- 0.2 foot in all unlined areas. The leachate collection blanket and compacted liner base limits shall have minimum thicknesses as shown on the drawings and the top of the liner grade finish tolerance is +0.1 feet.
- B. After the clay liner area has been compacted, the surface shall be finish rolled with a smooth steel wheel roller weighing not less than 10 tons. Finished surface of the clay liner shall be within a tolerance as specified in Article 3.06 A of this Section. Localized depressions, including roller marks, shall not be deeper than 1/4-inch. Additionally, the clay liner shall be adequately smooth as required by the HDPE liner installer.
- C. Treatment after Completion of Grading
1. After grading is completed, permit no further excavation, filling or grading, except with the approval of the Engineer.
  2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

3. Contractor shall be responsible for any repairs required to the compacted liner base surface prior to installation of the geomembrane. This shall include any repairs required by excessive drying or erosion.

D. Geomembrane Anchor Trench Grading

1. The anchor trenches shall be excavated to the lines and depth shown on the design drawings, prior to geomembrane placement.
2. Rounded corners shall be provided in the trenches where the geomembrane enters the trench to allow the geomembrane to be uniformly supported by the subgrade and to avoid sharp bends in the geomembrane. No loose soil will be allowed to underlie the geomembrane in the anchor trenches.

### 3.07 Surface Water Control

- A. Regulations and Permits: Obtain all necessary soil erosion control permits in accordance with the Georgia Soil Erosion and Sedimentation Control Act and all pertinent rules, laws, and regulations of all applicable federal, state, county, and municipal regulatory agencies.
- B. Unfavorable Weather: Do not place, spread or roll any fill material during unfavorable weather conditions. Do not resume operations until moisture content and fill density are satisfactory to the Engineer.
- C. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depressions.
- D. Pumping and Drainage
  1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the work.
  2. Dewater by means which will insure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil.
  3. All pumping and drainage shall be done with no damage to property or structures and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic or the work of other contractors, and in accordance with all pertinent laws, ordinances, and regulations.
  4. Do not overload or obstruct existing drainage facilities.

5. Comply with the requirements of Section 02140 of these Specifications.

### 3.08 Settlement

- A. The Contractor shall be responsible for all settlement of backfill, fills, and embankments which may occur within one year after final acceptance of the work by the Owner.
- B. The Contractor shall make, or cause to be made, all repairs or replacements made necessary by settlement within 30 days after receipt of written notice from the Engineer or Owner.
- C. The Contractor shall make, or cause to be made, all repairs or replacements made necessary by settlement of the leachate collection blanket until the project area is accepted and approved by Georgia EPD.

### 3.09 Protection and Restoration of the Work Area

- A. The Contractor shall not construct permanent roadbeds, berms, drainage structures, or any structures other than those shown on the Drawings, which alter the original topographic features of the site, without written permission from the Engineer.
- B. All temporary construction or alterations to the original topography will incorporate measures to prevent erosion into the surrounding wetlands and/or detention ponds. All areas shall be returned to their original topographic condition as soon as possible after work is completed in the area. All materials of construction and other non-native materials shall be disposed by the Contractor.
- C. The Contractor shall provide temporary culverts or other drainage structures, as necessary, to permit the free migration of water between portions of a swamp, wetland, or stream which may be temporarily divided by construction.
- D. The Contractor shall not spread, discharge, or dump any fuel oil, gasoline, pesticide, or any other pollutant to adjacent swamps or wetlands.
- E. During construction, the compacted liner base should be protected from detrimental climatic effects by incorporating the following procedures:
  1. No frozen low permeability soil liner material shall be placed.
  2. Low permeability soil liner material shall not be placed on a previous lift of low permeability soil liner material, which is frozen. Frozen in-place low permeability soil liner material shall be removed prior to placement of additional low permeability soil liner material.

3. Low permeability soil liner material which has been subjected to a freeze/thaw cycle(s) shall be scarified and/or disked prior to recompaction and prior to placement of subsequent lifts of low permeability soil liner material.
4. Exposed finished lifts of low permeability soil liner material should be sprinkled with water daily to minimize desiccation, as necessary.
5. At the end of each day's construction activities, completed lifts or sections of compacted low permeability soil liner should be sealed by rolling with a rubber tire or smooth-drum roller or by back dragging with a bulldozer, and should be sprinkled with water, as needed.
6. Proper grading should be provided at the end of each workday to assure adequate runoff in the event of overnight rain.

### 3.10 Protection of Wells and Monitoring Points

The Contractor shall protect all groundwater wells and other monitoring points within or adjacent to any excavation or fill area, and shall be responsible for any damage.

### 3.11 Cleaning

Upon completion of the work of this Section, remove all rubbish, trash, and debris resulting from construction operations. Remove surplus equipment and tools. Leave the site in a neat and orderly condition acceptable to the Engineer, and in conformance with Section 01710 of these Specifications.

Table 1  
Construction Quality Assurance-Soil Material

Item	Testing	Method	Frequency	Acceptance Criteria
Structural Fill	Field Density (nuclear, sand cone, drive cylinder) <sup>(4)</sup>	ASTM D 6938 or ASTM D 1556 or ASTM D 2937	1/10,000 ft <sup>2</sup> /lift	≥95% of Maximum Dry Density as Determined by Standard Proctor
	Moisture Content (field test)	ASTM D 2216 or ASTM D 3017 or ASTM D 4643 or ASTM D 4959	1/10,000 ft <sup>2</sup> /lift	
	Moisture Content (lab test)	ASTM D 2216	Every 10 <sup>th</sup> Field Moisture Test	± 2% of optimum
	Particle Size	ASTM D 422	1/10,000 yd <sup>3</sup> or Change in Material	≤3"
	Atterberg Limits	ASTM D 4318	1/10,000 yd <sup>3</sup> or Change in Material	
	Standard Proctor	ASTM D 698	1/10,000 yd <sup>3</sup> or Change in Material	
	Compacted Liner Base Layers (Borrow Source) <sup>1</sup>	Moisture Content	ASTM D 2216	1/1,000 yd <sup>3</sup>
Particle Size		ASTM D 422	1/1,000 yd <sup>3</sup>	See Text
Atterberg Limits		ASTM D 4318	1/5,000 yd <sup>3</sup>	
Permeability (Remodeled Sample)		ASTM D 5084	1/10,000 yd <sup>3</sup> or Change in Material	Compacted liner base: k≤1x10 <sup>-7</sup> cm/sec or k≤1x10 <sup>-5</sup> cm/sec (as applicable)
Standard Proctor		ASTM D 698	1/5,000 yd <sup>3</sup> or Change in Material	
Compacted Liner Base Layers (Field Testing)	Field Density (nuclear, sand cone, drive cylinder) <sup>(4)</sup>	ASTM D 6938 or ASTM D 1556 or ASTM D 2937	1/10,000 ft <sup>2</sup> /lift or 1/lift/800 L.F. of Sidewall	≥95% of Maximum Dry Density as Determined by Standard Proctor or as identified by permeability test results
	Atterberg Limits	ASTM D 4318	1/40,000 ft <sup>2</sup> /lift	

Item	Testing	Method	Frequency	Acceptance Criteria
			or 1/lift/800 L.F. of Sidewall	
Compacted Liner Base Material (Undisturbed Sample) <sup>1</sup>	Moisture Content	ASTM D 2216	1/40,000 ft <sup>2</sup> /lift or 1/lift/800 L.F. of Sidewall	See Text
	Permeability	ASTM D 5084	1/40,000 ft <sup>2</sup> /lift or 1/lift/800 L.F. of Sidewall	Liner Base: $k \leq 1 \times 10^{-7}$ cm/sec sec or $k \leq 1 \times 10^{-5}$ cm/sec (as applicable)
Compacted Liner Base Layers Material (Undisturbed Sample)	Dry Density	ASTM D 6938	1/40,000 ft <sup>2</sup> /lift or 1/lift/800 L.F. of Sidewall	≥95% of Maximum Dry Density as Determined by Standard Proctor or as identified by permeability test results
	Atterberg Limits	ASTM D 4318	1/40,000 ft <sup>2</sup> /lift or 1/lift/800 L.F. of Sidewall	
Leachate Collection Gravel	Particle Size	ASTM C 136	1/1,500 yd <sup>3</sup>	See Text
	Permeability	ASTM D 2434	1/3,000 yd <sup>3</sup>	
	Calcium Carbonate	ASTM D 3042	1 per Source	< 5 percent
Leachate Collection Blanket <sup>1</sup>	Particle Size	ASTM C 136	1/1,500 yd <sup>3</sup>	≤1/2-inch
	Permeability	ASTM D 2434	1/3,000 yd <sup>3</sup>	≥ $1 \times 10^{-3}$ cm/sec Or ≥ $1 \times 10^{-1}$ cm/sec
	Calcium Carbonate	ASTM D 3042	1 per Source	< 5 percent

<sup>(1)</sup>If nuclear method (ASTM D 6938/D 3017) is used for field density/moisture, every 25<sup>th</sup> density test and every 5<sup>th</sup> moisture test must be checked using an alternate method.

END OF SECTION

## Part 1 General

### 1.01 Scope

- A. Furnish and install stormwater diversion cover where shown on the Drawings. All work shall be performed in strict accordance with the Drawings, Specifications, the Owner's Construction Quality Assurance (CQA) Plan, and the methods approved by the cover fabricator.
- B. Sufficient temporary cover material shall be furnished to cover all areas as shown on the Drawings, including overlaps at field seams..
- C. It is the intent of these Specifications to ensure a quality finished product. It shall be the responsibility of the Contractor to ensure that these requirements are met.

### 1.02 Submittals

- A. The temporary cover manufacturers shall submit certification that all sheets manufactured for the Project have been produced in accordance with these Specifications and that the manufacturer's specifications have been met. This information must be submitted for review prior to material delivery. The Engineer reserves the right to halt installation until proper certification is submitted and determined acceptable for use.
- B. The Contractor shall submit to the Engineer a physical sample of the temporary cover used. The sample shall be labeled with the manufacturer's name, product identification, lot number and roll number.
- C. The Contractor shall also submit to the Engineer inventory tickets, roll numbers or batch identifications, packing papers and invoices for the diversion cover used.
- D. A minimum of one field superintendent per shift shall be designated by the Contractor and approved by the Engineer.

### 1.03 Handling and Storage

- A. The diversion cover shall be shipped in accordance with the manufacturer's recommendations. The diversion cover shall be marked and tagged with the following information:
  - 1. Manufacturer's name
  - 2. Product identification
  - 3. Lot number or batch number

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Temporary Stormwater Cover<sup>1</sup>

- 4. Roll number
- 5. Roll dimensions
  
- B. The diversion cover which has been delivered to the Project site shall be stored in accordance with the manufacturer's written recommendations.
  
- C. Care shall be taken to keep the materials clean and free from debris prior to installation.
  
- D. Any material not properly stored on the Project site shall be rejected by the Engineer.

## Part 2 Products

### 2.01 Temporary Stormwater Diversion Cover

The stormwater diversion cover shall be a minimum of 20 mils thick, woven coated polyethylene as manufactured by Colorado Lining, Owens Corning or approved equal.<sup>1</sup>

### 2.02 Temporary Stormwater Diversion Cover Ballast

- A. The temporary stormwater diversion shall be provided with sand bag ballast installed on an 50 ft by 50 ft grid over all exposed diversion cover areas. An alternate ballast system may be selected by the Owner. The alternate shall be Wind Defender HD as manufactured by Wind Defender, LLC.

## Part 3 Execution

### 3.01 Installation

- A. The Contractor is responsible for maintenance and repair of the temporary stormwater diversion cover, ballast and leachate collection blanket until the Project is completed.
  
- B. The cover shall be weighted with tied together sandbags weighing approximately 30 pounds or other approved materials as recommended by the manufacturer. The materials used to weight the cover shall be anchored at the top of the slope to prevent slippage of the cover downslope. The Contractor shall provide necessary sand bags. If sandbags are used, sandbags shall be constructed of materials having ultraviolet resistance equal to or exceeding that of the cover, but not less than one year. Alternate ballast, if selected by Owner, shall be installed in accordance with the manufacturers recommendations.<sup>1</sup>
  
- C. Adjacent panels shall be overlapped a minimum of 6-inches. The upgradient panel

edge should overlap above the adjacent downgradient panels.

- D. The cover shall be placed over smooth graded leachate collection sand blanket after the sand has been accepted by the Owner. The cover shall extend up the sideslopes to cover all of the sand.
- E. The cover is required to be anchored as shown on the Drawings without damaging the geosynthetic materials used in the liner system.

### 3.02 Field Seaming

- A. Adjoining runs of stormwater diversion cover shall be laid with 6-inch minimum overlap.
- B. The seams shall be continuously connected by sewing or by a method recommended by the manufacturer.
- C. If seams are sewn, thread shall be of polymeric material having a similar chemical resistance to the temporary stormwater diversion cover and having an ultraviolet resistance equal to or exceeding that of the temporary stormwater diversion cover.

### 3.03 Repair of Damaged and Sampled Areas

Any holes or tears in the stormwater diversion cover shall be repaired by patching with the same material. The patch shall have a minimum overlap of 12-inches on all edges and be continuously bonded by sewing in accordance with Article 3.02, Paragraph C above, or by a method recommended by the manufacturer.

### 3.04 Acceptance<sup>1</sup>

- A. The diversion cover shall be accepted by the Owner when:
  - 1. The installation is complete as determined by the Engineer.
  - 2. Verification of the adequacy of all seams and repairs is complete.
  - 3. All documentation of installation is completed, including all reports.
  - 4. The Contractor provides written certification that the installation was in accordance with the manufacturer's general recommendations, the CQA Plan, and these Specifications, except as noted.

END OF SECTION

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## Part 1 General

### 1.01 Scope

- A. This Section includes the work required to furnish and install polyethylene geomembrane lining system where shown on the Drawings. All work shall be performed in strict accordance with the Drawings, Specifications, the Owner's Construction Quality Assurance (CQA) Plan, and the methods approved by the geomembrane manufacturer.
- B. Sufficient geomembrane material shall be provided to cover all areas as shown on the Drawings, including overlaps at seams and anchor trenches.
- C. It shall be the responsibility of the Contractor to ensure that the geomembrane is installed without any known defect and in intimate contact with the underlying liner base.

### 1.02 Applicable Publications and Standards

American Society for Testing and Materials (ASTM Publications)

ASTM D 792	Standard Test Method for Density and Specific Gravity of Plastics by Displacement
ASTM D 1004	Standard Test Method for Tear Resistance of Plastic Film and Sheeting
ASTM D 1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 3895	Standard Test Method for Oxidative Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by Muffle-Furnace Technique
ASTM D 4437	Standard Practice for Non-Destructive Testing for Determining the Integrity for Seams Used in Joining Flexible Polymeric Sheet Geomembranes
ASTM D 4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

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**Geomembranes**

ASTM D 5721	Standard Practice Air-Oven Aging of Polyolefin Geomembranes
ASTM D 5820	Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes
ASTM D 5885	Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry
ASTM D 5994	Standard Test Method for Measuring Core Thickness of Textured Geomembranes
ASTM D 7466	Standard Test Method for Measuring the Asperity Height of Textured Geomembranes

**Geosynthetic Research Institute (GRI Standards)**

GRI-GM13	Standard Specification for Test Methods, Testing Properties and Testing Frequency for HDPE Smooth and Textured Geomembranes
GRI-GM19	Standard Specification for Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

**1.03 Submittals****A. Initial Submittal Data**

1. Contractor shall submit product data for the geomembrane product proposed for use on this project. The product data shall include information from the manufacturer on product characteristics including certification that the liner meets the requirements of Tables 1 and 2 of this Section.
2. Contractor shall submit information on the proposed geomembrane installer including experience and confirmation that they are approved by the manufacturer.

**B. Manufacturers Quality Certification Data**

Once the initial submittal data has been reviewed and determined acceptable by the Engineer, the Contractor shall submit the following:

1. A statement identifying the resin supplier, resin properties, resin production plant, resin brand name, and resin production date. Resin properties must meet the requirements of Table 1. The resin material shall be virgin material

with no more than 10 percent rework. No post consumer resin of any type shall be added to the formulation.

2. The Contractor shall submit manufacturer roll numbers, roll dimension data and resin batch identifications for the geomembrane that is scheduled for use on this project.
  3. Contractor shall utilize the services of a testing laboratory approved by the Engineer to perform the MQC tests at the frequency outlined in Table 2 of this Section. MQC certificates for each roll reporting the test results shall be submitted to the Engineer prior to conformance testing.
- C. Contractors Quality Conformance Data: Once the MQC submittal data has been reviewed and determined acceptable by the Engineer, the Engineer will obtain samples of geomembrane materials prior to installation. These samples, at least one per 100,000 square feet of each material, will be submitted for conformance testing at a laboratory selected by, and paid by, the Owner. Geomembrane conformance tests shall be those listed in Table 2, with the exception of Stress Crack, OIT, Oven Aging, UV Resistance, and Asperity Height. In the event of discrepancies between test results by the Contractor's and the Owner's laboratories, the Owner's laboratory results shall take precedence.
- D. Shop Drawings and Other Submittal Data
1. Panel Layout Drawings: The Contractor shall submit to the Engineer panel layout construction drawings. Field welds and panels shall have an appropriate identification system. The manufacturer of the geomembrane used in this work shall approve all shop drawings and the proposed panel layout to cover the area shown on the Drawings.
  2. Material Inventory: The Contractor shall also submit to the Engineer inventory tickets, roll numbers or batch identifications, packing papers and invoices for the geomembrane as it arrives at the site.
  3. The Contractor shall provide personnel resumes demonstrating compliance with the following requirements:
    - a. A minimum of one field superintendent per shift shall be designated by the Contractor and approved by the Engineer. Each field superintendent shall have a minimum of three years and five million square feet of field experience in installing the type geomembrane to be installed on this project. Any change or replacement of superintendent during the Project must be approved by the Engineer.
    - b. The weld technicians shall have a minimum of one year and one million square feet welding experience on the type geomembrane to be installed on this

project.

- c. Personnel names must be logged daily to correlate field seaming log records with appropriate approved technicians and superintendents.

## Part 2 Products

### 2.01 HDPE Geomembrane Liner

- A. The geomembrane shall be HDPE material manufactured of new, first-quality products designed and manufactured for the purpose of containment of municipal solid waste landfills.
- B. The geomembrane shall be so produced as to be free of holes, blisters, undisbursed raw materials or any sign of contamination by foreign matter. Any such defects shall be repaired in accordance with the manufacturer's recommendations. The Engineer may reject all or portions of units (or rolls) of liner if significant quantities of production flaws are observed.
- C. The geomembrane rolls shall meet the material properties as specified in Table 2. Only the rolls as certified under the MQC/ CQC process detailed in Part 1 shall be approved for use on this project.

### 2.02 Shipment and Storage

- A. The geomembrane shall be shipped in accordance with the manufacturer's recommendations. Folded or otherwise creased liner will not be accepted. Each geomembrane roll shall be marked and tagged with the following information:
  - 1. Manufacturer's name and date manufactured
  - 2. Product identification
  - 3. Lot number or batch number
  - 4. Roll number
  - 5. Roll dimensions and weight
  - 6. Manufacturer's Inspector
- B. Geomembrane which have been delivered to the Project site shall be stored in accordance with the manufacturer's written recommendations.
- C. Care shall be taken to keep the materials clean and free from debris prior to installation.
- D. Any geomembrane not properly stored on the Project site may be rejected by the Engineer.

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## Part 3 Execution

### 3.01 Pre-construction Conference

A geomembrane pre-construction conference will be held prior to installation of the geomembrane. The Contractor, geomembrane installer, Engineer and the Owner shall be in attendance. The testing of welds, characteristics of “good” welds, and repair procedures will be discussed and agreed upon at the pre-construction conference. General installation and quality control procedures, installation details, and lines of communication will also be discussed.

### 3.02 Liner Base Preparation

- A. Geomembrane installation shall not begin until the liner base has been prepared in accordance with Section 02200 of these Specifications. No rubber tired vehicles, except small recreational all terrain vehicles (ATV) approved by the Engineer, are permitted on final dressed surfaces unless otherwise authorized by the Engineer.
- B. The surface on which the geomembrane is to be placed shall be maintained in a firm, clean, dry and smooth condition during liner installation. The geomembrane installer shall certify in writing that the surface on which the geomembrane is to be installed is acceptable before commencing work. This certification of acceptance shall be given to the Engineer prior to commencement of installation in the area under consideration.

### 3.03 Installation

- A. Geomembrane liner shall be installed in accordance with the manufacturer's recommendations and the requirements of these Specifications in the areas shown on the Drawings.
- B. No horizontal seams are allowed on a slope or within five feet of the crest or toe of the slope. A “slope” for the purpose of this requirement is defined as any area with a slope greater than 10 percent.
- C. Unroll only those factory-packaged sections which are to be anchored or seamed together in one day. Panels should be positioned with the overlap recommended by the manufacturer, but not less than 3-inches.
- D. After panels are initially in place, remove as many wrinkles as possible. Unroll several panels and allow the geomembrane to “relax” before beginning field seaming. The purpose of this is to make the edges which are to be bonded as smooth and free of wrinkles as possible. Wrinkles high enough, in the opinion of the Engineer, to fold over when covered shall be repaired to the satisfaction of the Engineer.

- E. Once panels are in-place and smooth, commence field seaming operations. Sandbags or other temporary weights shall be used as necessary to secure the geomembrane until construction, including leachate collection layer, is complete.
- F. No support equipment used by any contractor shall be allowed on the geomembrane. Personnel working on the geomembrane shall not smoke, wear damaging shoes or engage in any activity which damages the geomembrane.
- G. Damaged and sample coupon areas of geomembrane shall be repaired by the Contractor. Repaired areas will be tested for seam integrity by the Contractor. Damaged materials are the property of the Contractor and will be removed from the site at the Contractor's expense.
- H. The Contractor shall direct surface water away from the geomembrane edges, openings, and incomplete seams. Any water flow under the geomembrane shall be removed and the liner base repaired.
- I. The liner shall be kept clean until placement of the protective cover. Any ponded water or sediment shall be completely removed by the Contractor.

### 3.04 Field Seaming

#### A. General

1. All foreign matter (dirt, water, oil, etc.) shall be removed from the area to be seamed. If the seam is to be bonded by the extrusion process, the bonding surfaces must be thoroughly cleaned by mechanical abrasion as recommended by the manufacturer to remove surface cure and prepare the surfaces for bonding. No solvents shall be used to clean the geomembrane.
2. In general, field seaming should work toward an open liner end in order to minimize cutting and patching of large wrinkles that become trapped. Seams shall be located in substantial accordance to the pre-construction panel layout drawing. When seaming the side slopes, seaming shall start at the crest of the slope and work down the slope. Tack welds, if used, shall use heat only; no double-sided tape, glue or other method will be permitted. The geomembrane shall be seamed completely to the ends of all panels to minimize the potential of tear propagation along the seam. Seaming of the bottom geomembrane to the sidewall geomembrane shall be conducted when conditions minimize thermal expansion effects. The completed geomembrane shall not exhibit "trampolining" or "bridging" and shall be in full contact with the underlying liner base.
3. At the end of each day or installation segment, the geomembrane, including unseamed edges and unpatched openings, shall be anchored and secured

against damage by wind, rain or other effects of weather. All unseamed edges shall be anchored by sand bags or other approved devices as necessary. Sand bags securing the geomembrane on the side slopes should, if necessary, be connected, by a rope fastened at the top of the slope by a temporary anchor. Staples, U-shaped rods or other penetrating anchors shall not be used to secure the geomembrane. The methodology and execution of temporary anchoring and protection of the geomembrane is fully the responsibility of the Contractor. Any material or liner base damaged as the result of weather effects shall be repaired or replaced at no cost to the Owner.

4. The Contractor shall keep surface water runoff from beneath the geomembrane at all times during construction. The Contractor's panel placement and seam welding technique and welding schedule shall minimize or eliminate the accumulation of water beneath the geomembrane. Any water found ponded beneath the geomembrane after the geomembrane has been installed shall be removed by the Contractor. Any liner base beneath installed geomembrane that, in the opinion of the CQA Engineer, has become excessively moist, soft or unsuitable to perform its intended function shall be replaced at no cost to the Owner.
5. After field seaming is complete in a given area, geomembrane edges in the anchor trench should be buried. Do not bury the geomembrane edge in the anchor trench within 30 feet of an incomplete or unbonded field seam. Final backfilling of anchor trench shall be coordinated with leachate collection layer placement.

#### B. Methods

1. Field seaming may be accomplished through extrusion or fusion welding or a combination of these methods. Solvent welding is not acceptable. The Engineer reserves the right to reject any proposed seaming method believed unacceptable.
2. Extrusion welding shall apply a molten bead of HDPE extrudate to preheated sheets of geomembrane. The molten bead shall cause the surfaces of the geomembrane to melt, after which the entire mass cools and bonds together.
3. The fusion welding process shall heat the area to be joined to the melting point and then shall apply pressure to join the melted surfaces.
4. The sheets to be joined shall be overlapped at least 3-inches for extrusion welding and at least 4-inches for fusion welding after the necessary aligning and cutting.

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**Geomembranes**

5. In general, seams shall be oriented parallel to the line of maximum slope, i.e., oriented up and down, not across, the slope. Where seams are oriented across a slope, the upgradient panel shall overlap the downgradient panel unless otherwise approved by the Engineer. In corners and odd shaped geometric locations, the number of field seams should be minimized.
6. No horizontal seams shall be located on a slope or within five feet of the toe or crest of the slope.
7. The panel layout within the leachate sump area shall be adjusted to require the minimum number of seams. If possible, the entire floor area of the sump shall be one continuous sheet with no seams.
8. No seaming shall be attempted above 40°C (104 °F) ambient air temperature. Below 5 °C (41 °F) ambient air temperature, preheating of the geomembrane may be required. It shall be the responsibility of the Contractor to demonstrate that conditions are favorable for seaming by acceptable test seams which duplicate, as closely as possible, actual field conditions. Preheating may be achieved by natural and/or artificial means (shelters and heating devices).
9. A moveable protective layer of plastic may be placed directly below each overlap of geomembrane that is to be seamed. This is to prevent any moisture build-up between the sheets to be welded. No material may be left between the geomembrane and the liner base material.
10. Seaming shall extend to the outside edge of panels to be placed in anchor trenches.
11. A firm substrata may be provided by using a flat board, a conveyor belt, or similar hard surface directly under the seam overlap to achieve proper support for seaming devices. No material may be left between the geomembrane and the liner base material.
12. Grinding prior to welding shall be performed as recommended by the geomembrane manufacturer and shall be done perpendicular to the sheet edge. Overground or improperly ground areas shall be replaced at the Contractor's expense.
13. No folds, wrinkles or "fish-mouths" shall be allowed within the seam area. Where wrinkles or folds occur, the material shall be cut, overlapped and an extrusion-weld shall be applied. During wrinkle or fold repairs, adjacent geomembrane may not necessarily be required to meet the minimum overlap, if approved by the Engineer. All welds on completion of the work shall be tightly bonded and sealed.

### 3.05 Inspection and Testing of HDPE Geomembrane Seams

- A. General: A quality control technician, employed by the Engineer, shall inspect each sheet and seam. Any area showing a defect shall be marked and repaired in accordance with repair procedures as specified in Article 3.06 of this Section.
- B. Test Seams by Contractor: Test seams shall be made on fragment pieces of geomembrane to verify that seaming conditions are adequate. Such test seams will be made prior to field seaming at the beginning of each seaming period and at least twice per day, for each seaming apparatus used that day. Also, each seaming technician will make at least one test seam each day worked.
  - 1. The test seam sample shall be at least 5 feet long by 1 foot wide with the seam centered lengthwise. Six adjoining specimens 1-inch wide each shall be die cut from the test seam sample. These specimens, which shall be tested with a tensiometer in the field for shear (three samples) and peel (three samples) by the Contractor and witnessed by the Engineer, shall not fail. If a test seam sample fails in either shear or peel, the entire operation will be repeated. If the additional test seam fails, the seaming apparatus and seamer shall be rejected and shall not be used for seaming until the deficiencies are corrected and two consecutive successful full test seams are achieved. Test seam failure is defined as failure of any one of the specimens tested in shear or peel.
  - 2. The Engineer will observe all test seam procedures. The remainder of the successful test seam sample will be assigned a number and marked accordingly by the Engineer. The Engineer will also log the date, hour, ambient temperature, number of seaming unit, name of seamer and pass or fail description. At least one tested specimen from each test as selected by the Engineer will be retained by the Engineer.
  - 3. The criteria for determining a passing test seam is described in Article 3.05, Paragraph C.4.f. No field measurements for strain will be required.
- C. Field Seams
  - 1. General: Both fusion and extrusion field seams shall be tested by the Contractor over their entire length using non-destructive techniques and at specified intervals using destructive tests. The Contractor shall perform all pressure and vacuum testing under the observation of the Engineer.
  - 2. Non-Destructive Testing by Contractor
    - a. Single Weld Seams: The Contractor shall maintain and use equipment and personnel at the site to perform continuous vacuum box testing on all single weld field seams in accordance with ASTM D 4437 and ASTM

D 5641. The system shall be capable of applying a vacuum of at least 5 psi. The vacuum of approximately 5 psi shall be held for a minimum of 15 seconds for each section of seam. If no bubbles appear after 15 seconds, the vacuum box shall be moved over the next adjoining area with a minimum 3-inch overlap. This process shall be repeated until the seam is completely tested. All areas where soap bubbles appear shall be marked and repaired.

- b. Double Weld Seams: The Contractor shall maintain and use equipment and personnel to perform air pressure testing of all double weld seams. The system shall be capable of applying a pressure of at least 30 psi for not less than five minutes. Pressure loss tests shall be conducted in accordance with the procedures outlined in ASTM D 5820. Following a two minute pressurized stabilization period, pressure losses over a measurement period of five minutes shall not exceed 4 psi. If the channel maintains pressure as required, the opposite end of the channel should be cut to confirm the length of seam that has passed the test. Should the pressure not stabilize or the loss of pressure be more than allowed, the Contractor should locate the faulty area and repair the seam. All repaired areas should be re-tested.
3. Destructive Testing by the Contractor
    - a. The Contractor shall obtain seam samples from locations selected by the Engineer. The Contractor shall complete field destructive tests on a portion of each sample. If the Contractor's test indicates that the seam meets this specification, the Engineer shall conduct a laboratory destructive test.
    - b. Laboratory destructive testing by the Contractor is not required, but may be performed at the Contractor's option.
    - c. The Engineer shall observe all seam field test procedures. The remainder of the successful seam sample will be assigned a number and marked accordingly by the Engineer, who will also log the date, seam number, approximate location in the seam, and field test pass-or-fail description, if applicable. The Engineer shall be responsible for the archive specimen.
  4. Destructive Testing by Engineer
    - a. Destructive testing will be performed on an average of every 500 linear feet of field seam, or more frequently if deemed necessary by the Engineer. A field seam weld is defined as an extrusion or fusion weld that permanently bonds two pieces of geomembrane material. Rain flaps are considered temporary and are not counted for purposes of this

requirement. The locations will be selected by the Engineer. Sufficient size samples will be obtained by the Contractor to provide one sample to the Owner's archive, one sample to the Engineer for laboratory testing, and one or two samples to be retained by the Contractor for field testing and, at the Contractor's option, laboratory testing.

- b. Testing requirements are as follows: Each sample shall be large enough to test five specimens in peel and five specimens in shear, except that five peel specimens are required for each track of a double track fusion seam. Test results will be compared to the criteria in Article 3.05, Paragraph C.4.f. Four of the five specimen test results must meet the criteria in Article 3.05, Paragraphs C.4.f.ii. for the seam to be considered a passing seam. If the average of the five specimens is adequate, but one of the specimens is below the specified minimum average, values for this one specimen must be at least 80 percent of the specified minimum average value required for the seam. All samples should fail in film tear bond.
- c. If unresolved discrepancies exist between the Engineer's and Contractor's test results, the archived sample may be tested by the Engineer. The Engineer's test results shall take precedence in any discrepancy.
- d. Samples which do not pass either the shear or peel tests will be re-sampled from locations at least 10 feet on each side of the original location. These two re-test samples must pass both shear and peel testing. If these two samples do not pass, then additional samples will be obtained at 10 foot intervals until the questionable seam area is defined.
- e. Tests shall be conducted in peel and shear using a tensiometer. No strain measurements from field tests of seams will be required.
- f. The criteria for determining a passing welded seam shall be:
  - i. Failure is by Film Tear Bond (FTB), and
  - ii. Shear strength, shear elongation at break, peel strength and peel separation for the seam is in accordance with Table 1(a) of GRI-GM19.

### 3.06 Repair of Damaged and Sampled Areas

- A. Seam and non-seam areas of the geomembrane will be evaluated by the Contractor and the Engineer for identification of defects, holes, blisters, undispersed raw materials, and signs of contamination by foreign matter.

- B. Each suspect location, both in seam and non-seam areas, will be non-destructively tested. Each location, which fails the non-destructive testing, will be marked and repaired by the Contractor.
- C. Repair procedures will vary depending on the type damage found but shall be in general accordance with the following:
  - 1. Defective seams will be repaired by cap-strip reconstruction.
  - 2. Small tears or holes will be repaired by patching.
  - 3. Pinholes will be repaired by patching.
  - 4. Blisters, larger holes, undispersed raw materials, and contamination by foreign matter will be repaired by patching.
  - 5. All panel intersections of three or more panels will be covered by a patch.
  - 6. Patches shall be geomembrane round or oval in shape and extend a minimum of six inches beyond all edges of the defect. Patches will be applied using the approved method as required in these specifications.
  - 7. All seams made in repairing defects will be subjected to the same non-destructive test procedures as outlined for all other seams. Additionally, repair seaming is subject to the same destructive testing frequency as a panel or production seam.
- D. Seam sections which need repair due to failing destructive test results, overheating, and burn holes shall be reconstructed by cap-stripping with geomembrane. Cap-stripping involves applying a strip of geomembrane, a minimum distance of six inches on all sides of the defective seams, and seaming it to the sheet material by extrusion welding.

### 3.07 Acceptance

- A. Geomembrane Lining System Acceptance: The Contractor shall retain ownership and responsibility for the geomembrane lining system until acceptance by the Owner and Georgia EPD.
- B. Acceptance of the geomembrane lining system shall be based on, but not limited to:
  - 1. The installation being complete as determined by the Engineer;
  - 2. Verification of the adequacy of all seams and repairs, including associated testing, is complete;

3. All documentation of installation is completed, including all reports;
4. The Contractor provides the Owner with record drawings of the panel layout and seam locations with reference numbers for test locations.
5. The Contractor provides written certification that the installation was in accordance with the manufacturer's recommendations, the CQA Plan and these Specifications.
6. All test results and documentation has been reviewed, accepted and approved by the Georgia EPD.

TABLE 1  
HDPE RESIN PROPERTIES

Resin Requirements	Method	Units	Smooth 30-120 mil	Textured 30-120 mil
Melt Index	ASTM D1238	g/10 min	< 1.0	< 1.0
Density	ASTM D1505 or ASTM D792, Method B	g/cm <sup>3</sup>	> .932	> .932

1. The resin manufacturer shall test each batch of resin (200,000 pounds) as specified above.
2. The geomembrane manufacturer shall independently test the Melt Index and Density of each batch of resin received.

TABLE 2  
HDPE GEOMEMBRANE PROPERTY REQUIREMENTS

Test Description	Method	Units	Textured 60 mil	QC Test Frequency
Thickness, minimum	ASTM D5994	mils	60	1 per roll
Asperity Height <sup>(1)</sup> , minimum average	ASTM D7466	mils	16 <sup>1</sup>	Every 2 <sup>nd</sup> roll <sup>(2)</sup>
Density, minimum average	ASTM D1505 or ASTM D792, Method B	g/cc	0.940	180,000 lb
Tensile <sup>(3)</sup> , minimum average	ASTM D6693, Type IV			
Yield		lb/in	126	20,000 lb
Break		lb/in	90	
Elongation @ Yield		%	12	
Elongation @ Break		%	100	
Tear Resistance, minimum average	ASTM D1004	lb	42	50,000 sf
Puncture Resistance, minimum average	ASTM D4833	lb	90	40,000 sf
Stress Crack Resistance <sup>(4)</sup>	ASTM D5397	hrs	300	180,000 lb
Carbon Black Content (range)	ASTM D4218 <sup>(5)</sup>	%	2-3	40,000 sf
Carbon Black Dispersion	ASTM D5596		Note 6	40,000 sf
OIT, minimum average				
a) standard <b>or</b>	ASTM D3895	min	100	200,000 lb
b) high pressure	ASTM D5885	min	400	200,000 lb
Oven Aging at 85 °C <sup>(7)</sup>	ASTM D5721			
a) standard <b>or</b>	ASTM D3895	%	55	Per Formulation
b) high pressure	ASTM D5885	%	80	Per Formulation
UV Resistance (high pressure) <sup>(8)</sup> , minimum average - % retained after 1600 hrs	ASTM 5885	%	50	Per Formulation

- (1) Of 10 readings; 8 out of 10 must be  $\geq 7$  mils, and lowest individual reading must be  $\geq 5$  mils; also see note 5.
- (2) Alternate the measurement side for double sided textured sheets
- (3) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction. Yield elongation is calculated using a gauge length of 1.3 inches; Break elongation is calculated using a gauge length of 2.0 inches.
- (4) P-NCTL test is not appropriate for testing textured liners. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheets. The yield stress used to calculate the applied load for the SP-NCTL test should be the mean value via MQC testing.
- (5) Other methods such as ASTM D 1603 or D 6370 are acceptable if an appropriate correlation to ASTM D 4833 can be established.
- (6) Carbon black dispersion for 10 different views: 9 in Categories 1 and 2 with one allowed in category 3.
- (7) Minimum Average – percent retained after 90 days
- (8) UV resistance is based on percent retained value regardless of the original HP-OIT value.

END OF SECTION

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## Part 1 General

### 1.01 Scope

- A. This Section includes the work required to furnish and install non-woven geotextile where shown within the landfill cell as indicated on the Drawings. All work shall be performed in strict accordance with the Drawings, Specifications, the Owner's Construction Quality Assurance (CQA) Plan, and the methods approved by the geotextile manufacturer.
- B. Sufficient geotextile material shall be provided to cover all areas as shown on the Drawings, including overlaps and anchor trenches.

### 1.02 Applicable Publications and Standards

American Society for Testing and Materials (ASTM Publications)

ASTM D 4354	Practice for Sampling Geosynthetics for Testing
ASTM D 4355	Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus
ASTM D 4491	Standard Test Method for Water Permeability of Geotextiles by Permittivity
ASTM D 4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile
ASTM D 5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles
ASTM D 6241	Standard Test Method for the Static Puncture Strength of Geotextiles Using a 50-mm Probe

## Geosynthetic Research Institute (GRI Standards)

- |             |   |
|-------------|---|
| GRI-GT12(a) | Standard Specification for Test Methods and Properties for for Nonwoven Geotextiles used as Protection (or Cushioning) Materials  |
| GRI-GT13(a) | Standard Specification for Test Methods and Properties for for Geotextiles Used as Separation between Subgrade Soil and Aggregate |

### 1.03 Submittals

- A. Initial Submittal Data: Contractor shall submit product data for the geotextile product proposed for use on this project. The product data shall include information from the manufacturer on product characteristics including certification that the material meets the requirements of Tables 1 or 2 of this Section.
- B. Manufacturers Quality Certification Data: Once the initial submittal data has been reviewed and determined acceptable by the Engineer, the Contractor shall submit the following:
1. The Contractor shall submit manufacturer roll numbers, roll dimension data and product lot number for the geotextile that is scheduled for use on this project.
  2. Contractor shall utilize the services of a testing laboratory approved by the Engineer to perform the MQC tests at the frequency of at least one per 100,000 square feet of each material. MQC certificates for each roll reporting the test results shall be submitted to the Engineer prior to conformance testing.
  3. MQC tests shall include at least all of the tests as referenced in Table 1 or 2 of this section. If both cushion and filtration geotextiles are to be installed on this project, then both tables will be applicable.
- C. Contractors Quality Conformance Data: Once the MQC submittal data has been reviewed and determined acceptable by the Engineer, the Engineer will obtain samples of geotextile materials prior to installation. These samples, at least one per 100,000 square feet of each material, will be submitted for conformance testing at a laboratory selected by, and paid by, the Owner. Geotextile conformance tests shall be as follows.
1. Mass per unit area;
  2. Grab tensile strength;

3. Puncture resistance;
4. Apparent opening size (filter applications only).

Test results shall meet the requirements listed in Tables 1 or 2. In the event of discrepancies between test results by the Contractor's and the Owner's laboratories, the Owner's laboratory results shall take precedence.

- D. Material Inventory: The Contractor shall also submit to the Engineer inventory tickets, roll numbers or batch identifications, packing papers and invoices for the geotextile as it arrives at the site.

### 1.03 Handling and Storage

- A. The geotextile shall be shipped in accordance with the manufacturer's recommendations. The geotextile shall be supplied in rolls wrapped in protective covers and marked or tagged with the following information:
  1. Manufacturer's name and date manufactured;
  2. Product identification;
  3. Lot number or batch number;
  4. Roll number;
  5. Roll dimensions.
- B. Geotextile which has been delivered to the Project site shall be stored in accordance with the manufacturer's written recommendations.
- C. During shipment and storage, care shall be taken to keep the geotextile materials protected from ultraviolet light exposure, precipitation, dirt, mud, dust and damage prior to installation.
- D. Any geotextile not properly stored on the Project site may be rejected by the Engineer and must be replaced by the Contractor, at no cost to the Owner.

## Part 2 Products

### 2.01 Geotextile

- A. Geotextile shall be a non-woven product meeting the properties listed in Table 1 for filtration applications and Table 2 for cushion applications.

Geotextiles

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- B. The geotextile shall be made from polypropylene.
- C. Geotextile rolls shall be fifteen feet wide (nominal). Cutting of rolls, if approved by the Engineer, shall be cut by the manufacturer and not field cut.

## Part 3 Execution

### 3.01 Installation

- A. Geotextile panels shall be handled and placed in such a manner as to ensure that they are not damaged and that the deployment process does not damage any underlying layers.
- B. Geotextile materials shall be weighted with sandbags as appropriate to protect unrolled materials from wind damage.
- C. Personnel working on the geotextile shall not smoke, wear damaging shoes, or engage in other activities which could damage the material. Any such damage to the geotextile or other geosynthetic layers resulting from such activities shall be repaired by and at the expense of the Contractor.
- D. Geotextile panels shall be deployed in such a manner as to minimize wrinkles and folds.
- E. Geotextile panels on slopes greater than 10 percent shall extend from the anchor trench to a minimum of five feet beyond the toe of slope without cross seams.
- F. Minimize slippage of the geotextile and assure that no tensile stress is induced in the material.
- G. Geotextile shall be cut using only a geotextile cutter approved by the geotextile Manufacturer and the Engineer. Special care shall be taken to protect other geosynthetic materials (if any) from damage which could be caused by the cutting of the geotextile.
- H. After installation, an examination of the geotextile over the entire surface shall be conducted to ensure that no potentially harmful foreign objects, such as needles, are present. Any foreign objects so encountered shall be removed by the Contractor, or the geotextile shall be replaced.

### 3.02 Field Seaming

- A. Geotextiles may be seamed by overlapping six inches and bonding thermally on a continuous basis or by sewing. Only continuous sewing shall be allowed on slopes steeper than 10 percent.

- B. If seams are sewn, thread shall be of polymeric material having similar chemical resistance to the geotextile. If the geotextile is to be exposed for more than 30 days, the thread shall have ultraviolet resistance equal to or exceeding that of the geotextile.
- C. Thermal bonding of geotextile shall be in accordance with the manufacturer's written requirements. No thermal bonding shall be performed in areas where potentially explosive conditions exist (near areas of an active landfill cell).
- D. The Contractor shall take measures to prevent soil, granular materials, or foreign materials from entering or becoming trapped beneath the geotextile during placement and seaming operations.

### 3.03 Repair

Any holes or tears in the geotextile shall be repaired by patching with the same geotextile material. The patch shall be a minimum of 12-inches larger in all directions than the area to be repaired and shall be continuously sewn or thermally bonded.

### 3.04 Placement of Materials on top of Geotextile

- A. The Contractor shall place materials on the geotextile in such a manner as to ensure that:
  - 1. The geotextile and underlying lining materials are not damaged;
  - 2. Minimal slippage of the geotextile on the underlying layers occurs;
  - 3. No excess tensile stresses occur in the geotextile.

### 3.05 Acceptance

- A. The Contractor shall retain ownership and responsibility for the geotextile until acceptance by the Owner and the Georgia EPD.
- B. Acceptance of the geotextile shall be based on, but not limited to the following:
  - 1. The installation is complete as determined by the Engineer;
  - 2. All documentation of installation is completed, including all reports;
  - 3. The Contractor provides written certification that the installation was in accordance with the manufacturer's general recommendations and these Specifications, except as noted;

4. All test results and documentation have been reviewed, accepted, and approved by the Georgia EPD.

TABLE 1  
MINIMUM STANDARDS FOR NON-WOVEN GEOTEXTILE MATERIALS  
FILTRATION APPLICATION

Property	ASTM Test Method	Units	Values
			10 oz.
Apparent Opening Size	D 4751	mm	0.3
Permittivity	D 4491	sec <sup>-1</sup>	0.02
Mass per Unit Area	D 5261	oz/yd <sup>2</sup>	10
Trapezoidal Tear Strength	D 4533	Lbs	95
Grab Tensile Strength	D 4632	Lbs	270
CBR Puncture Strength	D 6241	lbs	320
Ultraviolet Stability <sup>(2)</sup>	D 4355	% retained	70

- (1) All values are MARV except AOS which is a maximum average roll value (MaxARV) and UV resistance; it is a minimum value  
(2) Evaluation to be on 2.0 inch strip tensile specimens after 500 hours exposure.

TABLE 2  
MINIMUM STANDARDS FOR NON-WOVEN GEOTEXTILE MATERIALS  
CUSHION APPLICATION

Property	ASTM Test Method	Units	Values
			10 oz.
Mass per Unit Area	D 5261	oz/yd <sup>2</sup>	10
Grab Tensile Strength	D 4632	lb	270
Grab Tensile Elongation	D 4632	%	50
Trapezoidal Tear Strength	D 4533	lb	95
CBR Puncture Strength	D 6241	lb	700
CBR Puncture Elongation	D 6241	in.	1.5
Ultraviolet Resistance <sup>(2)</sup>	D 4355	%	70

- (1) All values are MARV except UV resistance; it is a minimum value.  
(2) Evaluation to be on 2.0 inch strip tensile specimens after 500 hours exposure.

END OF SECTION