REQUEST FOR PROPOSALS

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

City of Rome, Georgia

GEORGIA REGISTERED No. 030071 PROFESSIONAL ENGINEER MARC A. LIVERMAN

September 2019

ATLANTIC COAST CONSULTING, INC.

Request for Proposals

Walker Mountain Road Site 2 MSWL

Phase 8 Cell Construction

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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 No bid may be withdrawn after the closing time for the receipt of bids for a period of 30 days.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. 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@romega.us, acarroll@romega.us, cjenkins@romega.us, via Email. All questions and answers will be posted on the website – 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

Bidder Name: Address *(principal place of business)*:	**Surety** Name: Address *(principal place of business)*:
Owner Name: **City of Rome, Georgia** Address *(principal place of business)*: **601 Broad Street** **Rome, Georgia 30162-1433**	**Bid** Project *(name and location)*: **Walker Mountain Road Site 2** **MSWL Phase 8 Cell Construction** **Bid No: 036-19** **433 Walker Mountain Rd SW, Rome, GA 30161** Bid Due Date: **October 22, 2019**
Bond Penal Sum: Date of Bond:	
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.	

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

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.

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. Futhermore, 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,-Gerorgia
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

a.	1	EA	Construction Exit	$_____/EA	$ _____
b.	992	LF	Silt Fence – Type NS	$_____/LF	$ _____
c.	11	EA	Stone Check Dams	$_____/EA	$ _____
d.	1,886	LF	Rip Rap Lined Ditch	$_____/SF	$ _____
e.	1,983	LF	Grass Ditch with Turf Reinforcement Matting	$_____/LF	$ _____
f.	4,908	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.	339	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

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.	605,282	SF	24-Inch Leachate Collection Blanket	$_____/SF	$ _____

			(1 x10^{-3} 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.	605,282	SF	60 Mil HDPE Textured Geomembrane	$_____/SF	$ _____
b.	1,644	LF	Perimeter Berm & Permanent Anchor Trench	$_____/LF	$ _____
c.	809	LF	Temporary Anchor Trench	$_____/LF	$ _____
d.	1,010	LF	Tie to Existing Liner	$_____/LF	$ _____
e.	109	LF	Temporary Leachate Berm	$_____/LF	$ _____
f.	912	LF	Temporary Liner Anchor Berm	$_____/LF	$ _____
ITEM 7 – LEACHATE COLLECTION SYSTEM					
a.	1,462	LF	Perforated 6-Inch Leachate Collection Line	$_____/LF	$ _____
b.	106	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, 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.

*** ALTERNATE NO. 1***

ITEM 14 – ALTERNATIVE LINER BASE

a.	605,282	SF	Liner Base -18-Inch Select Backfill (1×10^{-5} cm/sec)	$_____/SF	$ _____
b.	605,282	SF	Liner Base – 6-Inch Subbase (1×10^{-5} cm/sec) with Geosynthetic Clay Liner (GCL)(5×10^{-9} cm/sec)	$_____/SF	$ _____

*** ALTERNATE NO. 2***

ITEM 15 – ALTERNATIVE LEACHATE COLLECTION BLANKET

a.	605,282	SF	24-Inch Leachate Collection Blanket (1×10^{-1} cm/sec) with 10 oz Geotextile	$_____/SF	$ _____

*** 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

Section	Title
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/0 – 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

SHEET NO.	SHEET TITLE
-	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

BIDDERS DECLARATION

The bidder understands, agrees and warrants:

That the bidder has carefully read and fully understands the full scope of the specifications:

That the bidder has the capability to successfully undertake and complete the responsibilities and obligations in said specifications.

That the bidder has liability insurance and a declaration of insurance form is included in the bid package.

That this bid may be withdrawn by requesting such withdrawal in writing at any time prior to **October 22, 2019, 10:00 a.m.,** but may not be withdrawn after such date and time.

That the City of Rome reserves the right to reject any or all bids and to accept that bid which will, in its opinion, best serve the public interest. The City of Rome reserves the right to waive any technicalities and formalities in the bidding.

That by submission of this bid the bidder acknowledges that the City of Rome has the right to make any inquiry or investigation it deems appropriate to substantiate or supplement information supplied by the bidder.

If a partnership, a general partner must sign.

If a corporation, the authorized corporate officer(s) must sign and the corporate seal must be affixed to this bid.

BIDDER:

_____	_____
Name	Title
_____	_____
Name	Title

AFFIX CORPORATE SEAL (If Applicable)

CERTIFICATE OF NON-DISCRIMINATION

In connection with the performance of work under this contract, the bidder agrees as follows:

The bidder agrees not to discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, ancestry or disability. The vendor shall take affirmative action to insure that employees are treated without regard to their race, creed, color, sex, national origin, ancestry or disability. Such action shall include, but not be limited to the following: employment, upgrading, demotion, transfer, recruiting or recruitment, advertising, lay-off or termination, rates of pay or other compensation and selection for training, including apprenticeship.

In the event of the bidder's non-compliance with this non-discrimination clause, the contract may be canceled or terminated by the City of Rome. The bidders may be declared, by the City of Rome, ineligible for further contracts with the City of Rome until satisfactory proof of intent to comply shall be made by the vendor.

The bidder agrees to include this non-discrimination clause in any sub-contracts connected with the performance of this agreement.

_____

BIDDER

_____

SIGNATURE

_____

TITLE

CITY OF ROME

DRUG-FREE WORKPLACE CERTIFICATE

By signature on this certificate, the Bidder certifies that the provisions of O.C.G.A. Section 50-24-1 through 50-24-6 related to the "Drug-Free Workplace Act" will be complied with in full. The Bidder further certifies that:

1. A drug-free workplace will be provided for the Bidder's employees during the performance of the contract; and

2. Each contractor who hires a subcontractor to work in a drug-free workplace shall secure from that subcontractor the following written certification: "As part of the subcontracting agreement with (contractor's name), (subcontractor's name) certifies to the contractor that a drug-free workplace will be provided for the subcontractor's employees during the performance of this contract pursuant to O.C.G.A. Section 50-24-3(b)(7)."

By signature on this certificate, the Bidder further certifies that it will not engage in the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana during the performance of the contract.

Bidder: _____

By: _____

Name Printed: _____

Title: _____

Date: _____

STATE OF GEORGIA PROMPT PAY ACT AFFIDAVIT

THIS AFFIDAVIT IS TO ACCOMPANY THE BID

GEORGIA PROMPT PAY ACT: The Georgia Prompt Pay Act was enacted by the General Assembly in 1994 and took effect January 1, 1995. This act requires owners to pay contractors within 15 days of receipt of a pay request by the owner or the owner's representative. If payment is not made the owner shall pay the contractor 1% per month interest on the delayed payment. Additionally, the contractor must pay subcontractors within 15 days of receipt of payment from the owner.

This Act is Code Section 13-11-1 (Georgia Laws of 1994, p. 1398 par. 4)

Firm Name: _____

Signature: _____

Title: _____

Subscribed and Sworn to before me this_____ day of _____, 20_____

_____
Notary Public

LIST OF LOCAL CONTRACTORS/ LOCAL MATERIALS SUPPLIERS

The following is the list of Local Contractors/Local Suppliers referenced in the Bid Form submitted by:

(Bidder).....

Dated.....……and which is an integral part of the Bid Form.

The following work will be performed (or provided) by Contractors/Suppliers and coordinated by us:

WORK SUBJECT	NAME
Paving Contractor……	
Storm Drain Contractor……	
Grading Contractor……	
Soil & Erosion Control Contractor……..……..……	
Liner Contractor……..…	
HDPE Piping Contractor……..……..…	

MATERIAL	NAME
Asphalt ……..	
Storm Drain…….	

HDPE Piping…….

60 mil HDPE Liner ……..…….

HDPE Piping …….

Geocomposite and Geosynthetic Clay Liner …...…….

Leachate Collection Blanket and Clay Liner ……...…….

LIST OF LOCAL SUB CONTRACTORS/ LOCAL MATERIALS SUPPLIERS

The following is the list of Local Sub Contractors/Local Suppliers referenced in the Bid Form submitted by:

(Bidder).....

Dated.....……and which is an integral part of the Bid Form.

The following work will be performed (or provided) by Sub Contractors/Suppliers and coordinated by us:

WORK SUBJECT NAME

Paving Contractor……

Storm Drain Contractor……

Grading Contractor……

Soil & Erosion Control Contractor……..……..……

Liner Contractor……..…

HDPE Piping Contractor……..……..…

MATERIAL NAME

Asphalt ……..

Storm Drain…….

HDPE Piping…….

60 mil HDPE Liner ……..…….

HDPE Piping …….

Geocomposite and Geosynthetic Clay Liner …...…….

Leachate Collection Blanket and Clay Liner ……...…….

LIST OF DBE SUB CONTRACTORS/ DBE MATERIALS SUPPLIERS

The following is the list of DBE Contractors/DBE Suppliers referenced in the Bid Form submitted by:

(Bidder).....

Dated.....……and which is an integral part of the Bid Form.

The following work will be performed (or provided) by Contractors/Suppliers and coordinated by us:

WORK SUBJECT NAME

Paving Contractor……

Storm Drain Contractor……

Grading Contractor……

Soil & Erosion Control Contractor……..……..……

Liner Contractor……..…

HDPE Piping Contractor……..……..…

MATERIAL NAME

Asphalt ……..

Storm Drain…….

HDPE Piping…….

60 mil HDPE Liner ……..…….

HDPE Piping …….

Geocomposite and Geosynthetic Clay Liner …...…….

Leachate Collection Blanket and Clay Liner ……...…….

STATE OF GEORGIA,
COUNTY OF _____:

NOTICE OF COMMENCEMENT

TO: CLERK OF SUPERIOR COURT OF _____ COUNTY, GEORGIA

Pursuant to O.C.G.A. § 13-10-62(a), not later than fifteen (15) days after physically commencing work on the property, the undersigned gives Notice of Commencement of improvements to property including the following information:

1. The name, address and telephone number of the contractor;

   _____
   _____
   _____

2. The name and location of the public work being constructed or a general description of the improvement;

   _____
   _____
   _____

3. The name and address of the state or the agency or the authority of the state that is contracting for the public works construction;

   _____
   _____
   _____

4. The name and address of the surety for the performance and payment bonds, if any; and

   _____
   _____
   _____

5. The name and address of the holder of the security deposit provided, if any.

   _____
   _____
   _____

Contractor: _____
By: _____
Name: _____
Title: _____

THIS DOCUMENT MUST BE FILED WITH THE CLERK OF THE SUPERIOR COURT FOR THE COUNTY IN WHICH THE PROJECT IS LOCATED AND A COPY OF THIS DOCUMENT MUST BE POSTED AT THE PROJECT SITE NOT LATER THAN FIFTEEN (15) DAYS AFTER THE CONTRACTOR PHYSICALLY COMMENCES WORK ON THE PROPERTY.

WITHIN TEN (10) CALENDAR DAYS OF THE RECEIPT OF A WRITTEN REQUEST, GIVE A COPY OF THIS NOTICE OF COMMENCEMENT TO ANY SUBCONTRACTOR, MATERIALMAN OR PERSON MAKING THE REQUEST.

CITY OF ROME, GEORGIA

SAVE COMPLIANCE AFFIDAVIT

O.C.G.A § 50-36-1(e) (2) Affidavit

By executing this affidavit under oath, as an applicant for a (n) Contract or Services, as referenced O.C.G.A. C. § 50-36-1, from the City of Rome, Georgia, the undersigned applicant verifies one of the following with respect to my application for a public benefit:

1) _____ I am a United State citizen.

2) _____ I am a legal permanent resident of the United States

3) _____ I am a qualified alien or non-immigrant under the Federal Immigration and Nationality Act with an alien number issued by the Department of Homeland Security or other federal immigration agency.
My alien number issued by the Department of Homeland Security or other federal immigration agency is: _____.

The undersigned applicant also hereby verifies that he or she is 18 years of age or older and has provided at least one secure and verifiable document, as required by O.C.G.A. § 50-36-1(e) (1), with this affidavit. The secure and verifiable document provided with this affidavit can best be classified as:
_____.

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of O.C.G.A. § 16-10-20, and face criminal penalties as allowed by such criminal statute.

Executed in _____ (city), _____ (state).

_____
Signature of Applicant

_____ Printed
Name of Applicant

SUBSCRIBED AND SWORN

BEFORE ME ON THIS THE

_____DAY OF _____, 20_____

_____
NOTARY PUBLIC
My Commission Expires:

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See **Specific Instructions** on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:
☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate
☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶
Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.
☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any)
Exemption from FATCA reporting code (if any)
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number
☐☐☐ – ☐☐ – ☐☐☐☐

or

Employer identification number
☐☐ – ☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here **Signature of U.S. person ▶** **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Cat. No. 10231X Form **W-9** (Rev. 12-2014)

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between **City of Rome-Floyd County Solid Waste Commission** ("Owner") and **[name of contracting entity]** ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: Construction of a landfill cell of approximately 13.7 acres.

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Walker Mountain Road Site 2 MSWL Phase 8 Cell Construction.

ARTICLE 3—ENGINEER

3.01 The Owner has retained **Atlantic Coast Consulting, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by **Engineer.**

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

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

4.03 *Contract Times: Days*

A. The Work will be substantially complete within 200 days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 210 days after the date when the Contract Times commence to run.

4.04 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

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1. *Substantial Completion:* Contractor shall pay Owner **$1,000.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **$750.00** for each day that expires after such time until the Work is completed and ready for final payment.
3. Liquidated damages for failing to timely attain Substantial Completion and Final Completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Work other than Unit Price Work, a lump sum of $**[number]**.

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

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Unit Price Work					
Item No.	**Description**	**Unit**	**Estimated Quantity**	**Unit Price**	**Extended Price**
				$	$
				$	$
				$	$
				$	$
				$	$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $**[number]**.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. **90** percent of the value of the Work completed (with the balance being retainage).

1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

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b. **90** percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to **100** percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less **200** percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the rate of **[number]** percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
   a. Performance bond (together with power of attorney).
   b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Specifications as listed in the table of contents of the project manual (copy of list attached).
6. Drawings listed on the attached sheet index.
7. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
   a. Notice to Proceed.
   b. Work Change Directives.
   c. Change Orders.
   d. Field Orders.
   e. Warranty Bond, if any.

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B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.

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

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

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

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

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

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

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

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

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

11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

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

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

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

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

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IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

Owner:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

*(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*

Contractor:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Date: _____
(date signed)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*

Attest: _____
(individual's signature)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

License No.: _____
(where applicable)

State: _____

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Pre-Award Oath

STATE OF GEORGIA COUNTY OF FLOYD

In accordance with O.C.G.A. §36-91-21(e), we, the undersigned of

_____,

being first duly sworn, deposes and says that:

We have not directly or indirectly violated O.C.G.A. §36-91-21 (d), and more specifically, we have not

- prevented or attempted to prevent competition in such bidding or proposals by any means whatever,
- prevented or endeavored to prevent anyone from making a bid or proposal thereof by any means whatever, nor
- caused or induced another to withdraw a bid or proposal for the work.

We, the undersigned, to the best of our knowledge, affirm that no other officers, agents or other persons acted for or represented the Contractor in the bidding for and procurement of this Contract.

Signature	Printed Name	Title	Date

_____ My Commission Expires: _____
(Notary Public)

(SEAL)

END OF SECTION

PERFORMANCE BOND

Contractor	**Surety**
Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **City of Rome, Georgia** Mailing address *(principal place of business)*: **601 Broad Street** **Rome, Georgia 30162-1433**	**Contract** Description *(name and location)*: **Walker Mountain Road Site 2** **MSWL Phase 8 Cell Construction** **433 Walker Mountain Rd SW, Rome, GA 30161** Contract Price: **[Amount from Contract]** Effective Date of Contract:

Bond

Bond Amount: **[Amount]**

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:

   3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;

   3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

   3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

   5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

   5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

   5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

   5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

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5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

   7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

   7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

   7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such

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statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

14. Definitions

    14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

    14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

    14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

    14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

    14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

16. Modifications to this Bond are as follows: **None**

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PAYMENT BOND

Contractor	**Surety**
Name: **[Full formal name of Contractor]** Address *(principal place of business)*: **[Address of Contractor's principal place of business]**	Name: **[Full formal name of Surety]** Address *(principal place of business)*: **[Address of Surety's principal place of business]**
Owner Name: **City of Rome, Georgia** Mailing address *(principal place of business)*: **601 Broad Street** **Rome, Georgia 30162-1433**	**Contract** Description *(name and location)*: **Walker Mountain Road Site 2** **MSWL Phase 8 Cell Construction** **433 Walker Mountain Rd SW, Rome, GA 30161** Contract Price: **[Amount, from Contract]** Effective Date of Contract:

Bond

Bond Amount: **[Amount]**

Date of Bond:

(Date of Bond cannot be earlier than Effective Date of Contract)

Modifications to this Bond form:

☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

Contractor as Principal	Surety
_____ *(Full formal name of Contractor)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature)(Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond will arise after the following:

   5.1. Claimants who do not have a direct contract with the Contractor

      5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2. Pay or arrange for payment of any undisputed amounts.

   7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

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8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

    16.1. *Claim*—A written statement by the Claimant including at a minimum:

        16.1.1. The name of the Claimant;

        16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;

        16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;

        16.1.4. A brief description of the labor, materials, or equipment furnished;

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16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;

16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;

16.1.7. The total amount of previous payments received by the Claimant; and

16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: **None**

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

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requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. Constituent of Concern—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

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recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

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33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

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43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

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1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

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F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

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into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

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ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

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inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

   a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

   b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

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B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

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established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

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D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

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B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

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and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

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5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

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Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;

b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

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3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

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or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

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of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

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conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

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Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

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

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

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Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

   1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

   2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

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L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

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4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

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Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

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6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

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B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

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2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

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3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:

   a. will certify that the proposed substitute item will:

      1) perform adequately the functions and achieve the results called for by the general design;

      2) be similar in substance to the item specified; and

      3) be suited to the same use as the item specified.

   b. will state:

      1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

      2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

      3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

   c. will identify:

      1) all variations of the proposed substitute item from the item specified; and

      2) available engineering, sales, maintenance, repair, and replacement services.

   d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

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E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

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H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

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7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

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7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

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I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

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3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

1. *Shop Drawings*

a. Contractor shall submit the number of copies required in the Specifications.

b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

2. *Samples*

a. Contractor shall submit the number of Samples required in the Specifications.

b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

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document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

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d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

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9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

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D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;
2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

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

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

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

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E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

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B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

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9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

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ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

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E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

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ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

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B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

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1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:

1. A mutually acceptable fixed fee; or
2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
    a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
    b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
    c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
    d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
    e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
    f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

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11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

   a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

   b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

   The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

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Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

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and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

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2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

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consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

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g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

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Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

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thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

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D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
3. by manufacturers of equipment furnished under the Contract Documents;
4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

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losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

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or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

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establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

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4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
    a. to supervise, direct, or control the Work;
    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
    a. the Work is defective, requiring correction or replacement;
    b. the Contract Price has been reduced by Change Orders;
    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

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b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

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submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

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significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

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d. a list of all duly pending Change Proposals and Claims; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

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appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

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F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);

2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;

3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or

4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

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attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

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provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
2. agree with the other party to submit the dispute to another dispute resolution process; or
3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

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18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, “Paragraph SC-4.05.”

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No suggested Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.02 *Copies of Documents*

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor two printed copies of conformed Contract Documents incorporating and integrating all Addenda and any amendments negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol:* The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. *Basic Requirements*

a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.

b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.

c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.

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d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.

e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party's use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.

f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. *System Infrastructure for Electronic Document Exchange*

a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.

1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 10 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.

2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.

b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.

c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash

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drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.

d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.

e. Each party is responsible for its own back-up and archive of documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.

g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.

C. *Software Requirements for Electronic Document Exchange; Limitations*

1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the EDP.

   a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.

2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.

3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

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SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. *Requests by Contractor for Electronic Documents in Other Formats*

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.

2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:

   a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may affect subsequent reuse.

   b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.

   c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.

   d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.

3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at $**[number]** per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

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ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

4.01 Commencement of Contract Times; Notice to Proceed

SC 4.01 Delete the final sentence of 4.01A and supplement Paragraph 4.01. by adding the following paragraph :

B. Should the Owner require additional time to award a Contract, the time may be extended by the mutual agreement between the Owner and the successful Bidder. If an award of Contract has not been made within 60 days from the Bid Opening or within the extension mutually agreed upon, the Bidder may withdraw the Bid without further liability on the part of either party.

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":

i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds **0.1 inches** of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.

ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: **32** degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: **104** degrees Fahrenheit.

2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by **National Weather Service** weather monitoring station at the **R.B. Russell Airport**.

3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the table in Exhibit **B**—Foreseeable Bad Weather Days.

4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in the table in Exhibit **B**—Foreseeable Bad

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Weather Days will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None available		

F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely: **[If there are no such drawings, so indicate in the table.]**

Drawings Title	Date of Drawings	Technical Data
Existing Conditions Plan	08/08/2019	**C-102, C-210**

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at **[location]** during regular business hours, or may request copies from Engineer.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
None Available		

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5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Drawings Title	Date of Drawings	Technical Data
None Available		

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2018 edition).

2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2018 edition).

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	$2,000,000.00
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Employer's Liability	
Each accident	$100,000.00
Each employee	$100,000.00
Policy limit	$500,000.00

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,

2. damages insured by reasonably available personal injury liability coverage, and

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3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.

   a. Such insurance must be maintained for three years after final payment.

   b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Severability of interests and no insured-versus-insured or cross-liability exclusions.

4. Underground, explosion, and collapse coverage.

5. Personal injury coverage.

6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).

2. Any exclusion for water intrusion or water damage.

3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.

4. Any exclusion of coverage relating to earth subsidence or movement.

5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).

6. Any limitation or exclusion based on the nature of Contractor's work.

7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

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I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	$2,000,000.00
Products—Completed Operations Aggregate	$2,000,000.00
Personal and Advertising Injury	$1,000,000.00
Bodily Injury and Property Damage—Each Occurrence	$1,000,000.00

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$100,000.00
Each Accident	$250,000.00
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$1,000,000.00

K. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	$250,000.00
General Aggregate	$250,000.00

L. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	$250,000.00
Annual Aggregate	$500,000.00

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M. *Unmanned Aerial Vehicle Liability Insurance:* If Contractor uses unmanned aerial vehicles (UAV—commonly *referred* to as drones) at the Site or in support of any aspect of the Work, Contractor shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the Supplementary Conditions as additional insureds; and provide a certificate to Owner confirming Contractor's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	**Policy limits of not less than:**
Each Claim	$500,000.00
General Aggregate	$1,000,000.00

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

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4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $500,000.00.

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $500,000.00.

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds."

11. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $500,000.00.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. Owner shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

B. The Contractor shall provide a written tabulation, plus other documentation as may be required, of all taxes, including sales tax, paid by the Contractor to assist the Owner in obtaining sales and/or use tax refunds for eligible machinery and equipment used for the

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primary purpose of reducing or eliminating air or water pollution in accordance with O.C.G.A. §48 8 4. Such written tabulation shall be included with each partial payment request. Additionally, the tabulation shall be documented with copies of invoices indicating the amount of tax paid, with all blanks completed on the invoice, and with a description of the function of the item included in the tabulation. All taxes will be paid by the Contractor. All refunds will accrue to the Owner.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with the Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

   a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

   b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

   c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

   a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

   b. Observe whether any Work in place appears to be defective.

   c. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

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5. *Inspections and Tests*

   a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to those performed by public or other agencies having jurisdiction over the Work.

   b. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor.

7. *Completion*

   a. Participate in Engineer's visits regarding Substantial Completion.

   b. Assist in the preparation of a punch list of items to be completed or corrected.

   c. Participate in Engineer's visit to the Site in the company of Owner and Contractor regarding completion of the Work, and prepare a final punch list of items to be completed or corrected by Contractor.

   d. Observe whether items on the final punch list have been completed or corrected.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of construction.

5 Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of **Rental Blue Book for Construction Equipment**.

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SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, "small tools and hand tools" means any tool or equipment whose current price if it were purchased new at retail would be less than $500.

13.03 *Unit Price Work*

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the extended price of a particular item of Unit Price Work amounts to five percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than twenty percent from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01

Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

2. Fifteen days after presentation of the Application for Payment to Owner with the Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

3. Owner and Contractor agree that all partial and final payments due shall be subject to the Georgia Prompt Pay Act (O.C.G.A. 13-11 1 through 13-11-11).

15.03 *Substantial Completion*

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to

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agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

ARTICLE 18—MISCELLANEOUS

18.01 Giving Notice

SC 18.01 Add the following new paragraph immediately after Paragraph 18.01.A:

B. The Contractor shall file all "Notices of Commencement" required for this Project in accordance with O.C.G.A. §44 14 361.5 et.seq. and §36 91 92 et.seq., as applicable. The Contractor shall respond to all requests for copies of a Notice of Commencement. Should the Owner or Engineer receive such a request, this request will be forwarded to the Contractor for further handling. The name and address of the Owner shall be as stated in paragraph (c) of this Article. The name and general description of the Project shall be as stated in the Advertisement for Proposal.

18.07 Controlling Law

SC-18.07 Add the following new paragraph immediately after Paragraph 18.07.A:

B. Each and every provision of this agreement shall be construed in accordance with and governed by Georgia law. The parties acknowledge that this contract is executed in FLOYD County, Georgia and that the contract is to be performed in FLOYD COUNTY, Georgia. Each party hereby consents to the FLOYD COUNTY Superior Court's sole jurisdiction over any dispute which arises as a result of the execution or performance of this agreement not resolved per Article 12 of the General Conditions, and each party hereby waives any and all objections to venue in the FLOYD COUNTY Superior Court.

Where professional engineering work is required in connection with any of the components required by the Contract, all Bidders and component suppliers must ensure that there is full compliance with all applicable laws of the State of Georgia and any other state governing professional engineering. The Owner and Engineer do not warrant that the name of an entity listed as an acceptable manufacturer is or will be in compliance with said laws.

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EXHIBIT A—SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Guidance Notes—Exhibit A

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	

Notes	
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.

Key	
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)
PDF	Portable Document Format readable by Adobe® Acrobat Reader Version XI or later
DWG	Autodesk® AutoCAD .dwg format Version 2013
DOC	Microsoft® Word .docx format Version 2013
EXC	Microsoft® Excel .xls or .xml format Version 2103
DB	Microsoft® Access .mdb format Version 2013

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EXHIBIT B—FORESEEABLE BAD WEATHER DAYS

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) (1)	Ambient Outdoor Air Temperature (degrees F)	
		Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.)	Number of Foreseeable Bad Weather Days in Month Based on High Temperature (at 3:00 p.m.)
January	7	6	
February	8	4	
March	8	2	
April	7		
May	7		
June	7		
July	8		
August	7		
September	5		
October	5		
November	6	3	
December	9	4	

Notes:
1. Two inches of sleet equal one inch of rain. Five inches of wet, heavy snow equal one inch of rain. Fifteen inches of “dry” powder snow equals one inch of rain.

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Part 1 General

1.01 Description

A. The Project consists of providing all labor, materials, tools, equipment, services, and incidentals and performing all Work required to construct complete in place and ready to operate approximately 112,500 CY of excavation, 59,200 CY of structural fill; 605,280 SF of low permeability liner base, HDPE geomembrane and leachate collection layer material; 1,462 LF of leachate collection pipe; sediment pond cleaning; 4,900 square yards of all-weather access road, and erosion and sedimentation control items.

B. All Work described above shall be performed as shown on the Drawings and as specified.

1.02 Project Location

The equipment and materials to be furnished will be installed at the locations shown on the Drawings.

1.03 Quantities

The Owner reserves the right to alter the quantities of work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered, increased or decreased. Payment for such increased or decreased quantity will be made in accordance with the Instructions to Bidders. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any conditions or provisions of the Contract and Bond.

1.04 Partial Owner Occupancy

The existing facilities to which these improvements are being made will continue operating during the period of construction.

END OF SECTION

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Part 1 General

1.01 Scope

The scope of this Section is to convey to the Contractor unique and unusual stipulations and requirements which have been established for this Project. Some requirements are based on technical aspects of the Project which are not otherwise conveyed to the Contractor. The provisions of this Section shall supersede the provisions of the Division 1 through 17 Specifications but shall not supersede the Bidding Requirements, Contract Forms or Conditions of the Contract.

1.02 Milestone Dates

The Contractor shall be required to complete the following activities by the indicated date or days after the Notice to Proceed:

Consecutive Calendar Days after Notice to Proceed	Milestone	Liquidated Damages Per Calendar Day
200	Completion of Phase 8 Cell	$1,000.00
210	Final Completion of All Work	$750

1.03 Submittals

A. Sequence Submittal

1. Submit a proposed sequence in accordance with Section 01310 with appropriate times of starting and completion of tasks to Engineer for review.

2. The Contractor may propose alternatives to the sequencing constraints to that shown in this Section in an attempt to reduce the disruption of the operation of the existing facility or streamline the tasks of this Contract. The Owner and Engineer are not obligated to accept any of these alternatives.

1.04 Existing Facility Operations

A. The Contractor shall coordinate the work with the Owner so that the construction will not restrain or hinder the operation of the existing facilities. If, at any time, any portion of the facilities are out of service, the Contractor must obtain approval from the Owner as to the date, time and length of time that portion of the facilities are

out of service.

B. Connections to the existing facilities or alteration of existing facilities will be made

at times when the facility involved is not in use or at times, established by the Owner, when the use of the facility can be conveniently interrupted for the period of time needed to make the connection or alteration.

C. After having coordinated the work with the Owner, the Contractor shall prepare a submittal in accordance with Section 01310 to include the time, time limits and methods of each connection or alteration and have the approval of the Engineer before any work is undertaken on the connections or alterations.

D. Before any roadway or facilities are blocked off, the Owner's approval shall be obtained to coordinate operations for the plant.

1.05 Sequencing

A. General

1. The Contractor shall be solely responsible for all construction sequencing.

2. The completion of specific preliminary sequencing tasks indicated will be required prior to any significant site demolition.

B. Notify the Owner at least ten days prior to starting to relocate piping or taking existing components out of service.

1.06 Sequencing Constraints

A. The Contractor shall complete, and deliver to the Owner, within the time allowed after the Notice to Proceed, all work associated with the milestone “Completion of Phase 8 Cell”. The work to be completed as part of this milestone is items as follows:

1. Landfill Phase 8 Cell as shown on the Drawings.

2. Leachate collection piping, manholes, valve vaults, and leachate gravity sewer connection as shown on the Drawings.

3. All work associated with the Phase 8 Cell shall be completed in accordance with the Contract Documents, including but not limited to the submission of as-built surveys and all other documents required from the Contractor in order to obtain EPD approval of the construction, and all ancillary work needed for the Owner to take occupancy of and to operate these portions of the work.

END OF SECTION

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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.

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.

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 lump sum 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 ($1x10^{-5}$ 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 geosynthectic 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 geosynthectic 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 ($1x10^{-3}$ 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 ($1x10^{-3}$ 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 ($1x10^{-1}$ 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 ($1x10^{-1}$ 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.

E. Tie to Existing Liner: All costs for Tie to Existing Liner, including location, earthwork, 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, 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 assurances 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 General

Management of the project shall be through the use of a logical method of construction planning, scheduling, and cost value documentation.

1.02 Existing Landfill Facilities

A. The existing facilities at the Walker Mountain Road Site 2 MSWL must of necessity remain in operation while new construction is in progress.

B. The Contractor shall coordinate his work with the Owner so that construction will not restrain or hinder operation of the existing facilities at the Landfill. If, at any time, any portion of the Landfill is out of service, the Contractor must obtain prior approval from the Owner as to the date, time and length of time that portion of the existing facilities are out of service.

C. Connections to the existing facilities or alteration of existing facilities will be made at times when the facility involved is not in use or at times, established by the Owner, when use of the facility can be conveniently interrupted for the period of time needed to make the connection or alteration.

D. After having coordinated his work with the Owner, the Contractor shall notify the Engineer of the time, time limits and methods of each connection or alteration and have approval of the Engineer before any work is undertaken on the connections or alterations.

E. Before any roadway or facilities are blocked off the Owner shall be contacted to coordinate operations for the landfill.

1.03 Other Utilities

The Contractor shall coordinate his operations with all utility companies in or adjacent to the area of his work. The Contractor shall require said utilities to identify in the field their property and provide drawings as necessary to locate them.

END OF SECTION

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Part 1 General

1.01 Description

A. All work under this contract shall be constructed in accordance with the lines and grades on the plans or as given by the Engineer or Owner. The full responsibility for holding to alignment and grade shall rest upon the Contractor.

B. The Owner will provide a bench mark and minimal horizontal control. The Contractor will be responsible for setting offsets from these points and all other layout and staking.

C. The Contractor shall safeguard all points, stakes, grade marks, bench marks, and monuments established on the work, shall bear the cost of reestablishing same if disturbed, and shall assume the entire expense of rectifying work improperly constructed due to failure to maintain and protect such established points, stakes, and marks.

END OF SECTION

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Part 1 General

1.01 Scope

A. Construction staking shall include all of the surveying work required to layout the Work and control the location of the finished Project. The Contractor shall have the full responsibility for constructing the Project to the correct horizontal and vertical alignment, as shown on the Drawings, as specified, or as ordered by the Engineer. The Contractor shall assume all costs associated with rectifying work constructed in the wrong location and/or elevations.

B. From the information shown on the Drawings and the information to be provided as indicated under Project Conditions below, the Contractor shall:

1. Be responsible for setting reference points and/or offsets, establishment of baselines, and all other layout, staking, and all other surveying required for the construction of the Project.

2. Safeguard all reference points, stakes, grade marks, horizontal and vertical control points, and shall bear the cost of re-establishing same if disturbed.

3. Stake out the permanent and temporary easements or the limits of construction to ensure that the Work is not deviating from the indicated limits.

4. Be responsible for all damage done to reference points, baselines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, baselines, center lines and temporary bench marks as a result of the operations.

C. Baselines shall be defined as the line to which the location of the Work is referenced, i.e., edge of pavement, road centerline, property line, right-of-way or survey line.

D. Record drawing surveys shall be performed in accordance with this Section and Section 01720 of these specifications.

1.02 Project Conditions

A. The Drawings provide the location and/or coordinates of principal components of the Project. The alignment of some components of the Project may be indicated in the Specifications. The Engineer may order changes to the location of some of the components of the Project or provide clarification to questions regarding the correct alignment.

B. The survey points, control points, and baseline to be provided to the Contractor shall be limited to only that information shown on the Drawings and which can be found on the Project site by the Contractor.

C. A topographic survey is included on the Drawings.

1.03 Quality Assurance

A. The Contractor shall furnish documentation, prepared by a surveyor currently registered in the State in which the Project is located, confirming that staking is being done to the horizontal and vertical alignment shown in the Contract Documents. This requires that the Contractor hire, at the Contractor's own expense, a currently registered surveyor, acceptable to the Owner, to provide ongoing construction staking or confirmation of such.

B. Any deviations from the Drawings shall be confirmed by the Engineer prior to construction of that portion of the Project.

C. Quantities for payments measured under this Contract shall be certified by the registered surveyor.

D. For landfill cell lined areas, certification of as-built grades as construction progresses is required. These as-built surveys must be provided to the Engineer in a format acceptable to him. The as-built surveys must be approved by the Engineer before the next stage of construction begins. The Engineer may independently verify any or all of the surveys for accuracy.

E. Number of Topographical Surveys: The Contractor shall perform all surveying required on the Project. The Contractor shall anticipate performing the following minimum number of surveys, the accuracy and handling of which is specified elsewhere:

1. Prior to performing any earthwork; after topsoil is stripped.

2. Before and after placement of unsuitable material in the stockpile area.

3. After final excavation/placement of all structural fill/prior to placement of select backfill;

4. After placement of subbase/prior to placement of geomembrane;

5. After placement of leachate collection blanket;

1.04 Site Work

A. Staking Precision: The precision of construction staking shall match the precision of a component's location indicated on the Drawings. If not indicated on the Drawings, staking of utilities shall be done in accordance with generally accepted practice for the type of utility.

B. Written certification, by a licensed surveyor, that landfill cell grades and corner locations match the locations shown on the Drawings is required prior to beginning construction of the liner.

C. Paved Surfaces: The Contractor shall establish a reference point for establishing and verifying the paving subgrade and finished grade elevations. Any variance with plan grades shall be identified by the Contractor and confirmed by the Engineer prior to constructing the base.

1.05 Landfill Quantities for Payment

A. Earthwork

1. The surveyor shall survey before and after the work is performed in such a manner to produce a topographical map with a two foot contour interval and sufficient spot elevations to define the topography. Ground elevations shall be obtained at a frequency equal to a 50 foot by 50 foot grid, plus intermediate spot elevations obtained at every change in slope. The initial survey shall be completed prior to any earthwork. The final survey shall be completed after replacement of topsoil has been completed.

2. The surveyor shall calculate the quantities of earthwork cut and fill and shall certify as to the accuracy of said survey and calculations.

3. The surveyor shall provide an electronic copy of the topography in an AutoCAD 2007 or later format. The drawing should be formatted for plotting at 1"=100'. Additionally, the drawing should include AutoCAD points, as well as, contours that are polylines with appropriate imbedded elevations. A separate survey point file shall be provided in a point number, northing, easting, elevation, and description comma delimited format.

B. Select Backfill and Subbase

1. The surveyor shall survey before and after the work is performed in such a manner to produce a topographic map with a two foot contour interval and sufficient spot elevations to define the topography. Ground elevations shall be obtained at a frequency equal to a 50 foot by 50 foot grid, plus intermediate spot elevations obtained at every change in slope.

2. The surveyor shall calculate the top surface area (three dimensional) of clay liner and shall certify as to the accuracy of said survey and calculations. The

surveyor shall also certify that all clay liner areas for which payment is requested have the absolute minimum thickness required.

3. The surveyor shall provide an electronic copy of the topography in an AutoCAD 2013 or later format. The drawing should be formatted for plotting at 1”=100’. Additionally, the drawing should include AutoCAD points, as well as, contours that are polylines with appropriate imbedded elevations. A separate survey point file shall be provided in a point number, northing, easting, elevation, and description comma delimited format.

C. Leachate Collection Blanket

1. The surveyor shall survey before and after the work is performed in such a manner to produce a topographic map with a two foot contour interval and sufficient spot elevations to define the topography. Ground elevations shall be obtained at a frequency equal to a 50 foot by 50 foot grid, plus intermediate spot elevations obtained at every change in slope.

2. The surveyor shall calculate the three dimensional surface area of top of the leachate collection sand blanket and shall certify as to the accuracy of said survey and calculations. The surveyor shall also certify that all sand blanket areas for which payment is requested have the minimum thickness required.

3. The surveyor shall provide an electronic copy of the topography in an AutoCAD 2013 or later format. The drawing should be formatted for plotting at 1”=100’. Additionally, the drawing should include AutoCAD points, as well as, contours that are polylines with appropriate imbedded elevations. A separate survey point file shall be provided in a point number, northing, easting, elevation, and description comma delimited format.

D. All Other Quantities will be Measured Jointly by the Engineer and Contractor

1.06 Pipe Quantities for Payment

A. Pipe

1. The surveyor shall survey as-built locations of all piping as constructed. Field survey shots shall be at a minimum at every break in grade, every 100ft, every change in pipe type, every change in direction, every structure and at the pipe termination. The field survey shots shall include northings, eastings, elevations and description.

2. The surveyor shall calculate the length of all pipes installed by category identified in the Bid or Proposal Form. The lengths shall be based on the field surveys and in accordance with requirements of Section 01025. The surveyor shall report the quantities in a signed and sealed summary letter.

The surveyor shall also calculate and report slopes of pipes. The surveyor shall note all slopes that are not in compliance with the project requirements.

3. The surveyor shall provide an electronic copy of the survey in an AutoCAD 2013 or later format. The drawing should be formatted for plotting at 1”=100’. Additionally, the drawing should include AutoCAD points, as well as, three dimensional polylines representing pipes with appropriate imbedded elevations. A separate survey point file shall be provided in a point number, northing, easting, elevation, and description comma delimited format.

1.07 As-Built Plans

A. As-built plans of all critical stages of construction as outlined on the plans shall be provided by the Contractor. These plans must be stamped and signed by a Georgia registered land surveyor and turned over to the Engineer in a hard copy and computer format as detailed above for review and approval.

B. The professionally certified as-built survey submittal shall include a reproducible drawing and three hard copies at a scale of 1”=100’, sealed by a Georgia registered land surveyor showing point numbers, locations, descriptions, elevations, and two-foot contours for each survey required as detailed above.

END OF SECTION

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Part 1 General

1.01 Description

Permits and Responsibilities

The Contractor shall, without additional expense to the Owner, be responsible for obtaining any necessary licenses and permits, and for complying with any applicable Federal, State and municipal laws, Codes and regulations, in connection with the execution of the Work. He shall take proper safety and health precautions to protect the Work, the workers, the public, and the property of others. He shall also be responsible for all materials delivered and work performed until completion and acceptance of the Work, except for any completed unit of construction thereof which may heretofore have been accepted.

END OF SECTION

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Part 1 General

1.01 Description

A. Whenever reference is made to conforming to the standards of any technical society, organization, body, code or standard, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the time of advertisement for Bids. This shall include the furnishing of materials, testing of materials, fabrication and installation practices. In those cases where the Contractor's quality standards establish more stringent quality requirements, the more stringent requirement shall prevail. Such standards are made a part hereof to the extent which is indicated or intended.

B. The inclusion of an organization under one category does not preclude that organization's standards from applying to another category.

C. In addition, all work shall comply with the applicable requirements of local codes, utilities and other authorities having jurisdiction.

D. All material and equipment, for which a UL Standard, an AGA or NSF approval or an ASME requirement is established, shall be so approved and labeled or stamped. The label or stamp shall be conspicuous and not covered, painted, or otherwise obscured from visual inspection.

E. The standards which apply to this Project are not necessarily restricted to those organizations which are listed in Article 1.02.

1.02 Standard Organizations

A. Piping and Valves

ACPA	American Concrete Pipe Association
ANSI	American National Standards Institute
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AWWA	American Water Works Association
CISPI	Cast Iron Soil Pipe Institute
DIPRA	Ductile Iron Pipe Research Association
FCI	Fluid Controls Institute
MSS	Manufacturers Standardization Society
NCPI	National Clay Pipe Institute
NSF	National Sanitation Foundation
PPI	Plastic Pipe Institute
Uni-Bell	PVC Pipe Association

B. Materials

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
GSI	Geosynthetic Institute

C. Painting and Surface Preparation

NACE	National Association of Corrosion Engineers
SSPC	Steel Structures Painting Council

D. Electrical and Instrumentation

AEIC	Association of Edison Illuminating Companies
AIEE	American Institute of Electrical Engineers
EIA	Electronic Industries Association
ICEA	Insulated Cable Engineers Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	ISA – The Instrumentation, Systems, and Automation Society
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
REA	Rural Electrification Administration
TIA	Telecommunications Industries Association
UL	Underwriter's Laboratories
VRCI	Variable Resistive Components Institute

E. Aluminum

AA	Aluminum Association
AAMA	American Architectural Manufacturers Association

F. Steel and Concrete

ACI	American Concrete Institute
AISC	American Institute of Steel Construction, Inc.
AISI	American Iron and Steel Institute
CRSI	Concrete Reinforcing Steel Institute
NRMA	National Ready-Mix Association
PCA	Portland Cement Association

PCI	Prestressed Concrete Institute

G. Welding

ASME	American Society of Mechanical Engineers
AWS	American Welding Society

H. Government and Technical Organizations

AIA	American Institute of Architects
APHA	American Public Health Association
APWA	American Public Works Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASQC	American Society of Quality Control
ASSE	American Society of Sanitary Engineers
CFR	Code of Federal Regulations
CSI	Construction Specifications Institute
EDA	Economic Development Administration
EPA	Environmental Protection Agency
FCC	Federal Communications Commission
FmHA	Farmers Home Administration
FS	Federal Specifications
IAI	International Association of Identification
ISEA	Industrial Safety Equipment Association
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
NBFU	National Board of Fire Underwriters
(NFPA)	National Fluid Power Association
NBS	National Bureau of Standards
NISO	National Information Standards Organization
OSHA	Occupational Safety and Health Administration
SI	Salt Institute
SPI	The Society of the Plastics Industry, Inc.
USDC	United States Department of Commerce
USGBC	United States Green Building Council
WEF	Water Environment Federation

I. General Building Construction

AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AITC	American Institute of Timber Construction
APA	American Parquet Association, Inc.

APA	American Plywood Association
BHMA	Builders Hardware Manufacturers Association
BIFMA	Business and Institutional Furniture Manufacturers Association
DHI	Door and Hardware Institute
FM	Factory Mutual Fire Insurance Company
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute
IME	Institute of Makers of Explosives
ISANTA	International Staple, Nail and Tool Association
ISDSI	Insulated Steel Door Systems Institute
IWS	Insect Screening Weavers Association
MBMA	Metal Building Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NAGDM	National Association of Garage Door Manufacturers
NCCLS	National Committee for Clinical Laboratory Standards
NFPA	National Fire Protection Association
NFSA	National Fertilizer Solutions Association
NKCA	National Kitchen Cabinet Association
NWMA	National Woodwork Manufacturers Association
NWWDA	National Wood Window and Door Association
RMA	Rubber Manufacturers Association
SBC	SBCC Standard Building Code
SDI	Steel Door Institute
SIA	Scaffold Industry Association
SMA	Screen Manufacturers Association
SPRI	Single-Ply Roofing Institute
TCA	Tile Council of America
UBC	Uniform Building Code

J. Roadways

AREA	American Railway Engineering Association
GDOT	Georgia Department of Transportation

K. Plumbing

AGA	American Gas Association
NSF	National Sanitation Foundation
PDI	Plumbing Drainage Institute
SPC	SBCC Standard Plumbing Code

L. Refrigeration, Heating, and Air Conditioning

AMCA	Air Movement and Control Association
ARI	American Refrigeration Institute

ASHRAE	American Society of Heating, Refrigeration, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
CGA	Compressed Gas Association
CTI	Cooling Tower Institute
HEI	Heat Exchange Institute
IIAR	International Institute of Ammonia Refrigeration
NB	National Board of Boilers and Pressure Vessel Inspectors
PFMA	Power Fan Manufacturers Association
SAE	Society of Automotive Engineers
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SMC	SBCC Standard Mechanical Code
TEMA	Tubular Exchangers Manufacturers Association

M. Equipment

AFBMA	Anti-Friction Bearing Manufacturers Association, Inc.
AGMA	American Gear Manufacturers Association
ALI	Automotive Lift Institute
CEMA	Conveyor Equipment Manufacturers Association
CMAA	Crane Manufacturers Association of America
DEMA	Diesel Engine Manufacturers Association
MMA	Monorail Manufacturers Association
OPEI	Outdoor Power Equipment Institute, Inc.
PTI	Power Tool Institute, Inc.
RIA	Robotic Industries Association
SAMA	Scientific Apparatus Makers Association

1.03 Symbols

Symbols and material legends shall be as scheduled on the Drawings.

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Part 1 General

1.01 Scope

A. Work under this Section includes all scheduling and administering of pre-construction and progress meetings as herein specified and necessary for the proper and complete performance of this Work.

B. Scheduling and Administration by Engineer or Owner:

1. Prepare agenda.
2. Make physical arrangements for the meetings.
3. Preside at meetings.
4. Record minutes including significant proceedings and decisions.
5. Distribute copies of the minutes to participants.

1.02 Preconstruction Conference

A. The Engineer or Owner shall schedule the preconstruction conference prior to the issuance of the Notice to Proceed.

B. Representatives of the following parties are to be in attendance at the meeting:

1. Owner.
2. Engineer.
3. Contractor and superintendent.
4. Major subcontractors.
5. Representatives of governmental or regulatory agencies when appropriate.

C. The agenda for the preconstruction conference shall consist of the following as a minimum:

1. Distribute and discuss a list of major subcontractors and a tentative construction schedule.

2. Critical work sequencing.

3. Designation of responsible personnel and emergency telephone numbers.

4. Processing of field decisions and change orders.

5. Adequacy of distribution of Contract Documents.

6. Schedule and submittal of shop drawings, product data and samples.

7. Pay request format, submittal cutoff date, paydate and retainage.

8. Procedures for maintaining record documents.

9. Use of premises, including office and storage areas and Owner's requirements.

10. Major equipment deliveries and priorities.

11. Safety and first-aid procedures.

12. Security procedures.

13. Housekeeping procedures.

14. Work hours.

1.03 Project Coordination Meetings

A. Schedule regular monthly meetings as directed by the Engineer or Owner.

B. Hold called meetings as the progress of the Work dictates.

C. The meetings shall be held at the location indicated by the Engineer or Owner.

D. Representatives of the following parties are to be in attendance at the meetings:

1. Engineer.
2. Contractor and superintendent.
3. Major subcontractors as pertinent to the agenda.
4. Owner's representative as appropriate.
5. Representatives of governmental or other regulatory agencies as appropriate.

E. The minimum agenda for progress meetings shall consist of the following:

1. Review and approve minutes of previous meetings.

2. Review work progress since last meeting.

3. Note field observations, problems and decisions.

4. Identify problems which impede planned progress.

5. Review Contractor's corrective measures and procedures to regain plan schedule, when applicable.

6. Review Contractor's revision to the construction schedule as outlined in the Supplementary Conditions.

7. Review submittal schedule; expedite as required to maintain schedule.

8. Maintenance of quality and work standards.

9. Review changes proposed by Owner for their effect on the construction schedule and completion date.

10. Complete other current business.

END OF SECTION

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Part 1 General

1.01 Scope

A. The work under this Section includes preparing, furnishing, distributing, and periodic updating of the construction schedules as specified herein.

B. The purpose of the schedule is to demonstrate that the Contractor can complete the overall Project within the Contract Time and meet all required interim milestones.

1.02 Submittals

A. Overall Project Schedule (OPS)

1. Submit the schedule within 10 days after date of the Notice to Proceed.

2. The Engineer will review the schedule and return it within 10 days after receipt.

3. If required, resubmit within 10 days after receipt of a returned copy.

B. Near Term Schedule (NTS)

1. Submit the first Near Term Schedule within 10 days of the Notice to Proceed.

2. The Engineer will review the schedule and return it within 10 days after receipt.

C. Submit an update of the OPS and NTS with each progress payment request.

D. Submit the number of copies required by the Contractor, plus three copies to be retained by the Engineer.

1.03 Approval

Approval of the Contractor's detailed construction program and revisions thereto shall in no way relieve the Contractor of any of the Contractor's duties and obligations under the Contract. Approval is limited to the format of the schedule and does not in any way indicate approval of, or concurrence with, the Contractor's means, methods and ability to carry out the Work.

1.04 Overall Project Schedule (OPS)

A. The Contractor shall submit to the Owner for approval a detailed Overall Project Schedule of the Contractor's proposed operations for the duration of the Project. The OPS shall be in the form of a Gantt/bar chart.

B. Gantt/Bar Chart Schedule

1. Each activity with duration of seven or more days shall be identified by a separate bar. Activities with duration of more than 30 days shall be sub-divided into separate activities.

2. The schedule shall include activities for shop drawing preparation and review, fabrication, delivery, and installation of major or critical path materials and equipment items.

3. The schedule shall show the proposed start and completion date for each activity. A separate listing of activity start and stop dates and working day requirements shall be provided unless the information is shown in text form on the Gantt/bar chart.

4. The schedule shall identify the Notice to Proceed date, the Contract Completion date, major milestone dates, and a critical path.

5. The schedule shall be printed on a maximum 11 x 17-inch size paper. If the OPS needs to be shown on multiple sheets, a simplified, one page, summary bar chart showing the entire Project shall be provided.

6. The schedule shall have a horizontal time scale based on calendar days and shall identify the Monday of each week.

7. The schedule shall show the precedence relationship for each activity.

1.05 Near Term Schedule (NTS)

A. The Contractor shall develop and refine a detailed Near Term Schedule showing the day to day activities with committed completion dates which must be performed during the upcoming 30 day period. The detailed schedule shall represent the Contractor's best approach to the Work which must be accomplished to maintain progress consistent with the Overall Project Schedule.

B. The Near Term Schedule shall be in the form of Gantt/bar chart and shall include a written narrative description of all activities to be performed and describe corrective action to be taken for items that are behind schedule.

1.06 Updating

A. Provide updated schedule with each application for payment.

B. Show all changes occurring since previous submission of the updated schedule.

C. Indicate progress of each activity and show actual completion dates.

D. The Contractor shall be prepared to provide a narrative report at the Project Coordination Meetings. The report shall include the following:

1. A description of the overall Project status and comparison to the OPS.

2. Identify activities which are behind schedule and describe corrective action to be taken.

3. A description of changes or revisions to the Project and their effect on the OPS.

4. A description of the Near Term Schedule of the activities to be completed during the next 30 days. The report shall include a description of all activities requiring participation by the Engineer and/or Owner.

END OF SECTION

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Part 1 General

1.01 Scope

A. The Contractor shall furnish all equipment and labor materials required to provide the Owner with digital construction videos and photographs of the Project.

B. Photo and video files shall become the property of the Owner and none of the videos or photographs herein shall be published without written permission of the Owner.

1.02 Pre and Post Construction Videos and Photographs

A. Prior to the beginning of any work, the Contractor shall take project videos and photographs of the work area to record existing conditions.

B. Following completion of the work, another video and photos shall be made showing the same areas and features as in the pre-construction video and photographs.

C. All conditions which might later be subject to disagreement shall be shown in sufficient detail to provide a basis for decisions.

D. The pre-construction video and photographs shall be submitted to the Engineer within 25 calendar days after the date of receipt of Notice to Proceed. Post-construction videos and photographs shall be provided prior to final acceptance of the project.

1.03 Progress Photographs

A. Photo files shall be provided in a .jpg or .tif format.

B. The photographs shall be embedded with a date and time marking. All image files shall be named to indicate date and description of work shown.

C. A minimum of ten photographs shall be submitted with each request for payment. The view selection will be as agreed to with the Engineer.

1.04 Submittals

A. Photographs and videos shall be submitted on either a CD or DVD, as well as, printed hard copies. Format for the video shall be MPEG or AVI.

B. Construction photographs shall be submitted with each payment request. Failure to include photographs may be cause for rejection of the payment request.

END OF SECTION

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Part 1 General

1.01 Scope

A. The work under this Section includes submittal to the Engineer of shop drawings, product data and samples required by the specifications and drawings.

B. Submittal Contents: The submittal contents required are detailed in each applicable specification section.

C. Definitions: Submittals are categorized as follows:

1. Shop Drawings

a. Shop drawings shall include technical data, drawings, diagrams, procedure and methodology, performance curves, schedules, templates, patterns, test reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.

b. Provide newly-prepared information, on reproducible sheets, with graphic information at accurate scale (except as otherwise indicated) or appropriate number of prints hereof, with name or preparer (firm name) indicated. The Contract Drawings shall not be traced or reproduced by any method for use as or in lieu of detail shop drawings. Show dimensions and note dimensions that are based on field measurement. Identify materials and products in the work shown. Indicate compliance with standards and special coordination requirements. Do not allow shop drawings to be used in connection with the Work without appropriate final “Action” markings by the Engineer.

c. Drawings shall be presented in a clear and thorough manner. Details shall be identified by reference to sheet and detail, specification section, schedule or room numbers shown on the Contract Drawings.

d. Minimum assembly drawings sheet size shall be 24 x 36-inches.

e. Minimum detail sheet size shall be 8-1/2 x 11-inches.

f. Minimum Scale:

i. Assembly Drawings Sheet, Scale: 1-inch = 30 feet.

ii. Detail Sheet, Scale: 1/4-inch = 1 foot.

2. Product Data

   a. Product data includes standard printed information on materials, products and systems, not specially prepared for this Project, other than the designation of selections from among available choices printed therein.

   b. Collect required data into one submittal for each unit of work or system, and mark each copy to show which choices and options are applicable to the Project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked and special coordination requirements.

3. Samples

   a. Samples include both fabricated and un-fabricated physical examples of materials, products and units of work, both as complete units and as smaller portions of units of work, either for limited visual inspection or, where indicated, for more detailed testing and analysis.

   b. Provide units identical with final condition of proposed materials or products for the work. Include “range” samples, not less than three units, where unavoidable variations must be expected, and describe or identify variations between units of each set. Provide full set of optional samples where the Engineer's selection is required. Prepare samples to match the Engineer's sample where indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations and compliance with standards. Samples are submitted for review and confirmation of color, pattern, texture and “kind” by the Engineer. Engineer will note “test” samples, except as otherwise indicated, for other requirements, which are the exclusive responsibility of the Contractor.

4. Miscellaneous submittals related directly to the Work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, statements of applicability, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work but not processed as shop drawings, product data or samples.

1.02 Specific Category Requirements

A. General: Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal. Submittals shall contain:

1. The date of submittal and the dates of any previous submittals.

2. The Project title.

3. Numerical submittal numbers, starting with 1.0, 2.0, etc. Revisions to be numbered 1.1, 1.2, etc.

4. The Names of:

   a. Contractor

   b. Supplier

   c. Manufacturer

5. Identification of the product, with the Specification section number, permanent equipment tag numbers and applicable Drawing Number.

6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the Work or materials.

8. Applicable standards, such as ASTM or Federal Specification numbers.

9. Notification to the Engineer in writing, at time of submissions, of any deviations on the submittals from requirements of the Contract Documents.

10. Identification of revisions on resubmittals.

11. An 8” x 3” blank space for Contractor and Engineer stamps.

12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria and coordination of the information within the submittal with requirements of the Work and of Contract Documents.

13. Submittal sheets or drawings showing more than the particular item under consideration shall have all but the pertinent description of the item for which review is requested crossed out.

1.03 Routing of Submittals

A. Submittals and routine correspondence shall be routed as follows:

1. Supplier or Subcontractor to Contractor (through representative if applicable)

2. Contractor to Engineer

3. Engineer to Contractor and Owner

4. Contractor to Supplier or Subcontractor

Part 2 Products

2.01 Shop Drawings

A. Unless otherwise specifically directed by the Engineer, make all shop drawings accurately to a scale sufficiently large to show all pertinent features of the item and its method of connection to the Work.

B. The number of shop drawings to be submitted shall be no less than the number required to be returned, plus three copies which will be retained by the Engineer.

2.02 Manufacturer's Literature

A. Where content of submitted literature from manufacturers includes data not pertinent to this submittal, clearly indicate which portion of the contents is being submitted for the Engineer's review.

B. Submit the number of copies which are required to be returned (not to exceed three) plus three copies which will be retained by the Engineer.

2.03 Samples

A. Samples shall illustrate materials, equipment or workmanship and established standards by which completed work is judged.

B. Unless otherwise specifically directed by the Engineer, all samples shall be of the precise article proposed to be furnished.

C. Submit all samples in the quantity which is required to be returned plus one sample which will be retained by the Engineer.

2.04 Colors

A. Unless the precise color and pattern is specifically described in the Contract Documents, wherever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the Engineer for review and selection.

B. Unless all available colors and patterns have identical costs and identical wearing capabilities, and are identically suited to the installation, completely describe the relative costs and capabilities of each.

Part 3 Execution

3.01 Contractor's Coordination of Submittals

A. Prior to submittal for the Engineer's review, the Contractor shall use all means necessary to fully coordinate all material, including the following procedures:

1. Determine and verify all field dimensions and conditions, catalog numbers and similar data.

2. Coordinate as required with all trades and all public agencies involved.

3. Submit a written statement of review and compliance with the requirements of all applicable technical Specifications as well as the requirements of this Section.

4. Clearly indicate in a letter or memorandum on the manufacturer's or fabricator's letterhead, all deviations from the Contract Documents.

B. Each and every copy of the shop drawings and data shall bear the Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement.

C. The Owner may backcharge the Contractor for costs associated with having to review a particular shop drawing, product data or sample more than two times to receive a “No Exceptions Taken” mark.

D. Grouping of Submittals

1. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items.

2. No review will be given to partial submittals of shop drawings for items which interconnect and/or are interdependent. It is the Contractor's responsibility to assemble the shop drawings for all such interconnecting and/or

interdependent items, check them and then make one submittal to the Engineer along with Contractor's comments as to compliance, non-compliance or features requiring special attention.

E. Schedule of Submittals

Within 30 days of Contract award and prior to any shop drawing submittal, the Contractor shall submit a schedule showing the estimated date of submittal and the desired approval date for each shop drawing anticipated. A reasonable period shall be scheduled for review and comments. Time lost due to unacceptable submittals shall be the Contractor's responsibility and some time allowance for resubmittal shall be provided. The schedule shall provide for submittal of items which relate to one another to be submitted concurrently.

3.02 Timing of Submittals

A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal, and for placing orders and securing delivery.

B. In scheduling, allow sufficient time for the Engineer's review following the receipt of the submittal.

3.03 Reviewed Shop Drawings

A. Engineer Review

1. Allow a minimum of 30 days for the Engineer's initial processing of each submittal requiring review and response, except allow longer periods where processing must be delayed for coordination with subsequent submittals. The Engineer will advise the Contractor promptly when it is determined that a submittal being processed must be delayed for coordination. Allow a minimum of two weeks for reprocessing each submittal. Advise the Engineer on each submittal as to whether processing time is critical to progress of the Work, and therefore the Work would be expedited if processing time could be foreshortened.

2. Acceptable submittals will be marked “No Exceptions Taken”. A minimum of three copies will be retained by the Engineer for Engineer's and the Owner's use and the remaining copies will be returned to the Contractor.

3. Submittals requiring minor corrections before the product is acceptable will be marked “Make Corrections Noted”. The Contractor may order, fabricate and ship the items included in the submittals, provided the indicated corrections are made. Drawings must be resubmitted for review and marked “No Exceptions Taken” prior to installation or use of products.

4. Submittals marked “Amend and Resubmit” must be revised to reflect required changes and the initial review procedure repeated.

5. The “Rejected - See Remarks” notation is used to indicate products which are not acceptable. Upon return of a submittal so marked, the Contractor shall repeat the initial review procedure utilizing acceptable products.

6. Only two copies of items marked “Amend and Resubmit” and “Rejected - See Remarks” will be reviewed and marked. One copy will be retained by the Engineer and the other copy with all remaining unmarked copies will be returned to the Contractor for resubmittal.

B. No work or products shall be installed without a drawing or submittal bearing the “No Exceptions Taken” notation. The Contractor shall maintain at the job site a complete set of shop drawings bearing the Engineer's stamp.

C. Substitutions: In the event the Contractor obtains the Engineer's approval for the use of products other than those which are listed first in the Contract Documents, the Contractor shall, at the Contractor's own expense and using methods approved by the Engineer, make any changes to structures, piping and electrical work that may be necessary to accommodate these products.

D. Use of the “No Exceptions Taken” notation on shop drawings or other submittals is general and shall not relieve the Contractor of the responsibility of furnishing products of the proper dimension, size, quality, quantity, materials and all performance characteristics, to efficiently perform the requirements and intent of the Contract Documents. The Engineer's review shall not relieve the Contractor of responsibility for errors of any kind on the shop drawings. Review is intended only to assure conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site. The Contractor is also responsible for information that pertains solely to the fabrication processes or to the technique of construction and for the coordination of the work of all trades.

3.04 Resubmission Requirements

A. Shop Drawings

1. Revise initial drawings as required and resubmit as specified for initial submittal, with the resubmittal number shown.

2. Indicate on drawings all changes which have been made other than those requested by the Engineer.

B. Project Data and Samples: Resubmit new data and samples as specified for initial submittal, with the resubmittal number shown.

3.05 Project Closeout

A. Prior to final completion, Contractor shall submit electronic copies of all approved (NET) shop drawings. Each shop drawing shall be scanned as a separate pdf file and named to match the submittal number.

B. Electronic, scanned copy of approved shop drawings shall be submitted to the Engineer on a CD or DVD.

END OF SECTION

Part 1 General

1.01 Scope

A. This Section includes testing which the Owner may require, beyond that testing required of the manufacturer, to determine if materials provided for the Project meet the requirements of these Specifications.

B. This work includes all testing required by the Owner to verify work performed by the Contractor is in accordance with the requirements of these Specifications, i.e., concrete strength and slump testing, soil compaction, etc.

C. This work does not include materials testing required in various sections of these Specifications to be performed by the manufacturer, e.g., manufacturer conformance testing of geosynthetic materials.

D. The testing laboratory or laboratories will be selected by the Owner. The testing laboratory or laboratories will work for the Owner.

E. The Owner's inspections and tests are for the sole benefit of the Owner and shall not:
   1. Relieve the Contractor of responsibility for providing adequate quality control measures,
   2. Relieve the Contractor of responsibility for damage to or loss of the material before acceptance,
   3. Constitute or imply acceptance, and
   4. Affect the continuing rights of the Owner after acceptance of the completed work.

1.02 Payment for Testing Services

A. The cost of testing services required by the Contract to be provided by the Contractor shall be paid for by the Owner, i.e., concrete testing, soil compaction, asphalt testing and geosynthetic testing.

B. The cost of additional testing services not specifically required in the Specifications, but requested by the Owner or Engineer, shall be paid for by the Owner.

C. The cost of testing laboratory services required to be performed by the Engineer shall be paid for by the Owner.

D. The costs that the Owner is to pay for testing laboratory services will be paid for in one of the following manners, as appropriate:

1. The testing laboratory will invoice the Contractor, who would then include such eligible costs in periodic payment requests under the terms and conditions of Cash Allowances.

2. Directly to the Engineer or testing laboratory.

E. The cost of material testing described in various sections of these Specifications or as required in referenced standards to be provided by a material manufacturer, shall be included in the price proposed for that item and shall not be paid for by the Owner.

F. The cost of retesting any item that fails to meet the requirements of these Specifications shall be paid for by the Contractor. Retesting shall be performed by the testing laboratory working for the Owner.

1.03 Contractor Responsibilities

A. Provide access to Work and/or manufacturer's facilities.

B. Provide representative samples of materials to be tested to the laboratory in required quantities.

C. Furnish required labor and facilities to:

1. Provide access to Work to be tested;
2. Obtain and handle samples at the site;
3. Facilitate inspections and tests;
4. Provide a storage box for concrete cylinders or other samples as required by the laboratory.

E. Notify the laboratory or the Engineer sufficiently in advance of operation to allow for the assignment of personnel and schedules of tests.

F. Laboratory Tests: Where such inspection and testing are to be conducted by an independent laboratory agency, the sample(s) shall be selected by such laboratory or agency, or the Engineer, and shipped to the laboratory by the Contractor at Contractor's expense.

G. Copies of all correspondence between the Contractor and testing agencies shall be provided to the Engineer.

H. Provide equipment and labor as required to verify leachate collection layer thickness as requested by the Engineer and/ or the Georgia EPD. Typically, this includes at least one hole per acre at locations as directed by the Engineer excavated to the base of the layer. Care should be taken to protect the surfaces

below the collection layer. Contractor is required to fill in the holes with like material after the site has been inspected by the Georgia EPD.

1.04 Quality Assurance

Testing shall be in accordance with all pertinent codes and regulations and with procedures and requirements of the American Society for Testing and Materials (ASTM).

1.05 Product Handling

The Contractor shall promptly process and distribute all required copies of test reports and related instructions to insure all necessary retesting or replacement of materials with the least possible delay in the progress of the Work.

1.06 Code Compliance Testing

Inspections and tests required by codes or ordinances or by a plan approval authority, and made by a legally constituted authority, shall be the responsibility of, and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.07 Contractor's Convenience Testing

Inspection or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.08 Schedules for Testing

A. Establishing Schedule

1. The Contractor shall, by advance discussion with the testing laboratory or the Engineer, determine the time required for the laboratory to perform its tests and to issue each of its findings, and make all arrangements for the testing laboratory to be on site to provide the required testing.
2. The Contractor shall provide all required time within the construction schedule.

B. When changes of construction schedule are necessary during construction, The Contractor shall coordinate all such changes of schedule with the testing laboratory or the Engineer as required.

C. When the testing laboratory or the Engineer is ready to test according to the determined schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributable to the delay will

be back-charged to the Contractor and shall not be borne by the Owner.

1.09 Taking Specimens

Unless otherwise provided in the Contract Documents, all specimens and samples for tests will be taken by the testing laboratory or the Engineer.

1.10 Transporting Samples

The Contractor shall be responsible for transporting all samples, except those taken by testing laboratory personnel or the Engineer, to the testing laboratory.

END OF SECTION

Part 1 General

1.01 Scope

A. Temporary facilities required for this work include, but are not limited to:

1. Temporary utilities such as water and electricity.
2. First aid facilities.
3. Sanitary facilities.
4. Potable water.
5. Temporary enclosures and construction facilities.

B. Temporary utilities for field offices shall be as specified in Section 01590 of these Specifications.

1.02 General

A. First aid facilities, sanitary facilities and potable water shall be available on the Project site on the first day that any activities are conducted on site. The other facilities shall be provided as the schedule of the Project warrants.

B. Maintenance: Use all means necessary to maintain temporary facilities in proper and safe condition throughout progress of the Work. In the event of loss or damage, immediately make all repairs and replacements necessary, at no additional cost to the Owner.

C. Removal: Remove all such temporary facilities and controls as rapidly as progress of the Work will permit.

1.03 Temporary Utilities

A. General

1. Provide and pay all costs for all water, electricity and other utilities required for the performance of the Work.

2. Pay all costs for temporary utilities until Project completion.

3. Costs for temporary utilities shall include all power, water and the like necessary for testing equipment as required by the Contract Documents.

B. Temporary Water: Provide all necessary temporary piping, and upon completion of the Work, remove all such temporary piping. Provide and remove water meters as

required by the water provider.

C. Temporary Electricity

1. Provide all necessary wiring for the Contractor's use.

2. Furnish, locate and install area distribution boxes such that the individual trades may use, their own construction type extension cords to obtain adequate power, and artificial lighting at all points where required by inspectors and for safety.

1.04 First Aid Facilities

The Contractor shall provide a suitable first aid station, equipped with all facilities and medical supplies necessary to administer emergency first aid treatment. The Contractor shall have standing arrangements for the removal and hospital treatment of any injured person. All first aid facilities and emergency ambulance service shall be made available by the Contractor to the Owner and the Engineer's personnel.

1.05 Sanitary Facilities

Prior to starting the Work, the Contractor shall furnish, for use of Contractor's personnel on the job, all necessary toilet facilities which shall be secluded from public observation. These facilities shall be either chemical toilets or shall be connected to the Owner's sanitary sewer system. All facilities, regardless of type, shall be kept in a clean and sanitary condition and shall comply with the requirements and regulations of the area in which the Work is performed. Adequacy of these facilities will be subject to the Engineer's review and maintenance of same must be satisfactory to the Engineer at all times.

1.06 Potable Water

The Contractor shall be responsible for furnishing a supply of potable drinking water for employees, subcontractors, inspectors, engineers and the Owner who are associated with the Work.

1.07 Enclosures and Construction Facilities

Furnish, install and maintain for the duration of construction, all required scaffolds, tarpaulins, canopies, steps, bridges, platforms and other temporary construction necessary for proper completion of the Work in compliance with all pertinent safety and other regulations.

1.08 Parking Facilities

Parking facilities for the Contractor's and Contractor's subcontractors' personnel shall be the Contractor's responsibility. The storage and work facilities provided by the Owner will not be used for parking by the Contractor's or subcontractor's personnel.

END OF SECTION

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Part 1 General

1.01 Barricades, Light, and Signals

A. The Contractor shall furnish and erect such barricades, fences, lights, and danger signals and shall provide such other precautionary measures for the protection of persons or property and of the work as are necessary. Barricades shall be painted in a color that will be visible at night. From sunset to sunrise, the Contractor shall furnish and maintain at least one light at each barricade and sufficient numbers of barricades shall be erected to keep vehicles from being driven on or into any work under construction.

B. The Contractor will be held responsible for all damage to the work due to failure of barricades, signs and lights and whenever evidence is found of such damage, the Contractor shall immediately remove the damaged portion and replace it at his cost and expense. The Contractor's responsibility for the maintenance of barricades, signs, and lights shall not cease until the project has been accepted by the Owner.

C. All job site security shall be coordinated with the Owner's landfill security procedures.

END OF SECTION

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Part 1 General

1.01 Scope

Limit blowing dust caused by construction operations by applying water or employing other appropriate means or methods to maintain dust control, subject to the approval of the Owner. As a minimum, this may require the use of a water wagon twice a day to suppress dusty conditions.

1.02 Protection of Adjacent Property

A. The Contractor shall make adequate provision to fully protect the surrounding area and will be held fully responsible for all damages resulting from Contractor's operations.

B. Protect all existing facilities (indoors or out) from damage by dust, fumes, spray or spills (indoors or out). Protect motors, bearings, electrical gear, instrumentation and building or other surfaces from dirt, dust, welding fumes, paint spray, spills or droppings causing wear, corrosion, malfunction, failure or defacement by enclosure, sprinkling or other dust palliatives, masking and covering, exhausting or containment.

1.03 Dust Suppression Plan

A. The Contractor shall obtain a copy of the site Dust Suppression Plan as required by the Title V Air Permit. The Contractor shall comply with all aspects of the plan including monthly submission of a Dust Suppression Log. The log is required to address all activities related to the Contractor’s on-site work.

END OF SECTION

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Part 1 General

1.01 Scope

A. The Contractor shall be responsible for conducting all Work in a safe manner and shall take reasonable precautions to ensure the safety and protection of workers, property and the general public. The Contractor's responsibility for protection is described in Article 7 of the General Conditions.

B. All construction shall be conducted in accordance with the latest applicable requirements for Part 1926 of the Occupational Safety and Health Act, Safety and Health Regulations for Construction, Section 107 of the Contract Work Hours and Safety Standards Act, as well as any other local, state or federal safety codes and regulations.

C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the Work is performed safely and in conformance with all applicable regulations.

D. The Contractor shall determine the safety hazards involved in prosecuting the Work and the precautions necessary to conduct the Work safely. If the Contractor is unsure as to any special hazards which may be unique to landfill or wastewater conveyance facilities, it shall be Contractor's responsibility to determine such information prior to beginning the Work.

E. The Contractor shall bear all risks associated with performing the Work and shall fully indemnify and hold harmless the Owner and Engineer.

1.02 Special Requirements

A. The Contractor's attention is directed to the fact that construction activities involving existing landfill facilities and sewer systems will occasionally involve work in potentially hazardous environments in which oxygen deficient, toxic or explosive conditions may exist. Additional hazards arise from the presence of pathogens in the waste and leachate and from the slime and scum layer that coat walking, working and other surfaces. In dealing with these hazards, the Contractor shall take special precautions to ensure worker safety. Such precautions shall include, but are not limited to, the following, as applicable:

1. Installing temporary forced air ventilation equipment and ducts for fresh air in enclosed areas.

2. Using pneumatic tools and equipment instead of electric-driven equipment in hazardous areas.

3. Avoiding the use of cutting torches, field welding and grinders in hazardous areas.

4. Cleaning and disinfecting working surfaces with hot water, high pressure washers prior to commencing work.

5. Installing sealed wooden baffles or bulkheads to isolate working areas from hazardous atmospheres.

6. Providing portable oxygen meters, combustible gas detectors and hydrogen sulfide detectors to continuously monitor the atmosphere in enclosed working areas.

7. Providing safety harnesses, safety lines and recovery crews for workers In hazardous areas.

8. Providing self-contained breathing apparatus with spare air cylinders for workers in hazardous areas.

9. Providing dry chemical fire extinguishers and connected fire hoses in areas where a danger of fire or explosion exists.

10. Providing adequate, oxygen-equipped, first aid facilities.

11. Providing suitable wash-up areas and facilities for workers.

12. Installing temporary lighting using explosion-proof fixtures in hazardous environments.

13. Installing approved warning and hazard signs and posting safety procedures.

14. Instructing all workers as to the hazards present; the procedures to be followed and the proper function and use of all safety and emergency equipment furnished.

B. Prior to commencing Work on existing facilities and equipment, the Contractor shall notify the system/facility superintendent and shall ensure that the source of electrical energy to all affected equipment is shut off and locked out at the appropriate motor control center. Local switches and pushbutton stations, where provided, shall be locked in the "off' position.

C. Prior to entering or commencing work in a hazardous area, the Contractor shall ensure that all safety and emergency equipment is in place and in satisfactory operating condition.

END OF SECTION

Part 1 General

1.01 Scope

A. The work under this Section shall include the providing of a field office for use by the Engineer and Contractor. The work shall include providing the field offices, located on the Project site, site preparation, utilities, removal of the office(s) and restoration of the area.

B. Furnish, install and maintain storage and work sheds needed for construction.

1.02 Requirements

A. General

1. The materials, equipment, and furnishings provided under this Section may be new or used (except as indicated otherwise), but must be serviceable, adequate for the required purpose, and must not violate applicable codes or regulations.

2. The Contractor shall make all provisions and pay all costs for installation, utilities, rent, permit fees, site work and removal for field offices and facilities.

B. Construction

1. Structurally sound, weather tight, with floors raised above ground.

2. Temperature Transmission Resistance: Compatible with occupancy and storage requirements.

3. At the Contractor's option, portable or mobile buildings may be used.

a. Mobile trailers shall be Class “A”, new and modified for office use.

b. Do not use mobile trailers for living quarters.

1.03 Submittals

A. Submit to the Engineer for approval a site plan showing the locations of field offices, parking, storage spaces and storage trailers.

B. Submit to the Engineer for approval, prior to installation, office floor plan and schematic drawings, showing the complete telephone system, including location of jacks, hubs, ports, etc. to be installed shall be provided for review by the Engineer

before installation of service.

Part 2 Products

2.01 Field Office

A. The office shall be fully installed, including all equipment and services, and available for occupation on the site at the beginning of the on-site Work, including the delivery of products, and shall remain on the site until the project is completed or final payment is made.

B. The Field Office shall include an office separate from the Contractor's for the exclusive use by the Engineer. This office shall be not less than 100 square feet of floor space with a lockable door.

C. The Field office shall include a central room, sized as required, to provide space for Project Meetings.

D. The Field Office shall be a pre-fabricated building or a mobile trailer having ceiling, floor and walls adequately insulated. The office shall have sufficient windows to allow adequate sunlight and ventilation, properly weatherproofed with proper screens. The office shall be properly skirted as approved by the Engineer. The office shall have at least one outside entrance with proper screen. Awnings or sunscreen approved by the Engineer shall be furnished over all windows. The outside entrances shall have locks and entrance deck at least four feet wide, with “non-slip” steps and handrails.

E. The office building shall be adequately wired for electricity in accordance with applicable codes to handle the total lighting, air conditioning, equipment and other loads. Lighting fixtures, in adequate numbers, shall be installed to give an illumination of 150 foot candles average and minimum glare. Fluorescent lamp fixtures with minimum 45 degrees shielding will be required. 110 volt convenience duplex outlets, one per wall in each room shall be provided. Provide air conditioning and heating combination unit to maintain 78 degrees F inside in winter with outside air temperature of 20 degrees F and 72 degrees F inside in summer with the outside temperature of 100 degrees F.

2.02 Engineer Office Interior Furnishings

A. Provide new, delivered, and set-up the following items for the Engineer’s office: (All maintenance services, consumable supplies, furnishings, etc. shall be provided for the full duration of the project.)

1. One desk-type phone shall be provided in each office and open area. At minimum, the desk-type phones shall have as features: speed dial, hold,

mute, speaker-phone and interoffice intercom.

2. One desk, per office, 60” x 30”, with at least three drawers.

3. One desk chair, per desk, on castors equal to Global Posture Back Desk Chair #8838BKPN04.

4. One five-gallon wastebasket.

B. Services and supplies to be supplied for the duration of the Project (in addition to utility services):

1. Repair and clean the offices, parking areas and access routes.

2. Provide complete janitorial services and supplies, including but not limited to toilet paper, soap, and paper towels. Cleaning shall be done on a daily basis during other than normal working hours.

2.03 Field Office Facilities

A. The Contractor shall maintain a local office with a telephone & fax in the general area of the Work, and will be required to have a responsible representative on call at all times.

B. Racks and files for Project Record Documents.

C. One 10-inch outdoor-type thermometer.

D. One 11-inch rain gauge graded to 0.01 inches equivalent to Tenite.

2.04 Utilities

A. General: Provide and pay all costs for all telephone, internet, water, sewer, and electricity required for the field office for the duration of the Project. Upon completion of the Work, remove all temporary utilities and telephone equipment.

B. Temporary Water and Sewer: Furnish and install all necessary temporary piping and appurtenances for water and sewer service required for field offices.

C. Temporary Electricity: The Contractor shall furnish and install all necessary electrical service for field offices.

D. Telephone Service

1. The Contractor shall provide telephone service to Contractor's office and separate service to the Engineer’s field office. All portions of the

communication system shall be maintained in good working condition. At least one phone jack shall be provided in each office and open area.

2. The telephone system in the Engineer's field office shall be a touch-tone, local to the site area code, two-line phone system with a separate dedicated line for facsimile machine.

3. All costs for the installation costs of lines, line extensions, service charges and recurring service charges for telephone services, including long distance phone calls, shall be paid by the Contractor at no additional cost to the Owner.

2.05 Parking Facilities

A. Parking facilities for the Contractor's field office shall be the Contractor's responsibility. The storage and work facilities provided by the Owner will not be used for parking.

B. The Contractor shall provide ample parking, graveled or paved, adjacent to the Engineer's field office. Adequate parking space shall be provided for at least one car per 100 square feet of the Engineer's field office, not including contractor's vehicles, at Engineer's field office.

2.06 Use of Permanent Facilities

Permanent facilities shall not be used for field offices or for storage.

Part 3 Execution

3.01 Preparation

Fill and grade sites for temporary structures to provide surface drainage.

3.02 Installation

A. Construct temporary field offices and storage facilities on proper foundations and provide connections for utility services.

1. Secure portable or mobile buildings when used.

2. Provide steps and landings at entrance doors.

3. Provide tie-downs for 100 mile per hour gusts and winds.

B. Locate construction office facilities at locations within the Project approved by the

Engineer.

3.03 Maintenance and Cleaning

Provide periodic maintenance and cleaning for temporary structures, furnishings, equipment and services.

3.04 Removal

A. Remove temporary field offices and utilities at Project Completion or as directed by the Engineer.

B. Remove foundations and debris; grade site to required elevations and clean areas. At a minimum, unless specified elsewhere, restore area to the condition it was in at the beginning of the project and regrass as required.

C. Furnishings furnished for the Engineer's field office are property of the Owner. Remove and relocate furnishings to a location identified by the Owner, as directed by the Engineer.

END OF SECTION

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Part 1 General

1.01 Scope

A. The Contractor shall provide transportation of all equipment, materials and products furnished under these Contract Documents to the Work site. In addition, the Contractor shall provide preparation for shipment, loading, unloading, handling and preparation for installation and all other work and incidental items necessary or convenient to the Contractor for the satisfactory prosecution and completion of the Work.

B. All equipment, materials and products damaged during transportation or handling shall be repaired or replaced by the Contractor at no additional cost to the Owner prior to being incorporated into the Work.

1.02 Transportation

A. All equipment shall be suitably boxed, crated or otherwise protected during transportation.

B. Where equipment will be installed using existing cranes or hoisting equipment, the Contractor shall ensure that the weights of the assembled sections do not exceed the capacity of the cranes or hoisting equipment.

C. Small items and appurtenances such as gauges, valves, switches, instruments and probes which could be damaged during shipment shall be removed from the equipment prior to shipment, packaged and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

1.03 Handling

A. All equipment, materials and products shall be carefully handled to prevent damage or excessive deflections during unloading or transportation.

B. Lifting and handling drawings and instructions furnished by the manufacturer or supplier shall be strictly followed. Eyebolts or lifting lugs furnished on the equipment shall be used in handling the equipment. Shafts and operating mechanisms shall not be used as lifting points. Spreader bars or lifting beams shall be used when the distance between lifting points exceeds that permitted by standard industry practice.

C. Under no circumstances shall equipment or products such as pipe, structural steel, castings, reinforcement, lumber, piles, poles, etc., be thrown or rolled off of trucks onto the ground.

D. Slings and chains shall be padded as required to prevent damage to protective coatings and finishes.

1.04 Owner Furnished Material

A. Owner furnished material shall mean any Owner material purchased and required by these Specifications to be installed by the Contractor.

B. The owner shall be responsible for transportation to the site of all Owner furnished material.

C. The Contractor shall off load and store all Owner furnished material per this Section of these Specifications.

END OF SECTION

Part 1 General

1.01 Scope

The work under this Section includes, but is not necessarily limited to, the furnishing of all labor, tools and materials necessary to properly store and protect all materials, equipment, products and the like, as necessary for the proper and complete performance of the Work.

1.02 Storage and Protection

A. Storage

1. Maintain ample way for foot traffic at all times, except as otherwise approved by the Engineer.

2. All property damaged by reason of storing of material shall be properly replaced at no additional cost to the Owner.

3. Packaged materials shall be delivered in original unopened containers and so stored until ready for use.

4. All materials shall meet the requirements of these Specifications at the time that they are used in the Work.

5. Store products in accordance with manufacturer's instructions.

B. Protection

1. Use means necessary to protect the materials, equipment and products of every section before, during and after installation and to protect the installed work and materials of all other trades.

2. All materials shall be delivered, stored and handled to prevent the inclusion of foreign materials and damage by water, breakage, vandalism or other causes.

3. Substantially constructed weathertight storage sheds, with raised floors, shall be provided and maintained as may be required to adequately protect those materials and products stored on the site which may require protection from damage by the elements.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the Engineer and at no additional cost to the Owner.

D. Equipment and products stored outdoors shall be supported above the ground on suitable wooden blocks or braces arranged to prevent excessive deflection or bending between supports. Items such as pipe, structural steel and sheet construction products shall be stored with one end elevated to facilitate drainage.

E. Unless otherwise permitted in writing by the Engineer, building products and materials such as cement, grout, plaster, gypsumboard, particleboard, resilient flooring, acoustical tile, paneling, finish lumber, insulation, wiring, etc., shall be stored indoors in a dry location. Building products such as rough lumber, plywood, concrete block and structural tile may be stored outdoors under a properly secured waterproof covering.

F. Tarps and other coverings shall be supported above the stored equipment or materials on wooden strips to provide ventilation under the cover and minimize condensation. Tarps and covers shall be arranged to prevent ponding of water.

1.03 Extended Storage

In the event that certain items of major equipment such as air compressors, pumps and mechanical aerators have to be stored for an extended period of time, the Contractor shall provide satisfactory long-term storage facilities which are acceptable to the Engineer. The Contractor shall provide all special packaging, protective coverings, protective coatings, power, nitrogen purge, desiccants, lubricants and exercising necessary or recommended by the manufacturer to properly maintain and protect the equipment during the period of extended storage.

1.04 Owner Furnished Equipment

The Contractor shall provide storage and protection for all Owner furnished equipment and materials, including extended storage as specified above.

END OF SECTION

Part 1 General

1.01 Scope

This Section outlines the Contractor's requirements for substitutions and product options.

1.02 Products List

A. General

1. Within 30 days after date of Notice to Proceed, submit to the Engineer five copies of a complete list of all products which are proposed for installation, unless otherwise indicated elsewhere in the Contract Documents.

2. Tabulate the list by each Specification Section.

B. For products specified under reference standards, include with the listing of each product the following:

1. Name and address of manufacturer,

2. Trade name,

3. Model or catalog designation,

4. Manufacturer's data including performance and test data, and reference standards.

1.03 Contractor's Options

A. No substitutions will be considered for the manufacturers listed by the Bidder in the Bid unless directed by the Owner.

B. For products specified only by reference standards, select any product meeting the standards by any manufacturer unless otherwise required elsewhere in the Contract Documents.

C. Products Specified by Naming Products

1. Whenever the Engineer's design is based on a specific product of a particular manufacturer, that manufacturer will be shown on the Drawings and/or listed first in the list of approved manufacturers in Divisions 2 through 3 of the Specifications. Any Bidder intending to furnish equipment of other than the

first listed manufacturer is cautioned to verify that the item being furnished will fit in the space allowed, perform the functions, and have the capabilities as specified. The Bid should reflect the cost of any accessory items which may be required to incorporate the other listed manufacturer's product in the work. This includes any architectural, structural, mechanical, piping, electrical, or other modifications required and the cost of additional engineering required to accommodate the product selected by the Bidder. The Contractor, after receiving the Notice to Proceed, shall submit shop drawings on the other listed manufacturer's product for the Engineer's review. If the manufacturer of this product is required to be named in the Bid, no deviation from that manufacturer named in the Bid is allowed unless directed by the Owner.

2. Whenever a product is specified with the term “equal to” preceding the list of approved manufacturers, in Divisions 2 through 3 of the Specifications, substitute products will be considered. It is the bidder's responsibility to verify that the substitute product will fit in the space allowed, perform the same functions, and have the same capabilities as the item specified. The substitute product shall not result in any additional costs to the Owner whether for accessory items; for architectural, structural, mechanical, piping, electrical or the other modifications to the work; or for engineering work required to accommodate the substitute product. The Contractor, after receiving notice to proceed, shall submit shop drawings on the substitute product for the Engineer's review. If the manufacturer of this product is required to be named in the Bid, no deviation from that manufacturer named in the Bid is allowed unless directed by the Owner.

3. Approval of the Engineer is dependent on determination that the product offered is essentially equal in function, performance, quality of manufacture, ease of maintenance, reliability, service life and other criteria to that on which the design is based and will require no major modifications to structures, electrical systems, control systems or piping systems.

END OF SECTION

Part 1 General

1.01 Scope

This Section covers the general cleaning which the Contractor shall be required to perform both during construction and before final acceptance of the Project unless otherwise shown on the Drawings or specified elsewhere in these Specifications.

1.02 Quality Assurance

A. Daily, and more often if necessary, conduct inspections verifying that requirements of cleanliness are being met.

B. In addition to the standards described in this Section, comply with all pertinent requirements of governmental agencies having jurisdiction.

1.03 Hazardous Material and Waste

A. The Contractor shall handle hazardous waste and materials in accordance with applicable local, state, and federal regulations. Waste shall also be disposed of in approved landfills as applicable.

B. The Contractor shall prevent accumulation of wastes which create hazardous conditions.

C. Burning or burying rubbish and waste materials on the site shall not be allowed.

D. Disposal of hazardous wastes or materials into sanitary or storm sewers shall not be allowed.

1.04 Disposal of Surplus Materials

Unless otherwise shown on the Drawings, specified or directed, the Contractor shall legally dispose all surplus materials and equipment from demolition and shall provide suitable off-site disposal site, or utilize a site designated by the Owner.

Part 2 Products

2.01 Cleaning Materials and Equipment

Provide all required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

2.02 Compatibility

Use only the cleaning materials, methods and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Engineer.

Part 3 Execution

3.01 Progress Cleaning

A. General

1. Do not allow the accumulation of scrap, debris, waste material and other items not required for construction of this Work.

2. At least each week, and more often if necessary, completely remove all scrap, debris and waste material from the job site.

3. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the environment.

B. Site

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris and waste material. Remove all such items to the place designated for their storage.

2. Restack materials stored on site weekly.

3. At all times maintain the site in a neat and orderly condition which meets the approval of the Engineer.

3.02 Final Cleaning

A. Definitions: Unless otherwise specifically specified, “clean” for the purpose of this Article shall be interpreted as the level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.

B. General: Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste. Conduct final progress cleaning as described in 3.01 above.

C. Site: Unless otherwise specifically directed by the Engineer, hose down all paved

areas on the site and all public sidewalks directly adjacent to the site; rake clean other surfaces of the grounds. Completely remove all resultant debris.

D. Post-Construction Cleanup: All evidence of temporary construction facilities, haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other evidence of construction, as directed by the Engineer.

E. Restoration of Landscape Damage: Any landscape feature damaged by the Contractor shall be restored as nearly as possible to its original condition at the Contractor's expense. The Engineer will decide what method of restoration shall be used.

F. Timing: Schedule final cleaning as approved by the Engineer to enable the Owner to accept the Project.

3.03 Cleaning During Owner's Occupancy

Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning of the occupied spaces shall be as determined by the Engineer in accordance with the Supplementary Conditions of the Contract Documents.

END OF SECTION

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Part 1 General

1.01 Scope

A. The work under this Section includes, but is not necessarily limited to, the compiling, maintaining, recording and submitting of project record documents as herein specified.

B. Record documents include, but are not limited to:

1. Drawings;

2. Specifications;

3. Change orders and other modifications to the Contract;

4. Engineer field orders or written instructions, including Requests for Information (RFI) and Clarification Memorandums;

5. Reviewed shop drawings, product data and samples; and

6. Test records.

C. The Contractor shall maintain on the Project site throughout the Contract Time an up to date set of Record Drawings.

1.02 Maintenance of Documents and Samples

A. Storage

1. Store documents and samples in the Contractor's field office, apart from documents used for construction.

2. Provide files and racks for storage of documents.

3. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with format of these Specifications.

C. Maintenance

1. Maintain documents in a clean, dry, legible condition and in good order.

2. Do not use record documents for construction purposes.

3. Maintain at the site for the Owner one copy of all record documents.

D. Make documents and samples available at all times for inspection by Engineer.

E. Failure to maintain the Record Documents in a satisfactory manner may be cause for withholding of a certificate for payment.

1.03 Quality Assurance

A. Unless noted otherwise, Record Drawings shall provide dimensions, distances and coordinates to the nearest 0.1 foot.

B. Unless noted otherwise, Record Drawings shall provide elevations to the nearest 0.01 foot for all pertinent items constructed by the Contractor.

1.04 Recording

A. Label each document “Project Record” in neat, large printed letters.

B. Recording

1. Record information concurrently with construction progress.

2. Do not conceal any work until required information is recorded.

1.05 Record Drawings

A. Record Drawings shall be reproducible, shall have a title block indicating that the drawings are Record Drawings, the name of the company preparing the Record Drawings, and the date the Record Drawings were prepared.

B. Legibly mark drawings to record actual construction, including:

1. All Construction

a. Changes of dimension and detail.

b. Changes made by Requests for Information (RFI), field order, clarification memorandums or by change order.

c. Details not on original Drawings.

2. Site Improvements, Including Underground Utilities

a. Horizontal and vertical locations of all exposed and underground utilities

and appurtenances, both new facilities constructed and those utilities encountered, referenced to permanent surface improvements.

b. Location of and dimensions of roadways and parking areas, providing dimensions to back of curb when present.

c. The locations shall be referenced to at least two easily identifiable, permanent landmarks (e.g., power poles, valve markers, etc.) or benchmarks.

d. The Record Drawings shall include all invert elevations, as well as, the horizontal angle and distance between manhole covers.

3. Structures

a. Depths of various elements of foundation in relation to finish first floor datum or top of wall.

b. Location of internal and buried utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.

4. The Record Drawings shall also provide a field run topographic survey of the waste cell area upon completion of:

a. The base grading and prior to construction of the liner base

b. The compacted liner base installation

c. The leachate collection blanket

1.06 Specifications

A. Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Requests for Information (RFI), field order, clarification memorandums, or by change order.

1.07 Submittal

A. At contract closeout, deliver original Record Documents and one electronic copy (pdf files) to the Engineer for the Owner.

B. Accompany submittal with transmittal letter, in duplicate, containing:

1. Date

2. Project title and number

3. Contractor's name and address

4. Title and number of each record document

5. Signature of Contractor or Contractor's authorized representative

END OF SECTION

Part 1 General

1.01 Project Maintenance and Warranty

A. Maintain and keep in good repair the Work covered by these Drawings and Specifications until acceptance by the Owner.

B. The Contractor shall warrant for a period of one year from the date of Owner's written acceptance of certain segments of the Work and/or Owner's written final acceptance of the Project, as defined in the Contract Documents, that the completed Work is free from all defects due to faulty products or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect throughout the warranty period.

C. The Contractor shall not be obligated to make replacements which become necessary because of ordinary wear and tear, nor as a result of improper operation or maintenance, nor as a result of improper work or damage by another Contractor or the Owner, nor to perform any work which is normally performed by a maintenance crew during operation.

D. In the event of multiple failures of major consequences prior to the expiration of the one year warranty described above, the affected unit shall be disassembled, inspected and modified or replaced as necessary to prevent further occurrences. All related components which may have been damaged or rendered non-serviceable as a consequence of the failure shall be replaced. A new 12 month warranty against defective or deficient design, workmanship, and materials shall commence on the day that the item is reassembled and placed back into operation. As used herein, multiple failure shall be interpreted to mean two or more successive failures of the same kind in the same item or failures of the same kind in two or more items. Major failures may include, but are not limited to, cracked or broken housings, piping, or vessels, excessive deflections, bent or broken shafts, broken or chipped gear teeth, premature bearing failure, excessive wear or excessive leakage around seals. Failures which are directly and clearly traceable to operator abuse, such as operations in conflict with published operating procedures or improper maintenance, such as substitution of unauthorized replacement parts, use of incorrect lubricants or chemicals, flagrant over-or under-lubrication and using maintenance procedures not conforming with published maintenance instructions, shall be exempted from the scope of the one year warranty. Should multiple failures occur in a given item, all products of the same size and type shall be disassembled, inspected, modified or replaced as necessary and rewarranted for one year.

E. HDPE Geomembrane Warranty

1. The Contractor shall warrant the integrity, within the realm of the limitations of the Contractor's responsibility, of the installed HDPE geomembrane for its intended use, from material or installation defects, for a period of one year from the date of final acceptance.

2. Such written warranty shall provide for the total and complete repair and/or replacement of any defect or defective areas of geomembrane upon written notification and demonstration by the Owner of the specific non-conformance of the geomembrane or installation with the Contract Documents. Such defects or non-conformance shall be repaired and/or replaced expeditiously, at no cost to the Owner.

3. Repair and/or replacement of defective membrane or membrane not conforming to the Contract Documents shall be considered a part of the Contract; all Contract Documents shall also apply to any warranty work.

4. The Contractor shall be responsible for obtaining any necessary warranties or certifications from the geomembrane manufacturer and submitting them to the Engineer and Owner prior to acceptance of the installed geomembrane.

F. The Contractor shall, at Contractor's own expense, furnish all labor, materials, tools and equipment required and shall make such repairs and removals and shall perform such work or reconstruction as may be made necessary by any structural or functional defect or failure resulting from neglect, faulty workmanship or faulty materials, in any part of the Work performed by the Contractor. Such repair shall also include refilling of trenches, excavations or embankments which show settlement or erosion after backfilling or placement.

G. Except as noted on the Drawings or as specified, all structures such as embankments and fences shall be returned to their original condition prior to the completion of the Contract. Any and all damage to any facility not designated for removal, resulting from the Contractor's operations, shall be promptly repaired by the Contractor at no cost to the Owner.

H. The Contractor shall be responsible for all road and entrance reconstruction and repairs and maintenance of same for a period of one year from the date of final acceptance. In the event the repairs and maintenance are not made immediately and it becomes necessary for the owner of the road to make such repairs, the Contractor shall reimburse the owner of the road for the cost of such repairs.

I. In the event the Contractor fails to proceed to remedy the defects upon notification within 15 days of the date of such notice, the Owner reserves the right to cause the required materials to be procured and the work to be done, as described in the

Drawings and Specifications, and to hold the Contractor and the sureties on Contractor's bond liable for the cost and expense thereof.

J. Notice to Contractor for repairs and reconstruction will be made in the form of a registered letter addressed to the Contractor at Contractor's home office.

K. Neither the foregoing paragraphs nor any provision in the Contract Documents, nor any special guarantee time limit implies any limitation of the Contractor's liability within the law of the place of construction.

END OF SECTION

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Part 1 General

1.01 Scope

A. Clearing and grubbing includes, but is not limited to, removing from the Project site, trees, stumps, roots, brush, structures, abandoned utilities, trash, debris and all other materials found on or near the surface of the ground in the construction area and understood by generally accepted engineering practice not to be suitable for construction of the type contemplated. Precautionary measures that prevent damage to existing features to remain are part of the Work.

B. Clearing and grubbing operations shall be coordinated with temporary and permanent erosion and sedimentation control procedures.

1.02 Quality Assurance

A. The Contractor shall comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction over the Project. All required permits of a temporary nature shall be obtained for construction operations by the Contractor.

B. Open burning, if allowed, shall first be permitted by the local authority having jurisdiction. The Contractor shall notify the local fire department and abide by fire department restrictions.

1.03 Job Conditions

Location of the Work: The area to be cleared and grubbed is shown schematically on the Drawings or specified below. It includes all areas designated for construction.

Part 2 Products

2.01 Equipment

The Contractor shall furnish equipment of the type normally used in clearing and grubbing operations including, but not limited to, tractors, trucks and loaders.

Part 3 Execution

3.01 Clearing and Grubbing

A. Materials to be cleared, grubbed and removed from the Project site include, but

are not limited to, all trees, stumps, roots, brush, trash, organic matter, paving, miscellaneous structures.

B. Grubbing shall consist of completely removing roots, stumps, trash and other debris from all graded areas so that topsoil is free of roots and debris. Topsoil is to be left sufficiently clean so that further picking and raking will not be required.

C. All stumps, roots, foundations and planking embedded in the ground shall be removed and disposed of. Piling and butts of utility poles shall be removed to a minimum depth of two feet below the limits of excavation for structures, trenches and roadways or two feet below finish grade, whichever is lower.

D. Surface rocks and boulders shall be grubbed from the soil and removed from the site if not suitable as rip rap.

G. The entire construction area shall be grubbed by heavy tractors with root rakes. Raking shall generally proceed along the contour rather than up and down slopes so as to inhibit soil erosion.

H. Where the tree limbs interfere with utility wires, or where the trees to be felled are in close proximity to utility wires, the tree shall be taken down in sections to eliminate the possibility of damage to the utility.

I. Any work pertaining to utility poles shall comply with the requirements of the appropriate utility.

J. All fences adjoining any excavation or embankment that, in the Contractor's opinion, may be damaged or buried, shall be carefully removed, stored and replaced. Any fencing that, in the Engineer's opinion, is significantly damaged shall be replaced with new fence material.

K. Stumps and roots shall be grubbed and removed to a depth not less than two feet below grade. All holes or cavities which extend below the subgrade elevation of the proposed work shall be filled with crushed rock or other suitable material, compacted to the same density as the surrounding material.

L. The Contractor shall exercise special precautions for the protection and preservation of trees, cultivated shrubs, sod, fences, etc. situated within the limits of the construction area but not directly within excavation and/or fill limits. The Contractor shall be held liable for any damage the Contractor's operations have inflicted on such property.

M. The Contractor shall be responsible for all damages to existing improvements resulting from Contractor's operations.

3.03 Disposal of Debris

A. The debris resulting from the clearing and grubbing operation shall be disposed on site as per the landfill site supervisor's requirements and shall be disposed of 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 in any street or alley. No debris shall be deposited upon any private property except with written consent of the property owner. In no case shall any material or debris be left on the Project, shoved onto abutting private properties or buried on the Project. There will be no tipping fee required for material being disposed of in the inert area.

END OF SECTION

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Part 1 General

1.01 Scope

A. The work specified in this Section consists of providing and maintaining temporary and permanent erosion and sedimentation controls as shown on the Drawings. This Section also specifies the subsequent removal of temporary erosion and sedimentation controls.

B. Temporary and permanent erosion and sedimentation controls include grassing and mulching of disturbed areas and structural barriers at those locations which will ensure that erosion during construction will be maintained within acceptable limits. Acceptable limits are as established by the Georgia Erosion and Sedimentation Control Act of 1975, as amended, Section 402 of the Federal Clean Water Act, and applicable codes, ordinances, rules, regulations and laws of local and municipal authorities having jurisdiction.

C. Land disturbance activity shall not commence until the Land Disturbance Permit has been issued.

D. Land disturbance permit(s) for on-site construction shall be obtained and paid for by the Owner and issued in the name of the Contractor.

E. Land disturbance permit for off-site borrow areas shall be obtained and paid for by the Contractor.

F. A Georgia storm water discharge permit for construction activities (NOI) shall be obtained and paid for by the Owner. The NOI will be re-issued in the name of the Contractor.

1.02 Submittals

A. Submit product data in accordance with the requirements of Section 01340 of these Specifications.

B. Prior to any construction activity, the Contractor shall submit, for the Engineer's approval, a schedule for the accomplishment of temporary and permanent erosion and sedimentation control work. No work shall be started until the erosion and sedimentation control schedule and methods of operation have been approved by the Engineer.

1.03 Quality Assurance

A. The temporary and permanent erosion and sedimentation control measures shown

on the Drawings are minimum requirements. Any additional erosion and sedimentation control measures required by the Contractor's means, methods, techniques and sequence of operation will be installed by the Contractor at no additional cost to the Owner.

B. Perform all work under this Section in accordance with all pertinent rules and regulations including, but not necessarily limited to, those stated in these Specifications. Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.

C. Provide all materials and promptly take all actions necessary to achieve effective erosion and sedimentation control in accordance with the Georgia Erosion and Sedimentation Control Act of 1975, as amended (OCGA §12-7-1, et. seq.) local ordinances, other permits, NPDES construction activity permits, local enforcing agency guidelines and these Specifications.

D. Basic Principles

1. Coordinate the land disturbance activities to fit the topography, soil types and conditions.

2. Minimize the disturbed area and the duration of exposure to erosive elements.

3. Provide temporary or permanent stabilization to disturbed areas immediately after rough grading is complete.

4. Safely convey run-off from the site to a stable outlet to prevent flooding and damage to downstream facilities resulting from increased runoff from the site.

5. Retain sediment on-site that was generated on-site.

6. Minimize encroachment upon watercourses.

E. Implementation

1. The Contractor is solely responsible for the control of erosion within the Project site and the prevention of sedimentation from leaving the Project site or entering waterways.

2. The Contractor shall install temporary and permanent erosion and sedimentation controls which will ensure that runoff from the disturbed area of the Project site shall pass through a filter system before exiting the Project site.

3. The Contractor shall provide temporary and permanent erosion and sedimentation control measures to prevent silt and sediment from entering the waterways. The Contractor shall maintain an undisturbed vegetative buffer a minimum of 25 or 50 feet from the top of the bank.

4. The Contractor shall limit land disturbance activity to those areas shown on the Drawings.

5. The Contractor shall maintain erosion and sedimentation control measures within disturbed areas on the entire site at no additional cost to the Owner until the acceptance of the Project. Maintenance shall include mulching, re-seeding, clean-out of sediment barriers and sediment ponds, replacement of washed-out or undermined rip rap and erosion control materials, to the satisfaction of the Engineer.

6. All fines imposed for improper erosion and sedimentation control shall be paid by the Contractor.

Part 2 Products

2.01 Sediment Barrier

A. Silt Fence

1. Silt fence fabric shall meet the requirements of Section 881.2.07 of the Georgia Department of Transportation Standard Specifications, latest edition.

2. Woven wire fabric shall meet the requirements of Section 894.2.02 of the Georgia Department of Transportation Standard Specifications, latest edition.

3. Type A, B or C silt fence fabric shall be an approved product on the Georgia DOT Qualified Product List No. 36, latest edition. Type C-System is not approved for this project.

B. Hay Bales: Hay bales shall be clean, seed-free cereal hay, rectangular in shape and contain five cubic feet or more of material.

C. Plywood shall be 3/4-inch thick exterior type (C-C grade).

D. 2” x 4” or 4” x 4” wood lumber or posts shall be No. 2 grade minimum.

2.02 Rip Rap

A. Stone Rip Rap: Use sound, tough, durable stones resistant to the action of air and

water. Slabby or shaley pieces will not be acceptable. Unless shown or specified otherwise, stone rip rap shall be Type 3.

1. Type 1 Rip Rap: Rip rap size shall conform to Section 805.2.01 of the Georgia Department of Transportation Standard Specification for Type 1 Stone Dumped Rip Rap.

2. Type 3 Rip Rap: Rip rap size shall conform to Section 805.2.01 of the Georgia Department of Transportation Standard Specification for Type 3 Stone Dumped Rip Rap.

2.03 Plastic Filter Fabric

A. Plastic filter fabric shall conform to the Georgia Department of Transportation Standard Specifications, Section 881.2.05 for woven fabrics.

B. Plastic filter fabric shall be an approved product on the Georgia Department of Transportation Qualified Product List No. 28, latest edition.

2.04 Erosion Control Matting

A. Erosion Control Matting shall conform to the Georgia Department of Transportation Standard Specifications, Section 713.2.B for waterways and slopes. Allowable types: synthetic, wood fiber, coconut fiber or excelsior)

B. Erosion Control Matting shall be an approved product on the Georgia Department of Transportation Qualified Product List No. 62, latest edition.

2.05 Construction Exit Stone

Use sound, tough, durable stone resistant to the action of air and water. Slabby or shaley pieces will not be acceptable. Aggregate size shall be in accordance with the National Stone Association Size R-2 (1.5 to 3.5-inch stone).

Part 3 Execution

3.01 General

A. Temporary and permanent erosion and sedimentation control measures shall prevent erosion and prevent sediment from exiting the site. If, in the opinion of the Engineer, the Contractor's temporary erosion and sedimentation control measures are inadequate, the Contractor shall provide additional maintenance for existing measures or additional devices to control erosion and sedimentation on the site at no additional cost to the Owner.

B. All erosion and sedimentation control devices and structures shall be inspected by the Contractor at least once a week and immediately prior to each rainfall occurrence. Any device or structure found to be damaged will be repaired or replaced by the end of the day. Sediment ponds shall be cleaned out to the elevation shown on the Contract Documents and prior to final completion of the project.

C. All erosion and sedimentation control measures and devices shall be constructed and maintained as indicated on the Drawings or specified herein until adequate permanent disturbed area stabilization has been provided and accepted by the Engineer. Once adequate permanent stabilization has been provided and accepted by the Engineer, all temporary erosion and sedimentation control structures and devices shall be removed.

3.02 Sediment Control

A. Construction Exit

1. Construction exit(s) shall be placed as shown on the Drawings and as directed by the Engineer. A construction exit shall be located at any point traffic will be leaving a disturbed area to a public right-of-way, street, alley, sidewalk or parking area.

2. Placement of Construction Exit Material: The ground surface upon which the construction exit material is to be placed shall be prepared to a smooth condition free from obstructions, depressions or debris. The plastic filter fabric shall be placed to provide a minimum number of overlaps and a minimum width of one foot of overlap at each joint. The stone shall be placed with its top elevation conforming to the surrounding roadway elevations. The stone shall be dropped no more than three feet during construction.

3. Construction Exit Maintenance: The Contractor shall regularly maintain the exit(s) with the top dressing of stone to prevent tracking or flow of soil onto public rights-of-way and paved surfaces as directed by the Engineer.

4. Construction Exit Removal: Construction exit(s) shall be removed and properly disposed of when the disturbed area has been properly stabilized, the tracking or flow of soil onto public rights-of-way or paved surfaces has ceased and as directed by the Engineer.

B. Sediment Barriers

1. Sediment barriers shall include, but are not necessarily limited to, silt fences, hay bales, rock check dams and inlet sediment traps, any device which prevents sediment from exiting the disturbed area.

2. Silt fences, hay bales and rock check dams shall not be used in any flowing stream, creek or river.

3. Sediment barriers shall be installed as shown on the Drawings and as directed by the Engineer.

4. Sediment barriers shall be maintained to ensure the depth of empounded sediment is no more than one-half of the original height of the barrier or as directed by the Engineer. Torn, damaged, destroyed or washed-out barriers shall be repaired, reinforced or replaced with new material and installed as shown on the Drawings and as directed by the Engineer.

5. Sediment Barrier Removal

   a. Sediment barrier shall be removed once the disturbed area has been stabilized with a permanent vegetative cover and the sediment barrier is no longer required as directed by the Engineer.

   b. Accumulated sediment shall be removed from the barrier and spread over the site.

   c. All non-biodegradable parts of the barrier shall be disposed of properly. The hay bales may be spread evenly across disturbed areas as a mulching material.

   d. The disturbed area created by barrier removal shall be permanently stabilized.

3.03 Erosion Control

A. Rip Rap

1. Rip rap shall be placed as shown on the Drawings and as directed by the Engineer. Rip rap shall be placed at all points where natural vegetation is disturbed on the banks of streams or drainage ditches. Compact backfill and place rip rap to prevent subsequent settlement and erosion. This requirement applies equally to construction along side a stream or drainage ditch as well as crossing a stream or drainage ditch.

2. Preparation of Foundations: The ground surface upon which the rip rap is to be placed shall be brought to the correct lines and grades before placement is commenced. Where filling of depressions is required, the new material shall be compacted with hand or mechanical tampers. Unless at creek banks or otherwise shown or specified, rip rap shall begin in a toe ditch constructed in original ground around the toe of the fill or the cut slope. The

toe ditch shall be two feet deep in original ground, and the side next to the fill or cut shall have that same slope. After the rip rap is placed, the toe ditch shall be backfilled and the excess dirt spread neatly on the site.

3. Placement of Plastic Filter Fabric

   a. Plastic filter fabric shall be placed under all rip rap unless shown or specified otherwise.

   b. The surface to receive filter fabric shall be prepared to a smooth condition free from obstructions, depressions and debris. The filter fabric shall be installed with the long dimension running up the slope and shall be placed to provide a minimum number of overlaps. The fabric shall be placed to provide a minimum width of one foot of overlap at each joint. The fabric shall be placed so that the upstream strip overlaps the downstream strip. The fabric shall be anchored in place with securing pins of the type recommended by the fabric manufacturer. Pins shall be placed on or within 3-inches of the centerline of the overlap. The fabric shall be placed loosely to avoid stretching and tearing during placement of the stone. The fabric shall be protected at all times during construction from clogging due to clay, silts, chemicals or other contaminants. Contaminated fabric or fabric damaged during installation or during placement of rip rap shall be removed and replaced with uncontaminated and undamaged fabric at no additional cost to the Owner.

4. Placement of Rip Rap: Rip rap shall be placed on a 6-inch layer of soil, crushed stone or sand overlaying the filter fabric. Rip rap shall be placed with its top elevation conforming to the finished grade or the natural existing slope of the stream bank and stream bottom. The stone shall be dropped no more than three feet during construction.

   Stone Rip Rap: Stone rip rap shall be placed to provide a uniform surface to the thickness shown on the Drawings. The thickness tolerance for the course shall be -3-inches and +6-inches.

B. Grassing

1. Grassing shall meet the requirements of Section 700 of the Georgia Department of Transportation Standard Specifications, latest edition, unless specified otherwise.

2. Seed rate, fertilization and other requirements shall be performed in accordance with the requirements of Section 02485 of these Specifications.

3. Temporary Stabilization: Temporary stabilization shall be provided as shown

on the Drawings and conforming to these Specifications to control erosion on the site. Temporary stabilization shall be provided to any area which will not receive permanent stabilization within the next 14 calendar days. Partial payment requests may be withheld for those portions of the Project not complying with this requirement.

4. Permanent Stabilization

a. Permanent stabilization shall be provided as shown on the Drawings and conforming to these Specifications to control erosion on the site. Permanent stabilization shall be provided to all areas of land disturbance within 14 calendar days of the completion of land disturbance.

b. Where permanent stabilization cannot be immediately established because of an inappropriate season, the Contractor shall provide temporary stabilization. The Contractor shall return to the site at the appropriate season to provide permanent stabilization in areas that received only temporary stabilization.

3.04 Clean-Up

A. Dispose of all excess erosion and sedimentation control materials in a manner satisfactory to the Engineer.

B. Final clean-up shall be performed in accordance with the requirements of Section 01710 of these Specifications.

3.05 Closeout

A. Contractor shall provide the Notice of Termination (NOT) for the Georgia storm water discharge from construction activities permit. The Contractor is responsible for executing the NOT, getting the Owner to sign, and for submission to EPD along with all required data. The Contractor shall provide documentation of EPD's acceptance and approval of the NOT.

END OF SECTION

Part 1 General

1.01 Scope

A. This Section shall apply to all excavation, except trench excavation.

B. Construct all permanent work in areas free from water. Design, construct and maintain all wells, pumps, vacuum systems, sumps, dikes, levees, cofferdams and diversion and drainage channels as necessary to maintain the areas free from water and to protect the areas to be occupied by permanent work from water damage. Remove temporary works after they have served their purpose.

C. The Contractor shall be responsible for the stability of all temporary and permanent slopes, grades, foundations, materials and structures during the course of the Contract. Repair and replace all slopes, grades, foundations, materials and structures damaged by water, both surface and subsurface, to the lines, grades and conditions existing prior to the damage, at no additional cost to the Owner.

Part 2 Products (Not Used)

Part 3 Execution

3.01 Care of Water

A. Except where the excavated materials are designated as materials for permanent work, material from required excavation may be used for dikes, levees, cofferdams and other temporary backfill.

B. Furnish, install, maintain and operate necessary pumping and other equipment for dewatering the various parts of the work and for maintaining the foundation and other parts free from water as required for constructing each part of the work.

C. Install all drainage ditches, sumps and pumps to control excessive seepage on excavated slopes, to drain isolated zones with perched water tables and to drain impervious surfaces at final excavation elevation.

D. Dewater by means which will insure dry excavations, preserve final lines and grades, do not disturb or displace adjacent soil.

E. 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.

F. Do not overload or obstruct existing drainage facilities.

G. After they have served their purpose, remove all temporary protective work at a satisfactory time and in a satisfactory manner. All diversion channels and other temporary excavations in areas where the compacted fill or other structures will be constructed shall be cleaned out, backfilled and processed under the same Specifications as those governing the compacted fill. Fill or grout all temporary dewatering wells unless otherwise directed by the Engineer.

H. When the temporary works will not adversely affect any item of permanent work or the planned usage of the Project, the Contractor may be permitted to leave such temporary works in place. In such instances, breeching of dikes, levees and cofferdams may be required.

3.02 Dewatering

A. By the use of well points, pumps, tile drains or other approved methods, the Contractor shall prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed.

B. Excavations shall be continuously dewatered to maintain a ground water level no higher than three to four feet below the lowest point in the excavation. Dewatering systems shall be designed to allow for localized variations in the depth of excavations required to reach a suitable foundation. Dewatering shall be accomplished well enough in advance of excavation to ensure that groundwater is already lowered prior to completing the final excavation to finish subgrade.

C. All destabilized subgrade conditions caused by inadequate or untimely dewatering operations shall be undercut and backfilled with suitable backfill material at no additional cost to the Owner.

D. Piezometric observation wells are required to monitor the ground water level to insure proper dewatering prior to excavation below the static water table. The number of wells required will vary depending on the size and depth of structures.

END OF SECTION

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 1×10^{-7} cm/sec when tested in accordance with the ASTM D 5084 using criterion supplied by the Engineer.

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 2.01.A.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 1×10^{-3} cm/sec when used with the specified double sided geocomposite or 1×10^{-1} cm/sec when tested in accordance with ASTM D 2434

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^{-1}	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

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.

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

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 recompacted 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 place 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

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)(1)	ASTM D 6938 or ASTM D 1556 or ASTM D 2937	1/10,000 ft^2/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^2/lift	
	Moisture Content (lab test)	ASTM D 2216	Every 10th Field Moisture Test	± 2% of optimum
	Particle Size	ASTM D 422	1/10,000 yd^3 or Change in Material	≤3”
	Atterberg Limits	ASTM D 4318	1/10,000 yd^3 or Change in Material	
	Standard Proctor	ASTM D 698	1/10,000 yd^3 or Change in Material	
Compacted Liner Base Layers (Borrow Source)	Moisture Content	ASTM D 2216	1/1,000 yd^3	
	Particle Size	ASTM D 422	1/1,000 yd^3	See Text
	Atterberg Limits	ASTM D 4318	1/5,000 yd^3	
	Permeability (Remodeled Sample)	ASTM D 5084	1/10,000 yd^3 or Change in Material	Compacted liner base: $k \leq 1x10^{-7}$ cm/sec
	Standard Proctor	ASTM D 698	1/5,000 yd^3 or Change in Material	
Compacted Liner Base Layers (Field Testing)	Field Density (nuclear, sand cone, drive cylinder) (1)	ASTM D 6938 or ASTM D 1556 or ASTM D 2937	1/10,000 ft^2/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^2/lift or	

Item	Testing	Method	Frequency	Acceptance Criteria
			1/lift/800 L.F. of Sidewall	
Compacted Liner Base Material (Undisturbed Sample)	Moisture Content	ASTM D 2216	1/40,000 ft^2/lift or 1/lift/800 L.F. of Sidewall	See Text
	Permeability	ASTM D 5084	1/40,000 ft^2/lift or 1/lift/800 L.F. of Sidewall	Liner Base: $k \leq 1x10^{-7}$ cm/sec
Compacted Liner Base Layers Material (Undisturbed Sample)	Dry Density	ASTM D 6938	1/40,000 ft^2/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^2/lift or 1/lift/800 L.F. of Sidewall	
Leachate Collection Gravel	Particle Size	ASTM C 136	1/1,500 yd^3	See Text
	Permeability	ASTM D 2434	1/3,000 yd^3	
	Calcium Carbonate	ASTM D 3042	1 per Source	< 5 percent
Leachate Collection Blanket	Particle Size	ASTM C 136	1/1,500 yd^3	≤1/2-inch
	Permeability	ASTM D 2434	1/3,000 yd^3	$\geq 1x10^{-2}$ cm/sec Or ≥1x10-1 cm/sec
	Calcium Carbonate	ASTM D 3042	1 per Source	< 5 percent

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

END OF SECTION

Part 1 General

1.01 Scope

A. The work under this Section consists of furnishing all labor, equipment and materials and performing all operations in connection with the trench excavation and backfill required to install the pipelines or other site utilities shown on the Drawings and as specified.

B. Excavation shall include the removal of any trees, stumps, brush, debris or other obstacles which remain after the clearing and grubbing operations, which may obstruct the work, and the excavation and removal of all earth, rock or other materials to the extent necessary to install the pipe or other utility and appurtenances in conformance with the lines and grades shown on the Drawings and as specified.

C. Backfill shall include the refilling and compaction of the fill in the trenches and excavations up to the surrounding ground surface or road grade at crossing.

D. The pipe zone area of the trench is divided into five specific areas:

1. Foundation: The area beneath the bedding, sometimes also referenced to as trench stabilization.

2. Bedding: The area above the trench bottom (or foundation) and below the bottom of the barrel of the pipe or bottom of the duct bank.

3. Haunching: The area above the bottom of the barrel of the pipe up to a specified height above the bottom of the barrel of the pipe or duct bank.

4. Initial Backfill: The area above the haunching material and below a plane 18-inches above the top of the barrel of the pipe or top of the duct bank.

5. Final Backfill: The area above a plane 18-inches above the top of the barrel of the pipe or duct bank.

E. The choice of method, means, techniques and equipment rests with the Contractor. The Contractor shall select the method and equipment for trench excavation and backfill depending upon the type of material to be excavated and backfilled, the depth of excavation, the amount of space available for operation of equipment, storage of excavated material, proximity of man-made improvements to be protected, available easement or right-of-way and prevailing practice in the area.

1.02 Quality Assurance

A. Density: All references to “maximum dry density” shall mean the maximum dry density defined by the “Maximum Density-Optimum Moisture Test”, ASTM D 698. Determination of the density of foundation, bedding, haunching, or backfill materials in place shall meet with the requirements of ASTM D 1556, “Density of Soil In Place by the Sand Cone Method”, ASTM D 2937, “Density of Soil In Place by the Drive-Cylinder Method” or ASTM D 2922, “Density of Soil and Soil-Aggregate In Place by Nuclear Methods (Shallow Depth)”.

B. Materials compliance testing 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 for through the appropriate cash allowance in 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 Paragraph 3.13 of this Section for a listing of all soil material testing requirements.

1.03 Safety

Perform all trench excavation and backfilling activities in accordance with the Occupational Safety and Health Act of 1970 (PL 91-596), as amended. The Contractor shall pay particular attention to the Safety and Health Regulations Part 1926, Subpart P “Excavation, Trenching & Shoring” as described in OSHA 2226 and O.C.G.A Title 43, Chapter 14.

Part 2 Products

2.01 Trench Foundation Materials

A. For utilities placed in structural fill, trench foundation materials shall consist of general structural fill placed and compacted in accordance with Section 02200 of these Specifications.

B. Crushed stone shall be utilized for trench foundation (trench stabilization) and shall meet the requirements of the Georgia Department of Transportation Specification 800.2, Group I (limestone, marble or dolomite) or Group II (quartzite, granite or gneiss). Stone size shall be between No. 57 and No. 4, inclusive.

C. Fine Aggregate: All fine aggregate shall conform to the Georgia Department of Transportation Standard Specifications for Construction of Road and Bridges, 801.2.

2.02 Bedding and Haunching Materials

A. Crushed stone utilized for bedding and haunching shall meet the requirements of the Georgia Department of Transportation Specification 800.01, Group I (limestone, marble or dolomite) or Group II (quartzite, granite or gneiss). Stone size shall be No. 57.

B. Earth materials utilized for bedding and haunching shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2-inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, earth bedding and haunching materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as bedding or haunching material, provide select material conforming to the requirements of this Section at no additional cost to the Owner.

C. Filter Fabric [Woven Type]

1. Filter fabric associated with bedding 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^{-1}	ASTM D 4491	0.02
Apparent Opening Size	in.	ASTM D 4751	0.024
Ultraviolet Stability	% ret @ 500 hrs	ASTM D 4355	50

2.03 Initial Backfill

A. Initial backfill material shall be crushed stone, fine aggregate or earth materials (as shown on the Drawings) as specified for bedding and haunching materials.

B. Earth materials utilized for initial backfill shall be suitable materials selected from materials excavated from the trench. Suitable materials shall be clean and free of rock larger than 2-inches at its largest dimension, organics, cinders, stumps, limbs, frozen earth or mud, man-made wastes and other unsuitable materials. Should the material excavated from the trench be saturated, the saturated material may be used as earth material, provided it is allowed to dry properly and it is capable of meeting the specified compaction requirements. When necessary, initial backfill materials shall be moistened to facilitate compaction by tamping. If materials excavated from the trench are not suitable for use as initial backfill material, provide select material conforming to the requirements of this Section.

2.04 Final Backfill

Final backfill material shall be general excavated earth materials, shall not contain rock larger than 2-inches at its greatest diameter, cinders, stumps, limbs, man-made wastes and other unsuitable materials. If materials excavated from the trench are not suitable for use as final backfill material, provide select material conforming to the requirements of this Section.

2.05 Select Backfill

Select backfill shall be materials which meet the requirements as specified for bedding, haunching, initial backfill or final backfill materials, including compaction requirements.

2.06 Concrete

Concrete for bedding, haunching, initial backfill or encasement shall be Class “B” concrete in accordance with Georgia Department of Transportation Standard Specifications, Section 500.

Part 3 Execution

3.01 Trench Excavation

A. Topsoil and grass shall be stripped a minimum of 6-inches over the trench excavation site and stockpiled separately for replacement over the finished grading areas.

B. Trenches shall be excavated to the lines and grades shown on the Drawings with the centerlines of the trenches on the centerlines of the pipes or utility and to the dimensions which provide the proper support and protection of the pipe and other structures and accessories.

C. Width

1. The sides of all trenches shall be vertical to a minimum of one foot above the top of the pipe. Unless otherwise indicated on the Drawings, the maximum trench width shall be equal to the sum of the outside diameter of the pipe plus two feet. The minimum trench width shall be that which allows the proper consolidation of the haunching and initial backfill material.

2. Excavate the top portion of the trench to any width within the construction easement or right-of-way which will not cause unnecessary damage to adjoining structures, roadways, pavement, utilities, trees or private property. Where necessary to accomplish this, provide sheeting and shoring.

3. Where rock is encountered in trenches, excavate to remove boulders and stones to provide a minimum of 9-inches clearance between the rock and any part of the pipe barrel or manhole.

4. Wherever the prescribed maximum trench width is exceeded, the Contractor shall use the next higher class (load factor) of bedding and haunching for the full trench width as actually cut, at no additional cost to the Owner. The excessive trench width may be due to unstable trench walls, inadequate or improperly placed bracing and sheeting which caused sloughing, accidental over-excavation, intentional over-excavation necessitated by the size of the Contractor's tamping and compaction equipment, intentional over-excavation due to the size of the Contractor's excavation equipment, or other reasons beyond the control of the Engineer or Owner.

D. Depth

1. The trenches shall be excavated to the required depth or elevation which allow for the placement of the utility and bedding to the thickness shown on the Drawings.

2. Where rock is encountered in trenches for pipelines, excavate to the minimum depth which will provide clearance below the pipe barrel of 8-inches for pipe 21-inches in diameter and smaller and 12-inches for larger pipe, valves and manholes. Remove boulders and stones to provide a minimum of 6-inches clearance between the rock and any part of the pipe, manhole or accessory. When rock is encountered in trenches for electrical duct banks, excavate to the minimum depth required to construct the duct banks to the dimensions shown on the Drawings.

E. Excavated Materials

1. Excavated materials shall be placed adjacent to the work to be used for backfilling as required. Topsoil shall be carefully separated and lastly placed in its original location.

2. Excavated material shall be placed sufficiently back from the edge of the excavation to prevent caving of the trench wall, to permit safe access along the trench and not cause any drainage problems. Excavated material shall be placed so as not to damage existing landscape features or man-made improvements.

3.02 Sheeting, Bracing, and Shoring

A. Sheeting, bracing, and shoring shall be performed in the following instances:

1. Where sloping of the trench walls does not adequately protect persons within the trench from slides or cave-ins.

2. In caving ground.

3. In wet, saturated, flowing or otherwise unstable materials. The sides of all trenches and excavations shall be adequately sheeted, braced and shored.

4. Where necessary to prevent damage to adjoining buildings, structures, roadways, pavement, utilities, trees or private properties which are required to remain.

5. Where necessary to maintain the top of the trench within the available construction easement or right-of-way.

6. Where shown on the Drawings, sheeting shall be steel sheeting.

B. In all cases, excavation protection shall strictly conform to the requirements of the Occupational Safety and Health Act of 1970, as amended and O.C.G.A 43-14-8.

C. Timber: Timber for shoring, sheeting, or bracing shall be sound and free of large or

loose knots and in good, serviceable condition. Size and spacing shall be in accordance with OSHA regulations.

D. Steel Sheeting and 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 live loads. 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. Sheet piling within three feet of an existing structure or pipeline shall remain in place, unless otherwise directed by the Engineer.

E. Trench Shield: A trench shield or box may be used to support the trench walls. The use of a trench shield does not necessarily preclude the additional use of bracing and sheeting. When trench shields are used, care must be taken to avoid disturbing the alignment and grade of the pipe or disrupting the haunching of the pipe as the shield is moved. When the bottom of the trench shield extends below the top of the pipe, the trench shield will be raised in 6-inch increments with specified backfilling occurring simultaneously. At no time shall the trench shield be "dragged" with the bottom of the shield extending below the top of the pipe.

F. Remove bracing and sheeting in units when backfill reaches the point necessary to protect the pipe and adjacent property. Leave sheeting in place when in the opinion of the Engineer it cannot be safely removed. Cut off any sheeting left in place at least two feet below the surface.

G. Sheet piling within three feet of an existing structure or pipeline shall remain in place, unless otherwise directed by the Engineer.

3.03 Dewatering Excavations

A. Dewater excavation continuously to maintain a water level two feet below the bottom of the trench.

B. Control drainage in the vicinity of excavation so the ground surface is properly pitched to prevent water running into the excavation.

C. There shall be sufficient pumping equipment, in good working order, available at all times, to remove any water that accumulates in excavations. Where the pipe line crosses natural drainage channels, the work shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work will be prevented. Provision shall be made for the satisfactory disposal of surface water to prevent damage to public or private property.

D. In all cases, accumulated water in the trench shall be removed before placing

bedding or haunching, laying pipe, placing concrete or backfilling.

E. Where dewatering is performed by pumping the water from a sump, crushed stone shall be used as the medium for conducting the water to the sump. Sump depth shall be at least two feet below the bottom of the trench. Pumping equipment shall be of sufficient quantity and/or capacity to maintain the water level in the sump two feet below the bottom of the trench. Pumps shall be a type such that intermittent flows can be discharged. A standby pump shall be required in the event the operating pump or pumps clog or otherwise stop operation.

F. Dewater by use of a well point system when pumping from sumps does not lower the water level two feet below the trench bottom. Where soil conditions dictate, the Contractor shall construct well points cased in sand wicks. The casing, 6 to 10-inches in diameter, shall be jetted into the ground, followed by the installation of the well point, filling casing with sand and withdrawing the casing.

3.04 Trench Foundation and Stabilization

A. The bottom of the trench shall provide a foundation to support the pipe or utility and its specified bedding. The trench bottom shall be graded to support the utility and bedding uniformly throughout its length and width.

B. If, after dewatering as specified above, the trench bottom is spongy, or if the trench bottom does not provide firm, stable footing and the material at the bottom of the trench will still not adequately support the utility, the trench will be determined to be unsuitable and the Engineer shall then authorize payment for trench stabilization.

C. Should the undisturbed material encountered at the trench bottom constitute, in the opinion of the Engineer, an unstable foundation for the utility, the Contractor shall be required to remove such unstable material and fill the trench to the proper subgrade with crushed stone.

D. Where the replacement of unsuitable material with crushed stone does not provide an adequate trench foundation, the trench bottom shall be excavated to a depth of at least two feet below the specified trench bottom. Place filter fabric in the bottom of the trench and support the fabric along the trench walls until the trench stabilization, bedding, haunching and pipe have been placed at the proper grade. The ends of the filter fabric shall be overlapped above the pipe.

E. Where trench stabilization is provided, the trench stabilization material shall be compacted to at least 95 percent of the maximum dry density in accordance with article 1.02 of this section, unless shown or specified otherwise.

3.05 Bedding and Haunching

A. Bedding material shall be placed to provide uniform support along the bottom of the pipe and to place and maintain the pipe at the proper elevation. The initial layer of bedding placed to receive the pipe shall be brought to the grade and dimensions indicated on the Drawings, and the pipe shall be placed thereon and brought to grade by tamping the bedding material or by removal of the slight excess amount of the bedding material under the pipe. Adjustment to grade line shall be made by scraping away or filling with bedding material. Wedging or blocking up of pipe shall not be permitted. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade shall not be permitted. Each pipe section shall have a uniform bearing on the bedding for the length of the pipe, except immediately at the joint. All bedding shall extend the full width of the trench bottom. Prior to placement of bedding material, the trench bottom shall be free of any water, loose rocks, boulders or large dirt clods.

B. At each joint, excavate bell holes of ample depth and width to permit the joint to be assembled properly and to relieve the pipe bell of any load.

C. After the pipe section is properly placed, add the haunching material to the specified depth. The haunching material shall be shovel sliced, tamped, vigorously chinked or otherwise consolidated to provide uniform support for the pipe barrel and to fill completely the voids under the pipe, including the bell hole. Prior to placement of the haunching material, the bedding shall be clean and free of any water, loose rocks, boulders or dirt clods.

D. Gravity Sewers and Accessories: Lay HDPE pipe with minimum Class “C” bedding, unless shown or specified otherwise.

1. Class “C” (Bedding Factor - 1.5): Excavate the bottom of the trench flat at a minimum depth as shown on the Drawings, below the bottom of the pipe barrel. Place and compact bedding material to the proper grade. Haunching material shall then be carefully placed by hand and compacted to provide full support under and up to a height of one-fourth the outside diameter of the pipe above the bottom of the pipe barrel.

E. Manholes: Excavate to a minimum of 12-inches below the planned elevation of the base of the manhole. Place and compact crushed stone bedding material to the required grade before constructing the manhole.

F. Excessive Width and Depth

1. Gravity Sewers: If the trench is excavated to excess width, provide the bedding class with the next higher bedding factor. Crushed stone haunching and initial backfill may be used in lieu of Class “A” bedding, where Class “A” bedding is necessitated by excessive trench width.

2. If the trench is excavated to excessive depth, provide crushed stone to place the bedding at the proper elevation or grade.

G. Compaction: Bedding and haunching materials under pipe, manholes and accessories shall be compacted to a minimum of 90 percent of the maximum dry density in accordance with Article 1.02 of this section, unless shown or specified otherwise.

3.06 Initial Backfill

A. Initial backfill shall be placed to anchor the pipe, protect the pipe from damage by subsequent backfill and ensure the uniform distribution of the loads over the top of the pipe.

B. Place initial backfill material carefully around the pipe in uniform layers to a depth of at least 18-inches above the pipe barrel. Layer depths shall be a maximum of 6-inches for pipe 18-inches in diameter and smaller and a maximum of 12-inches for pipe larger than 18-inches in diameter.

C. Backfill on both sides of the pipe simultaneously to prevent side pressures.

D. Compact each layer thoroughly with suitable hand tools or tamping equipment.

E. Initial backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless shown or specified otherwise.

F. If materials excavated from the trench are not suitable for use as backfill materials, provide select backfill material conforming to the requirements of this Section.

3.07 Final Backfill

A. Backfill carefully to restore the ground surface to its original condition.

B. The top 6-inches shall be topsoil obtained as specified in Article 3.01 of this Section.

C. Excavated material which is unsuitable for backfilling, and excess material, shall be disposed of, at no additional cost to the Owner, in a manner approved by the Engineer. Surplus soil may be neatly distributed and spread over the site, if approved by the Engineer. If such spreading is allowed, the site shall be left in a clean and sightly condition and shall not affect pre-construction drainage patterns. Surplus rock from the trenching operations shall be removed from the site.

D. If materials excavated from the trench are not suitable for use as backfill

materials, provide select backfill material conforming to the requirements of this Section.

E. After initial backfill material has been placed and compacted, backfill with final backfill material. Place backfill material in uniform layers, compacting each layer thoroughly as follows:

1. In 6-inch layers, if using light power tamping equipment, such as a “jumping jack”.

2. In 12-inch layers, if using heavy tamping equipment, such as hammer with tamping feet.

3. In 24-inch layers, if using a hydra-hammer.

F. Settlement: If trench settles, re-fill and grade the surface to conform to the adjacent surfaces.

G. Final backfill shall be compacted to a minimum 90 percent of the maximum dry density, unless specified otherwise.

3.11 Backfill Under Roads

Compact backfill underlying pavement and sidewalks, and backfill under dirt and gravel roads to a minimum 95 percent of the maximum dry density. The top 12-inches shall be compacted to a minimum of 98 percent of the maximum dry density. Compaction shall be performed in accordance with Article 1.02 of this section

3.12 Detection Tape

Detection tape shall be provided over all non-metallic piping and buried 4 to 10-inches beneath the ground surface directly over the top of the pipe. Should detection tape need to be installed deeper, the Contractor shall provide 3-inch wide tape. In no case shall detection tape be buried greater than 20-inches from the finished grade surface.

3.13 Testing and Inspection

A. The soil testing will be performed by an independent testing laboratory selected by the Owner.

B. The soils testing laboratory is responsible for the following:

1. Compaction tests in accordance with Article 1.02 of this Section.

2. Field density tests for each two feet of lift, one test for each 2,000 feet of pipe installed or more frequently if ordered by the Engineer.

3. Inspecting and testing stripped site, subgrades and proposed fill materials.

C. The Contractor's duties relative to testing include:

1. Notifying laboratory of conditions requiring testing.

2. Coordinating with laboratory for field testing.

3. Paying costs for additional testing performed beyond the scope of that required and for re-testing where initial tests reveal non-conformance with specified requirements.

4. Providing excavation as necessary for laboratory personnel to conduct tests.

D. Inspection

1. Earthwork operations, acceptability of excavated materials for bedding or backfill, and placing and compaction of bedding and backfill is subject to inspection by the Engineer.
2. Foundations and shallow spread footing foundations are required to be inspected by a geotechnical engineer, who shall verify suitable bearing and construction.

E. Comply with applicable codes, ordinances, rules, regulations and laws of local, municipal, state or federal authorities having jurisdiction.

END OF SECTION

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Part 1 General

1.01 Scope

The Contractor shall furnish all labor, materials, equipment and incidentals required to construct asphaltic concrete pavements to the grades and cross-sections shown on the Drawings and as specified herein.

1.02 Quality Assurance

A. Use only materials which are furnished by a bulk asphalt concrete producer regularly engaged in production of hot-mix, hot-laid asphalt concrete.

B. Comply with applicable requirements of Georgia Department of Transportation, Standard Specifications for Construction of Roads and Bridges (GDOTSS).

1.03 Submittals

A. Certificates: Provide certificates stating that materials supplied comply with Specifications. Certificates shall be signed by the asphalt producer and the Contractor.

B. Mix Design: Submit mix design for each course to the Engineer for acceptance.

C. Traffic paint manufacturer's application instructions and a description and other data relative to the Contractor's application equipment and methods shall be submitted to the Engineer for approval.

1.04 Conditions

A. Weather Limitations

1. Apply bituminous prime and tack coats only when the ambient temperature in the shade has been at least 40 degrees F.

2. Do not conduct paving operations when surface is wet, frozen or contains excess of moisture which would prevent uniform distribution and required penetration.

3. Construct asphaltic courses only when the underlying base is dry and when weather is not rainy. No asphalt courses shall be placed unless the temperature is in accordance with Table 4 of Section 400.03.05.E of the GDOTSS.

4. Place base course when air temperature is above 35 degrees F and rising. No base course shall be placed on a frozen or muddy subgrade.

B. Grade Control: Establish and maintain the required lines and grades for each course during construction operations.

1.05 Inspection and Testing

A. Pavement and base testing will be performed by an independent testing laboratory selected by the Owner. Costs of tests performed by an independent testing laboratory shall be paid for directly by the Owner and not as a part of this Contract. The Contractor shall supply any samples of materials necessary for conducting 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.

B. The testing agency shall test in-place courses for compliance with specified compaction, thickness and surface smoothness requirements.

C. The testing agency shall take one 4-inch diameter core per 400 square yards of paved surface at locations selected by the Engineer for density and thickness tests. Repair holes resulting from coring to match existing paving.

D. Compaction

1. Graded Aggregate Base: Minimum acceptable density shall be 95 percent of maximum dry density in accordance with ASTM D 1557, Method D. Conduct one test for each 400 square yards of in place material, but in no case less than one daily for each layer. Test density of graded aggregate base according to ASTM D 2167.

2. Asphaltic Concrete: Compare density of in place material against laboratory specimen of same mixture. Minimum acceptable density of in place material shall be 94 percent of the calculated voidless density based upon the effective specific gravity of the aggregate used. It is intended that acceptance density testing will be accomplished while the bituminous mixture is hot enough to permit further densification if such is shown to be necessary. If the density does not conform to the requirements stated herein above, the Contractor shall continue compaction effort until the required density is obtained.

E. Pavement Thickness: Inspect the cores of the base, binder and surface courses to determine the average thickness of the course. If the average thickness exceeds the allowable variation as shown below, additional cores shall be made at the Contractor's expense to determine the area of deficient thickness. The deficient area shall be corrected by overlay with the same type mix to the limits as determined by the Engineer.

1. Base Course: ±1/2-inch.

2. Binder and Surface Courses: ± 1/4-inch.

3. Overall: ± 1/2-inch.

F. Surface Smoothness: Test finished surface of each asphalt course for smoothness using a 10 foot straightedge. Intervals of tests shall be as directed by the Engineer. Surfaces will not be acceptable if exceeding the following:

1. Base and Binder Courses: 3/16-inch in 10 feet.

2. Surface Course: 1/8-inch in 10 feet.

G. Contractor's Duties Relative to Testing

1. Notifying laboratory of conditions requiring testing.

2. Coordinating with laboratory for field testing.

3. Paying costs for additional testing performed beyond the scope of that required and for retesting where initial tests reveal non-conformance with specified requirements.

4. Paying the cost of overlays or pavement removal and replacement which does not comply with the specified testing limits.

Part 2 Products

2.01 Materials

A. Graded Aggregate Base Course: Graded aggregate base course shall be of uniform quality throughout and shall meet the requirements of Section 815.2.01 of the Georgia Department of Transportation Standard Specifications.

B. Asphalt Base Course: Asphalt base course shall be of uniform quality throughout and shall meet the requirements of Section 828.2.03, 19.5 mm Superpave mix designs of the Georgia Department of Transportation Standard Specifications.

C. Binder Course: Binder course shall be of uniform quality throughout and shall conform to the requirements of Section 828.2.03, 19.5 mm Superpave mix designs of the Georgia Department of Transportation Standard Specifications.

D. Surface Course: Surface course shall be of uniform quality throughout and shall conform to the requirements of Section 828.2.03, 9.5 mm Superpave mix designs

of the Georgia Department of Transportation Standard Specifications.

E. Prime Coat: Prime coat shall be cutback asphalt in conformance to the requirements of Section 821 of the Georgia Department of Transportation Standard Specifications. The specific material utilized shall be determined by the Engineer in accordance with Table shown in Section 4.12.3.05.E of the GDOTSS.

F. Tack coat shall be asphalt cement, performance grade PG 64-22 in conformance to the requirements of Section 820.2.01 of the Georgia Department of Transportation Standard Specifications.

Part 3 Execution

3.01 Surface Preparation

A. Graded Aggregate Base Course

1. Check subgrade for conformity with elevations and section immediately before placing aggregate base material.

2. Place aggregate base material in compacted layers not more than 6-inches thick, unless continuing tests indicate that the required results are being contained with thicker layers.

3. In no case shall more than 8-inches of compacted base be placed in one lift.

4. Spread, shape, and compact all aggregate base material deposited on the subgrade during the same day.

5. The compacted base shall have sufficient stability to support construction traffic without pumping.

6. If compacted base becomes unstable as a result of too much moisture, the base material and underlying subgrade, if necessary, shall be dried and reworked to a moisture content that can be recompacted.

B. Loose and Foreign Material

1. Remove loose and foreign material from surface immediately before application of paving.

2. Use power brooms or blowers, and hand brooming as required.

3. Do not displace surface material.

C. Prime Coat

1. Do not apply prime coat if the surface is wet or if the temperature is less than 40 degrees F.

2. Uniformly apply at a rate of 0.15 to 0.30 gallon per square yard over compacted and cleaned subbase surface. The exact rate shall be as specified by the Engineer.

3. Apply enough material to penetrate and seal, but not flood the surface.

4. If surface becomes soft after prime coat is applied, the area shall be rolled with a pneumatic tired roller until the surface is firmly set.

5. Allow to cure and dry as long as required to attain penetration and evaporation of volatile. Close to traffic until the coating has cured.

6. Blot excess asphalt with just enough sand to prevent pick-up under traffic.

7. Remove loose sand before paving.

D. Tack Coat

1. Apply tack coat on finished asphalt pavement courses prior to placement of the next course.

2. Do not apply tack coat if the surface is wet or if the temperature is less than 40 degrees F.

3. Apply at a rate of 0.04 to 0.06 gallon per square yard of surface.

4. Apply tack coat by distributor spray bars except for small areas that can be coated by a hand sprayer. Brush apply to contact surfaces of curbs, gutters, manholes, and other structures projecting into or abutting asphalt concrete pavement.

5. Allow surfaces to dry until material is at condition of tackiness to receive pavement. Area shall be closed to traffic until pavement is completed over the tack coat.

3.02 Equipment

A. Provide size and quantity of equipment to complete the work specified within the Project time schedule.

B. Bituminous pavers shall be self-propelled that spread hot asphalt concrete mixtures without tearing, shoving or gouging surfaces, and control pavement edges to true

lines without use of stationary forms.

C. Rolling equipment shall be self-propelled, steel-wheeled and pneumatic-tired rollers that can reverse direction without backlash.

D. Provide rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heaters, and other miscellaneous small tools to complete the work specified.

3.03 Asphaltic Concrete Placement

A. Place asphalt concrete mix on prepared surface, spread and strike-off using paving machine.

B. Spread mixture at a minimum temperature of 235 degrees F.

C. Inaccessible and small areas may be placed by hand.

D. Place each course at a thickness such that when compacted it will conform to the indicated grade, cross-section, finish thickness, and density indicated.

E. Pavement Placing

1. Unless otherwise directed, begin placing along centerline of areas to be paved on crowned section, and at high side of sections on one-way slope, and in direction of traffic flow.

2. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.

3. Complete base courses for a section before placing surface courses.

4. Place mixture in as continuous an operation as practical.

5. Lift or layer thickness shall be in accordance with Table 5 in Section 400.03.05.F of the GDOTSS.

F. Hand Placing

1. Spread, tamp, and finish mixture using hand tools in areas where machine spreading is not possible, as acceptable to Engineer.

2. Place mixture at a rate that will ensure handling and compaction before mixture becomes cooler than acceptable working temperature.

G. Joints

1. Carefully make joints between old and new pavements, or between successive days work, to ensure a continuous bond between adjoining work.

2. Construct joints to have same texture, density and smoothness as adjacent sections of asphalt concrete course.

3. Clean contact surfaces free of sand, dirt, or other objectionable material and apply tack coat.

4. Offset transverse joints in succeeding courses not less than 24-inches.

5. Cut back edge of previously placed course to expose an even, vertical surface for full course thickness.

6. Offset longitudinal joints in succeeding courses not less than 6-inches.

7. When the edges of longitudinal joints are irregular, honeycombed, or inadequately compacted, cut back unsatisfactory sections to expose an even, vertical surface for full course thickness.

3.04 Asphaltic Concrete Compaction

A. Provide sufficient rollers to obtain the required pavement density.

B. Begin rolling operations as soon after placing as the mixture will bear weight of roller without excessive displacement.

C. Do not permit heavy equipment, including rollers to stand on finished surface before it has thoroughly cooled or set.

D. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

E. Start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. Roll to slightly different lengths on alternate roller runs.

F. Do not roll centers of sections first under any circumstances.

G. Breakdown Rolling

1. Accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and outside edge.

2. Operate rollers as close as possible to paver without causing pavement displacement.

3. Check crown, grade, and smoothness after breakdown rolling.

4. Repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.

H. Second Rolling

1. Follow breakdown rolling as soon as possible, while mixture is hot and in condition for compaction.

2. Continue second rolling until mixture has been thoroughly compacted.

I. Finish Rolling

1. Perform finish rolling while mixture is still warm enough for removal of roller marks.

2. Continue rolling until roller marks are eliminated and course has attained specified density.

J. Patching

1. Remove and replace defective areas.

2. Cut-out and fill with fresh, hot asphalt concrete.

3. Compact by rolling to specified surface density and smoothness.

4. Remove deficient areas for full depth of course.

5. Cut sides perpendicular and parallel to direction of traffic with edges vertical.

6. Apply tack coat to exposed surfaces before placing new asphalt concrete mixture.

3.05 Cleaning and Protection

A. Cleaning: After completion of paving operations, clean surfaces of excess or spilled asphalt materials to the satisfaction of the Engineer.

B. Protection

1. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened, and in no case no sooner than six hours.

2. Provide barricades and warning devices as required to protect pavement and the general public.

C. Maintenance: The Contractor shall maintain the surfaces of pavements until the acceptance of the Project. Maintenance shall include replacement, overlay, milling and reshaping as necessary to prevent raveling of the road material, the preservation of smooth surfaces and the repair of damaged or unsatisfactory surfaces, to the satisfaction of the Engineer.

3.06 Supervision and Approval

Failure of Pavement: Should any pavement restoration or repairs fail or settle during the life of the Contract, including the bonded period, promptly restore or repair defects.

END OF SECTION

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Part 1 General

1.01 Scope

A. This Section covers the requirements for Contractor's testing gravity, vacuum and pressure piping systems not specified under other sections.

B. Tests shall be performed on, but not limited to, the following:

1. Gravity Sewer Pipes

2. All Perforated and Non-Perforated PVC and HDPE Piping Systems

3. All HDPE Structures

C. All tests must be performed by the Contractor in the presence of the Engineer.

D. If the system fails to meet test requirements, the Contractor shall, at Contractor's expense, determine the source of leakage and make repairs as necessary to eliminate leakage and retest as directed.

E. All costs for the testing shall be borne by the Contractor.

F. Advise the Engineer at least 48 hours before tests are to be conducted.

Part 2 Products

2.01 Testing Equipment

Equipment to be used in making air or hydrostatic tests shall be specifically designed for this purpose.

2.02 Miscellaneous

All other equipment not specified herein shall be suited for the intended use.

Part 3 Execution

3.01 General

A. If the specified rate of leakage is exceeded, the Contractor shall locate the points of excessive leakage and institute appropriate measure of correction, whereupon the system shall be retested and this procedure continued until test requirements are met.

B. Unless specified otherwise the following tests shall be performed as directed by Engineer:

1. Low Pressure Air Testing (ASTM F1417)

   a. All gravity, non-perforated leachate piping.

2. Infiltration/ Exfiltration Testing (ASTM F2487)

   a. All fabricated HDPE structures.

3. Deflection Test

   a. All piping.

C. Clean and test lines before requesting final acceptance. Where any obstruction is met, clean the lines by means of rods, swabs, or other instruments. For pipes less than 24-inches in diameter, flush sections thoroughly at flow velocities, greater than 2.5 feet per second, adequate to remove debris from pipe and valve seats. For mains 24-inches in diameter and larger, the main shall be carefully swept clean, and mopped if directed by the Engineer. Partially open valves to allow the water to flush the valve seat. Partially operate valves to clean out seats.

D. Commence test procedures when the following conditions have been met.

1. Pipe section to be tested is cleaned in accordance with Section 02700 and free of dirt, sand or other foreign material.

2. Plug pipe outlets with test plugs. Brace each plug securely to prevent blowouts. Use concrete thrust blocking if necessary.

3.02 Low Pressure Air Testing

A. Low-pressure air testing of plastic pipe shall be in accordance with ASTM F1417, latest edition.

B. Provide necessary pipe connections between the section of line being tested and the compressed air supply, together with test pressure equipment, meters, pressure gauge, and other equipment, materials, and facilities necessary to perform the specified tests.

C. Furnish and install bulkheads, flanges, valves, bracing, blocking or other temporary sectionalizing devices that may be required.

D. Contractor provided testing equipment shall include, but may not be limited to:

1. Polyethylene flange adapter with steel blind flange.

2. Temperature gauge (32°F to 212°F) tapped and threaded into blind flange.

3. Pressure gauge (0 to 15 psig) ASME Standard B40.1 Grade 2A (accuracy of ±0.5% of full scale) with minor graduation marks no greater than 0.1 psig. Provide verification and results of gauge calibration prior to (less than 60 days) and after project completion.

4. Inlet valve to facilitate compressed air hose.

5. Ball valve to release pipe pressure at test completion.

6. Polyethylene reducers to be used to adapt test flange to size of pipe being tested.

7. Air compressor shall provide adequate oil-free air supply for testing.

8. Pressurizing equipment shall include a regulator set to avoid over pressurizing and damaging an otherwise acceptable section of pipe.

F. Pipe segments tested shall include butt fused sections less than 1000 feet in length. Blind flange with test apparatus shall be installed on one end and a fused cap or blind flange assembly on the opposite end.

G. Pipe to be tested shall be buried or laid on the ground surface and allowed to reach ambient temperature before testing. The tests shall be performed during a period when the pipe segment will be out of direct sunlight to minimize pressure changes as a result of temperature fluctuations.

H. Procedures:

1. Connect the air hose to the inlet tap and portable air control source. The air equipment shall consist of necessary valves and pressure gages to control an oil-free air source and the rate at which air flows into the test section to enable monitoring of the air pressure within the test section.

2. Add air slowly to the test section until the pressure inside the pipe reaches 4.0 psig.

3. After the pressure of 4.0 psig is obtained, regulate the air supply so that the pressure is maintained between 3.5 to 4.0 psig for at least 2 min depending on air/ground temperature conditions. The air temperature should stabilize in equilibrium with the temperature of the pipe walls. The pressure will

normally drop slightly until equilibrium is obtained; however, a minimum of 3.5 psig is required.

4. Determine the rate of air loss by the time-pressure drop method.

5. Air is slowly introduced into the section of pipe to be tested, until the air pressure is raised to approximately 4.0 psi and the test pipe section is stabilized as in 8.1. Disconnect the air supply and decrease the pressure to 3.5 psi before starting the test. Determine the time required for the pressure to drop from 3.5 psi to 2.5 psi, and compare this interval to the required time to decide if the rate of air loss is within the allowable. Minimum holding times required by pipe diameter are shown in Table 1 and Table 2 of ASTM F1417.

6. If the pressure drops 1.0 psig before the appropriate time shown in Table 1 has elapsed, the air loss rate shall be considered excessive and the section of pipe has failed the test. If the line fails the test, segmented testing may be utilized solely to find the location of leaks. Once leaks are located and repaired, retest the completed pipe installation to requirements of this test method.

3.03 Infiltration/ Exfiltration Testing

A. Infiltration/ exfiltration testing of polyethylene pipe and structures shall be in accordance with ASTM F2487, latest edition.

B. Infiltration Tests: Use only when groundwater is above the invert of the pipe.

1. Conduct testing from manhole to manhole. The length of pipeline tested shall not exceed 700 ft.

2. Stop all dewatering operations and allow the groundwater to return to its normal level. Infiltration testing shall not be used unless the groundwater level is at least 2 feet above the crown of the pipe for the entire length of the test section.

3. Plug all pipe outlets discharging into the test section.

4. Measure the groundwater elevation and determine the average head over the test section.

5. Measure infiltration leakage at the outlet of the test section. Because leakage allowances are small, measurements are best made by either timing the filling of a small container of known volume, or by directing flow into a container for a specified time and measuring the content, or by using small weirs.

6. If the measured rate of leakage is less than or equal to the allowable leakage in accordance with item D below, the section of pipeline tested is acceptable.

7. If the test section fails, the line shall be repaired and retested in accordance with this practice.

C. Exfiltration Tests: Use only when groundwater is below the invert of the pipe.

1. Conduct testing from manhole to manhole. The length of pipeline tested shall not exceed 700 ft.

2. Determine the groundwater elevation at both ends of the test section. If the groundwater level is less than 2 feet above the crown of the pipe measured from the highest elevation of the pipeline, the exfiltration test shall be used.

3. Plug all pipe outlets discharging into the test section. Fill the pipeline with water.

4. At the upstream manhole the test head shall be established as minimum of 2 feet above the crown of the pipe, or at least 2 feet above existing groundwater, whichever is higher.

5. Measure the leakage loss over a timed test period. The minimum test period shall be 15 minutes and the maximum shall not exceed 24 hours.

6. If the measured rate of leakage is less than or equal to the allowable leakage, in accordance with item D below, the section of pipeline tested is acceptable.

7. If the test section fails, the line shall be repaired and retested in accordance with this practice. The groundwater elevation shall be re-determined prior to a second test and the test head adjusted, if necessary.

D. Infiltration/ Exfiltration leakage allowance: Structures shall not leak more than 3% of the volume of the structure during a 24 hour period.

3.04 Deflection Testing

A. Deflection testing shall be conducted as specifically requested by the Engineer.

B. Test gravity sewer for excessive deflection by passing a mandrel through the pipe. Deflection of the pipe shall not exceed the following:

Nominal Pipe Diameter	Maximum Allowable Deflection
≤ 12-inches	5%
15 to 30-inches	4%
> 30-inches	3%

C. The mandrel size shall be based upon the maximum possible inside diameter for the type of pipe being tested, taking into account the allowable manufacturing tolerances of the pipe. The mandrel shall have an odd number of legs, or vanes, with a quantity of such equal to or greater than nine. The legs of the mandrel shall be permanently attached to the mandrel. A mandrel with variable sizes shall not be allowed. The mandrel shall be constructed of steel aluminum or other material approved by the Engineer, and shall have sufficient rigidity so the legs of the mandrel will not deform when pulling through a pipe. The mandrel dimensions shall be checked by the Engineer before use by the Contractor.

D. Excavate and install properly any section of pipe not passing this test. Re test until results are satisfactory.

E. This test shall be performed within the first 30 days of installation and during final inspection, at the completion of this contract.

END OF SECTION

ATTACHMENT 1
PE PIPE PRESSURE TEST REPORT FORM

Project Name:_____Date:_____

Contractor: _____Time:_____

Contractor Representative Performing Tests:_____

Owner Representative Observing Tests:_____

Description/ Location of Test Segment: (Pipe Diameter, length, SDR's, etc.)

_____

_____

_____

Location of Pipe Test Segment:_____
Station from:_____Station to:_____

Test Method:_____ Fluid Utilized:_____

Weather conditions/ ambient temperature (°F):_____

Test Gages Used:_____

Temperature: _____
Calculated Maximum Test Pressure:_____

Test Pressure:_____

Time/ Pressure Recordings:

_____

_____

_____

_____

_____

_____

_____

Pass/ Fail: _____ Retest (yes/ no)_____

Description/ Nature of leaks repair of retest segment:

_____

_____

Part 1 General

1.01 Scope

This work shall consist of the construction of landfill piping systems in accordance with these Specifications. Piping systems shall be constructed at locations shown on the Drawings and in conformity to the lines and grades indicated thereon, or as directed by the Engineer. The work shall include all necessary excavation and backfill together with such work and materials as may be necessary to make connections with other structures as shown on the Drawings.

1.02 Applicable Publications and Standards

American Society for Testing and Materials (ASTM Publications)

ASTM F 714	Standard Specification for Polyethylene Plastic Pipe
ASTM D 3035	Standard Specification for Polyethylene Plastic Pipe (OD)
ASTM D 3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
ASTM D 2321	Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
ASTM D 2774	Standard Practice for Underground Installation of Thermoplastic Pressure Pipe
ASTM F 2620	Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings
ASTM D 3261	Standard Specification for Butt Fusion Polyethylene Plastic Fittings
ASTM F 1055	Standard Specification for Electrofusion Fittings for Outside Diameter Controlled PE Pipe

1.03 Submittals

Complete shop drawings and engineering data shall be submitted to the Engineer in accordance with the requirements of Section 01340 of these Specifications.

1.04 Transportation and Handling

A. Unloading: Furnish equipment and facilities for unloading, handling, and

distributing pipe, fittings, valves and accessories. Make equipment available at all times for use in unloading. Do not drop or dump materials. Any materials dropped or dumped will be subject to rejection without additional justification.

B. Handling: Handle pipe, fittings, valves and accessories carefully to prevent shock or damage. Handle pipe by rolling on skids, forklift, or front loader. Do not use material damaged in handling.

1.05 Storage and Protection

A. Store all pipe which cannot be distributed along the route. Make arrangements for the use of suitable storage areas.

B. Stored materials shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times. Valves shall be drained and stored in a manner that will protect them from damage by freezing.

C. Pipe shall not be stacked higher than the limits recommended by the manufacturer. The bottom tier shall be kept off the ground on timbers, rails or concrete.

D. Store joint gaskets in a cool location, out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

1.06 Quality Assurance

A. Product manufacturers shall provide the Engineer with written certification that all products furnished comply with all applicable provisions of these Specifications.

B. If ordered by the Engineer, each pipe manufacturer shall furnish the services of a competent factory representative to supervise and/or inspect the installation of pipe. This service will be furnished for a minimum of five days during initial pipe installation.

Part 2 Products

2.01 High Density Polyethylene Pipe and Fittings

A. Pipe and Fittings Resin: The pipe supplied under this Section shall be high performance, very high molecular weight, high density polyethylene pipe. The fittings supplied under this Section shall be manufactured from a polyethylene compound having a cell classification equal to or exceeding the compound used in the pipe.

B. Resin physical properties shall be in accordance with the following per ASTM D3350:

Typical Physical Properties			
Property	Test Method	Unit	Value
Density	ASTM D1505	g/cm³	>0.947 – 0.955
Melt Index	ASTM D1238		< 0.15
Flexural Modulus	ASTM D790	psi	110,000 to <160,000
Tensile Strength at Yield	ASTM D638	psi	3,500 to <4,000
Slow crack growth resistance, PENT molded plaque, 80°C, 2.4 MPa	ASTM F1473	hours	500
Hydrostatic Strength Classification, hydrostatic design basis (23°C)	ASTM D2837	psi	1,600
Color and UV Stabilizer	ASTM D3350		C, Black with 2% minimum carbon black
Material Designation	PPI Recommendation	PE 4710	

C. Standards: Polyethylene pipe and fittings shall meet all the requirements of NSF listed pipe. HDPE pipe and fittings shall meet the requirements of ASTM D 3350.

D. Quality Control: The pipe shall be homogenous throughout and free of visible cracks, holes, foreign inclusions, or other deleterious defects, and shall be identifiable in color, density, melt flow and other physical properties throughout.

E. The Engineer requires certification that the pipe produced is represented by the quality assurance data. Additionally, test results from the manufacturer's testing which show the pipe does not meet appropriate ASTM standards of manufacturer's representation, will be cause for rejection of the pipe represented by the testing. These tests may include density and flow rate measurements from samples taken at selected locations within the pipe wall and thermal stability determinations according to ASTM 3350, 10.1.9.

F. The Engineer requires certified lab data from the manufacturer to verify the physical properties of the materials supplied under this specification and at Owner's expense may take random samples for testing by an independent laboratory.

G. Rejection: Polyethylene pipe and fittings which do not meet the requirements of this Section shall be rejected.

H. Perforations and slots shall be as detailed, factory machined and trimmed by the manufacturer or pipe supplier in the shop under controlled conditions. No pipe perforating or slotting will be allowed in the field. All perforated or slotted pipe shall be free of trimmings and debris when delivered and prior to installation.

I. HDPE pipe shall be in accordance with ASTM F714 and ASTM F3035, IPS pipe sized and be provided in accordance with the following schedule:

Description	DR	Diameter, inches	Minimum Pipe Length
Leachate Collection (perforated and non-perforated)	17	6	40 Feet, Smooth Wall

J. HDPE Fittings: Polyethylene fittings shall be manufactured from polyethylene compound having cell classification equal to or exceeding the compound used in the pipe.

1. All fittings 12 inches and smaller shall be molded and manufactured in accordance with ASTM D3261, unless otherwise approved by the ENGINEER. Fabricated fittings must have the same pressure rating as the pipe; a DR less than the pipe shall be used. Fabricated fittings are to be manufactured using a Data Logger to record temperature, fusion pressure, and a graphic representation of the fusion cycle shall be part of the Quality Control records.

2. Flanges for HDPE pipe shall have stainless steel back-up rings. Flange gaskets shall be full-face Neoprene.

   a. All bolts and nuts shall be made in the U.S.A. Bolts and nuts shall be threaded in accordance with ANSI/ASME 81.1, Coarse Thread Series, Class 2A external and Class 2B internal fit.

   b. All bolts shall be stainless steel machine bolts conforming to ASTM A 193, Grade B8. Nuts shall be heavy hex, stainless steel conforming to ASTM A 194, Grade 8.

K. Couplings: Electrofusion couplings shall conform to ASTM F1055 and be SDR 11 minimum. They shall be Central or approved equal.

2.02 Valves

A. Valve Connections: Provide valves suitable to connect to adjoining piping as specified below for pipe joints. Use pipe size valves unless noted otherwise on the

Drawings.

1. Threaded: Pipe sizes 2-inches and smaller.

2. Flanged: Pipe sizes 2-1/2 inches and larger.

B. PVC Gate Valves: PVC gate valves shall be constructed of Type 1, Grade 1 PVC. The valve shall have a non-rising stem, come standard with sealed position indicator, clean-out plug (PP gate style only). Valve shall have flanged end connections conforming to ANSI B16.1, Class 125. Valves shall be equal to ASAHI/America.

2.04 HDPE Manholes and Structures

HDPE manufactured manholes and structures shall be per Specification Section 02748.

2.05 Detection Tape and Locating Wire

A. Detection tape shall be composed of a solid aluminum foil encased in a protective plastic jacket. Tapes shall be color coded in accordance with APWA color codes and legends. Colors may be solid or striped. Tape shall be permanently printed with no surface printing allowed. Tape width shall be a minimum of 2-inches when buried less than 10-inches below the surface. Tape width shall be a minimum of 3-inches when buried greater than 10-inches and less than 20-inches. Detection tape shall be equal to Lineguard Type III Detectable or Allen Systems Detectatape.

B. Tracer wire shall be #12 gauge insulated single strand copper wire.

Part 3 Execution

3.01 Existing Utilities and Obstructions

A. The Drawings indicate utilities or obstructions that are known to exist according to the best information available to the Owner. The Contractor shall call the Utilities Protection Center (UPC) [(800-282-7411) as required by Georgia law (GA Code Section 25-9-1 through 25-9-13)] [(800-922-0983) and all utilities, agencies or departments that own and/or operate utilities in the vicinity of the construction work site, at least 72 hours (three business days) prior to construction, to verify the location of the existing utilities.

B. Existing Utility Location: The following steps shall be exercised to avoid interruption of existing utility service.

1. Provide the required notice to the utility owners and allow them to locate

their facilities according to Georgia law. Field utility locations are valid for only ten days after original notice. The Contractor shall ensure that, at the time of any excavation, a valid utility location exists at the point of excavation.

2. Expose the facility to verify its true location and grade for a distance of at least 10 feet in advance of construction to verify its true location and grade. Repair, or have repaired, any damage to utilities resulting from locating or exposing their true location at no additional cost to the Owner.

3. Avoid utility damage and interruption by protecting it with means or methods recommended by the utility owner.

4. Maintain a log identifying when phone calls were made, who was called, area for which utility relocation was requested and work order number issued, if any. The Contractor shall provide the Engineer an updated copy of the log bi-weekly, or more frequently if required.

C. Conflict with Existing Utilities

1. Horizontal Conflict: Horizontal conflict shall be defined as when the actual horizontal separation between a utility, main, or service and the proposed sewer does not permit safe installation of the sewer by the use of sheeting, shoring, tieing-back, supporting, or temporarily suspending service of the parallel or crossing facility. The Contractor may change the proposed alignment of the sewer to avoid horizontal conflicts if the new alignment remains within the available right-of-way or easement and complies with regulatory agency requirements after a written request to and subsequent approval by the Engineer. Where such relocation of the sewer is not approved by the Engineer, the Contractor shall arrange to have the conflicting utility, main, or service relocated.

2. Vertical Conflict: Vertical conflict shall be defined as when the actual vertical separation between a utility, main, or service and the proposed sewer does not permit the crossing without immediate or potential future damage to the utility, main, service, or the sewer. The Contractor may change the proposed grade of the sewer to avoid vertical conflicts if the changed grade provides minimum required capacity, maintains adequate cover and complies with regulatory agencies requirements, after written request to and subsequent approval by the Engineer. Where such relocation of the sewer is not approved by the Engineer, the Contractor shall arrange to have the conflicting utility, main, or service relocated.

D. Electronic Locator: Have available at all times an electronic pipe locator and a magnetic locator, in good working order, to aid in locating existing pipe lines or other obstructions.

3.02 Construction along Roadways

A. Install pipe lines and appurtenances along roadways in accordance with the applicable regulations of, and permits issued by, the County, and the City with reference to construction operations, safety, traffic control, road maintenance and repair.

B. Traffic Control

1. The Contractor shall: provide, erect and maintain all necessary barricades; suitable and sufficient lights and other traffic control devices; provide qualified flagmen where necessary to direct traffic; take all necessary precautions for the protection of the work and the safety of the public.

2. Construction traffic control devices and their installation shall be in accordance with the current Manual On Uniform Traffic Control Devices for Streets and Highways.

3. Construction traffic control devices shall be maintained in good repair, and shall be clean and visible to affected traffic for daytime and nighttime operation. Traffic control devices affected by the construction work zone shall be inspected daily.

C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off the pavement in a timely manner.

D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material. Care shall be taken to provide positive drainage to avoid ponding or concentration of runoff.

E. Maintaining Roadways

1. Maintain roadways in suitable condition for movement of traffic until completion and final acceptance of the work.

3.03 General Pipe Installation

A. All pipe, fittings and valves shall be installed in accordance with the manufacturer's recommendations and the requirements of these Specifications.

B. Perforations shall be constructed by the manufacturer as detailed in the Drawings and no field perforating will be allowed. Perforated leachate pipe shall be laid in the trench as detailed on the Drawings. The Engineer shall be allowed to review the perforated leachate pipe prior to backfill and prior to acceptance for payment.

C. The pipe interior shall be kept clean before and after laying. Pipe shall be kept clean before installation by proper storage and handling. Any open pipe ends shall be plugged and covered. Shavings shall be removed from pipe as much as possible while joining sections.

3.04 Location and Grade

A. The Drawings show the alignment of the piping and the location of other appurtenances.

B. Construction Staking

1. The location of principal components of the work is shown on the Drawings. The Contractor shall be responsible for performing all survey work required for construction, including the establishment of base lines and any detailed surveys and bench marks adjacent to the work. Base lines shall be defined as the line to which the location of the work is referenced, i.e. edge of pavement, road centerline, property line, right-of-way or survey line. This work shall include the staking out of permanent and temporary easements to insure that the Contractor is not deviating from the designated easements.

2. The level of detail of survey required shall be that which the correct location of the site piping can be established for construction.

C. Reference Points: The Contractor shall take all precautions necessary, which includes, but is not necessarily limited to, installing reference points, in order to protect and preserve the centerline or baseline established by the Owner.

D. The Contractor shall be responsible for any damage done to reference points, base lines, center lines and temporary bench marks, and shall be responsible for the cost of re-establishment of reference points, base lines, center lines and temporary bench marks as a result of the operations.

3.05 Laying and Pipe Installation

A. General

1. Proper implements, tools and facilities shall be provided for the safe performance of the work. All pipe and fittings shall be lowered carefully into the trench by means of slings, ropes or other suitable tools or equipment in such a manner as to prevent damage to piping materials and protective coatings and linings. Under no circumstances shall piping materials be dropped or dumped into the trench.

2. All pipe, fittings, and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

3. All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and free from dirt, sand, grit or any foreign materials before the pipe is laid. No pipe containing dirt shall be laid.

4. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.

5. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

6. Applying pressure to the top of the pipe, such as with a backhoe bucket, to lower the pipe to the proper elevation or grade, shall not be permitted.

7. After the pipe has been laid and approved, the backfilling shall be carefully done so that the pipe will not become displaced. The backfilling around the pipe shall be with the gravel specified. Unless otherwise designated on the Drawings or by special provision, the backfilling shall be 6-inches on each side of the pipe and 6-inches over the pipe.

8. Lateral and other connections shall be made where indicated on the Drawings or as directed by the Engineer.

9. Expediting of Work: Excavate, lay the pipe, and backfill as closely together as possible. Do not leave unjointed pipe in the trench overnight. Backfill and compact the trench as soon as possible after laying and jointing is completed. Cover the exposed end of the installed pipe each day at the close of work and at all other times when work is not in progress. If necessary to backfill over the end of an uncompleted pipe or accessory, close the end with a suitable plug, either push-on, mechanical joint, restrained joint or as approved by the Engineer.

10. Joint Assembly: Push-on, mechanical and flange joints shall be assembled in accordance with the manufacturer's recommendations.

11. Cutting Pipe: Cut pipe using a suitable saw; remove all burrs and smooth the end before jointing. The Contractor shall cut the pipe and bevel the end, as necessary, to provide the correct length of pipe necessary for installing

the fittings, accessories and closure pieces in the correct location.

B. Alignment and Gradient

1. Lay pipe straight in alignment and gradient or follow true curves as nearly as practicable. Do not deflect any joint more than the maximum deflection recommended by the manufacturer.

2. Maintain a transit, level and accessories on the job to lay out angles and ensure that deflection allowances are not exceeded.

3. The Contractor shall check the invert elevation for gravity sewers at each manhole at least three times daily, start, mid-day and end of day. Elevations shall be checked more frequently if more than 100 feet of pipe is installed in a day or if the pipe is being constructed at minimum slope.

4. The Contractor shall check the horizontal alignment of the sewers at the same schedule as for invert elevations.

3.06 HDPE Pipe Joining

A. Perforated and Non-Perforated Pipe (HDPE): Sections of polyethylene pipe and fittings shall be joined into continuous lengths on the job site above ground. The joining method shall be the butt fusion method and shall be performed by qualified persons and in strict accordance with the pipe manufacturer's recommendations and ASTM F 2620. The butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment and fusion pressures. No butt fusing shall be allowed when ambient temperature is below 32˚ F without prior approval by the Engineer.

B. Electrofusion couplings shall be used only where approved by the engineer and shall be located on the final record drawings.

C. HDPE flanges shall be provided where HDPE pipe joins PVC pipe or fittings.

3.07 Handling of Fused Pipe

Fused segments of polyethylene pipe shall be handled so as to avoid damage to the pipe. When lifting fused sections of pipe, chains or cable type chokers must be avoided. Nylon slings are required. Spreader bars are recommended when lifting long fused sections. Care shall be exercised to avoid cutting or gouging the pipe.

3.08 Detection Tape and Tracer Wire

A. Detection tape and tracer wire shall be provided over all non-metallic piping except

the leachate collection piping.

B. Detection tape shall be installed along the centerline of the pipe at a depth of 12 to 24 inches.

C. Tracing wire shall be installed on all buried non-metallic piping and service laterals from the main to the meter or junction, and provide continuous conductivity. Area markers shall be at least every 500' with tracer wire attached, unless a structure, fire hydrant and/or air release valve are available. On structures, the tracing wire lead shall be 5' minimum length and securely attached to the inside of the lid. On laterals, the tracing wire shall terminate inside the meter box or junction box if available. Where laterals connect to mains and no junction box or meter box is available, the wire shall be joined securely together with a waterproof direct bury connector or splice. Connectors and/or splices shall be approved by the Engineer. The connectors or splices shall be wrapped with rubberized insulation tape that shall completely cover all areas of the connector or splice. The wire shall maintain electrical continuity through all connectors and splices. Tracing wire will be installed on all non-buried metallic piping and service laterals directly on top of the pipe. Tracing wire shall be securely fastened a minimum of 6-inches above ground to fire hydrants, above/below ground valves, and valve covers. The wire shall be secured to the pipe with tape or other acceptable methods at spacings of no more than 36" apart. This tracing wire system shall be checked and tested by the contractor, in the presence of the Engineer, prior to acceptance of the installation. All equipment, meters, detectors, etc., needed for testing the tracer wire shall be furnished by the Contractor.

3.09 Trenching and Backfill

A. Pipe (other than leachate collection lines) shall be laid as detailed in the construction drawings and in accordance with Section 02200 and/or Section 02225.

B. Leachate collection pipe and rock toe drains shall be as detailed in the construction drawings. Fittings shall be used at all bends such that the pipe conforms to the slope and alignment of the liner. Perforated leachate collection pipe shall be bedded in gravel as detailed. The gravel should be placed such that it uniformly and continuously supports the pipe.

3.10 Constructing Within Structures

A. Proper and suitable tools and appliances for safe and convenient handling and laying of pipe and fittings shall be used. Any damage shall be remedied as directed by the Engineer.

B. All pipe and fittings shall be carefully examined by the Contractor for defects just

before installing and no pipe or fitting shall be installed if it is defective. If any defective pipe or fitting is discovered after having been installed, it shall be removed and replaced in a satisfactory manner with a sound pipe or fitting by the Contractor at Contractor's own expense.

C. All pipes and fittings shall be thoroughly cleaned before they are installed and shall be kept dean until they are used in the completed work. Open ends of pipe shall be kept plugged with a bulkhead during construction.

D. All elbows, tees, brackets, crosses, and reducers in pressure piping systems shall be adequately restrained against thrust.

E. Wall pipe and wall sleeves shall be constructed when the wall or slab is constructed. Blocking out or breaking of the wall for later installation shall not be permitted.

F. All piping shall be installed in place without springing or forcing.

G. Piping shall be supported as shown on the Drawings.

3.11 Valve Installation

A. All valves and appurtenances shall be installed in the locations shown on the Drawings, true to alignment and properly supported. Any damage to the above items shall be repaired to the satisfaction of the Engineer before they are installed.

B. Prior to the installation of sleeve type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8-inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6-inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares. After the bolts have been inserted and all nuts have been made-up finger-tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.

3.12 Inspection and Testing

All piping and manholes shall be tested in accordance with Section 02601.

3.13 Cleaning

A. All excess or unsuitable material shall be disposed of as directed by the Engineer. Final cleaning up shall be performed in accordance with the requirements of Section 01710 of these Specifications.

B. The Contractor shall clean by water flushing all HDPE pipe beginning at cleanouts.

Lines shall be flushed until completely free of debris. The Contractor shall clean by flushing with water all HDPE structures. Structures shall be flushed until completely free of debris. The Contractor shall recover and remove all debris from system and dispose of in an environmentally safe manner.

C. The pipe cleaning shall be done as soon as possible after installation and prior to connection to existing piped systems. The Contractor is responsible for providing clean water for flushing as well as for the proper disposal of the waste water.

D. Final clean-up shall meet the approval of the Engineer and the Owner.

END OF SECTION

Part 1 General

1.01 Scope

The work covered in this Section shall include the furnishing and laying of precast concrete pipe, corrugated metal pipe or plastic pipe with fittings as called for on the Drawings and specified, including trench excavation and backfill.

1.02 Quality Assurance

A. Each length of pipe, each fitting and special fitting shall be inspected by an independent commercial testing laboratory acceptable to the Engineer prior to delivery. Each joint of pipe and each special shall be stenciled or otherwise clearly and legibly marked with the laboratory's mark of acceptance.

B. Each pipe shall be clearly marked as required by the governing ASTM standard specifications to show its class or gauge, date of manufacture, and the name or trademark of the manufacturer. Elliptical reinforced concrete pipe shall be clearly marked top and bottom and the minor axis clearly noted on the interior surface of the pipe.

C. Any pipe or specials which have been broken, cracked, or otherwise damaged before or after delivery or which have failed to meet the required tests shall be removed from the site and shall not be used therein.

Part 2 Products

2.01 Pipe

A. Pipe and special fittings shall be furnished in sizes, types and classes at the locations shown on the Drawings, and/or specified herein.

B. All pipe and special fittings shall be of all new materials which have not been previously used.

2.02 Concrete Pipe

A. Circular concrete pipe shall be reinforced concrete pipe conforming to ASTM C 76. All pipe shall be Class III unless shown otherwise on the Drawings. Minimum wall thickness design shall correspond to Wall C for pipes larger than 36”. Pipes 36” and smaller shall have minimum Wall B.

B. Elliptical concrete pipe shall be reinforced concrete pipe conforming to ASTM C 507. All pipe shall be Class HE-III unless shown otherwise on the Drawings.

2.03 Joint Materials

A. Concrete Pipe Joints: Rubber gaskets for bell and spigot joints shall be O-ring rubber gasket joints conforming to the latest revisions of ASTM Standard Specification C 443 for Joints for Circular Concrete Sewer and Culvert Pipe, Using Flexible Watertight Rubber Gaskets.

B. HDPE Pipe Joints: Joints for pipe and fittings shall be of the bell and spigot type with a confined gasket meeting the requirements of ASTM D 3212. The gasket shall comply with the physical non-pressure requirements of ASTM F 477.

C. Joints for corrugated metal drainage structures shall be the standard type single piece corrugated coupling bands fabricated of the same material as the drainage structure. The minimum band length shall be 12-inches. Coupling bands shall be fabricated according to AASHTO M190; or AREA Volume 1, Chapter 1, Part 4 for railroad applications.

2.04 Bedding

A. Bedding for concrete pipe shall be Class “A”, Class “B” and Class “C” type, as shown on the Drawings to fit the depth of trench, type and size of pipe, width of trench and bearing value of subgrade.

B. Class “A” Bedding shall consist of concrete cradles or caps constructed as shown on the Drawings. Wherever the Contractor places concrete outside the dimensions shown on the Drawings, the cost of such concrete will be at the expense of the Contractor.

C. Where concrete cradle is used, the pipe shall be laid on concrete saddles so constructed as to provide both vertical and lateral support for the pipe while the cradle is being placed. Pipe supports of wood blocks, loose brick, etc., will not be permitted. The concrete cradle shall be poured after the joints have been made with care being taken to prevent movement of the pipe.

D. Class “B” Bedding shall consist of 1/2-inch or smaller crushed rock or gravel, sand or other approved granular materials as shown on the Drawings. Placement of this material shall be done carefully. Material shall be thoroughly compacted by tamping.

E. Class “C” Bedding shall consist of 1/2-inch or smaller crushed rock or gravel, sand, or other approved materials as shown on the Drawings. Placement of this material shall be done carefully. Material shall be thoroughly compacted by tamping.

F. The determination of the bedding class shall be from actual width of trench. If Contractor increases width of trench for the Contractor's convenience or due to

collapse of trench walls so that a higher class of bedding is required, the increased cost of the same shall be borne by the Contractor. If the bearing value of the subgrade is determined by the Engineer to be inadequate for a particular class of bedding, the Contractor shall substitute a higher class of bedding as directed by the Engineer.

Part 3 Execution

3.01 Excavation

Excavation shall be performed in accordance with the requirements of Sections 02200 and/or 02225 of these Specifications.

3.02 Pipe Laying - HDPE Pipe

A. Corrugated plastic storm pipe, metal pipe or pipe arch shall be laid true to line and grade on a bed which is uniformly firm throughout its entire length.

B. Pipes shall be laid only on a foundation which is substantially free of water.

C. The ends of sections shall be fully and closely jointed according to applicable standards and true to lines and grades given. Each section or joint of pipe shall be securely attached to the adjoining section or joint of pipe with connecting bands or other approved type of joint. The bands or other type of joint shall be tightly drawn or connected so as to form a rigid joint.

D. For coated metal pipe, any breaks in the bitumen or treatment of bituminous coated pipe shall be refilled with the type and kind of bitumen used in coating the pipe originally.

E. The ends of pipe shall be rigidly supported to prevent any movement pending which might occur during the construction of end supports.

F. Any pipe which is not in true alignment or which shows any settlement after laying or is damaged shall be taken up and relaid at the Contractor's expense.

3.03 Filling Around and Over Storm Sewers and Pipe Culverts

A. When storm sewers or pipe culverts are placed under the roadway proper, granular backfill material will be used as detailed in the Drawings. The trench for the pipe shall be cut 6-inches below the proposed bottom of pipe and shall be cut to a width as indicated on the bedding detailed in the Drawings. The trench shall be filled to a compacted depth of 6-inches with granular backfill material. Additional granular backfill material shall be placed and shaped by means of a template to fit the bottom of the pipe to a depth of 1/4 the outside diameter of the pipe or to the

spring line of pipe arches. After the pipe is laid to line and grade, the granular backfill material shall be compacted by means of a vibrator or mechanical tampers. Tamping by hand will not be permitted. The remaining portion of the trench shall be filled in 6-inch lifts with suitable backfill material. Each lift shall be compacted with mechanical tampers.

B. The bedding for the pipe must be laid in a dry trench, and any water encountered in ditches, springs, etc. shall be considered a necessary part of construction and shall be handled by pumping, ditching or any other method satisfactory to the Engineer.

3.04 Manhole and Precast Concrete Product Construction

A. Construct manholes as shown on the Drawings.

B. Precast Concrete: Handle sections carefully to prevent cracking or chipping. Provide uniform bedding of the bottom section to prevent uneven loading. Install gaskets and joint sealants in accordance with manufacturer's recommendations to produce a watertight structure.

C. Pipe Connections: All pipes shall be connected to precast concrete manholes by a rubber boot provided in a cored or precast hole of the proper diameter. All boot connections shall be grouted in from the outside of the structure prior to backfilling.

D. Top Elevations: Build manholes outside of paved areas to 18-inches above finished grade unless otherwise shown on the Drawings or directed by the Engineer. Build manholes in paved areas to existing grades.

E. Frames and Covers: Unless frame and cover is at grade, the frame shall be cast into the cone section.

F. Invert Elevations: The invert elevations shown on the Drawings shall be for the invert at the centerline of the precast concrete manhole. Prior to setting the laser or other vertical alignment control system for the sewer upstream of the manhole, the Contractor shall verify the elevation of the sewer installed at the manhole. Should the elevation differ from that shown on the Drawings, the Contractor shall take the following corrective action:

1. If the sewer is laid at negative grade, the Contractor shall remove and reinstall the sewer at the correct grade at no additional cost to the Owner.

2. If the sewer is laid at a grade less than that shown on the Drawings, thus reducing the sewer's capacity, the Owner may require the sewer to be removed and relaid at the correct grade at no additional cost to the Owner. As a minimum, the grade to the next upstream manhole shall be adjusted such that the next upstream manhole shall be set at the correct elevation.

3. If the sewer is laid at a grade greater than that shown on the Drawings, and if the Contractor can show that there are no conflicts with upstream existing utilities or obstructions, the Contractor shall adjust the grade of the next upstream manhole such that the next upstream manhole shall be set at the correct elevation. If such an adjustment, in the Engineer's opinion, is substantial, the grade adjustment shall be spread over multiple sections of the sewer. If such an adjustment, in the Owner's opinion, significantly reduces the sewer's capacity, the Owner may require the Contractor to remove and relay that portion of the sewer laid at the improper grade.

G. Manholes shall be constructed such that their walls are plumb.

H. Top Elevations: Build precast concrete structures above finished grade as required to daylight drains provided for floor doors.

I. Seal all manhole joints and lift holes, both inside and out, with grout. Between precast sections, this is in addition to joint sealant.

J. Fabricated products shall be installed in accordance with the fabricator's/ manufacturer's recommendations and as shown on the Drawings.

3.05 Existing Utilities

All existing sewers, water lines, gas lines, underground conduits, telephone lines, sidewalks, curbs, gutters, pavements, electric lines or other utilities or structures in the vicinity of the work shall be carefully protected by the Contractor from damage at all times. Where it is necessary for the proper accomplishment of the work to repair, remove and/or replace any such utility, the work shall be done as directed by the Engineer. No separate payment shall be made for removing and replacing and/or repairing damaged existing sewers, water, gas, electric, or telephone lines, or conduits or other utilities, culverts, drains, or similar existing services or structures that are to remain in service. The removal, replacement and/or repair of these items shall be paid for in the unit price bid by the Contractor on other items of work.

3.06 Cleaning

After completing each section of the storm sewer or culvert, the Contractor shall remove all debris and construction materials and equipment from the site, grade and smooth over the surface on both sides of the line and leave the entire area in a clean, neat and serviceable condition in accordance with the requirements of Section 01710 of these Specifications.

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Part 1 General

1.01 Scope

This Section covers the materials and fabrication of HDPE structures used for wastewater and manholes.

1.02 Quality Assurance

A. The products shall contain no recycled compound except that which is generated in the manufacturer's own plant from the same raw material. The products shall be homogenous throughout and free of visible cracks, holes, foreign inclusions or other deleterious defects, and shall be identifiable in color, density, and other physical properties throughout. The manufacturer shall provide certification that the products produced are represented by the quality assurance data.

B. Products shall be constructed by a fabricator or manufacturer with at least five years experience in the construction of products similar to those being provided.

1.03 Submittal Requirements

A. Submittals on fabricated products shall be clearly marked as to what is being provided. The Contractor shall submit fabricator's shop drawings with the following information on each product provided:

1. Indicate compliance with applicable ASTM Standard.

2. Unit weight of material.

3. Physical dimensions including material thickness.

4. Method of joining.

5. Recommended bedding and installation details.

6. Anti-flotation anchor requirements.

The information above is the minimum required. The fabricator shall submit additional information necessary to define unique characteristics of the products provided.

B. Manufacturer's certificate of compliance. The Engineer requires certified lab data from the manufacturer to verify the physical properties of the materials supplied

under this specification and Engineer, at his own expense, may take random samples for testing by an independent laboratory.

C. Pipe work in structures shall be detailed by the Contractor to conform to the general arrangement shown on the plans and to fit the equipment to be provided. Shop drawings of pipe layout and equipment shall be submitted to the Engineer and approved prior to installation.

D. HDPE Manholes and Structures: The manufacturer shall submit shop drawings on all HDPE manholes and structures. The shop drawings shall be stamped by an engineer registered in the State of Georgia.

Part 2 Products

2.01 HDPE Manholes and Structures

A. The structures shall be made of high density, high molecular weight polyethylene pipe material meeting the requirements of Class 345464C as defined in ASTM D 3350 Standard Specification for Polyethylene Plastics Molding Pipe and Fittings Materials.

B. Material shall be joined by the extrusion weld method or the butt fusion method in strict accordance with the manufacturer's recommendations. The equipment used in the joining procedures shall be capable of meeting all conditions of the pipe or plate material manufacturer.

C. Products shall have HDPE pipe penetrations and stub-outs for flange or butt fusion connections as shown on the Drawings. Stub-outs and penetrations other than those made from standard tees or other fittings shall be extrusion welded to the wall of the structure along with gusset plates as shown on the detail Drawings. All stub-outs and penetrations inside and outside shall be installed by the manufacturer or fabricator.

D. Structures shall be designed by the manufacturer for all loading conditions resulting from dead and live loads as well as loading conditions resulting from transportation, installation, or flotation.

E. The manhole and base shall be of sufficient thickness to withstand the installed height in compacted soil.

Part 3 Execution

3.01 Installation

Fabricated products shall be installed in accordance with the manufacturer's recommendations and as shown on the Drawings.

3.02 Inspection and Acceptance

A. All work shall be subject to inspection and approval prior to final acceptance. Final acceptance shall be contingent upon the following:

1. The Owner accepts HDPE structures when the installation is finished, all testing results are satisfactory, installation documentation and site inspection is completed, and structures have been flushed. Structures shall be tested in accordance with Section 02601.

2. The Contractor shall clean by flushing with water all HDPE structures. Structures shall be flushed until completely free of debris. The Contractor shall recover and remove all debris from system and dispose of in an environmentally safe manner.

3. Final clean-up shall meet the approval of the Engineer and the Owner.

END OF SECTION

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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

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 Poly Ethylene as manufactured by Colorado Lining or approved equal.

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 sandbags 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.

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

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.

5. All test results and documentation has been reviewed and approved by the Georgia EPD.

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

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.

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.

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^3	> .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 (1), minimum average	ASTM D7466	mils	10	Every 2nd roll(2)
Density, minimum average	ASTM D1505 or ASTM D792, Method B	g/cc	0.940	180,000 lb
Tensile (3), 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 (4)	ASTM D5397	hrs	300	180,000 lb
Carbon Black Content (range)	ASTM D4218(5)	%	2-3	40,000 sf
Carbon Black Dispersion	ASTM D5596		Note 6	40,000 sf
OIT, minimum average				
a) standard **or**	ASTM D3895	min	100	200,000 lb
b) high pressure	ASTM D5885	min	400	200,000 lb
Oven Aging at 85°C (7)	ASTM D5721			
a) standard **or**	ASTM D3895	%	55	Per Formulation
b) high pressure	ASTM D5885	%	80	Per Formulation
UV Resistance (high pressure) (8), minimum average - % retained after 1600 hrs	ASTM 5885	%	50	Per Formulation

(1) Of 10 readings; 8 out of 10 must be ≥ 7 mils, and lowest individual reading must be ≥ 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 geosynthetic clay liner (GCL) where shown on the Drawings. All work shall be performed in strict accordance with the Drawings, Specifications, ASTM practices and guides listed below and the methods approved by the liner fabricator.

B. Sufficient GCL material shall be provided to cover all areas as shown on the Drawings, including overlaps at field seams and anchor trenches.

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 this requirement is met.

1.02 Applicable Publications and Standards

American Society for Testing and Materials (ASTM Publications)

ASTM D 5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles
ASTM D 5887	Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liner Specimens Using Flexible Wall Permeameter
ASTM D 5888	Practice for Storage and Handling of Geosynthetic Clay Liners
ASTM D 5890	Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners
ASTM D 5891	Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners
ASTM D 5893	Standard Test Method for Measuring Mass per Unit Area of Geosynthetic Clay Liners
ASTM D 6102	Guide for Installation of Geosynthetic Clay Liners
ASTM D 6496	Standard Test Method for the Determining Average Bonding Peel Strength Between the Top and Bottom Layers of Needle Punched Geosynthetic Clay Liners

ASTM D 6768	Standard Test Method for Tensile Strength of Geosynthetic Clay Liners

Geosynthetic Research Institute (GRI Standards)

GRI-GCL3	Standard Specification for Test Methods, Required Properties and Testing Frequencies of Geosynthetic Clay Liners (GCLs)

1.03 Quality Assurance

A. The Contractor shall submit quality control certificates to the Engineer prior to initiating field work. As a minimum the Contractor shall utilize the services of a testing laboratory approved by the Engineer to perform the quality control tests outlined on Table 1 of this Section prior to delivery of the GCL to the site.

B. Once the initial testing has been reviewed by the Engineer and the site specific materials have been manufactured, the Contractor shall make available the rolls for conformance testing. Conformance testing shall be performed by an independent laboratory selected by the Engineer and paid by the Owner. The conformance testing shall be in accordance with Table 2 of this Section prior to delivery of the GCL to the site.

C. Quality control test results shall be submitted to the Engineer prior to shipping the GCL rolls.

D. All installation procedures and testing shall be in accordance with these Specifications and the manufacturer's general recommendations.

1.04 Submittals

A. The Contractor shall provide a warranty to the Owner covering materials and workmanship of the GCL.

B. The manufacturer shall provide the origin (bentonite and geotextile supplier's name and production plant); GCL identification (brand name, number); roll width, length and weight; production date of the GCL material and its component parts.

C. The Contractor shall submit, to the Engineer, a physical sample of the GCL. The samples shall be labeled with the manufacturer's name and product identification.

D. The Contractor shall also submit to the Engineer inventory tickets, roll numbers or batch identifications, packing papers and invoices for the GCL used.

1.05 Shipment and Storage

A. The GCL shall be shipped in accordance with ASTM D 5888 and the manufacturer's recommendations. The rolls 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. GCL which has been delivered to the Project site shall be stored in accordance with ASTM D 5888 and the manufacturer's written recommendations.

C. During shipment and storage, the GCL material shall be protected from ultraviolet light exposure, precipitation, snow or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. GCL rolls shall be covered with a waterproof, tightly fit plastic covering or otherwise protected. GCL rolls shall remain wrapped until the day they are to be installed.

D. GCL material shall not be exposed to precipitation or snow prior to being installed. If stored on site, the rolls shall be kept off of the ground in an enclosed area.

E. Any GCL not properly stored on the Project site shall be rejected by the Engineer. Any damaged rolls shall be rejected and replaced at no cost to the Owner.

1.06 Warranty

For needle punched products, The Contractor shall provide certification that the GCL has been continuously inspected with metal detectors and magnets, during manufacture of GCL and is essentially free of broken needles and fragments that would negatively effect the performance of the final product.

Part 2 Products

2.01 Geosynthetic Clay Liner

A. General Requirements

1. The Contractor shall supply the geosynthetic clay liner (GCL) materials whose properties meet or exceed the criteria included in these Specifications.

2. The GCL shall consist of a manufactured product where a layer of bentonite is retained between two geotextiles (one woven and one nonwoven) by needle-punching to provide internal reinforcement.

3. Bentonite shall contain not less than 80% montmorillionite clay.

4. GCL rolls shall be marked during manufacture with continuous overlap lines along each edge to assist in maintaining the minimum recommended overlap during installation. Lines shall be printed in easily visible, non-toxic ink.

5. No disassociation from the bentonite core shall occur if the liner is cut, punctured, torn or hydrated.

B. Material Properties: The GCL shall meet the requirements of Tables 1.

Part 3 Execution

3.01 Subgrade Preparation

A. GCL 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), are permitted on final dressed surfaces unless authorized by the Engineer.

B. The surface on which the GCL is to be placed shall be maintained in a firm, clean, dry and smooth condition during GCL installation. The geosynthetic installer shall be responsible for accepting the underlying compacted liner base, and shall certify in writing that the surface on which the GCL and geomembrane will be installed is acceptable. This certification of acceptance shall be given to the Engineer prior to commencement of GCL installation in the area under consideration.

3.02 Installation

A. GCL shall be installed in accordance with ASTM D 6102, the manufacturer's recommendations and the requirements of these Specifications.

B. The anchor trench shall be excavated prior to GCL placement to the lines and grades shown on the Drawings. Care shall be taken when backfilling the trench to prevent any damage to the GCL.

C. GCL shall be installed on the compacted liner base in conjunction with the geomembrane installation or soil cover placement. Due to the sensitivity to water of the GCL, the geomembrane or soil cover shall be installed over the GCL as quickly as possible to minimize potential damage from rain water. The Contractor shall unwrap and install only as much GCL in one working day as can be covered. In no case shall the GCL be exposed to the elements at the end of the day. GCL may be placed within an ambient temperature range of 32 to 104 degrees F.

D. Handling

1. The Contractor shall handle all GCL's in such a manner as to ensure they are not damaged in any way.

2. In the presence of wind, all GCL's shall be sufficiently weighted with sandbags to prevent their movement. Such sandbags shall be installed during placement and shall remain until the GCL is covered.

3. During placement, care shall be taken not to entrap stones or moisture under the GCL. Wrinkles shall be minimized. Care shall be taken not to unnecessarily walk on or drag equipment across the exposed GCL.

4. Any GCL damaged by stones or other foreign objects, or installation activities shall be replaced at no additional cost to the Owner.

5. The GCL shall not be installed on a saturated subgrade or on standing water. The GCL shall be installed in a way that prevents hydration of the mat prior to completion of construction of the overlying geomembrane liner system.

6. GCL material shall be deployed from the highest to the lowest point and shall be deployed down the slope, not across the slope.

7. The GCL shall not be installed during precipitation or other conditions that may cause hydration of the GCL.

8. Geomembrane installation shall immediately follow the GCL installation. All GCL that is placed during a day's work shall be covered with geomembrane

before the Contractor leaves the site at the end of the day.

9. Geomembrane shall not be placed on a GCL which is hydrated.

10. Protective cover soil overlying the liner system shall immediately follow the installation of the GCL or geomembrane. The GCL shall be removed and replaced if it becomes hydrated before the protective cover soil is placed.

11. GCL shall be cut using a utility blade in a manner approved by the Engineer. Care shall be taken to prevent damage to any underlying liner system components during cutting and to prevent fugitive clay particles from coming in contact with drainage materials.

12. The deployed GCL shall be visually inspected to ensure that no potentially harmful objects are present, e.g., stones, blades, small tools, sandbags, etc.

13. The method and equipment used to deploy the GCL shall not damage the geomembrane or supporting soil surface.

14. If the GCL has two different carrier textiles, the GCL shall be installed relative to the adjacent soil or geosynthetics as shown on the Drawings or as directed by the Engineer.

15. The GCL panels shall be placed parallel to the direction of the slope.

3.03 Repair

A. Irregular shapes, cuts or tears shall be repaired by covering the damaged area with GCL to provide a minimum 12-inch overlap on all sides. Additional bentonite shall be added to the overlapped area.

B. Care shall be taken to remove any soil or other material which may have penetrated the GCL.

C. The CQA Engineer shall observe any repairs, note any deviation with the above requirements, and report them to the Contractor.

3.04 Placement of Materials on top of GCL

A. The geosynthetics installer shall place materials on the GCL in the following manner:

1. Cause no damage to GCL or any underlying geosynthetics;

2. Allow minimal slippage of the GCL on underlying layers;

3. Cause no excess tensile stresses in the GCL;

4. Equipment used for placing the overlying material shall not be driven directly on the GCL, unless approved by the Engineer;

5. A minimum thickness of one foot of soil must be maintained between a light, low ground pressure dozer (such as a wide pad Caterpillar D-6 or lighter) and the GCL;

6. A minimum thickness of 1.5 feet of soil must be maintained between rubber-tired vehicles and the GCL; and

7. In heavy traffic areas such as access ramps, soil thickness shall be at least three feet.

B. Any deviation from the above shall be noted by the Engineer.

3.05 Seams

A. Seams on slopes shall be parallel to the slope.

B. On slopes steeper than 10H:1V, GCL panels shall extend from the anchor trench or a point five feet from the crest of the slope, to a point five feet beyond the toe of slope. No horizontal seams or end-to-end seams between panels will be allowed in these areas.

C. For GCL seams along the length of the mat, the overlap will be at least 6-inches or more if recommended by the manufacturer; along the width of the mat, the overlap will be at least 18-inches or more if recommended by the manufacturer. All seams shall have sufficient overlap that the minimum overlaps shall be maintained after any GCL shrinkage that may occur after installation or covering with the geomembrane.

D. Overlaps shall not be nailed or stapled to the subgrade.

E. For needle-punched GCLs, apply granular bentonite to overlapped area at a rate required by the manufacturer. Make certain that the needle-punched GCL overlap seams are offset at least five feet from the overlying geomembrane seams. For GCLs with extra bentonite manufactured at the roll edges, install per the manufacturers recommendations.

F. Seaming requirements recommended by the manufacturer shall be followed when more stringent and not in conflict with this Section.

3.07 Acceptance

A. GCL Acceptance: The Contractor shall retain ownership and responsibility for the GCL until acceptance by the Owner and the Georgia EPD.

B. Acceptance of the lining system shall be based on, but not limited to:

1. The installation is complete as determined by the Engineer;

2. Verification of the adequacy of all overlaps and repairs, including manufacturer's certification 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 panels.

5. The Contractor provides written certification that the installation was in accordance with the manufacturer's general recommendations and these Specifications, except as noted.

6. All test results and documentation has been reviewed, accepted and approved by the Georgia EPD.

TABLE 1

REQUIRED PHYSICAL PROPERTIES FOR GEOSYNTHETIC CLAY LINER MANUFACTURERS QUALITY CONTROL TESTING

Properties	ASTM Test Method	Specified Values	Minimum Testing Frequency
Clay (as received)			
Moisture content (%) (1)(2)	D 4643	35	1 per 100,000 lbs
Fluid loss (ml) (1)	D 5891	18	1 per 100,000 lbs
Geotextiles (as received)	D 5261		1 per 225,000 SF
Cap fabric (nonwoven) – mass/ unit area (oz/sy)		5.8	
Cap fabric (woven) – mass/ unit area (oz/sy)		3.0	
Carrier fabric (nonwoven composite) – mass/ unit area (oz/sy)		5.9	
Carrier fabric (woven) – mass/ unit area (oz/sy)		3.0	
GCL			
Mass of bentonite per unit area (lb/sf) (2)	D 5993	0.75	1 per 50,000 SF
Peel strength (lb/in)	D 6496	(5)	1 per 50,000 SF
Permeability (cm/sec) (1) (4)	D 5887	5×10^{-9}	1 per 250,000 SF
Index Flux (1) (4) (cm^3/sec-cm^2)	D 5887	1×10^{-6}	1 per 250,000 SF
Internal Shear Strength	D 6243	(6)	1 per project
Component Durability			
Geotextile and reinforcing yarns (% strength retained) (3)	GRI GCL3	65	yearly

(1) These values are maximum (all others are MARV)
(2) Mass after oven drying per method
(3) Value represents the minimum percent strength retained from the as-manufactured value after oven aging at 60°C for 50 days
(4) Either permeability or index flux can be reported. Permeability or index flux testing to be performed with water @ 5 psi maximum effective confining stress and 2 psi head.
(5) The minimum average peel strength shall be 1.0 lb/in. for unreinforced GCLs and 3.5 lb/in. for reinforced GCLs
(6) Required value shall be taken from manufacturer's standard material specification sheet for the selected GCL material. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength identified in the site's design.

TABLE 2

REQUIRED PHYSICAL PROPERTIES FOR GEOSYNTHETIC CLAY LINER CONFORMANCE TESTING

Properties	Qualifier	Unit	Specified Values	ASTM Test Method	Minimum Testing Frequency
Mass of Bentonite per Unit Area(1)	MARV	lbs/ft^2	0.75	D 5993	250,000 SF
Permeability	Maximum	cm/sec	5×10^{-9}	D 5887	100,000 SF
GCL Tensile Strength, MD	Minimum	lbs/in	23	D 6768	100,000 SF
GCL Peel Strength	Minimum	lbs/in	2.1	D 6496	100,000 SF

(1) Mass after oven drying per method

END OF SECTION

Part 1 General

1.01 Scope

A. This Section includes the work required to furnish and install geosynthetic drainage nets (geonets) and geocomposites where shown on the Drawings. All work shall be performed in strict accordance with the Drawings, Specifications, and the methods approved by the manufacturer.

B. Sufficient geosynthetic drainage material shall be provided to cover all areas as shown on the Drawings, including overlaps at field seams and anchor trenches.

C. References to geosynthetic drainage material in this specification are intended to refer to geonets, geocomposites, or both, as appropriate.

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 1238	Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer
ASTM D 1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 1603	Standard Test Method for Carbon Black Content of Olefin Plastics
ASTM D 4218	Standard Test Method for Determination of Carbon Black Content in Polyethylene Compounds by Muffle-Furnace Technique
ASTM D 4716	Standard Test Method for Determining the (In-plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
ASTM D 4873	Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
ASTM D 5035	Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
ASTM D 5199	Standard Test Method for Measuring the Nominal

	Thickness of Geosynthetics
ASTM D 6364	Standard Test Method for Determining Short-Term Compression Behavior of Geosynthetics
ASTM D 7005	Standard Test Method for Determining the Bond Strength (Ply Adhesion) of Geosynthetics

Geosynthetic Research Institute (GRI Standards)

GRI-GC13	Standard Guide for Joining and Attaching Geonets and Drainage Composites

1.03 Quality Assurance Testing and Submittals

A. Initial Submittal Data

1. The Geosynthetics Manufacturer shall submit certification that all materials manufactured for the project have been produced in accordance with these Specifications.

2. Contractor shall submit product data for the geosynthetic drainage material 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 Table 1 of this Section.

3. Geotextile portion of the geocomposite shall meet the requirements of Section 02778.

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 resin batch identifications for the geosynthetic drainage material 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 outlined in Table 1 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 geosynthetic drainage 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. Geosynthetic drainage materials conformance tests shall be as shown on Table 1. 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.

1.04 Handling and Storage

A. The geosynthetic drainage material shall be shipped in accordance with ASTM D 4873 and the manufacturer's recommendations.

B. The geosynthetic drainage material 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 or batch number;

4. Roll number;

5. Roll dimensions.

C. Geosynthetic drainage material which has been delivered to the Project site shall be stored in accordance with ASTM D 4873 and the manufacturer's written recommendations.

D. During shipment and storage, the geosynthetic drainage material shall be protected from mud, dirt, dust, puncture, cutting, or other damaging or deleterious conditions.

E. If the geosynthetic drainage material is intended to be installed with a specific side against an adjacent material, then the drainage material shall be clearly marked to indicate the proper orientation.

F. Any geosynthetic drainage material not properly shipped or 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 Geonets

A. The geonet shall be HDPE material manufactured of new, first-quality products designed and manufactured for the purpose of use in municipal solid waste

landfills.

B. The geonet shall be manufactured by extruding two sets of polyethylene strands to form a biplanar structure to provide planar water flow.

C. The geonet shall be capable of withstanding outdoor exposure (including ultraviolet light) for 30 days or the anticipated exposure period, whichever is greater, without significant loss of physical properties.

D. The geonets shall retain their structure during handling, placement, and long-term service.

2.02 Geotextiles

A. The geotextile materials shall meet the requirements of Section 02778 and shall be tested accordingly.

B. The geotextile materials used for the geocomposite shall be 10 oz/ SY fabric per Table 1 of Section 02778.

2.03 Geocomposites

A. The geocomposite shall be manufactured by heat bonding a continuous-filament, non-woven geotextile to both sides of an HDPE geonet. No burn through of geotextiles shall be permitted. No glue or adhesive shall be permitted.

B. The geotextiles and the geonet shall be bonded in such a way that neither component is compromised to the point where proper functioning is impeded.

Part 3 Execution

3.01 Installation

A. Geosynthetic drainage material 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. Any such damage shall be repaired by the Contractor and at no expense to the Owner.

B. Geosynthetic drainage material shall not be deployed during precipitation events or on slopes with frost accumulation.

C. Geosynthetic drainage material shall be deployed in such a manner as to preclude wrinkles and folds which would impair drainage capacity.

D. In the presence of wind, geosynthetic drainage materials shall be weighted with sandbags until cover material is installed.

E. Geosynthetic drainage materials on slopes shall extend to a minimum of five feet beyond the toe of slope. Cross seams on slopes greater than 10 percent are not allowed.

F. Geosynthetic drainage material shall not be welded to geomembrane.

G. Geosynthetic drainage material shall be cut using cutters approved by 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 geosynthetic drain.

H. All components of the geosynthetic lining system, including geomembranes, geotextiles, and geosynthetic drains shall be kept free of mud, dust, dirt, and debris that could damage the geomembrane or contribute to clogging of the geosynthetic drainage material.

I. Personnel working on the geosynthetic drainage material shall not smoke, wear damaging shoes, or engage in other activities which could damage the material. Any such damage to the geosynthetic drainage material or other geosynthetic layers resulting from such activities shall be repaired by the Contractor and at no expense to the Owner.

J. Following installation of the geosynthetic drainage material, an examination of the entire surface shall be conducted to ensure that no potentially harmful foreign objects are present. Any foreign object so encountered shall be removed by the Contractor, or the geosynthetic drainage material shall be replaced.

3.02 Joining

A. Adjacent geosynthetic drainage panels shall be joined as shown on the Drawings and as specified herein. At a minimum, the following requirements shall be met:

1. Adjacent panels shall be overlapped by at least 4-inches for side adjacency and 12-inches for end adjacency, or more if needed to comply with manufacturer's recommendations.

2. At overlapped edges, the geotextile should be detached from the geonet such that the full length of the specified overlap is with geonet over geonet. The geotextile shall completely cover the net and be bonded together. Geotextile bonding shall be by heat burnishing with shoes or plates or sewing.

3. Overlaps shall be joined by using electrical/ cable ties, unless other fasteners are approved by the Manufacturer. Metallic devices are not allowed.

4. Overlaps shall be tied in approximately the center of the overlap and shall encompass more than a single strand of each of the panels.

5. Ties shall be spaced on five-foot centers along the sides and areas of constant grade. The tie spacing shall be on six-inch centers along the panel ends and areas of grade change.

B. When more than one layer of geosynthetic drain is installed, joints shall be staggered.

3.03 Repair

A. Holes, tears, or damage to the geosynthetic drain shall be repaired by placing a patch extending a minimum of one foot beyond the edges of the defect. The patch shall be secured with the ties used for panel joining. Ties shall be located at approximately four inches from the edge of the patch and shall be spaced every six inches.

B. Holes or tears extending more than 50 percent of the panel width shall require the entire length of damaged geosynthetic drainage material to be removed and replaced.

3.04 Placement of Materials over Geosynthetic Drainage Material

A. The Contractor shall ensure that all soil materials are placed over the geosynthetic drainage material in such a manner as to ensure that:

1. The geosynthetic drainage material and underlying lining materials are not damaged;

2. Minimal slippage of the geosynthetic drainage material on underlying layers occurs;

3. No excess tensile stresses occur in the geosynthetic drainage material.

B. Soil shall never be placed in direct contact with a geonet. Geonets shall be separated from soil materials by a geomembrane or a geotextile.

3.05 Acceptance

A. The Contractor shall retain ownership and responsibility for the geosynthetic drainage layer until acceptance by the Owner and the Georgia EPD.

B. Acceptance of the geosynthetic drainage layer 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 GEOSYNTHETIC DRAINAGE MATERIALS

Property	ASTM Test Method	Units	Qualifier	Value	MQC Testing Frequency	QA Conformance Testing Frequency
Geonet						
Geonet Thickness	D 5199	mil	MARV	250	1 per 100,000 SF	1 per 250,000 SF
Density	D 1505 or D 792	g/cm^3	MARV	0.94	1 per 100,000 SF	1 per 250,000 SF
Tensile Strength (MD)	D 5035/ D 7179	lbs	MARV	55	1 per 100,000 SF	1 per 250,000 SF
Carbon Black	D 1603	%	range	2 - 3	1 per 100,000 SF	1 per 250,000 SF
Compressive Strength	D 6364	lb/sf	MARV	15,000	1 per project	1 per project
Geocomposite (2)						
Transmissivity (1)	D 4716	m^2/sec	MIN	See Note 1	1 per project	1 per project
Ply Adhesion (Minimum)	D 7005 (3)	lb/in	MARV	1.0	1 per 100,000 SF	1 per 250,000 SF

(1) Transmissivity shall be measured in a 12-inch x 12-inch box with adjacent conditions matching detail, 100 hour duration and 0.1 gradient. The value shall be at least 1.32×10^{-3} m^2/sec at 700 psf, 1.94×10^{-3} m^2/sec at 4,760 psf, and 3.02×10^{-3} m^2/sec at 10,250 psf. Transmissivity measured using water at 21 ±2°C.

(2) Geotextile fabric shall meet the requirements of Section 02778, Table 1.

(3) The minimum average ply adhesion for Geocomposites shall be 1 pound per inch (ppi) as determined by ASTM D7005 with the following modification. Three (3) out of the five (5) samples must each have a value greater than or equal to 1 ppi and the remaining two (2) out of the five (5) samples must each have a ply adhesion greater than 0.5 ppi.

END OF SECTION

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Part 1 General

1.01 Scope

A. The work covered by this Section consists of furnishing all labor, equipment and material required to place topsoil, seed, commercial fertilizer, agricultural limestone and mulch material, including seedbed preparation, harrowing, compacting and other placement operations on graded earthen areas as described herein and/or shown on the Drawings. In general, grassing operations shall be conducted on all newly graded earthen areas not covered by structures, pavement or sidewalks; all cleared or grubbed areas which are to remain as finish grade surfaces; and on all existing turf areas which are disturbed by construction operations and which are to remain as finish grade surfaces. Areas disturbed by borrow activities shall also be seeded according to these Specifications.

B. Types of work required include following:

1. Fine grading and preparing of lawn areas.

2. Furnishing and applying new topsoil.

3. Furnishing and applying soil amendments.

4. Furnishing and applying fertilizers.

5. Seeding areas.

6. Replanting unsatisfactory or damaged grassed areas.

C. The work shall include temporary grassing operations to stabilize earthen surfaces during construction, inclement weather or during inappropriate seasons for permanent seeding. Additionally, temporary stabilization shall be used to minimize siltation and erosion. Temporary grassing shall be performed at the times and locations as directed by the Engineer and as detailed on the Drawings.

1.02 Quality Assurance

A. Prior to seeding operations, the Contractor shall furnish to the Engineer labels or certified laboratory reports from an accredited commercial seed laboratory or a state seed laboratory showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this Section.

B. Prior to topsoil operations, the Contractor shall obtain representative samples and

furnish soil test certificates including textural, pH, and organic analysis from the State University Agricultural Extension Services or other certified testing laboratory.

C. Sod Analysis: Notify Engineer of sod source, including name and telephone number of supplier, and seed mix of sod.

1.03 Job Conditions

A. Planting Time: Sow lawn seed only during normal planting seasons for each type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of substantial completion.

B. Specified work is minimum required, and any and all necessary materials and operations including reworking, must be performed to obtain specified results.

1.04 Special Project Warranty:

A. Warrant grassing until final acceptance and through specified maintenance period.

Part 2 Products

2.01 Topsoil

A. Utilizing designated stockpiles or borrow areas on site, the Contractor shall place a minimum of 4-inches of topsoil over all graded earthen areas and over any other areas to be seeded. Sources of topsoil shall be approved by the Engineer prior to disturbance. Importing topsoil from offsite sources shall be at the discretion of the Engineer and shall be justification for additional compensation to the Contractor. A change order properly authorized by the Owner shall be agreed upon prior to importing offsite topsoil. No additional compensation will be allowed for spreading of topsoil.

B. Topsoil shall be a friable loam containing a large amount of humus and shall be original surface soil of good, rich, uniform quality, free from any material such as hard clods, stiff clay, hardpan, partially disintegrated stone, pebbles larger than 1/2-inch in diameter, lime, cement, bricks, ashes, cinders, slag, concrete, bitumen or its residue, boards, sticks, chips or other undesirable material harmful or unnecessary to plant growth. Topsoil shall be reasonably free from perennial weeds and shall not contain objectionable plant material, toxic amounts of either acid or alkaline elements or vegetable debris undesirable or harmful to plant life.

C. Topsoil shall be natural topsoil without admixture of subsoil material, and shall be classifiable as loam, silt loam, clay loam, sandy loam or a combination thereof. The pH shall range from 5.5 to 7.0. Topsoil shall contain not less than five percent

nor more than 20 percent, by weight, of organic matter as determined by loss on ignition of oven-dried samples to 65 °C.

2.03 Seed

A. Seed shall be delivered in new bags or bags that are sound and labeled in accordance with the U.S. Department of Agriculture Federal Seed Act. All seed shall meet the requirements of Georgia Seed Laws, Rules and Regulations.

B. All seed shall be from the last crop available at time of purchase and shall not be moldy, wet or otherwise damaged in transit or storage.

C. Seed shall bear the growers analysis testing to 98 percent for purity and 90 percent for germination. At the discretion of the Engineer, samples of seed may be taken for verification against the grower's analysis.

D. Species, rate of seeding, fertilization and other requirements are shown on the Drawings.

2.04 Soil Amendments

A. Fertilizer and liming materials shall comply with applicable state, local and federal laws concerned with their production and use.

B. Commercial fertilizer conforming to the standards of the Association of Official Agricultural Chemists shall be a ready mixed material equivalent to the grade or grades specified in the Seeding Schedule shown on the Drawings. Container bags shall have the name and address of the manufacturer, the brand name, net weight and chemical composition.

C. Agricultural limestone shall be a pulverized dolamitic limestone having a calcium carbonate content of not less than 85 percent by weight. Agricultural limestone shall be crushed so that at least 85 percent of the material will pass a No. 10 mesh screen and 50 percent will pass a No. 40 mesh screen.

D. Standard commercial grade nitrogen conforming to state fertilizer laws. Provide in either granular or liquid form at Contractor's option.

2.06 Mulch Material

A. All mulch materials shall be air dried and reasonably free of noxious weeds and weed seeds or other materials detrimental to plant growth.

B. Mulch shall be composed of wood cellulose fiber, straw or stalks, as specified herein. Mulch shall be suitable for spreading with standard mulch blowing equipment.

C. Straw mulch shall be partially decomposed stalks of wheat, rye, oats or other approved grain crops.

D. Stalks shall be the partially decomposed, shredded residue of corn, cane, sorghum or other approved standing field crops.

E. Wood fiber shall meet the requirements of GDOT Specification Section 718 and be listed as approved on QPL 25.

2.07 Mulch Binder

A. Mulch on slopes exceeding 3 to 1 ratio shall be held in place by the use of an approved mulch binder. The mulch binder shall be non-toxic to plant life and shall be acceptable to the Engineer.

B. Emulsified asphalt binder shall be Grade SS-1h, ASTM D 977.

B. Approved alternate tackifiers are as listed on the Georgia DOT Qualified Product List No. 33, latest edition.

2.08 Innoculants for Legumes

All leguminous seed shall be inoculated prior to seeding with a standard culture of nitrogen-fixing bacteria that is adapted to the particular seed involved.

2.09 Water

Water shall be clean, clear water free from any objectionable or harmful chemical qualities or organisms and shall be furnished by the Contractor.

Part 3 Execution

3.01 General

A. These Specifications set forth minimum operations and material applications which are acceptable. Contractor is required to establish a satisfactory stand of grass by using these or supplemental methods and/or materials as may be required.

B. Where grassing is required between curbs and sidewalks or behind sidewalks in areas adjacent to private residential or commercial property, the Engineer may change the type of grassing specified to match any type of grass which may be planted and growing on the adjacent lawn. No modifications of the Contract Unit Price will be made for this substitution.

3.02 Securing and Placing Topsoil

A. Topsoil shall be secured from areas from which topsoil has not been previously removed, either by erosion or mechanical methods. Topsoil shall not be removed to a depth in excess of the depth approved by the Engineer.

B. The area or areas from which topsoil is secured shall possess such uniformity of soil depth, color, texture, drainage and other characteristics as to offer assurance that, when removed the product will be homogeneous in nature and will conform to the requirements of these Specifications.

C. All areas from which topsoil is to be secured, shall be cleaned of all sticks, boards, stones, cement, ashes, cinders, slag, concrete, bitumen or its residue and any other refuse which will hinder or prevent growth.

D. In securing topsoil from a designated pit, or elsewhere, should strata or seams of material occur which do not come under the requirements for topsoil, such material shall be removed from the topsoil or if required by the Engineer, the pit shall be abandoned.

E. Before placing or depositing topsoil upon any areas, all improvement within the area shall be completed, unless otherwise approved by the Engineer.

F. The areas in which topsoil is to be placed or incorporated shall be prepared before securing topsoil for use.

3.03 Seedbed Preparation

A. Before fertilizing and seeding, the topsoil surfaces shall be trimmed and worked to true line from unsightly variation, bumps, ridges and depressions and all detrimental material, roots and stones larger than 2-inches in any dimension shall be removed from the soil.

B. Not earlier than 24 hours before the seed is to be sown, the soil surface to be seeded shall be thoroughly cultivated to a depth of not less than 4-inches with a weighted disc, tiller, pulvimixer or other equipment, until the surface is smooth and in a condition acceptable to the Engineer.

C. If the prepared surface becomes eroded as a result of rain or for any other reason, or becomes crusted before the seed is sown, the surface shall again be placed in a condition suitable for seeding.

D. Ground preparation operations shall be performed only when the ground is in a tillable and workable condition, as determined by the Engineer.

3.04 Soil Amendments

A. Following seedbed preparation, fertilizer shall be applied to all areas to be seeded so as to achieve the application rates shown on the Drawings.

B. Fertilizer shall be spread evenly over the seedbed and shall be lightly harrowed, raked, or otherwise incorporated into the soil for a depth of 1-inch.

C. Fertilizer and nitrogen need not be incorporated in the soil as specified above when mixed with seed in water and applied with power sprayer equipment. The seed shall not remain in water containing fertilizer for more than 30 minutes when a hydraulic seeder is used.

D. Agricultural limestone shall be thoroughly mixed into the soil according to the rates shown in the Seeding Schedule shown on the Drawings. The specified rate of application of limestone may be reduced by the Engineer if pH tests indicate this to be desirable. It is the responsibility of the Contractor to obtain such tests and submit the results to the Engineer for adjustment in rates.

3.05 Seeding

A. Seed of the specified group shall be sown as soon as preparation of the seedbed has been completed. No seed shall be sown during high winds, nor until the surface is suitable for working and is in a proper condition. Seeding shall be performed during the dates shown on the Drawings unless otherwise approved by the Engineer. Seed mixtures may be sown together provided they are kept in a thoroughly mixed condition during the seeding operation.

B. Seed shall be uniformly sown by any approved mechanical method suitable for the slope and size of the areas to be seeded, preferably with a broadcast type seeder, windmill hand seeder or approved mechanical power drawn seed drills. Hydro-seeding and hydro-mulching may be used on steep embankments, provided full coverage is obtained. Care shall be taken to adjust the seeder for seedings at the proper rate before seeding operations are started and to maintain their adjustment during seeding. Seed in hoppers shall be agitated to prevent segregation of the various seeds in a seeding mixture.

C. Immediately after sowing, the seeds shall be covered and compacted to a depth of 1/8 to 3/8-inch by a cultipacker or suitable roller.

D. Leguminous seeds shall be inoculated prior to seeding with an approved and compatible nitrogen-fixing inoculant in accordance with the manufacturer's mixing instructions.

3.06 Mulching

A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. The mulch shall be applied evenly so as to permit sunlight to penetrate and the air to circulate and at the same time shade the ground, reduce erosion and conserve soil moisture.

B. One of the following mulches shall be spread evenly over the seeded areas at the following application rates:

1. Wood Cellulose Fiber: 1,400 pounds/acre.

2. Straw: 4,000 pounds/acre.

3. Stalks: 4,000 pounds/acre.

4. These rates may be adjusted at the discretion of the Engineer at no additional cost to the Owner, depending on the texture and condition of the mulch material and the characteristics of the seeded area.

C. Mulch on slopes greater than 3 to 1 ratio shall be held in place by the use of an approved mulch binder. Binder shall be thoroughly mixed and applied with the mulch. Emulsified asphalt shall be applied at the approximate rate of 100 gallons of product with 100 gallons of water per ton of mulch as required to hold the mulch in place. Alternate binders or tackifiers shall be mixed at rates per the manufacturers written instructions.

D. The Contractor shall cover structures, poles, fences and appurtenances if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.

E. Mulch and binder shall be applied by suitable blowing equipment at closely controlled application rates in a manner acceptable to the Engineer.

3.07 Hydroseeding Lawns

A. Mix specified seed, fertilizer, and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

B. Apply slurry uniformly to all areas to be seeded. Rate of application as required to obtain specified seed sowing rate.

3.08 Watering

A. The Contractor shall be responsible for maintaining the proper moisture content of the soil to insure adequate plant growth until a satisfactory stand is obtained. If necessary, watering shall be performed to maintain adequate water content in the

soil.

B. Watering shall be accomplished by hoses, tank truck or sprinklers in such a way to prevent erosion, excessive runoff and over-watered spots.

C. Water sod with fine spray immediately after planting. During first week, water daily or more frequently as necessary to maintain moist soil to depth of 4 inches.

3.09 Maintenance

A. Upon completion of seeding operations, the Contractor shall clear the area of all equipment, debris and excess material and the premises shall be left in a neat and orderly condition.

B. The Contractor shall maintain all seeded areas without additional payment until final acceptance of the work by the Owner, and any regrading, refertilizing, reliming, reseeding or remulching shall be done at Contractor's own expense. Seeding work shall be repeated on defective areas until a satisfactory uniform stand is accomplished. Damage resulting from erosion, gulleys, washouts or other causes shall be repaired by filling with topsoil, compacting and repeating the seeding work at Contractor's expense.

C. It is the responsibility of the Contractor to make one application of a maintenance fertilizer according to the recommendations listed in the Seeding Schedule shown on the Drawings.

D. Begin maintenance of lawns immediately after each area is planted and continue for the periods required to establish acceptable lawns, but no less than the following:

1. Seeded lawns, at least 60 days, after date of substantial completion. If seeded in fall and not given full 60 days of maintenance, or if not considered acceptable at that time, continue maintenance during following spring until acceptable lawn is established.

2. Sodded lawns, at least 30 days after date of substantial completion.

E. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading, replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

F. Remulch with new mulch in areas where mulch has been disturbed by wind or maintenance operations sufficiently to nullify its purpose. Anchor as required to prevent displacement.

G. Replant bare areas with same materials specified for lawns.

H. Watering: Provide and maintain temporary piping, hoses and lawn watering equipment to convey water from sources and to keep lawn areas uniformly moist as required for proper growth.

I. Lay out temporary lawn-watering system and arrange watering schedule to prevent puddling, water erosion, and displacement of seed or mulch (if any). Lay out temporary watering system to avoid necessity of walking over muddy or newly seeded areas.

J. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height. Remove no more than 40 percent of grass leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Time initial and subsequent mowings to maintain following grass height:

Mow grass from 1-1/2 inches to 2 inches high. Do not mow to less than 1-1/2 inches.

K. Apply second fertilizer application after first mowing and when grass is dry. Use fertilizer that will provide at least 1.0 lb. of actual nitrogen per 1,000 sq. ft. of lawn area.

3.10 Application of Nitrogen

A. Make two applications of nitrogen to all grassed areas using mechanical spreading equipment. Apply at a uniform rate of not less than 70 pounds per acre per application. Make both applications only when weather conditions will permit uniform and even distribution and when moisture conditions will not cause harm to grass.

B. Place first application of nitrogen when young grass reaches a height of at least one inch. Make the second application of nitrogen between 30 and 45 days after the first application.

3.11 Protection

A. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

3.12 Required Coverage

A. Grassed areas will be considered acceptable when a viable stand of grass covers at least 98 percent of the total area with no bare spots exceeding one square foot and the ground surface is fully stabilized against erosion.

3.13 Acceptance

A. When work is substantially completed, including maintenance, Engineer will, upon request, make an inspection to determine acceptability.

B. Lawn work may be inspected for acceptance in parts agreeable to Engineer, provided work offered for inspection is complete, including maintenance.

C. Replant rejected work and continue specified maintenance until reinspected by Engineer and found to be acceptable.

D. Seeded lawns will be acceptable provided requirements, including maintenance and coverage, have been met and healthy, uniform close stand of specified grass is established free of weeds, bare spots, and surface irregularities.

3.14 Cleanup

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto surface of roads, walks, or other paved areas.

END OF SECTION

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