

Contract Documents

Phase 5 Construction Ridge Road Class III Landfill TDWM Permit No. DML-78-0126

Prepared for:

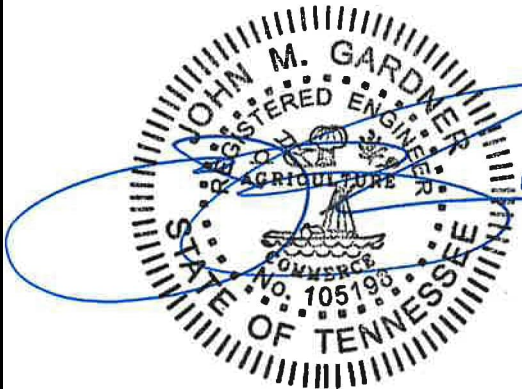
**Sevier Solid Waste, Inc.
Pigeon Forge, Tennessee**



Bid Issue Documents

11/14/23

November 2023



Prepared by:

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

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Phase 5 Construction Ridge Road Class III Landfill

Contract Documents

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Construction Quality Assurance Plan

Attached

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Separate

NOTICE OF BIDDING

Phase 5 Expansion Sevier Solid Waste, Inc.

Sealed bids (proposals) will be received by the Owner, Sevier Solid Waste, Inc., in the Offices of the Engineer, Smith Gardner, Inc. (Address: 14 N. Boylan Ave, Raleigh, NC 27603; Phone: (919) 882-0577) until 2:00 p.m., Central time on **December 15, 2023** and then at said office be privately opened for the following:

PHASE 5 EXPANSION: Includes construction of a low-permeability, geologic buffer for a Class III landfill unit, complete with earthwork, drainage structures, and erosion and sedimentation control measures. Additional required site work will include excavating and removing fire debris waste from the expansion area to the operating Class III Landfill. The preceding is not a complete description of all work involved.

Bids may be sent via email to john@smithgardnerinc.com to arrive by 2:00 P.M. Central time on December 15, 2023 with the signed proposal delivered by end of day on Monday, December 18, 2023.

A Performance Bond and Payment Bond will be required for the successful Bidder in the amount of one hundred percent (100%) of the Contract price, conditioned upon the faithful performance of the Contract, payment of all persons supplying labor or furnishing materials, and payment of all liabilities incurred in connection with the Work under this Contract.

Each Bidder must be appropriately licensed as a General Contractor in compliance with TCA 62-6-102.

No Bidder may withdraw their Bid within 60 days after the date of Bid opening.

The Owner reserves the right to reject any and all Bids and any part of a Bid and to waive formalities and technicalities in the bidding procedure.

A Pre-Bid Meeting will be held on Wednesday, November 29, 2023 at the site at 1:00 p.m. local time. Potential Bidders are required to attend. The Site Address is:

Sevier Solid Waste, Inc.
1855 Ridge Road
Pigeon Forge, TN 37863
(865) 453-5676

Contract Documents will be emailed as a PDF, and AutoCAD files will be provided by the Engineer.

Neither the Owner nor the Engineer will be responsible for full or partial sets of Contract Documents, including any Addendums, obtained from any other source.

Sevier Solid Waste, LLC

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INSTRUCTIONS TO BIDDERS

1.0 Defined Terms

Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract, NSPE Document C-700 (2002 edition) shall have the meanings assigned to them in the General Conditions as modified, changed, added to, or deleted by the Supplementary Conditions.

2.0 Qualifications of Bidders

To demonstrate their qualifications for the Project, each Bidder shall submit with their Proposal satisfactory proof of their and all Subcontractor's qualifications to perform in a satisfactory manner and within the time specified in the Proposal, all of the work covered by the Contract Documents. Each Bidder shall submit, among other items, information, evidence, and statements with respect to the following:

- 2.1 That they are properly licensed.
- 2.2 That they have a well-trained and competent organization which has done work of similar character and value.
- 2.3 That they will have available adequate equipment and facilities to do the work at the proper time or times. The Bidder shall list equipment and facilities in such detail that they can be quickly and accurately checked.
- 2.4 That they have ample equipment, supplies, and repair parts to maintain all required equipment and facilities properly and with a minimum of delay.
- 2.5 If the Bidder is a corporation or partnership, the names of all corporate officers or partners, and the name of the executive or partner who will give their personal attention to the work.
- 2.6 A financial statement indicating the financial history and viability of the Bidder and proposed Subcontractors.
- 2.7 A statement relating the Bidder's history over the last five years regarding project related litigation initiated by or against the Bidder.
- 2.8 A listing of completed projects by the Bidder and proposed Subcontractors similar in nature and magnitude to the work proposed herein. The information shall include, at a minimum, the following:
 - 1) Project Information (name, location, value, date)
 - 2) Owner Information (name, address, telephone number, contact person)
 - 3) Engineer Information (name, address, telephone number, contact person).
- 2.9 Evidence that the Bidder and Subcontractors meet the requirements regarding soil installation qualifications as specifically detailed in the technical specifications.

- 2.10 Statements that the Bidder has:
- 1) Operated under the current corporate name for the last four years.
 - 2) Never failed to complete a project: if so, explain.
 - 3) A history of completing projects consistently on time and within the bid amount.
- 2.11 That they have an established safety program and that employees are well-trained and competent with regard to safety on similar projects of size and value. Bidders shall demonstrate experience by key personnel (Project Manager/Site Superintendent/Site Health and Safety Officer) to be assigned to this project which shall include, at a minimum, the following:
- 1) Number of lost workdays from OSHA 200 logs for the last three (3) years included with total number of employee workdays over the same period.
 - 2) Worker's compensation experience modifier rate (EMR) for the last three (3) years.
- 2.12 With regard to **Schedule**, the qualifications statement of the Bidder may include a proposed, alternate time frame and schedule to complete the work under this Contract, in lieu of the time frame indicated by the Engineer in the Contract Documents. The Schedule shall include a breakdown by major components of the work (i.e. subgrade, soil liner, geomembrane, etc.). Favorable consideration will be given to the Bidder who can demonstrate and commit to a more expeditious schedule and earlier completion date.

All information submitted will be kept strictly confidential and used strictly in determining whether the Bidder is qualified to do work set forth in the Contract Documents.

All Subcontractors must be named and divulged at the time of Bid opening and included on the Bid forms. Failure to do so will be considered non-responsive and may be cause for rejection of the Bid by the Owner.

3.0 Not used.

4.0 Examination of Contract Documents and Site

- 4.1 Before submitting their Bid, each Bidder shall have the following responsibilities:
- 4.1.1 examine the Contract Documents thoroughly;
 - 4.1.2 visit the site to familiarize himself with local conditions that may in any manner affect performance of the work;
 - 4.1.3 familiarize himself with federal, state, and local laws, ordinances, rules and regulations affecting performance of the work;
 - 4.1.4 carefully correlate their observations with the requirements of the Contract Documents; and
 - 4.1.5 notify Engineer of all the conflicts, errors, or discrepancies in the Contract Documents and Drawings.

- 4.1.6 the site shall be inspected only in the company of an authorized representative of the Owner with appointments made through Sevier Solid Waste, Inc., Mr. Tom Leonard, General Manager (Phone: (865) 453-5676).
- 4.2 Latent physical conditions at the site affecting performance of the work have been considered by the Engineer in preparing the Drawings and Specifications. Before submitting their Bid, each Bidder will, at their own expense, make such additional observations, surveys and investigations as they may deem necessary to determine their Bid Price for performance of the work within the terms of the Contract Documents. Any Bidder desiring access to the site for the purpose of additional investigations must advise the Owner for coordination of access (see contact information in Paragraph 4.1.6 above).
- 4.3 The submission of a Bid will constitute an incontrovertible representation by the Bidder that they have complied with every requirement of this Article 4.0 of these Instructions to Bidders.

5.0 Interpretation

- 5.1 All questions about the meaning or intent of the Contract Documents shall be submitted in writing to:

Smith Gardner, Inc.
14 N. Boylan Avenue
Raleigh, North Carolina 27603
Attn.: John M. Gardner, P.E.
Phone Number: (919) 828-0577
Email: john@smithgardnerinc.com

Replies will be issued by Addenda, electronically mailed or otherwise delivered to all parties recorded by the Engineer as having received the bidding documents. Questions received less than five (5) days prior to the date for opening of Bids will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

- 5.2 Addenda, when issued, will be on file at the offices of the Owner and Engineer at least twenty-four (24) hours before Bids are opened. It shall be the Bidder's responsibility to make inquiry as to the Addenda issued. All such Addenda shall become part of the Contract Documents and all Bidders shall be bound by such Addenda, whether or not received by the Bidders.
- 5.3 Complete sets of Contract Documents must be used in preparing Bids; neither the Owner or the Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents (including incomplete Contract Documents due to compatibility or other issues when printing from provided electronic versions). The Owner and the Engineer in making copies of the Contract Documents available on the above terms do so only for the purpose of obtaining Bids for the work and do not confer a license or grant for any other use.

6.0 Not used.

7.0 Contract Time

- 7.1 The number of days for completion of the work (the CONTRACT TIME) will be as set forth in the Agreement. The Contractor shall commence work on the date specified in the Notice to Proceed, and they shall complete the work within the stipulated Contract time.
- 7.2 Extension of the stipulated CONTRACT TIME will be provided for those normal working days that the Engineer determines that weather conditions prohibit Project work in accordance with the Supplementary Conditions.

8.0 Subcontractors

- 8.1 If the Owner or the Engineer after due investigation has reasonable objection to any proposed Subcontractor, person or organization specified by the Bidder, they may require before giving the Notice of Award that the apparent low Bidder submit an acceptable substitute without an increase in their Bid Price. If the Bidder declines to make any such substitution, the Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors. Any Subcontractor, other person or organization so listed and to whom the Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to the Owner and Engineer. This does not remove responsibilities for said Subcontractor, supplier, etc. to comply with the Contract Documents.
- 8.2 The Contractor shall not be required to employ any Subcontractor, other person, or organization against whom they have reasonable objection.

9.0 Proposal Form

- 9.1 Proposals shall be submitted on the Proposal Form furnished within the Contract Documents. Bidders agree that Proposals submitted on the specified Proposal Form, which is detached from the Contract Documents, will be considered and will have the same force and effect as if attached thereto.
- 9.2 All blank spaces for Bid prices in the Proposal Form shall be properly completed in ink in both words and numerals. In case of conflict between the Price in words and its equivalent shown in numerals, the words will take precedence. Blank spaces will be considered as zero (-0-). **PROPOSALS SHALL NOT BE CONDITIONAL, LIMITED, OR RESTRICTED IN ANY WAY.**
- 9.3 Bids by corporations must be executed in the corporate name by the president or vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal shall be affixed and attested by the corporate secretary or an assistant secretary. The corporate address and state of incorporation shall be shown with the signature.
- 9.4 Bids by partnership must be executed in the partnership name and signed by a partner, with their title and the official address of the partnership shown below the signature. The Owner reserves the right to request submission of partnership documents to determine the authority of the partner to execute the instrument.

- 9.5 All names must be printed in ink below the signature on the Proposal Form.
- 9.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in on the Proposal Form).

10.0 Submission of Proposals

- 10.1 Proposals shall be submitted at the time and place indicated in the Advertisement for Bids and shall be included in an opaque sealed envelope, marked with the Project Title, name and address of the Bidder, Contractor's License number, and be accompanied by the other required documents. No Proposal will be considered unless filed on or before the time and at the place designated in the Advertisement for Bids. Proposals received after the time set for the opening will be returned unopened.
- 10.2 Proposals sent by mail should be registered mail or express courier. The sealed Proposal, marked as indicated above, should be enclosed in an additional sealed envelope similarly marked and addressed to:

Sevier Solid Waste, Inc.
1855 Ridge Road
Pigeon Forge, TN 37863
(865) 453-5676
Attn.: Tom Leonard, General Manager

Proposals sent by mail or courier, and arriving after the time for opening of Bids shall not be considered as valid Bids. In such instances, the Bidder shall have no claim against the Owner.

- 10.3 THE FOLLOWING FORMS AND INFORMATION SHALL BE COMPLETELY FILLED OUT AND SUBMITTED WITH THE BIDS:
- 1) Entire Proposal Form including:
 - a. Bid Form;
 - b. Qualifications of Bidders;
 - c. Proposed Subcontractors; and
 - d. Proposal Signature.

Failure to submit all of the above forms and information with the Proposal may be just cause for rejection of the Proposal by the Owner in the Owner's sole discretion.

11.0 Modification and Withdrawal of Proposals

- 11.1 Written or telegraphic modifications of Proposals may be accepted if received in accordance with the requirements for the submission of Proposals as provided in Article 10 above. Bidders are cautioned that if, in the opinion of the Owner or the Engineer such modifications are not explicit, or are in any sense subject to misinterpretation, then the Proposal so amended or modified will be subject to rejection.

- 11.2 Except as otherwise provided by law, any Bidder upon their properly notarized, written request received within 24 hours before Bids are opened will be given permission to withdraw their Proposal prior to the time scheduled for the opening of Bids. At the time of opening of the Proposals, when such Proposal is included, it will be returned to the Bidder unread. Errors, inaccuracies, or negligence on the part of the Bidder in preparing their Proposal confers no right for the withdrawal of the Proposal after it has been opened, except as otherwise provided by law.

12.0 Opening of Bids

Proposals will be received and Bids privately opened (unless obviously non-responsive).

13.0 Bids to Remain Open

All Bids shall remain open for sixty (60) days after the day of the Bid opening, but the Owner may, in their sole discretion, release any Bid prior to that date.

14.0 Award of Contract

- 14.1 The Owner reserves the right to reject any and all Bids and waive any and all informalities, and the right to disregard all non-conforming or conditional Bids or counter proposals.
- 14.2 In evaluating Bids, the Owner shall consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and alternates and installed prices as requested in the Proposal forms. They will consider the qualifications and experience of Subcontractors and other persons and organizations (including those who are to furnish the principal items of material or equipment) proposed for those portions of the work as to which the identity of Subcontractors and other persons and organizations must be submitted, as required by Article 8 above. They may conduct such investigations as they deem necessary to establish the responsibility, qualifications, and financial ability of the Bidders, proposed Subcontractors and other persons and organizations to do the work in accordance with the Contract Documents to the Owner's satisfaction within the prescribed time. The Owner reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to the Owner's satisfaction.
- 14.3 If a Contract is to be awarded, it will be awarded to the lowest responsible, responsive Bidder whose evaluation by the Owner and/or Engineer indicates to the Owner that the Award will be in the best interest of the Project and as otherwise provided by law.
- 14.4 The Owner will give the apparent successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening. The Bidder will be required to execute the contract within fifteen (15) calendar days of date of Notice of Award of Contract and deliver to the Owner.
- 14.5 In addition, the successful Bidder, within the period stipulated in Paragraph 14.4, shall procure, execute, and deliver to the Owner and maintain, at their own cost and expense, a Performance Bond and a Payment Bond as specified in the General Conditions.

14.6 Failure or refusal of the Bidder whose Proposal is accepted to execute the Contract as hereinbefore provided shall constitute a breach by such Bidder of the Contract created by the acceptance of the Proposal, and in such event, the Owner at their option, may determine that such Bidder has abandoned the Contract. Thereupon such Bidder's Proposal and the acceptance thereof shall be null and void.

15.0 Meetings

A non-mandatory Pre-Bid Meeting will be held at the time and place indicated in the Advertisement for Bids to discuss the Project and answer pertinent questions. Representatives of the Owner and Engineer will be available to answer questions and supervise a visit of the Project site.

16.0 Compliance With Laws

16.1 The Bidder's attention is directed to the fact that all applicable federal regulations, State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract Documents throughout and they will be deemed to be included in the Contract Documents the same as though herein written out in full.

17.0 Coordination

The Contractor is reminded that they will be working in close proximity to an ongoing, active landfill operation and as such, should expect to encounter situations that could present access conflicts. In this event, the Contractor, being aware of this probability, and having worked in this environment in the past, shall always yield to the landfill operations, unless otherwise instructed by the Owner, without claim for delay and at no additional cost to the Owner. Refer to Section 01010, Paragraph G. "Coordination" for additional information.

18.0 Site Conditions

With the approval of the Owner, the Contractor will be permitted access to various areas of the property to perform the work under this Contract. However, in addition to other sections of these Contract Documents, the Contractor is responsible for returning these areas to at least their pre-construction condition at the completion of the work and also for maintaining all existing site features in at least pre-construction condition for the duration of the Contract at no additional cost to the Owner. This includes, but is not limited to, access roads, site areas, utilities, equipment, structures, etc. unless otherwise directed by the Owner at their sole discretion. Refer to Section 01010, Paragraph L. "Protection of Property" for additional information.

END OF SECTION

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PROPOSAL

To: Sevier Solid Waste, Inc.

From: Bidder: _____
Address: _____

Phone: _____ FAX: _____
Email: _____
Contractor's License No.: _____
Date of Bid: _____

The undersigned hereby signifies that it is their intention and purpose to enter into a formal Contract with Sevier Solid Waste, Inc. (Owner), to furnish all labor, materials, tools, equipment, apparatus, supplies, etc., required and to do all the work necessary for and because of the construction, erection, and/or installation of the proposed

Phase 5 Construction Ridge Road Class III Landfill

in accordance with the Contract Documents, including the following Addenda (Bidder shall list to acknowledge receipt):

No.: _____
Date: _____

and in accordance with the terms of this Proposal which are as follows:

THAT: The undersigned has carefully examined the Drawings and Specifications and all other Contract Documents and fully understands them.

THAT: The undersigned has carefully examined the site of the project and is familiar with the conditions under which the work, or any part thereof, is to be performed and the conditions which must be fulfilled in furnishing and/or installing, erecting, or constructing any or all items of the Project.

THAT: The undersigned will provide all necessary tools, machinery, equipment, apparatus, and all other means necessary to do all the work and will furnish all labor, materials, and all else required to complete such Contract as may be entered into, in the manner prescribed in and in accordance with the terms of the Specifications and the Contract and in accordance with the true intent and meaning thereof, and in accordance with the Drawings and the requirements of the Engineers under them, in a first class manner.

THAT: The undersigned hereby declares that the only person, or persons, interested in the Bid as principal(s) is, or are, named herein; that no other persons have any interest in the Bid or in the Contract

to be entered into; that this Bid is made without connection with any person, company, or parties making a Bid; and that it is in all respects fair and in good faith without collusion or fraud.

THAT: The Owner reserves the right to reject any and all Bids and to waive formalities and technicalities in the Bidding procedure.

THAT: The rights of the Owner and the recommendations of the Engineers are not to be questioned in the Award of Contracts or the rejection of any or all Bids.

THAT: It is the intention of the Owner to let Contracts on the basis of the Bids received in accordance with the Contract Documents and in such manner as they may deem to be for the best interests of the Owner.

THAT: The work under each Section will be awarded under one Contract and that the Owner shall have the right to include such item or items as the Owner may deem to be in the best interests of the Owner.

THAT: On being awarded the Contract, the undersigned will execute a Performance Bond and a Payment Bond, on the forms included herein, each equal to one hundred percent (100%) of the Contract price, as security for the faithful performance the Contract.

THAT: The undersigned shall submit, in the blank spaces provided, all data, guarantees, and other information called for.

THAT: The undersigned shall submit, herewith, drawings, cuts, and/or Specifications showing and describing in detail the equipment and/or apparatus which the undersigned proposes to furnish.

THAT: This Proposal shall be signed and submitted in the manner prescribed in the Instructions to Bidders.

THAT: Should this Proposal be accepted by the Owner and the undersigned fail or neglect to execute the Contract and furnish the required Bonds within fifteen (15) days after receiving notifications of the acceptance of the Proposal and/or receipt of the formal Contract and Bond forms, the certified check or the Bid Bond, deposited herewith, shall be retained by the Owner as liquidated damages, it being understood that the Owner reserves the right to extend the time allowed for executing the Contract and/or furnishing the required Bonds.

THAT: It is the intent of these Contract Documents to obtain a Contract based on a Lump Sum Price except where Unit Prices are specifically requested. Where a discrepancy exists between words and numbers in the Bid amount, the written words shall govern.

THAT: The undersigned represents that they are properly licensed.

Bid Form

Phase 5 Construction Ridge Road Class III Landfill

Bidder agrees to perform all the work described in the Specifications and shown on the Contract Drawings for the lump sum and unit prices listed in the Bid Schedule(s) below.

Measurement and Basis for Payment:

Some of the line items in the Bid Schedule(s) may include approximate quantities as estimated by the Engineer. The Contractor shall not rely on the quantities given, but shall instead estimate all quantities independently as required to complete the Proposal. The Bid Schedule(s) outlines each item and the corresponding lump sum or unit price listed by the Contractor. The price associated with each lump sum item shall be the full compensation paid for the work described, regardless of the Engineer's or Contractor's estimated quantity. For Lump Sum items, no claim shall be made by the Contractor for deviations between the Contractor's estimated and the actual quantity required to complete the work described, wherein no measurement will be made.

A description of measurement and payment for each Lump Sum and Unit Price Bid item can be found in Section 01025, Measurement and Payment, of these Specifications.

Unit Price Deviations:

The Bidder is responsible for providing unit prices consistent with typical industry norms for the work described. Unit prices which appear inconsistent with typical prices for similar work shall be justified by the Bidder at the request of the Engineer. Providing unit prices which do not reasonably reflect the work described, either high or low, which are not justified satisfactorily to the Engineer, may deem the Bidder non-responsive and invalidate the Bidder's Proposal.

A1. Base Bid Schedule - Liner System:

Pay Item Number	Description	Spec. Reference	Estimated Quantity ¹	Units	Unit Cost	Extended Cost
	Site Preparation	02110	1	LS	Lump Sum	
	Phase 5 Excavation	02222	132,000	CY		
	Fire Debris Excavation and Disposal	02222	25,000	CY		
	Backfill of Fire Debris Excavation	02223	15,000	CY		
	Embankment	02223	125,000	CY		
	Geologic Buffer in Phase 5	02250	64,115	CY	Lump Sum	
	Geologic Buffer in Sediment Basin 5	02250	1,275	CY	Lump Sum	
	Fire Debris Cover Soil	02250	3,010	CY		
	Sub-Phase Divider Berm	DWGs	85	LF	Lump Sum	
	Side Slope Diversion Berm	02270	2,410	LF		
	Geosynthetic Rain Cover	02782	85,000	SF		
	Temporary Stormwater Pump	DWGs	1	LS	Lump Sum	
	Silt Fence	02270	410	LF	Lump Sum	
	Sediment Basin Infrastructure	02270	1	LS	Lump Sum	
	Drop Inlet DI-2	02608	1	EA	Lump Sum	
	Culvert C-2	02720	70	LF	Lump Sum	
	Culvert C-3	02720	40	LF	Lump Sum	
	Rip Rap Outlet Protection	02270	2	EA	Lump Sum	
	Plunge Pool	02270	2	EA	Lump Sum	
	Drainage Channel PC-2	02270	290	LF	Lump Sum	
	Drainage Channel PC-3 and PC-4	02270	870	LF	Lump Sum	
	Drainage Channel PC-5	02270	420	LF	Lump Sum	

Pay Item Number	Description	Spec. Reference	Estimated Quantity ¹	Units	Unit Cost	Extended Cost
	Drainage Channel PC-6	02270	165	LF	Lump Sum	
	Revegetation	02930	7.5	AC		
	Surveying Control	-----	1	LS	Lump Sum	
	Bonds, Mobilization & Insurance	-----	1	LS	Lump Sum	

The TOTAL BASE BID PRICE for the pay items listed above is as follows:

(In Words) _____ Dollars and _____ Cents.

(In Numbers) (\$ _____)

Notes:

1. Engineer's estimated quantities are based on in-place quantities. Areas and lengths are based on horizontally projected areas and lengths. No adjustments have been made for stripping topsoil, slopes, uneven contours, overlaps, seams, anchor trenches, compaction factors, etc.

NOTE: PROPOSAL SIGNATURE REQUIRED ON PAGE P-10. ALL PROPOSALS MUST BE PROPERLY EXECUTED TO BE CONSIDERED A VALID BID.

Liquidated Damages

The undersigned agrees, further, that the Owner may retain those amounts indicated below from the amount of Compensation due the undersigned, under the terms of the Contract, for each and every day that the work remains incomplete beyond the completion date specified in the Notice to Proceed or date established in a duly-executed change order which increases/decreases the Contract performance period. This amount is agreed upon as the proper measure of liquidated damages the Owner will sustain, per day, by the failure of the undersigned to complete the work, within the stipulated time, and it is not to be construed, in any sense, as a penalty.

No Contractor shall have a claim against the Owner as a result of other construction Contractor's lack of progress or project completion.

	Owner's Liquidated Damages
Phase 5 Construction	\$1,000/day

Liquidated damages will be assessed for the above listed amount(s) for each and every day the work remains incomplete after the completion date(s) listed above.

Completion for above listed item(s) shall be defined as completely installed including all associated appurtenances, tested and ready for the intended service.

Qualifications of Bidders

In order to assist the Owner in determining whether the Bidder is qualified to perform the work, as set forth in the Contract Documents, the Bidder shall furnish the information as required in the Instructions To Bidders and attach to this Proposal Form.

Proposed Subcontractors

The Bidder shall provide names and contact information for the following subcontractors. If more than one firm is under consideration for this work, please list each additional firm below or on a separate attached sheet. If the Bidder intends to perform one or more of the tasks identified below, please note "To be Performed by (Bidder Name)". The Contractor whose bid is accepted shall not substitute any person or subcontractor in the place of the subcontractors listed below, except:

- A. If the listed subcontractor's bid is later determined by the Contractor to be non-responsible or non-responsive, or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work; or
- B. With the approval of the Owner for good cause shown by the Contractor.

Task	Proposed Subcontractor Information		
	Firm Name, Address, and Phone #	Dollar Amount	% of Total
Surveying:			
Revegetation:			
Other: _____			
Other: _____			

Proposal Signature
(Sign on Next Page)

Corporation:

The Bidder is a corporation organized and existing under the laws of the State of _____, which operates under the legal name of _____ and the full names of its officers are as follows:

President: _____
Vice-President: _____
Secretary: _____
Manager: _____

and it does have a corporate seal. The _____ is authorized to sign construction proposals and Contracts for the company by action of its Board of Directors taken _____, a certified copy of which is hereto attached. *(Strike out this last sentence if not applicable.)*

Partnership:

The business is a partnership consisting of individual partners whose full names are as follows:

The partnership does business under the legal name of:

Individual:

The Bidder is an individual whose full name is:

and if operating under a trade name, said trade name is as follows:

(SIGN BELOW)

Dated _____, 20__.

Legal Entity

(SIGN HERE)

By: _____

Printed Name

SEAL
(If Corporation)

Telephone Number

Subscribed and sworn to before me this _____ day of _____, 20__

Notary Public

County

My Commission Expires: _____

(SEAL)

Instructions to Contractors and Requirements as to Form for this Contract

Please observe the following in completing the attached Agreement:

1. The Owner may Contract with three types of legal entities.
 - (a) If the Contract is with an individual, that individual should sign the Agreement exactly as their name is set out. If the Contract is with an individually-owned business, the Contract should be with the individual owner, and not the named business.
 - (b) Signature on behalf of a corporation should be by the president or a vice president, attested by the corporate secretary, with the corporate seal affixed. An official other than president or vice president should attach documentation of their authority to sign and bind the company.
 - (c) If the Contract is with a partnership, all members of the partnership should sign unless an authorized partner is so designated. Documentation of such authorization should be attached.
2. After signing the Agreement, the appropriate notary's acknowledgment, either in the corporate form or individual/partnership form should be completed.
3. The Performance and Payment Bonds should be attached to the Contract package. The Bonds, in approved form, must be signed by the authorized agent of the Surety Company issuing the Bonds, and an executed Power of Attorney document authorizing the agent to sign must accompany the Bond Documents.
4. The Agreement should not be dated, except by the last person signing the Agreement.
5. Complete the Acceptance of Notice of Award.
6. Complete Page AG-3 in its entirety.
7. Complete Pages AG-5, and AG-6 in their entirety.
8. Certificate of Insurance, Page AG-7:
 - (a) Article 5 of the General Conditions requires the Certificate of Insurance to list additional insureds in each policy issued.
 - (b) Most Certificates of Insurance state under the cancellation clause that "the issuing company will endeavor to mail 30 days written notice to the ...". If your certificate states this, the words "endeavor to" must be stricken in order to comply with the Contract Documents.
9. One copy of the Contract is sent to the Contractor. The original should be signed and returned to the Owner for signature, after which two duplicates will be returned to the Contractor. One copy may be retained by the Contractor and the other is for the use of the Bonding Company(s).

10. Failure to fully complete the Contract Documents will cause delays in the approval by the Owner and therefore delay the issuance of the Notice to Proceed.

AGREEMENT

This Agreement made this _____ day of _____, 20_____, by and between Sevier Solid Waste, Inc., party of the first part, hereinafter called the Owner, and _____ of _____, party of the second part, hereinafter called the Contractor.

WITNESSETH

THAT, WHEREAS, a Contract for:

Phase 5 Construction Ridge Road Class III Landfill

as prepared by Smith Gardner, Inc. has recently been awarded to the Contractor by the Owner at and for a sum equal to the aggregate cost of the work to be done and labor, materials, equipment, apparatus, and supplies furnished at the prices and rates respectively named therefor, in the Proposal attached hereto.

AND WHEREAS, it was one of the conditions of said Award that a formal Contract should be executed by and between the Owner and the Contractor, evidencing the terms of said Award, and that the Contractor shall commence the work to be performed under this Agreement on the date specified in the Notice to Proceed, and shall fully complete the same within **120 CONSECUTIVE CALENDAR DAYS**, thereafter unless the Contract Time is extended otherwise by the Contract Documents.

NOW THEREFORE, THIS CONTRACT FURTHER WITNESSETH THAT, the Contractor doth hereby covenant and agree with the Owner that they will well and faithfully perform and execute such work and furnish such labor, materials, equipment, apparatus, and supplies, in accordance with each and every one of the conditions, covenants, stipulations, terms, and provisions contained in the Contract Documents, at and for a sum equal to the aggregate cost of the work done and labor, materials, equipment, apparatus, and supplies furnished at the prices and rates respectively named therefore in the Proposal attached hereto, and will well and faithfully comply with and perform each and every obligation imposed upon them by said Contract Documents and the terms of said Award.

It is agreed and understood that the term "Contract Documents" means and includes the following:

1. Advertisement for Bids;
2. Instructions to Bidders;
3. Proposal;
4. Information/Documents provided with the Bid (i.e. qualifications, etc.)
5. Agreement;
6. Notices (Notice of Award; Notice to Proceed);
7. Bonds (Performance Bond; Payment Bond);
8. General Conditions;
9. Supplementary Conditions;
10. Specifications (General Specifications; Technical Specifications);
11. CQA Plan;
12. Addenda (enumerated in Proposal); and
13. Contract Drawings.

It is further mutually agreed between the parties hereto that if, at any time after the execution of this Agreement and the performance and payment Bonds hereto attached for its faithful performance and payment, the Owner shall deem the surety or sureties upon such Bonds to be unsatisfactory, or if, for any reason, such Bonds cease to be adequate to cover the performance or payment of the work, the Contractor shall, at their expense, within five (5) days after the receipt of notice from the Owner so to do, furnish an additional Bond or Bonds in such form and amount and with such surety or sureties as shall be satisfactory to the Owner. In such event no further payment to the Contractor shall be deemed to be due under this agreement until such new or additional security for the faithful performance and payment of the work shall be furnished in a manner and form satisfactory to the Owner.

The Contractor shall make payments to all persons supplying materials in the prosecution of the work, and to all laborers and others employed thereon in accordance with the General Conditions and in a manner as required by law.

The Owner does hereby covenant and agree with the Contractor that it will pay to the Contractor, when due and payable under the terms of the Contract Documents and the Award, the sum mentioned above, and that it will well and faithfully comply with and perform each and every obligation imposed upon it by said Contract Documents and the terms of said Award.

Further Agreements:

IN WITNESS WHEREOF, said (Legal Entity) _____
has caused these presents to be signed in its corporate name by its _____
_____, its corporate seal to be hereto affixed and attested by its
secretary, and the Owner has caused these presents to be executed in its name by the officer indicated,
and attested as of the day and year first above written.

_____ Legal Entity*

By: _____

_____ Printed Name

Title: _____

ATTEST:

Secretary
(SEAL)

Sevier Solid Waste, Inc.

ATTEST:

(TITLE)
(SEAL)

By: _____
Tom Leonard, General Manager

*Note: If the Contractor is a Corporation, the legal name of the Corporation shall be set forth above, together with the signature of the officer or officers authorized to sign Contracts on behalf of the Corporation; if Contractor is a partnership, the true name of the firm shall be set forth above, together with the signatures of all the partners; and if Contractor is an individual, their signature shall be placed above. If signature is by an agent other than an officer of a Corporation or a member of a partnership, a Power of Attorney must be attached hereto. Signature of Contractor shall also be acknowledged before a Notary Public or other person authorized by law to execute such acknowledgment.

Contractor's Affidavit

STATE OF _____)

COUNTY OF _____)

THIS IS TO CERTIFY that on this day personally appeared before me _____ with whom I am personally acquainted, who, being duly sworn, says that _____ is the _____ President and that the said _____ is the _____ Secretary of _____, the Corporation described in and which executed the foregoing Contract; that they know the common seal of said corporation; that the seal affixed to the said instrument is said common seal; that the name of the corporation was subscribed thereto by the said _____ President and that the said _____ President and _____ Secretary subscribed their names thereto and said common seal was affixed, all by order of the Board of Directors of said Corporation, and said instrument is the act and Deed of said Corporation.

WITNESS my hand and notarial seal this _____ day of _____, 20_____

Notary Public

County

My Commission Expires: _____
(SEAL)

Certificate of Insurance

(Attach)

This page intentionally left blank.

NOTICES

Notice of Award

To: Contractor: _____
Address: _____

Project: Phase 5 Construction
Ridge Road Class III Landfill

You are hereby notified that the Owner has considered the Proposal submitted by you for the above-described project in response to its advertisement dated _____, 20_.

It appears that it is to the best interest of said Owner to accept your Proposal in the amount of: _____ Dollars (\$ _____) for construction of the project (List Accepted Options/Alternates if Any).

You are required by the Instructions to Bidders to execute the formal Contract with the Owner and to furnish the required Contractor's Performance and Payment Bonds within fifteen (15) days from the date of the delivery of this Notice to you.

If you fail to execute said Contract and to furnish said Bonds within fifteen (15) days from the date of delivery of this Notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Proposal as abandoned and to award the work covered by your Proposal to another, or to re-advertise the work or otherwise dispose thereof as the Owner may see fit.

Sevier Solid Waste, Inc.

BY: _____
Tom Leonard, General Manager

DATE: _____

Acceptance of Notice

Receipt of the above Notice of Award is hereby acknowledged this _____ day of _____, 20____.

BY: _____

Printed Name

TITLE: _____

Notice to Proceed

To: Contractor: _____
Address: _____

Project: Phase 5 Construction
Ridge Road Class III Landfill

Contract No. _____ Contract Amount \$ _____

You are hereby notified to commence work on the referenced project on or before _____
_____ and are to fully complete the work within **120**
CONSECUTIVE CALENDAR DAYS thereafter. Your Contract completion date is therefore _____
_____.

The Contract provides for assessment of the sum of \$1,000.00 as liquidated damages for each consecutive calendar day after the above established Contract completion date that the work remains incomplete.

SMITH GARDNER, INC.

BY: _____
John M. Gardner, P.E., Senior Project Manager

DATE: _____

BONDS

Performance Bond

This Bond is executed on this _____ day of _____, 20____. (See Note)

PRINCIPAL (Name and Address):

SURETY (Name and Address):

Sevier Solid Waste, Inc. is the OWNER.

The amount of the Bond is _____ Dollars (\$_____).

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto the above named Owner in the penal sum of the amount stated above in lawful money of the United States, for the payment of which sum well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas, the Principal entered into a certain Contract with the Owner, dated the _____ day of _____, 20____, for work described by Drawings and Specifications prepared by Smith Gardner, Inc. a copy of said Contract is hereto attached and made a part hereof for the construction of:

Phase 5 Construction Ridge Road Class III Landfill

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term of said Contract and any extensions thereof that may be granted by the Owner, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

PRINCIPAL

SURETY

Principal Name and Corporate Seal

Surety Name and Corporate Seal

By:

Signature

Printed Name

Title

By:

Signature (Attach Power of Attorney)

Printed Name

Title

Attest:

Signature

Printed Name

Title

Attest:

Signature

Printed Name

Title

Note: Date of Performance Bond must not be prior to date of the Agreement.

Payment Bond

This Bond is executed on this _____ day of _____, 20____. (See Note)

PRINCIPAL (Name and Address):

SURETY (Name and Address):

Sevier Solid Waste, Inc. is the OWNER.

The amount of the Bond is _____ Dollars (\$_____).

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal and Surety above named, are held and firmly bound unto the above named Owner in the penal sum of the amount stated above in lawful money of the United States, for the payment of which sum well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas, the Principal entered into a certain Contract with the Owner, dated the _____ day of _____, 20____, for work described by Drawings and Specifications prepared by Smith Gardner, Inc. a copy of said Contract is hereto attached and made a part hereof for the construction of:

**Phase 5 Construction
Ridge Road Class III Landfill**

NOW THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and material in the prosecution of the work provided for in said Contract, and any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

PRINCIPAL

SURETY

Principal Name and Corporate Seal

Surety Name and Corporate Seal

By:

Signature

Printed Name

Title

By:

Signature (Attach Power of Attorney)

Printed Name

Title

Attest:

Signature

Printed Name

Title

Attest:

Signature

Printed Name

Title

Note: Date of Payment Bond must not be prior to date of the Agreement.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By



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AMERICAN SOCIETY OF CIVIL ENGINEERS

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These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. 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 which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer 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, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

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

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given 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 under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

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

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

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

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *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.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *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 for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

administrative requirements and procedural matters applicable thereto.

44. *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 at the Site.

45. *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 thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, 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 any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *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, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times

but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. Intent of Certain Terms or Adjectives

1. 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 requirements of and information in the Contract Documents and conformance with the design concept of the completed 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 Paragraph 9.09 or any other provision of the Contract Documents.

C. Day

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. Defective

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

- a. does not conform to the Contract Documents, or
- b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or
- c. 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 14.04 or 14.05).

E. Furnish, Install, Perform, Provide

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean 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, shall mean 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, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which 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 Bonds and Evidence of Insurance

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement

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 Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 Starting the Work

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

2.05 Before Starting Construction

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), 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 Documents;

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 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.

2.06 Preconstruction Conference

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 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 Initial 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 for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall 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 component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one 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. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

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

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement 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 or code, or any instruction of a Supplier shall be effective to change the duties or

responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, 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 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

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 knew or reasonably should have known thereof.

B. Resolving Discrepancies

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

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); 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 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, 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 Engineer's consultants, including electronic media editions; or
2. reuse any of 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 adaption by Engineer.

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

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's

sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party..

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor 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. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

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 the Work is to be performed 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.

4.02 *Subsurface and Physical Conditions*

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

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities 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; or

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.

4.03 *Differing Subsurface or Physical Conditions*

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

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

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 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

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 Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final 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

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

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, 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 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will

promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *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 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.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities 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; or

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 any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) 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.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. 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, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. 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 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. If Owner and Contractor cannot agree as to

entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, 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 a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection

from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed 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:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims 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.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, 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 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 Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss 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 perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, 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. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *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. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or

received from the superintendent shall be binding on Contractor.

6.02 *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 at all times maintain good discipline and order at the Site.

B. 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 shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *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.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall 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 shall 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.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 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 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description 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 or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

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

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

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

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

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

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

2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

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

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not 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

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

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

E. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the 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.

F. Contractor's Expense: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual

or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

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

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, 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 any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *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 a particular 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 shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. 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 opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *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. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear 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. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *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.

6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 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 by or based upon Contractor's performance of the Work.

B. Removal of Debris During Performance of the Work: During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall 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 all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. Loading 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 property to stresses or pressures that will endanger it.

6.12 *Record Documents*

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

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. 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, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. 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. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.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 (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , 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).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of 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.

6.16 *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 threatened 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 thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will 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 6.17.D.

2. *Samples*: Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. 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 6.17.D.

B. 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. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

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

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. 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, conform to the information given in 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 (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.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's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. Resubmittal Procedures

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.

6.18 Continuing the Work

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 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 and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

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

1. abuse, modification, or improper 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.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

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 or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury 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 respective consultants, agents, officers, directors, partners, or employees 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 6.20.A shall 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.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal

shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and
2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. 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 their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, 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.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

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

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

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

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *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.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *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 Documents and will not be changed without written consent of Owner and Engineer.

9.02 *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 9.09. 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.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which 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. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. 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 thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show

partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents 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 shall 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 Paragraph 14.07.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 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *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 by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *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 as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

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

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the 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; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice 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) is required by the provisions of any bond to be given to a surety, 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.

10.05 *Claims*

A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK;
ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

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. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall 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 shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall 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, who 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 shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

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

5. Supplemental costs including 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, and hand tools not owned by the workers, which are 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.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, 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 property insurance established in accordance with Paragraph 5.06.D), 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 shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

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

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

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

B. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, 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 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

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

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

4. 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.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. Contractor's Fee: When all the Work is performed on the basis of cost-plus, Contractor's fee shall

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 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

1. Contractor agrees that:

a. 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

b. 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 on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a 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 on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 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. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

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. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

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

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an

allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall 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 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five 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 Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, 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 the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

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

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

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.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. 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, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, 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, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay 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 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 Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. 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, or both, 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, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *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, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall 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.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay 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 correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *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 terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
2. correct such defective Work; or
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If 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. 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 correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. 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 .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, 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.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay 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) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *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 rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, 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, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, 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 (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) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. 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 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. 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. 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 shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, 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 on the Site 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, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to 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 Documents; or

b. that 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.

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, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, 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 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

- a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
- b. the Contract Price has been reduced by Change Orders;
- c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

- a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
- b. 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;
- c. there are other items entitling Owner to a set-off against the amount recommended; or
- d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action 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, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 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 (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

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 tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

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 significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and 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 14.04 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 5.10 regarding property insurance.

14.06 *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 is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *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, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible 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.

B. *Engineer's Review of Application and Acceptance*

1. 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 Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. 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. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance

with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *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 notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will 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 established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. 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

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.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 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) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed 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.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. 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. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven 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;

3. 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) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven 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 15.03.

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, seven 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 provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 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 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents 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.

17.03 *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 Documents. 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.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 0800

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC No. C-700, 2002 Edition) as indicated below. All provisions which are not so amended or supplemented remain in full force and effect. The terms used in these Supplementary Conditions have the meanings stated in the General Conditions.

ARTICLE 2 - PRELIMINARY MATTERS

2.03 *Commencement of Contract Times; Notice To Proceed*

Amend Paragraph 2.03.A as follows:

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement 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 Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier. By mutual consent of the parties to the Contract, these time limits may be changed.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.03 *Reporting and Resolving Discrepancies*

Add the following paragraph after Paragraph 3.03.B.1:

2. Where conflicts exist between these General Conditions, Supplementary Conditions, the General and Technical Specifications, the Construction Quality Assurance Plan, and the Contract Drawings, the most stringent requirements shall govern.

ARTICLE 5 - BONDS AND INSURANCE

5.03 *Certificates of Insurance*

Add the following Paragraphs after Paragraph 5.03.B:

C. Failure of Owner to demand such certificates or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. By requiring such insurance and insurance limits herein, Owner does not represent that coverage and limits will necessarily be adequate to protect Contractor, and such coverage and limits shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Liability Insurance*

Add the following paragraph after Paragraph 5.04.B:

C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

1. Worker's Compensation, and related coverages under Paragraphs 5.04.A.1 and 5.04.A.2 of the General Conditions:

- a. State: Statutory.
- b. Applicable Federal (e.g. Longshoreman's): Statutory.
- c. Employer's Liability: \$500,000.

2. Contractor's General Liability under Paragraphs 5.04.A.3 through 5.04.A.6 of the General Conditions, which shall include completed operations and product liability coverages.

- a. General Aggregate (Except Products - Completed Operations): \$2,000,000
- b. Products - Completed Operations Aggregate: \$2,000,000
- c. Personal and Advertising Injury (Per Person/Organization): \$1,000,000
- d. Each Occurrence (Bodily Injury and Property Damage): \$1,000,000
- e. Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable
- f. Excess or Umbrella Liability:
 - 1) General Aggregate: \$2,000,000
 - 2) Each Occurrence: \$2,000,000.

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

- a. Bodily Injury:
 - Each Person: \$1,000,000
 - Each Accident: \$1,000,000
- b. Property Damage:
 - Each Accident: \$1,000,000
- c. Combined Single Limit (Bodily Injury and Property Damage): \$1,000,000.

4. The Contractual Liability coverage required by Paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

- a. Bodily Injury:
 - Each Accident: \$1,000,000
 - Annual Aggregate: \$2,000,000
- b. Property Damage:
 - Each Accident: \$1,000,000
 - Annual Aggregate: \$2,000,000

5. The entities listed below and their respective officers, managers, directors, employees, and consultants are to be added as Additional Insureds on the Contractor's General Liability insurance policy by attachment of ISO Forms CG2026 (04/13) and CG2037 (04/13) or form(s) providing equivalent coverage:

<u>Owner:</u>	<u>Sevier Solid Waste, Inc.</u>
<u>Engineer:</u>	<u>Smith Gardner, Inc. (S+G)</u>
<u>CQA Engineer:</u>	<u>Geoservices, LLC</u>

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.06 *Concerning Subcontractors, Suppliers, and Others*

Amend Paragraph 6.06.B as follows:

B. If the ~~Supplementary Conditions~~Instructions to Bidders require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the ~~Supplementary Conditions~~Instructions to Bidders, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

6.20 *Indemnification:*

Amend Paragraph 6.20.A as follows:

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, 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 performance of the Work, provided that any such claim, cost, civil penalties, fines, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury 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.

Add the following paragraph after Paragraph 6.20.C:

D. Nothing in the Contract Documents shall create or give to third parties any claim or right of action against Contractor, Owner, or Engineer beyond such as may legally exist irrespective of the Contract.

ARTICLE 7 - OTHER WORK AT THE SITE

7.02 *Coordination*

Delete in its entirety.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.02 *Replacement of Engineer*

Delete in its entirety.

8.11 *Evidence of Financial Arrangements*

Delete in its entirety.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

Add the following to the end of Paragraph 11.01A:

The work to be done by Contractor, specified and enumerated under this contract, shall include any minor details of the work not specifically mentioned in the specifications or shown on the plans, but obviously necessary for the proper completion of the work, which shall be considered incidental and as being a part of and included with the work for which prices are given in the Bid Form. Contractor will not be entitled to any additional compensation therefor.

Amend Paragraph 11.01.A.5.c as follows:

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. These rates shall include all fuel, lubricants, insurance, etc. Equipment rental charges shall not exceed the prorated monthly rental rates listed in the current edition of the "Compilation of Rental Rates for Construction Equipment" as published by the Associated Equipment Distributors. Charges per hour shall be determined by dividing the monthly rates by 176. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

11.03 *Unit Price Work*

Delete Paragraph 11.03.D in its entirety and replace with the following:

D. The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the Bid price of a particular item of Unit Price Work amounts to five percent (5%) or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than twenty percent (20%) from the estimated quantity of such item indicated in the Agreement; and
2. if there is no corresponding adjustment with respect to any other item of Work; and
3. if Contractor believes that Contractor has incurred additional expense as a result thereof or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price, either Owner or Contractor may make a claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variation in the quantity of Unit Price Work performed.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.03 *Delays*

Add the following paragraphs after Paragraph 12.03.E:

F. *Weather Delay Days*: Contract Time extensions for abnormal weather conditions ("Weather Delay Days") will be allowed if the cumulative number of Weather Delay Days is greater than the number shown in the table below (Standard Baseline) for the applicable month. Weather Delay Days shall be determined as follows:

Standard Baseline*:

JAN	FEB	MAR	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
9	9	10	8	10	10	11	9	7	6	7	9

*Based on Days With \geq 0.10 Inches Rainfall. Data from SE Regional Climate Center, Gatlinburg 2 SW, TN Weather Station, 1950-2022.

1. A Weather Delay Day may be counted if one or more of the following conditions prevents work on the project for fifty percent (50%) or more of the Contractor's scheduled work day and critical path construction activities were included in the day's schedule:

- a. Precipitation (rain, snow, or ice) of at least one-tenth (0.10) inch, liquid measure;
- b. Temperatures that do not rise above that required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice;
- c. Sustained wind in excess of twenty five (25) miles per hour; or
- d. There is a hindrance to site access or site work based on at least one-half (0.5) inch of precipitation which occurred on an immediately prior day or over a consecutive day period since the last day worked and Contractor has taken all reasonable accommodations to avoid such hindrance ("Impact Day").

2. Additionally, the following stipulations apply to the determination of allowable Weather Delay Days and applicable Contract Time extensions:

- a. Sundays and designated holidays shall not be allowed as Weather Delay Days unless specifically defined as normal work days in the Contract.
- b. Consecutive Impact Days shall not be allowed as Weather Delay Days unless conditions warrant (i.e. resulting from significant precipitation event (at least two (2.0) inches), snow/ice, etc.) and if recommended by the Engineer based on other site factors (temperatures, soil conditions, etc.).
- c. An extension of the Contract Time for Weather Delay Days shall be requested in writing to the Engineer within 60 calendar days of the applicable Weather Delay Day along with all required documentation. Such requests made after the 60 calendar day limitation will not be considered. Required documentation shall include:
 - 1) Actual weather data (site weather station (if applicable), nearest NOAA weather station, or other independently verified source approved by Owner and Engineer at the beginning of the project); and
 - 2) Daily Contractor work logs showing the timing of precipitation events and which and to what extent critical path construction activities were affected by weather.

G. Owner, at Owner's sole discretion, may waive the requirements of Paragraph 12.03.A and grant extensions to the Contract Time for any reason Owner deems valid.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.03 *Tests and Inspections*

Delete Paragraph 13.03.B in its entirety and replace with the following:

B. Owner shall employ and pay for inspections and testing services specifically noted as such in the Contract. All others required shall be the responsibility of Contractor.

Add the following paragraph after Paragraph 13.03.F:

G. Owner reserves the right to independently perform at its own expense, laboratory tests on random samples of material or performance tests on equipment delivered to the site. These tests if made will be conducted in accordance with the appropriate referenced standards or Specification requirements. The entire shipment represented by a given sample, samples, or piece of equipment may be rejected on the basis of the failure of samples or pieces of equipment to meet specified test requirements. All rejected materials or equipment shall be removed from the site, whether stored or installed in the Work, and the required replacement shall be made, all at no additional cost to Owner.

13.05 *Owner May Stop the Work*

Amend Paragraph 13.05.A as follows:

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, or if the Work interferes with the operation of the existing facility Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall 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.

13.06 *Correction or Removal of Defective Work*

Add the following paragraph after Paragraph 13.06.B:

C. At any time during the progress of the Work and up to the date of final acceptance, Engineer shall have the right to reject any work which does not conform to the requirements of the Contract Documents, even though such work has been previously inspected and paid for. Any omissions or failure on the part of Engineer to disapprove or reject any Work or materials at the time of inspection shall not be construed as an acceptance of any defective work or materials.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

Add the following paragraph after Paragraph 14.01.A:

B. If requested to do so, Contractor shall submit for Engineer's approval, a complete breakdown of all Lump Sum Items in the Proposal. This breakdown, modified as directed by Engineer, will be used as a basis for preparing estimates and establishing progress payments.

14.02 *Progress Payments*

Delete Paragraph 14.02.A.3 in its entirety and replace with the following:

3. Applications for Payment shall include the percentage of the total amount of the Contract which has been completed from the start-up of the Project to and including the last day of the preceding month, or other mutually agreed upon day of the month accompanied by such data and supporting evidence as Owner or Engineer may require.

Forms to be used shall be prepared by Contractor and submitted to Engineer for approval and recommendation for payment by Owner. At the option of Owner, partial payment up to the estimated value, less retainage, may be allowed for any materials and equipment not incorporated in the Work, pursuant to the following conditions:

- a. Equipment or materials stored on the site shall be properly stored, protected, and maintained.
- b. For any partial payment Contractor shall submit, with their monthly progress payment from each material or equipment manufacturer, bills or invoices indicating actual stored material cost.
- c. Contractor shall submit evidence that they have paid for materials or equipment stored and for which Engineer has authorized partial payment and previous progress payments, prior to submission of the next monthly payment request.

Owner will retain five percent (5%) of the amount of each such estimate until Work covered by the Contract is fifty percent (50%) complete. When the project is fifty percent (50%) complete, the Owner, with written consent of the surety, shall not retain any further retainage from periodic payments due the Contractor if the Contractor continues to perform satisfactorily and any nonconforming work identified in writing prior to that time by the Engineer or Owner has been corrected by the Contractor and accepted by the Engineer or Owner. If the Owner determines the Contractor's performance is unsatisfactory, the Owner may reinstate retainage for each subsequent Application for Payment up to the maximum amount of five percent (5%). The project shall be deemed fifty percent (50%) complete when the Contractor's gross project invoices, excluding the value of materials stored off-site, equal or exceed fifty percent (50%) of the value of the Contract, except the value of materials stored on-site shall not exceed twenty percent (20%) of the Contractor's gross project invoices for the purpose of determining whether the project is fifty percent (50%) complete.

If Owner determines it is appropriate to reduce retainage, the method used for such adjustment shall be to fix retainage at two and one-half percent (2.5%) of the original Contract amount (when the work is 50% complete) and to pay all subsequent Applications for Payment to the full approved amount. The intent of such an adjustment is to gradually reduce retainage to two and one-half percent (2.5%) of the original Contract amount when the work is one hundred (100) percent complete.

Amend Paragraph 14.02.B.5.d and add Paragraphs 14.02.B.5.e-g as follows:

- d. Engineer has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02A.; or
- e. Contractor has failed to make payment to subcontractors or suppliers or for labor; or
- f. Contractor has failed to make acceptable submittals in accordance with accepted schedules; or
- g. Liability for liquidated damages has been incurred by Contractor.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

Add the following paragraph after Paragraph 15.01.A:

B. Should Owner suspend Work due to repeated unsafe Work conducted by Contractor which is confirmed by subsequent inspection by the governing safety agency (State, Federal, or local), Contractor shall not be allowed any adjustment in Contract Price or extension of Contract Time attributed to this delay.

15.02 *Owner May Terminate for Cause*

Amend Paragraph 15.02.A.2 as follows:

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction (including those governing employee safety);

Add the following paragraph after Paragraph 15.04:

15.05 Assignment of Contract

A. Contractor shall not assign, transfer, convey or otherwise dispose of the Contract, or of their legal right, title, or interest in or to the same or to any part thereof, without the prior written consent of Owner. Contractor shall not assign by power of attorney or otherwise any monies due them and payable under this Contract without the prior written consent of Owner. Such consent, if given, will in no way relieve Contractor from any of the obligations of this Contract. Owner shall not be bound to abide by or observe the requirements of any such assignment.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

Add the following paragraph after Paragraph 17.01.A:

B. No oral statement of any person whomsoever shall in any manner or degree modify or otherwise affect the terms of this Contract. Any notice to Contractor, from Owner and Engineer, relative to any part of this Contract shall be in writing.

Add the following article after Article 17:

ARTICLE 18 - LIQUIDATED DAMAGES FOR FAILURE TO COMPLETE WORK ON TIME

18.01 Liquidated Damages

A. If Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by Owner in accordance with Article 12, then Contractor will pay to Owner the amount for liquidated damages as specified in the Contract for each calendar day that Contractor shall be in default after the time stipulated in the Contract Documents.

END OF SECTION

General Specifications

Phase 5 Construction Ridge Road Class III Landfill

Prepared for:

Sevier Solid Waste, Inc.
Pigeon Forge, TN

November 2023

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Phase 5 Construction Ridge Road Class III Landfill

General Specifications

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SECTION 01010

SUMMARY OF WORK

A. Scope of Work

1. The work to be done under this Contract and in accordance with these Specifications consists of furnishing all equipment, superintendence, labor, skill, material and all other items necessary for the construction of the Project.

The Contractor shall perform all work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

2. The principal features of the work to be performed under this Contract include:

PHASE 5 CONSTRUCTION: Includes construction of an approximately 8.0 acre Class III (construction & demolition debris) landfill unit complete with geologic buffer and related earthwork and drainage structures.

The foregoing description(s) shall not be construed as a complete description of all work required.

B. Contract Drawings

The work to be done is shown on the set of Contract Drawings entitled "Ridge Road Class III Landfill - Phase 5 Construction Drawings" dated November 2023.

C. General Arrangement

1. The Contract Drawings indicate the extent and general arrangement of the work. If any departures from the Contract Drawings are deemed necessary by the Contractor to accommodate the materials and equipment they propose to furnish, details of such departures and reasons therefore shall be submitted as soon as practicable to the Engineer for approval. No such departures shall be made without the prior written approval of the Engineer. Approved changes shall be made without additional cost to the Owner for this work.
2. The specific equipment proposed for use by the Contractor on the Project may require changes or other work to provide a complete satisfactory operating installation. The Contractor shall submit to the Engineer, for approval, all necessary drawings and details showing such changes to verify conformance with the overall Project requirements and overall Project operating performance. The Bid Price shall include all costs in connection with the preparation of new drawings and details and all changes to construction work to accommodate the proposed materials and equipment.
3. The following materials will be supplied by the Owner:

- a. On-site soil suitable for structural fill (Embankment). Note that this material will likely require the Contractor to select and process (e.g., disc, blend, moisture condition, etc.) the excavated soils to satisfy the specified requirements.
4. The following material **is believed to be** available on-site but is **subject to Contractor verification and management**:
 - a. Soil suitable for Geologic Buffer. Note that this material will likely require the Contractor to select and process (e.g., disc, blend, moisture condition, etc.) the excavated soils to satisfy the specified requirements.

Should suitable soil not be available in sufficient quantity, the Contractor shall be responsible for amending on-site soils or importing suitable soil from off-site. Refer to Section 02250, Geologic Buffer, of these Specifications for additional information.

D. Construction Permits, Easements, and Encroachments

1. The Owner shall obtain or cause to be obtained all permanent and temporary construction easements as shown on the Contract Drawings. The Contractor shall verify that these agreements have been obtained and shall comply with the conditions set forth in each agreement.
2. The Contractor shall obtain, keep current, and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated. Record copies of all permits shall be furnished to the Engineer.
3. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency, or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to their operations on this Project.
4. The Contractor shall provide any required Bond(s) and any additional specific insurance coverage required of the Owner by Encroachment Agreement(s) in accordance with the Encroachment Agreement(s) with the Owner.
4. The Contractor is responsible for all transportation permits required for performance of this Contract.

E. Time of Work

1. The normal time of work for this Contract shall generally be between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday. Additionally, no work shall be performed on the following legal holidays should they occur during the Contract Time:

1. New Year's Day
2. Martin Luther King, Jr. Day
3. Good Friday
4. Memorial Day
5. Independence Day
6. Labor Day
7. Thanksgiving (2 Days)
8. Christmas (2 Days)

When a holiday falls on a Sunday, the holiday shall be observed on the following Monday.

The Contractor may elect to work beyond these times or on Sundays (only as approved in advance by the Owner) provided that all costs incurred by the Owner for additional engineering or landfill site staff required to be present during non-landfill hours shall be borne solely by the Contractor. Similarly, the Owner shall deduct the cost of additional inspection/monitoring or other required support service costs from monies due the Contractor.

Note that during periods of short daylight, the Contractor is required to provide ample temporary lighting as described in the following paragraph.

2. If it shall become imperative to perform work at night, the Owner and Engineer shall be informed a reasonable time in advance of the beginning of such work. Temporary lighting and all other necessary facilities for performing and inspecting the work shall be provided, maintained, and paid for by the Contractor at no additional cost to the Owner. The Contractor shall take all necessary steps and precautions to ensure a safe workplace for night work including compliance with all applicable statutes, ordinances, rules, and regulations.
3. Unless otherwise specifically permitted, all work that would be subject to damage shall be stopped during inclement, stormy, or freezing weather. Only such work as will not suffer injury to workmanship or materials will be permitted. The Contractor shall carefully protect their work against damage or injury from the weather, and when work is permitted during freezing weather, they shall provide and maintain approved facilities for heating the materials and for protecting the partially completed and finished work.

F. Surveys and Layout

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Contract Drawings or as directed by the Engineer. Elevations of existing ground and appurtenances shown on the Contract Drawings are believed to be reasonably correct but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the stake out survey shall be referred immediately to the Engineer for interpretation or correction.
2. All survey work for construction control purposes shall be made by the Contractor at their expense. The Contractor shall provide a competently qualified survey party under the supervision of a Registered Land Surveyor, all necessary instruments, stakes, and other material to perform the work. Benchmarks in relatively close proximity to the work will be provided by the Owner for horizontal/vertical control.

3. The Contractor shall establish all baselines for the location of the principal component parts of the work together with a suitable number of bench marks and batter boards adjacent to the work. Based upon the information provided by the Contract Drawings, the Contractor shall develop and make all detail surveys necessary for construction, including slope stakes, batter boards, stakes for all working points, lines, and elevations.
4. The Contractor shall have the responsibility to carefully preserve the bench marks, reference points, and stakes, and in the case of destruction thereof by the Contractor or resulting from their negligence, the Contractor shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points, and stakes.
5. Existing or new control points, property markers, and monuments that will be or are destroyed during the normal causes of construction shall be reestablished by the Contractor at no cost to the Owner and all reference ties recorded therefore shall be furnished to the Engineer. All computations necessary to establish the exact position of the work shall be made and preserved by the Contractor.
6. The Engineer may check all or any portion of the work and the Contractor shall afford all necessary assistance and adequate time to the Engineer in carrying out such checks. Any necessary corrections to the work shall be immediately made by the Contractor. Such checking by the Engineer shall not relieve the Contractor of any responsibilities for the accuracy or completeness of their work.
7. GPS-Based Grading Systems:

If any global positioning system (GPS) based computer equipment is to be used in the grading of the site, the Contractor shall submit the digital data, GPS build file, or model surface in an AutoCAD compatible format to the Engineer for approval prior to construction.
8. Survey Grid:

A Map showing the control points to be used to verify construction shall be prepared by the Owner's Surveyor. The control points be at slope breaks and as necessary to record the constructed topography and spaced at a 100-foot or smaller grid.
9. Record (As-Built) Drawings:

For this project, the Owner's Surveyor shall prepare and furnish one (1) reproducible and one (1) digital sets of the following Record (As-Built) Drawings to the Engineer:

Phase 5 Construction:
 - a. Bottom of Excavation;
 - b. Top of Geologic Buffer; and
 - k. Finish grades for all work within the Contract Limits (including locations and invert elevations of all stormwater piping and structures and limits of all aggregate and asphalt surfacing).

The Record Drawings shall indicate all critical locations/elevations of structures, earthwork, piping, roads, utilities, existing benchmarks, etc. Refer to the individual sections of these Specifications (where applicable) for additional requirements of each drawing.

The scale, level of detail, and format of the Record Drawings must be to the satisfaction of and approval by the Engineer. The digital drawings shall be readable by AutoCAD Version 2000 or later in the *.DWG or *.DXF format. Topographical maps shall be drawn at full scale in 3-dimensional polylines with X, Y, and Z labeled accurately for each. The layering system shall have descriptive names easily discernible as to the content of the drawing or a layer code sheet shall be provided explaining the layering system. The drawings shall be produced in a fashion that conforms with industry computer aided drafting standards.

10. Tolerances:

For this project, the maximum allowable deviation from the lines and grades, as shown on the Contract Drawings, are shown in the following table.

Survey Item	Tolerance
Horizontal Location:	± 1.0 Feet
Subgrade Elevations (Prepared Subgrade or Compacted Embankment):	± 0.2 Feet
Slopes (vertical/horizontal x 100):	± 0.50 %
Geologic Buffer Thickness:	- 0.00 Feet + 0.2 Feet

6. Coordination

1. The Contractor shall allow the Owner or their agents, and other Project Contractors or their agents, to enter upon the work for the purpose of constructing, operating, maintaining, removing, repairing, altering, or replacing such pipes, sewers, conduits, manholes, wires, poles, or other structures and appliances which may be required to be installed at or in the work. The Contractor shall cooperate with all aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with their work, or in connection with normal use of the facilities.
2. Each Contractor shall cooperate fully with the Owner, the Engineer, and all other Contractors employed on the work, to effect proper coordination and progress to complete the Project on schedule and in proper sequence. Insofar as possible, decisions of all kinds required from the Engineer shall be anticipated by the Contractor to provide ample time for inspection, or the preparation of instructions.
3. Each Contractor shall assume full responsibility for the coordination of all parts of their work with that of other Contractors. Each Contractor's Superintendent shall coordinate all work with other Contractors in the laying out of work. Each Contractor shall lay out

their own work in accordance with the Contract Drawings, Specifications, and instructions of latest issue and with due regard to the work of other Contractors.

4. Periodic coordinating meetings shall be held per Section 01200, Project Meetings, of these Specifications.
5. Active Landfill Operations:

The Contractor shall coordinate their work with that of the Owner and Owner's personnel so as to not create any disruption to the access or operation of the active C&D landfill areas or the active borrow and stockpile areas.

H. Additional Engineering Services

1. In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, etc., of the equipment and accessories furnished, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.
2. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

I. Additional Owner's Expenses

1. In the event the work of this Contract is not completed within the time set forth in the Contract or within the time to which such completion may have been extended in accordance with the Contract Documents, the additional engineering or inspection charges incurred by the Owner may be charged to the Contractor and deducted from the monies due them. Extra work or supplemental Contract work added to the original Contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the Owner before assessing engineering and inspection charges against the Contractor.
2. In the event that the Engineer is required to provide additional engineering services as a result of Contractor's errors, omissions, or failure to conform to the requirements of the Contract Documents, or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

J. Subsurface Data (Where Applicable)

1. Subsurface data are offered in good faith solely for placing the Bidder in receipt of all information available to the Owner and Engineer and in no event is to be considered as part of the Contract Documents.
2. The Bidder must interpret such subsurface data according to their own judgment and acknowledge that they are not relying upon the same as accurately describing the subsurface conditions, which may be found to exist.

The test boring logs present factual information of the subsurface conditions at the specific test boring location only. The Bidder should not consider, or conclude, that the subsurface conditions will be consistent between test boring locations.

3. The Bidder further acknowledges that they assume all risks contingent upon the nature of the subsurface conditions to be actually encountered by them in performing the work covered by the Contract, even though such actual conditions may result in the Bidder performing more or less work than they originally anticipated.

K. Not used.

L. Protection of Property

1. The Contractor shall be responsible for the preservation and protection of property adjacent to and within the work site against damage or injury as a result of their operations under this Contract. Any damage or injury occurring on account of any act, omission, or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the sole expense of the Contractor to an equal or superior condition than previously existed.
2. The Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, their employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Engineer to direct the correction of unsafe conditions or practices shall not relieve the Contractor of their responsibility hereunder.
3. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at their own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

M. Fire Protection

1. The Contractor shall take all necessary precautions to prevent fires at or adjacent to the work, buildings, etc., and shall provide adequate facilities for extinguishing fires which do occur.
2. When fire or explosion hazards are created in the vicinity of the work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal, the Engineer, and the Owner of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.
3. Landfill Gas Hazards:

The Contractor is reminded that construction is to take place around/over solid waste which generates methane, hydrogen sulfide, and/or other potentially flammable or hazardous gases. The Contractor shall take all necessary steps to protect their personnel and equipment from the explosive or other hazardous conditions which may result due to the presence of landfill gas during construction. The Contractor shall notify the Owner and Engineer immediately if a problem with landfill gas arises. In this case, the Owner and Engineer will develop a plan to control the landfill gas such that the Contractor may continue to work. Any delays resulting from the development of a plan may be granted to the Contractor as a time extension if the critical path of the work is affected. The Contractor shall hold the Owner and Engineer harmless in the event of an accident resulting from the ignition of landfill gas.

N. Chemicals

All chemicals used during Project construction or furnished for Project operation, whether herbicide, pesticide, disinfectant, polymer, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable Federal, State, and/or local rules and regulations. Material safety data sheets (MSDS) shall be submitted as requested by the Owner.

O. Existing Utilities and Structures

1. The term existing utilities shall be deemed to refer to both publicly and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers, leachate piping, landfill gas (LFG) piping and wells, and all appurtenant structures.
2. Where existing utilities and structures are indicated on the Contract Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work within the Contract limits.

3. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this Project. This determination shall be based on the actual locations, elevations, slopes, etc. of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Contract Drawings. If an interference exists, shown or not shown in the Contract Drawings, the Contractor shall immediately cease work in the area of the interference and shall report to the Engineer for further direction.
4. If the Engineer agrees that an interference exists, they shall modify the design as required. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents. In the event the Contractor fails to bring a potential conflict or interference to the attention of the Engineer prior to beginning excavation work, any actual conflict or interference which does arise during the Project shall be corrected by the Contractor, as directed by the Engineer, at no additional expense to the Owner.
5. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to insure no interruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at their own expense in a manner approved by the Engineer and further subject to the requirements of any authority having jurisdiction. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.
6. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Engineer and the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Engineer may, at their discretion, have the respective authority to provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor.

P. Not used.

Q. Applicable Standards and Codes

1. Wherever reference is made to any published standards, codes, or standard specifications, it shall mean the latest standard code, specification or tentative specification of the technical society, organization or body referred to, which is in effect at the date of invitation for Bids.
2. All materials, products, and procedures used or incorporated in the work shall be in strict conformance with applicable codes, regulations, specifications, and standards.
3. A partial listing of codes includes the following:

- a. National Fire Codes.
- b. Underwriters Laboratories, Inc.
- c. National Electrical Manufacturer's Association
- d. American National Standards Association
- e. Regulations and Standards of the Occupational Safety and Health Act (OSHA)
- f. Uniform Building Code (UBC)
- g. American Society for Testing and Materials (ASTM).

The following is a partial list of typical abbreviations which may be used in the Specifications, and the organizations to which they refer:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGA	American Gas Association
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
DIPRA	Ductile Iron Pipe Research Association
COE	U.S. Army Corps of Engineers
CRSI	Concrete Reinforcing Steel Institute
Fed Spec	Federal Specifications
GRI	Geosynthetic Research Institute
IEEE	Institute of Electrical and Electronic Engineers
IPCEA	Insulated Power Cable Engineers Association
ISO	Insurance Services Offices
NBS	National Bureau of Standards
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
OSHA	Occupational Safety and Health Act
PCI	Precast Concrete Institute
TDOT	Tennessee Department of Transportation
UL	Underwriters Laboratories, Inc.
USGS	United States Geological Survey

- 4. The Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.
- 5. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on-site by the Contractor.

R. Limits of Work Area

1. The Contractor shall confine their construction operations within the Contract limits shown on the Contract Drawings and/or property lines and/or fence lines. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner's approval. Such storage or temporary structures, even within the Contract's limits, shall be confined to the Owner's property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.
2. Damage or impact by the Contractor to areas within or outside the Contract limits shall be the sole responsibility of the Contractor to remedy (including fines) the impact/damage to at least prior condition/function. This shall include sensitive areas including, but not limited to, wetlands and archeological sites.

S. Weather Conditions

The Contractor shall take necessary precautions (in the event of impending storms) to protect all work, materials, or equipment from damage or deterioration due to, but not limited to, floods, driving rain, wind, and snow/ice storms. The Owner reserves the right, through the opinion of the Engineer, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project. The Contractor shall not claim any compensation for such precautionary measures so ordered, nor claim any compensation from the Owner for damage to the work from weather elements.

T. Periodic Cleanup: Basic Site Restoration

1. During construction, the Contractor shall regularly remove from the site of the work all accumulated debris and surplus materials of any kind which result from their operations. Unused equipment and tools shall be stored at the Contractor's yard or base of operations for the Project.
2. When the work involves installation of sewers, drains, water mains, manholes, underground structures, or other disturbance of existing features in or across streets, rights-of-way, easements, or private property, the Contractor shall (as the work progresses) promptly backfill, compact, grade, and otherwise restore the disturbed area to the basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or functions consistent with the original use of the land. Unsightly mounds of earth, large stones, boulders and debris shall be removed so that the site presents a neat appearance.
3. The Contractor shall perform the cleanup work on a regular basis and as frequently as ordered by the Engineer. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such work shall also be accomplished, when ordered by the Engineer, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

4. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Engineer's satisfaction, the Owner may, upon five (5) days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause such work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Engineer, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due them.

U. Use of Facilities Before Completion

1. The Owner reserves the right to enter and use any portion of the constructed facilities before final completion of the whole work to be done under this Contract. However, only those portions of the facilities which have been completed to the Engineer's satisfaction, as evidenced by their issuing a Certificate of Substantial Completion covering that part of the work, shall be placed in service.
2. It shall be the Owner's responsibility to prevent premature connections to or use of any portion of the installed facilities by private or public parties, persons or groups of persons, before the Engineer issues their Certificate of Substantial Completion covering that portion of the work to be placed in service.
3. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner, their agents, and the Engineer to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

A. General

This section includes the units and methods of measurement and the basis of payment for work done under this Contract. The work required for each item shall be as required and/or reasonably implied by the Contract Documents to complete the work. Note that all measurement work shall be subject to verification (surveyed or otherwise) by the Owner.

B. Measurement and Payment

1. Section 02110: Site Preparation:

All work required for Site Preparation shall be included for payment in the Contractor's Unit Price Bid for this work, per acre prepared. Measurement of this area shall be made by the Contractor's surveyor based on the horizontal projected area. No adjustments will be made in the area for slope or uneven contours.

2. Section 02222: Excavation:

All work required for Excavation shall be included for payment in the Contractor's Unit Price Bid for this work, per cubic yard excavated, as itemized below:

- a. Phase 5 Cell Excavation, which shall be determined by the Engineer and shall be taken as the net cut volume determined by comparing the existing topography at the start of the project (by Owner's surveyor) with constructed excavation (i.e., as-built) topography elevations (also by the Owner's surveyor), minus the calculated quantity of Fire Debris removed from within the proposed Phase 5 waste limits.
- b. Fire Debris Excavation shall be determined by the Engineer and shall be taken as the cut volume determined by comparing the existing topography at the top of Fire Debris with the soil grades after the Fire Debris has been removed. Survey's shall be made by the Contractor's surveyor. Fire Debris Excavation shall include haul and disposal (without gate fees) in the operating Class III Landfill.
- c. Overexcavation and Backfill, which includes the overexcavation of unsuitable soils, the backfilling of the excavation with structural fill, and the stockpiling of unsuitable soils where designated by the Owner shall be included for payment in the Contractor's Unit Price Bid for this work, per cubic yard in-place. Measurement of this quantity shall be made by the Contractor with oversight and approval by the Owner's representative. Note that Overexcavation and Backfill does not apply to removal or replacement of Fire Debris, which are included in other pay items.

Note that all work required for Borrow Excavation shall be considered incidental to the other pay items in this contract and no separate measurement or payment will be made.

3. Section 02223: Embankment:

All work required for Embankment shall be included for payment in the Contractor's Unit Price Bid for this work, per cubic yard in-place. The Embankment quantity shall be determined by the Engineer and shall be taken as the fill volume when comparing the existing topography at the start of the project (by Owner's surveyor) with the As-Built survey of the Design Excavation Grades. In areas where Fire Debris has been removed below the Design Excavation grades, the excavated grades will be compared to the Design Excavation Grades (i.e., the bottom of the Geologic Buffer).

4. Section 02250: Geologic Buffer and Cover Soil:

All work required for Geologic Buffer shall be included for payment in the Contractor's Lump Sum Price for the Geologic Buffer in Phase 5 and Geologic Buffer in Sediment Basin 5, wherein no measurement will be made, except for:

- a. Fire Debris Cover Soil, which shall be included for payment in the Contractor's Unit Price Bid for this work, per cubic yard-in place as calculated by multiplying the surface area of Fire Debris to be covered (as measured by the Owner's Surveyor) by the 1.5-foot thickness of the Fire Debris Cover Soil.

5. Section 02270: Erosion and Sedimentation Control:

All work required for Erosion and Sedimentation Control, which is not otherwise covered under related sections of these Specifications, shall be included for payment in the Contractor's Lump Sum and Unit Price Bid for the following items:

- a. Sedimentation Basins, which includes related earthwork (except for Geologic Buffer in Sediment Basin 5) and materials (including riser/barrel structure, baffles, etc.), shall be paid on the basis of the Contractor's Lump Sum Price for this work, wherein no measurement will be made.
- b. Drainage Channels, which includes related earthwork and materials (including rip rap, RECPs, Type GT-S geotextile, and/or GCL), shall be paid on the basis of the Unit Price Bid for this work, per linear foot of each channel in-place. Measurement of drainage channels shall be made by the Contractor's surveyor based on the horizontal projected length. No adjustments will be made in the length for slopes, uneven contours, repairs, or wasted material.
- c. Silt Fence, which includes related earthwork and materials, shall be paid on the basis of the Unit Price Bid for this work, per linear foot in-place.
- d. Stone Filter Fence, which includes related earthwork and materials (including fencing, stone, etc.), shall be paid on the basis of the Unit Price Bid for this work, per linear foot in-place.

- e. Rip Rap Aprons, which includes related earthwork and materials (including rip rap and Type GT-S geotextile), shall be paid on the basis of the Unit Price Bid for this work, per each apron in-place.
- f. Diversion Berms, which includes related earthwork and materials, shall be paid on the basis of the Unit Price Bid for this work, per linear foot in-place. Measurement of diversion berms shall be made by the Contractor's surveyor based on the horizontal projected length. No adjustments will be made in the length for slopes, uneven contours, repairs, or wasted material.
- g. Rock Check Dams, which includes related earthwork and materials, shall be paid on the basis of the Unit Price Bid for this work, per each check dam in-place.

6. Section 02271: Rip Rap:

All work required for Rip Rap shall be considered incidental to the other pay items in this contract and no separate measurement or payment will be made.

7. Section 02275: Rolled Erosion Control Products:

All work required for Rolled Erosion Control Products, which is not otherwise covered under related sections of these Specifications, shall be included for payment in the following items:

- a. Erosion Control Blanket, which includes related earthwork and materials, shall be paid on the basis of the Unit Price Bid for this work, per square yard of material in-place. Measurement of erosion control blanket shall be made by the Contractor's surveyor (or as field measured by the Contractor and Owner's representative). No adjustments will be made in the area for overlaps, seams, anchor trenches, repairs, or wasted material.

8. Section 02500: Roadway Work:

All work required for Roadway Work shall be included for payment in the following items:

- a. Aggregate Surfacing, which includes related earthwork and materials (including Type GT-S geotextile and ABC), shall be paid on the basis of the Unit Price Bid for this work, per square yard of each designated thickness in-place. Measurement of this area shall be made by the Contractor's surveyor based on the horizontal projected area. No adjustments will be made in the length for slopes, uneven contours, repairs, or wasted material.

9. Section 02608: Precast Concrete Structures:

All work required for Precast Concrete Structures, which is not otherwise covered under related sections of these Specifications, shall be included for payment in the following items:

- a. All work required for Precast Concrete Drop Inlets, which includes related earthwork and materials, shall be included for payment in the Contractor's Unit Price Bid for this work, per each drop inlet in-place.

10. Section 02720: Stormwater Systems:

All work required for Stormwater Systems shall be considered incidental to the other pay items in this contract and no separate measurement or payment will be made, except for the following items:

- a. Concrete Culvert, which includes related earthwork and materials, shall be paid on the basis of the Unit Price Bid for this work, per linear foot of each size and class pipe in-place.

11. Section 02930: Revegetation:

All work required for Revegetation shall be included for payment in the Contractor's Unit Price Bid for this work, per acre in-place. Measurement of this area shall be made by the Contractor's surveyor based on the horizontal projected area. No adjustments will be made in the area for slopes, uneven contours, repairs, or wasted material.

12. Surveying:

This work shall consist of all surveying and control work required by the Contract Documents. This includes establishment of appropriate local site benchmarks, baseline surveys, location of utilities, stakeout of elevation and positional information required to complete the construction and obtaining all survey information required to compile Record (As-Built) Drawings as required by the Contract Documents. All work required for Surveying shall be included for payment in the Contractor's Lump Sum Price for this work, wherein no measurement will be made.

13. Bonds, Mobilization, and Insurance:

This work shall consist of securing the appropriate bonds and insurance policies for the project, performance of preparatory construction operations, and performance of project closeout activities including the movement of personnel and equipment to and from the project site, safety equipment, and other facilities to begin work on a substantial phase of the Contract. All work required for Bonds, Mobilization, and Insurance shall be included for payment in the Contractor's Lump Sum Price for this work, wherein no measurement will be made. The amount of this item shall be limited to a maximum of four percent of the total Bid price. At least twenty (20) percent of this item must be allocated for demobilization at the end of the project.

C. Submittals

Before completion of the first pay application, the Contractor shall prepare and submit copies of their proposed pay application to the Engineer for review.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

A. Pre-Bid Meeting

1. A Pre-Bid Meeting will be held at the time and place to be designated in the Advertisement for Bids.
2. The Engineer will be available to discuss the Project and answer pertinent questions. No oral interpretation will be made as to the meaning of the Contract Documents. Interpretation, if deemed necessary by the Engineer, will be in the form of an Addendum to the Contract Documents following the meeting.

B. Preconstruction Meeting

1. A preconstruction meeting will be held after Award of Contract, but prior to the start of work at the site.
2. Attendance:
 - a. Owner
 - b. Engineer
 - c. CQA Engineer
 - d. Contractor
 - e. Safety Representative (As Appropriate)
 - f. Representatives of Governmental or other Regulatory Agencies (As Appropriate).
3. Tentative Agenda:
 - a. Tentative construction schedule/milestones
 - b. Work sequencing
 - c. Designation of responsible personnel
 - d. Processing of Field Decisions and Change Orders
 - e. Adequacy of distribution of Contract Documents
 - f. Submittal of Shop Drawings and samples
 - g. Procedures for maintaining record documents
 - h. Use of site and Owner's requirements
 - i. Major equipment deliveries and priorities
 - j. Safety and first aid procedures
 - k. Security procedures
 - l. Housekeeping procedures
 - m. Processing of Partial Payment Requests
 - n. General regard for community relations.

C. Progress Meetings

1. Progress meetings will be held monthly (or as otherwise directed by the Owner) at the project site during the performance of the work of this Contract. Additional meetings may be called as progress of work dictates.
2. The Engineer or their representative will preside at meetings and record minutes of proceedings and decisions. The Engineer will subsequently distribute copies of minutes to participants.
3. Attendance:
 - a. Owner
 - b. Engineer
 - c. CQA Engineer
 - d. Contractor
 - e. Subcontractors as pertinent to the agenda.
4. Tentative Agenda:
 - a. Review and approve minutes of previous meetings.
 - b. Review progress of work since last meeting.
 - c. Review proposed 30-60 day construction schedule.
 - d. Note and identify problems which impede planned progress.
 - e. Develop corrective measures and procedures to regain planned schedule.
 - f. Revise construction schedule as indicated and plan progress during next work period.
 - g. Maintaining of quality and work standards.
 - h. Complete other current business.
 - i. Report on community and governmental relations.
 - j. Schedule next progress meeting.

END OF SECTION

SECTION 01300

SUBMITTALS

A. General

This section describes the submittal process and the various submittal items which are required for this work. Submittal items include:

1. Progress Schedule
2. Proposed Products List
3. Product Data
4. Samples
5. Working Drawings
6. Other Submittals

A summary list of required submittals for this project is shown on Table 1 of this section. Note that this summary list does not relieve the Contractor of providing additional submittal information, not listed in Table 1, which may be required by the Contract Documents.

B. Procedure for Submittal and Contractor Responsibilities

1. Submittals shall be transmitted in sufficient time to allow the Engineer at least ten (10) working days (or greater if specified elsewhere) for review and processing.
2. Unless otherwise stated or agreed to, the Contractor shall transmit an electronic copy of all submittals to the Engineer in a format acceptable to the Engineer and Owner. If hard copies of submittals are necessary (or required by the Contract Documents), the Contractor shall transmit five (5) copies of all hard copy submittals to the Engineer. Transportation charges on all submittals shall be the Contractor's responsibility.
3. All submittals from subcontractors, manufacturers, or suppliers shall be sent directly to the Contractor for checking. The Contractor shall thoroughly check all submittals for accuracy and conformance to the intent of the Contract Documents before submitting them to the Engineer. ALL SUBMITTALS SHALL BEAR THE CONTRACTOR'S STAMP OF APPROVAL CERTIFYING THAT THEY HAVE BEEN SO CHECKED. SUBMITTALS WITHOUT THE CONTRACTOR'S STAMP OF APPROVAL WILL NOT BE REVIEWED BY THE ENGINEER AND WILL BE RETURNED TO THE CONTRACTOR.
4. All submittals shall be bound, dated, properly labeled, and consecutively numbered. Information on the label shall indicate submittal number (corresponding to Table 1 of this section), specification section, Contract Drawing number, subcontractors, manufacturer's or supplier's name, and the name or type of item the submittal covers. Each part of a submittal shall be marked and tabulated. Submittals shall be accompanied by a letter of transmittal, containing date, Project title, Contractor's name, number and titles of submittals, and any other pertinent data to facilitate review.

5. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure.

C. Procedure for Review

1. Submittals will be reviewed and annotated by the Engineer in one of the following ways:

"Furnish as Submitted" - no exceptions are taken.

"Furnish as Noted" - minor corrections are noted and shall be made.

"Revise and Resubmit" - major corrections are noted and a resubmittal is required.

"Rejected" - Based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment or a submission of other equipment is required.
2. If a submittal is satisfactory to the Engineer, the Engineer will annotate the submittal "Furnish as Submitted" or "Furnish as Noted" and transmit electronically to the Contractor. For hard copy submittals, the Engineer will transmit two (2) copies to the Contractor.
3. If a resubmittal is required, the Engineer will annotate the submittal "Revise and Resubmit" or "Rejected" and transmit electronically to the Contractor for appropriate action. For hard copy submittals, the Engineer will transmit four (4) copies to the Contractor for appropriate action.
4. The Contractor shall revise and resubmit submittals as required by the Engineer until submittals are acceptable to the Engineer.
5. No materials or equipment shall be ordered, fabricated, shipped, or any work performed until the Engineer returns to the Contractor the submittals, herein required, annotated either "Furnish as Submitted" or "Furnish as Noted".
6. The Engineer's review of the Contractor's submittals shall in no way relieve the Contractor of any of their responsibilities under the Contract. An acceptance of a submittal shall be interpreted to mean that the Engineer has no specific objections to the submitted material, subject to conformance with the Contract Drawings and Specifications.
7. The Engineer's review will be confined to general arrangement and compliance with the Contract Drawings and Specifications only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades, etc.
8. Acceptance of a Working Drawing by the Engineer will constitute acceptance of the subject matter for which the Drawing was submitted and not for any other structure, material, equipment, or appurtenances indicated or shown.

9. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations, and/or omissions.
10. Additional Engineering Services:
 - a. It is understood by the Contractor that the Owner may charge the Contractor the Engineer's charges for review in the event a submittal is not approved (either "Furnish as Submitted" or "Furnish as Noted") by the third submittal. These charges shall be for all costs associated with engineering review, meetings with the Contractor or manufacturer, etc. commencing with the fourth submittal.
 - b. In the event that the Engineer is required to provide additional engineering services as a result of a substitution of materials or equipment by the Contractor, the additional services will be provided in accordance with Section 01010, Summary of Work, of these Specifications, and will be covered in supplementary or revised information which will be issued to the Contractor.

D. Progress Schedule

1. General:
 - a. Within ten (10) days after the start date defined in the Notice to Proceed, the Contractor shall prepare and submit copies of their proposed progress schedule to the Engineer for review.
 - b. If so required, the schedule shall be revised until it is acceptable to the Owner. Acceptance by the Owner does not constitute confirmation that the schedule is accurate and complete only that it appears to meet minimum job requirements; and, thus, shall not relieve the Contractor of any Contract dates, milestones, or deadlines.
 - c. The schedule shall be updated monthly, depicting progress to the last day of the month and copies submitted to the Engineer not later than the fifth day of the month. PROGRESS PAYMENTS MAY NOT BE PROCESSED WITHOUT A CURRENT PROGRESS SCHEDULE.
2. Form of Schedule:
 - a. The schedule shall be prepared in the form of a horizontal bar chart showing in detail the proposed sequence of the work and identifying construction activities for each structure and for each portion of work including the critical path, predecessor relationships, milestones, etc.
 - b. The schedule shall be time scaled, identifying the first day of each week, with the estimated date starting and completion of each stage of the work in order to complete the Project within the Contract time.

E. Proposed Products List

1. Within fifteen (15) days after the start date defined in the Notice to Proceed, the Contractor shall prepare and submit copies of their tabulation of principal items of equipment and materials to be purchased to the Engineer for review.
2. The list shall include the manufacturer name, trade name, and model number for each product.

F. Product Data

1. The Contractor shall furnish for review information on proposed products as required by the Contract Documents or requested by the Engineer.
2. Product data shall indicate, at a minimum, the material properties specified in the Contract Documents.

G. Samples

1. The Contractor shall furnish for review all samples as required by the Contract Documents or requested by the Engineer.
2. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish, or texture and shall be properly labeled to show the nature of the material, trade name of manufacturer, and location of the work where the material represented by the sample will be used.

H. Working Drawings

1. General:
 - a. Working Drawings include, but are not limited to, Shop Drawings, layout drawings in plan and elevation, etc. The Contractor shall be responsible for securing all of the information, details, dimensions, Drawings, etc., necessary to prepare the Working Drawings required and necessary under this Contract and to fulfill all other requirements of their Contract. The Contractor shall secure such information, details, Drawings, etc. from all possible sources including the Contract Drawings, Working Drawings prepared by subcontractors, Engineers, suppliers, etc.
 - b. Working Drawings shall accurately and clearly present the following:
 - (1) All working and installation dimensions.
 - (2) Arrangement and sectional views.
 - (3) Units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the structures.
 - (4) Necessary details and information for making connections between the various trades including, but not limited to, accessories, appurtenances, etc.

- c. Working Drawings specifically prepared for this Project shall be on Mylar or other approved reproducible material sheets of the same size as the Contract Drawings. Drawings shall conform to recognized drafting standards and be neat, legible, and drawn to a large enough scale to show in detail the required information.
 - d. Contract Drawings are used for engineering and general arrangement purposes only and are not to be used for Working Drawings.
2. Working Drawing Requirements:
- a. Shop Drawings:
 - (1) The Contractor shall submit for review by the Engineer Shop Drawings for all fabricated work and for all manufactured items required to be furnished by the Contract Documents.
 - (2) Structural and all other layout Drawings prepared specifically for the Project shall have a plan scale of not less than 1 inch = 4 feet.
 - (3) Where manufacturer's publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared Shop Drawings, such submittals shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submittals showing only general information are not acceptable.
3. Record Working Drawings:
- a. Prior to final payment, the Contractor shall furnish the Engineer one complete set of all accepted Working Drawings, including Shop Drawings, for piping, etc.
 - b. Manufacturer's publications, submitted in lieu of prepared Shop Drawings, will not be required in reproducible form. However, five (5) sets of such material shall be furnished by the Contractor to the Engineer.
 - c. Working Drawings furnished shall be corrected to include any departures from previously accepted Drawings.
 - d. Refer to Section 01010 Paragraph F.9 (Summary of Work - Record (As-Built) Drawings) for additional information regarding required record drawings.

I. Operation and Maintenance Manuals

- 1. Copies of Operation and Maintenance Manuals, prepared specifically for this Project, shall be furnished for each item of equipment furnished under this Contract at the time it is installed.

2. Manuals shall contain complete information in connection with assembly, operation, lubrication, adjustment, maintenance, and repair, including detailed parts lists with drawings or photographs identifying the parts.
3. All copies of the manuals furnished shall be assembled and bound in separate volumes, by major equipment items or trades, and properly indexed to facilitate locating any required information.
4. The Engineer and the Owner shall be the sole judge of the acceptability and completeness of the manuals and may reject any submittal for insufficient information included, incorrect references, and/or the manner in which the material is assembled.
5. The approved sets of operation and maintenance manuals shall be furnished prior to final acceptance.

J. Other Submittals

Other required submittals include, but are not limited to: proposed handling/installation procedures, information on proposed construction equipment, borrow area information, material certifications, qualifications for manufacturers and installers, manufacturer instructions/recommendations, test reports, and design data.

Table 1: Summary List of Required Submittals

Specification Section	Submittal Number	Description
01300 (Submittals)	01300-1	Progress Schedule
	01300-2	Proposed Products List
	01300-3	Record Working Drawings
02110 (Site Preparation)	02110-1	Permit(s) or Approval(s) for Burning of Clearing Debris
02222 (Excavation)	02222-1	Information on Excavation Equipment
02223 (Embankment)	02223-1	Information on Equipment to be Used for Embankment
02240 (Geotextiles)	02240-1	Mill Certificate (Each Product)
	02240-2	Seaming Procedures
	02240-3	Delivery Tickets or Other Approved Receipts
02250 (Geologic Buffer)	02250-1	Information on Equipment to be Used for Geologic Buffer
	02250-2	Information on Off-Site Borrow Sources
	02250-3	Survey Results

Specification Section	Submittal Number	Description
02270 (Erosion And Sedimentation Control)	02270-1	Certification and Summary of Required Test Results on Materials to be Provided
	02270-2	Delivery Tickets or Other Approved Receipts
02271 (Rip Rap)	02271-1	Delivery Tickets or Other Approved Receipts
02275 (Rolled Erosion Control Products)	02275-1	Mill Certificate and Sample (Each Product)
	02275-2	Installation Guidelines/Instructions
	02275-3	Delivery Tickets or Other Approved Receipts
02500 (Roadway Work)	02500-1	Certification and Summary of Required Test Results on Materials to be Provided
	02500-2	Delivery Tickets or Other Approved Receipts
02608 (Precast Concrete Structures)	02608-1	Shop Drawings
	02608-2	Certification and Summary of Required Test Results on Materials to be Provided
02720 (Stormwater Systems)	02720-1	Certification and Summary of Required Test Results on Materials to be Provided
	02720-2	Delivery Tickets or Other Approved Receipts
02930 (Revegetation)	02930-1	Results of Soil Tests and Proposed Modifications
	02930-2	Seed Certificates
	02930-3	Fertilizer Invoices

END OF SECTION

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SECTION 01400

QUALITY CONTROL AND QUALITY ASSURANCE

A. General

1. Definitions:

a. Construction Quality Control (CQC)

Construction Quality Control refers to actions taken by manufacturers, fabricators, installers, and/or the Contractor to ensure that the materials and the workmanship meet the requirements of the Contract Documents. CQC is provided by the Contractor at no additional cost to the Owner. The Contractor shall follow CQC procedures as required by the Contract Documents and the Project CQA Manual.

b. Construction Quality Assurance (CQA)

Construction Quality Assurance is defined as a planned and systematic program employed by the Owner to assure conformity of the construction with the Contract Documents. CQA is provided by the CQA Engineer as a representative of the Owner and is independent from the Contractor and all manufacturers. The CQA program is designed to provide adequate confidence that items or services meet contractual and regulatory requirements and will perform satisfactorily in service.

2. On this Project, the Owner will provide for the services of a CQA Engineer on-site to selectively test materials and monitor compliance with the requirements of the Contract Documents. This will be in addition to Construction Quality Control (CQC) provided and paid for by the Contractor. The Contractor will afford these representatives access to the job site for the performance of their duties as described in the Contract Documents.

3. CQA test methods and frequency of testing are defined in the accompanying Project CQA Manual. The Contractor shall participate in and conform with all terms and requirements of this document.

B. Testing Laboratory Services

1. General:

a. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Owner unless otherwise indicated in the Specifications.

b. Materials to be tested include, but are not necessarily limited to the following: geosynthetics, concrete, and pipe.

- c. Tests required by the Owner shall not relieve the Contractor from the responsibility of supplying certificates from manufacturers or suppliers to demonstrate conformance with the Specifications.

2. Procedure:

- a. The Contractor shall plan and conduct their operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.
- b. The collection, field preparation, and storage of field samples and test specimens shall be as directed by the Engineer with the cooperation of the Contractor.

3. Significance of Tests:

Test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or noncompliance with the Specification requirements, unless:

- a. Supplementary testing shall prove, to the satisfaction of the Owner, that the initial samples were not representative of actual conditions or
- b. Observation(s) of the test sampling or procedures as made by the CQA Engineer or the Engineer render the results invalid.

4. Supplementary and Other Testing:

Nothing shall restrict the Contractor from conducting tests they may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner. Testing of this nature shall be conducted at the Contractor's expense.

C. Imperfect Work, Equipment, or Materials

1. Any work, equipment, or materials furnished by the Contractor not in conformance with the Contract Documents which is discovered before the final acceptance of the work, as established by the date of Final Payment, or during the Contractor's guarantee period, shall be removed, replaced, and/or corrected to conform to the Contract Documents immediately even though it may have been overlooked by the Engineer and estimated for payment.
2. Any equipment or materials condemned or rejected by the Engineer shall be tagged as such and shall be immediately removed from the site. Satisfactory work or materials shall be substituted for that rejected.
3. The Engineer may order tests of work, equipment, or materials which appear to be in non-conformance with the Contract Documents to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of

such tests shall be borne by the Contractor; and the nature, tester, extent, and supervision of the tests will be as determined by the Engineer. If the results of the tests indicate that the required functional capability of the work, equipment, or material was not impaired, consistent with the final general appearance of same, the work, equipment, or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work, equipment, or materials has been impaired, then such work, equipment, or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect work, equipment, or material in lieu of performing the tests.

D. Inspection and Tests

1. The Contractor shall allow the Engineer ample time and opportunity for testing materials and equipment to be used in the work. The Contractor shall at all times furnish the Engineer and their representatives, facilities including labor, and allow proper time for inspecting and testing materials, equipment, and workmanship.
2. The Contractor must anticipate possible delays that may be caused in the execution of their work due to the necessity of materials and equipment being inspected and accepted for use.
3. The Contractor shall furnish, at their own expense, all samples of materials required by the Engineer for testing.
4. Not used.
5. Where other tests or analyses are specifically required in other sections of these Specifications, the cost thereof shall be borne by the party so designated in such sections.
6. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Engineer for the purpose of determining conformance with the Contract Documents if such tests, inspections, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Engineer as a result of such tests, inspections, or investigations, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. In this connection, the cost of any additional tests and investigations, which are ordered by the Engineer to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

END OF SECTION

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SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

A. Temporary Utilities

1. General:

- a. The Contractor shall provide temporary sanitary service, light and power, heating, and water service for their operations at the site unless otherwise provided as agreed to by the Owner. The temporary services shall be provided for use throughout the construction period.
- b. The Contractor shall coordinate and install all temporary services in accordance with the requirements of the utility companies having jurisdiction and as required by applicable codes and regulations.
- c. At the completion of the work, or when the temporary services are no longer required, the temporary facilities shall be restored to their original conditions.
- d. All costs in connection with the temporary services including, but not limited to, installation, utility company service charges, maintenance, relocation, and removal shall be borne by the Contractor at no additional cost to the Owner.
- e. Some temporary facilities that may be required may be indicated on the Contract Drawings; however, the Contract Drawings do not necessarily show any or all of the temporary facilities that the Contractor ultimately uses to complete the work.

2. Temporary Sanitary Service:

Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the work and properly screened from public observation, shall be provided and maintained at suitable locations by the Contractor, all as prescribed by State and local requirements. The contents of same shall be removed and disposed of in a manner consistent with State and local requirements, as the occasion requires. Each Contractor shall rigorously prohibit the committing of nuisances within, on, or about the work. Sanitary facilities shall be removed from the site when no longer required.

3. Temporary Light and Power:

- a. The Contractor shall provide at their sole expense such temporary light and power as required for their operations.
- b. Upon completion of the work, but prior to acceptance by the Owner, the Contractor shall remove all temporary services, security lighting systems, temporary general lighting systems, and all temporary electrical work from the premises.

4. Temporary Water:

- a. The Contractor shall provide temporary water service for construction purposes, sanitary facilities, fire protection, all field offices, and for cleaning. The Contractor shall pay all charges associated with the connection and all charges for potable water used under this Contract.
- b. Each Contractor shall supply potable water for their employees either by portable containers or drinking fountains.
- c. An adequate number of hose bibs, hoses, and watertight barrels shall be provided for the distribution of water.
- d. Water service shall be protected from freezing and the service shall be extended and relocated as necessary to meet temporary water requirements.

B. First Aid Facilities and Accidents

1. First Aid Facilities:

The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of their personnel who may be injured in connection with the work.

2. Accidents:

- a. The Contractor shall report immediately by telephone or messenger to both the Owner and the Engineer all accidents whatsoever out of, or in connection with, the performance of the work, whether on or adjacent to the site, which cause death, personal injury, or property damage. The Contractor shall further issue a written report to the Engineer within 24 hours which describes these accidents giving full details and statements of witnesses.
- b. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall report within 2 business days the facts, in writing, to the Engineer, giving full details of the claim.

C. Protection of Work and Material

- 1. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract as well as other areas of the site that may be impacted by the Contractor or Subcontractors.
- 2. All work and materials shall be protected against damage, injury, or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at their own expense. Protection measures shall be subject to the approval of the Engineer.

D. Barricades, Warning Signs, and Lights

1. The Contractor shall provide, erect, and maintain as necessary, strong and suitable barricades, danger signs, and warning lights along all roads accessible to the public, as required by the authority having jurisdiction, to insure safety to the public. All barricades and obstructions along public roads shall be illuminated at night and all lights for this purpose shall be kept burning from sunset to sunrise.
2. Each Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, the Owner's operating personnel, or those visiting the site.

E. Access Roads and Parking Areas

1. Access Roads:

- a. The Contractor shall construct and maintain such temporary access roads as required to perform the work of this Contract.
- b. The Contractor shall access the site through the existing site entrance shown on the Contract Drawings or as otherwise designated by the Owner. The existing roadway leading to the construction area shall be maintained by the Contractor to provide access to the construction area. The Contractor shall not disturb areas outside the clearing limits shown on the Contract Drawings unless approved by the Owner.
- c. Access roads shall be located within the property lines of the Owner unless the Contractor independently secures easements for their use and convenience. Contractor shall submit written documentation (consent form, etc.) to the Engineer for any Contractor secured easements across privately held property. The easement agreement shall specify terms and conditions of use and provisions for site restoration. A written release from the property owner certifying that all terms of the easement agreement have been complied with by the Contractor shall be furnished to the Engineer prior to final payment.
- d. The Contractor shall obtain all necessary permits and pay all costs associated with any bonds required by the State transportation department for the use of State maintained roads or similar requirements for local roads and private drives.

2. Parking Areas:

The Contractor shall use existing parking areas and/or construct and maintain suitable parking areas for their construction personnel on the Project site within the clearing limits shown on the Contract Drawings where approved by the Engineer and the Owner.

3. Restoration:

At the completion of the work, the surfaces of land disturbed by the Contractor's activities, whether in the Contract Limits or not, shall be restored by the Contractor. At a

minimum, such restoration shall include establishment of a permanent ground cover (Revegetation or other means acceptable to the Owner) adequate to restrain erosion for all disturbed areas. Revegetation shall be in accordance with Section 02930, Revegetation, of these Specifications. The Contractor shall also maintain and restore to pre-construction conditions (as directed and approved by the Owner) all site paved and gravel roadway surfaces (including shoulders) used during the performance of their work. The cost of all restoration work shall be at the Contractor's sole expense.

F. Dust and Mud Control

1. The Contractor shall take all necessary measures to control dust and mud from their operations, and to prevent spillage of excavated materials on public or site roads.
2. The Contractor shall remove all spillage of excavated materials, debris, dust, or mud from public roads by methods approved by the Engineer.
2. The Contractor shall apply water at locations and in such quantities and at such frequencies as may be required by the Owner or Engineer to control dust and mud and prevent either from becoming a nuisance to the surrounding area. Other measures (dust suppressants, etc.) may be required, as determined by the Owner or Engineer.
3. Dust and mud control and cleaning measures shall be provided at no additional cost to the Owner.

G. Traffic Regulations

The Contractor shall obey all traffic laws and comply with all the requirements, rules, and regulations of the State Department of Transportation and other local authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc. for the protection of traffic on public roadways.

H. Not Used.

I. Contractor's Field Office

At their option and upon approval by the Owner, the Contractor may furnish, equip, and maintain a field office at the site of a size required for their operations.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

A. General

1. All equipment, materials, instruments, or devices incorporated in this Project shall be new and unused, unless indicated otherwise in the Contract Documents. Equipment and materials to be incorporated into the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work, and they shall be delivered as nearly as feasible in the order required for executing the work.
2. The Contractor shall protect all equipment and materials from deterioration and damage, including provision of temporary storage buildings as needed. Storage of equipment and materials shall be in locations completely protected from flooding, standing water, excessive dust, falling rock, brush fire, etc. Storage areas shall be located sufficiently distant from all construction activities and the movement of construction vehicles to minimize the potential for accidental damage. Any equipment or materials of whatever kind which may have become damaged or deteriorated from any cause shall be removed and replaced by good and satisfactory items at the Contractor's expense for both labor and materials.
3. Equipment and materials shall be installed in accordance with the requirements of the General Conditions and the respective Specification Sections.

B. Storage of Materials and Equipment

1. The Contractor shall store their materials and equipment at the job site in accordance with the requirements of the General Conditions and as hereinafter specified. All equipment and materials shall be stored in accordance with manufacturer's recommendations and as directed by the Owner or Engineer, and in conformity to applicable statutes, ordinances, regulations, and rulings of the public authority having jurisdiction.
2. The Contractor shall enforce the instructions of the Owner and Engineer regarding the posting of regulatory signs for loadings on structures, fire safety, and smoking areas.
3. The Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property.
4. The Contractor shall not store materials in such a manner that they are exposed to weather which, in the Engineer's opinion can alter the material properties.
5. The Contractor shall not store unnecessary materials or equipment on the job site, and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.

6. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels, and inlets shall be kept unobstructed at all times.

C. Connections to Equipment

1. Connections to equipment shall follow manufacturer's recommendations as to size and arrangement of connections and/or as shown in detail on the Contract Drawings or approved Shop Drawings. Piping connections shall be made to permit ready disconnection of equipment with minimum disturbance of adjoining piping and equipment.

D. Substitutions

1. Requests for substitutions of equipment or materials shall conform to the requirements of the General Conditions and as hereinafter specified.
 - a. The Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature, and performance data together with samples of the materials, where feasible, to enable the Owner and Engineer to determine if the proposed substitution is equal.
 - b. The Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.
 - c. A list of installations where the proposed substitution is equal.
2. Where the approval of a substitution requires revision or redesign of any part of the work, including that of other Contracts, all such revision and redesign, and all new drawings and details therefore, shall be provided by the Contractor at their own cost and expense, and shall be subject to the approval of the Owner and Engineer.
3. In the event that the Engineer is required to provide additional engineering services, then the Engineer's charges for such additional services shall be charged to the Contractor by the Owner in accordance with the requirements of the General Conditions.
4. In all cases the Owner and Engineer shall be the judge as to whether a proposed substitution is to be approved. The Contractor shall abide by their decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without written approval of the Owner and Engineer.
5. The Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.
6. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.

END OF SECTION

SECTION 01700

PROJECT CLOSEOUT

A. Final Cleaning

1. At the completion of the work, the Contractor shall remove all rubbish from and about the site of the work, and all temporary structures, construction signs, tools, materials, supplies, and equipment which they or any of their Subcontractors may have used in the performance of the work.
2. The Contractor shall thoroughly clean all materials, equipment, and structures; all marred surfaces shall be touched up to match adjacent surfaces so as to leave work in a clean and new appearing condition.
3. The Contractor shall maintain cleaning until the Project, or portion thereof, is occupied by the Owner.

B. Final Cleanup: Site Rehabilitation

1. Before finally leaving the site, the Contractor shall wash and clean all exposed surfaces which have become soiled or marked, and shall remove from the site of work all accumulated debris and surplus materials of any kind which result from their operation, including construction equipment, tools, sheds, sanitary enclosures, etc. The Contractor shall leave all equipment, fixtures, and work, which they have installed, in a clean condition. The completed Project shall be turned over to the Owner in a neat and orderly condition.
2. The site of the work shall be rehabilitated or developed in accordance with other sections of the Specifications and the Drawings. In the absence of any portion of these requirements, the Contractor shall completely rehabilitate the site to a condition and appearance equal or superior to that which existed just prior to construction, except for those items whose permanent removal or relocation was required in the Contract Documents or ordered by the Owner.

C. Final Inspection

1. Final cleaning and repairing shall be so arranged as to be finished upon completion of the construction work. The Contractor will make their final cleaning and repairing, and any portion of the work finally inspected and accepted by the Engineer shall be kept clean by the Contractor, until the final acceptance of the entire work.
2. When the Contractor has finally cleaned and repaired the whole or any portion of the work, they shall notify the Engineer that they are ready for final inspection of the whole or a portion of the work, and the Engineer will thereupon inspect the work. If the work is not found satisfactory, the Engineer will order further cleaning, repairs, or replacement.
3. When such further cleaning or repairing is completed, the Engineer, upon further notice,

will again inspect the work. The "Final Payment" will not be processed until the Contractor has complied with the requirements set forth, and the Engineer has made their final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents.

D **Project Closeout**

1. As construction of the Project enters the final stages of completion, the Contractor shall, in concert with accomplishing the requirements set forth in the Contract Documents, attend to or have already completed the following items as they apply to their contract:
 - a. Scheduling equipment manufacturers visits to site.
 - b. Required testing of Project components.
 - c. Scheduling start-up and initial operation.
 - d. Scheduling and furnishing skilled personnel during initial operation.
 - e. Correcting or replacing defective work, including completion of items previously overlooked or work which remains incomplete, all as evidenced by the Engineer's "Punch" Lists.
 - f. Attend to any other items listed herein or brought to the Contractor's attention by the Engineer.

2. In addition, and before the Certificate of Substantial Completion is issued, the Contractor shall submit to the Engineer (or to the Owner if indicated) certain records, certifications, etc. which are specified elsewhere in the Contract Documents. A partial list of such items appears below, but it shall be the Contractor's responsibility to submit any other items which are required in the Contract Documents:
 - a. Test results of Project components.
 - b. Performance Affidavits for equipment.
 - c. Certification of equipment or materials in compliance with Contract Documents.
 - d. Operation and maintenance instructions or manuals for equipment.
 - e. One set of neatly marked-up record drawings showing as-built changes and additions to the work under their Contract.
 - f. Any special guarantees or bonds (Submit to Owner).

The Contractor's attention is directed to the fact that required certifications and information under some items above must actually be submitted earlier in accordance with other sections of the Specifications.

END OF SECTION

Technical Specifications

Phase 5 Construction Ridge Road Class III Landfill

Prepared for:

Sevier Solid Waste, Inc.
Pigeon Forge, TN

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Phase 5 Construction Ridge Road Class III Landfill

Technical Specifications

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SECTION 02110

SITE PREPARATION

Site Preparation: Site Preparation includes clearing, grubbing, and/or stripping operations.

A. Description

1. General:

- a. The Contractor shall furnish all labor, material, and equipment to complete Site Preparation in accordance with the Contract Drawings and these Specifications.
- b. Principal items of work include:
 1. Notifying all authorities owning utility lines running to or on the property. Protect and maintain all utility lines to remain and cap those that are not required in accordance with instructions of the Utility Companies, and all other authorities having jurisdiction.
 2. Clearing the site within the clearing limits, including removal of grass, brush, shrubs, trees, loose debris, and other encumbrances except for trees to remain.
 3. Boxing and protecting all areas to be preserved.
 4. Removing all topsoil from designated areas and stockpiling on site where directed by the Engineer for future use.
 5. Disposing from the site all debris resulting from work under this Section.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
Erosion and Sedimentation Control	02270

B. Construction

1. Clearing of the Site:

- a. Clearing limits, as shown on the Contract Drawings, shall be established by the Owner's Surveyor. Once established, the clearing limits shall be inspected and approved by the Engineer prior to clearing the affected areas.

- b. Install required erosion and sedimentation control measures prior to performing clearing and grubbing activities.
- c. Before the start of excavation and grading operations, the areas within the clearing limits shown on the Contract Drawings shall be cleared and grubbed.
- d. Clearing shall consist of cutting, removal, and satisfactory disposal of all trees, fallen timber, brush, bushes, rubbish, fencing, and other perishable and objectionable material.

Should it become necessary to remove a tree, bush, brush, or other plants outside the clearing limits, the Contractor shall do so only after permission has been granted by the Engineer.

- e. Where necessary, excavation resulting from the removal of trees, roots, and the like shall be filled with suitable material, as approved by the Engineer, and thoroughly compacted per the requirements contained in Section 02223, Embankment, of these Specifications.
- e. In temporary construction easement locations, only those trees and shrubs shall be removed which are in actual interference with excavation or grading work under this Contract, and removal shall be subject to approval by the Engineer. However, the Engineer reserves the right to order additional trees and shrubs removed at no additional cost to the Owner, if such, in their opinion, they are too close to the work to be maintained or have become damaged due to the Contractor's operations.
- f. Unless otherwise shown or specified, the Contractor shall clear and grub a strip at least 15 feet wide along all permanent fence lines installed under this Contract.

2. Stripping and Stockpiling Existing Topsoil:

- a. Existing topsoil on the site within areas designated on the Contract Drawings shall be stripped to whatever depth it may occur, and stored in locations directed by the Engineer.
- b. The topsoil shall be free of stones, roots, brush, rubbish, or other unsuitable materials before stockpiling.
- c. Care shall be taken not to contaminate the stockpiled topsoil with any unsuitable materials.

3. Grubbing:

- a. Grubbing shall consist of the removal and disposal of all stumps, roots, logs, sticks, and other perishable materials to a depth of at least 6 inches below ground surfaces.

- b. Large stumps located in areas to be excavated may be removed during grading operations, subject to the approval of the Engineer.

4. Disposal of Cleared and Grubbed Material:

No open burning of clearing debris will be allowed on this project. Air curtain burning will be allowed only by permit if permitted or approved by State Department of Agriculture, Division of Forestry and in accordance with T.C.A. 39-14-306. Any material other than plant growth shall not be burned. Otherwise, all trees, stumps, roots, bushes, etc. shall be removed from the site and disposed of by the Contractor.

Alternatively, the Contractor may grind woody materials into wood mulch and either remove from the site or stockpile on-site in the location(s) approved by the Owner.

END OF SECTION

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SECTION 02222

EXCAVATION

Excavation: Excavation includes excavating, sealing, hauling, scraping, undercutting, removal of accumulated surface water or ground water, stockpiling, and all necessary and incidental items as required for bringing the landfill and related structures to the specified lines and grades.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment required to complete Excavation of the project area in accordance with the Contract Drawings and these Specifications. Excavation of the landfill and related structures shall be to the elevations shown on the Contract Drawings unless the excavation is limited due to Rock as defined in Paragraph A.4.f. (below). Removal of topsoil is not addressed in this section, but as noted below:

- a. Clearing and grubbing and removal of topsoil is addressed in Section 02110, Site Preparation, of these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Site Preparation	02110
Dewatering	02140
Embankment	02223
Erosion and Sedimentation Control	02270
Roadway Work	02500
CQA Manual	Attached

3. Quality Assurance:

Quality Assurance during Excavation will be provided by the Owner as described in the accompanying Project CQA Manual.

4. Definitions:

- a. Excavation: shall consist of the removal and satisfactory disposal and/or stockpiling of all materials (borrow and/or unsuitable materials included) located within the limits of construction including widening cuts and shaping of slopes necessary for the preparation of roadbeds, slope areas, cutting of any ditches, channels, waterways, entrances, and other work incidental thereto.

- b. Borrow: shall consist of approved on-site material required for the construction of embankments/fills or for other portions of the work.
- c. Unsuitable Material: is any in-place or excavated material which contains undesirable materials or is in a state which is not appropriate, in the opinion of the CQA Engineer, for the intended use or support of planned structures, embankment, or excavation. This may include but not be limited to organic material, waste/refuse, soft, or wet material not meeting required specifications, etc.
- d. Unsuitable Material Overexcavation: shall consist of the removal and satisfactory disposal of all unsuitable material located within the limits of construction and below subgrade elevations shown or indicated on the Contract Drawings. Where excavation to the subgrade elevations results in a subgrade or slopes of unsuitable material, the Contractor shall overexcavate such material to below the grades shown or indicated on the Contract Drawings or as otherwise directed by the Engineer and CQA Engineer.
- e. Rock; For the purposes of this Project, Rock shall refer to any material occupying an original volume of at least one cubic yard which cannot be excavated with a single-tooth ripper drawn by a large crawler tractor or an excavator equipped with a rock ripping bucket having a draw bar pull capability of 50,000 pounds (Caterpillar D8K or equivalent dozer; Caterpillar 330 or equivalent excavator).

B. Materials

Excavation shall include the removal of all soil, weathered rock, boulders, conduits, pipe, unsuitable material, and all other obstacles encountered and shown or indicated on the Contract Drawings and/or specified herein. No blasting is allowed on this project.

C. Submittals

The Contractor shall submit the following to the CQA Engineer:

- 1. Information on Excavation equipment to be used.
- 2. Survey Results:

Survey results for the completed landfill subgrade shall be submitted for review prior to placement of overlying materials.

D. Construction

- 1. The Contractor shall conduct Excavation activities in such a manner that erosion of disturbed areas and off site sedimentation is absolutely minimized as outlined in Section 02270, Erosion and Sedimentation Control, of these Specifications.

2. The Contractor shall excavate to the lines and grades shown on the Contract Drawings. As the excavation is made, the materials will be examined and identified to the CQA Engineer.

The Contractor will perform all surveys necessary to establish and verify lines and grades for all Excavation, including pipe excavations, soil overexcavation, and anchor trenches.

3. Stockpiling:

The Contractor shall stockpile materials as needed in appropriate stockpiles as approved by the CQA Engineer.

Stockpiles shall be properly sloped and the surfaces sealed by the Contractor at the end of each working day, or during the day in the event of heavy rain, to the satisfaction of the Engineer.

4. The Contractor shall protect all existing facilities and structures including, but not limited to, existing utilities, monitoring wells, signs, grade stakes, etc. during the grading and stockpiling operations.
5. All excavations shall be made in the dry and in such a manner and to such widths as will give ample room for properly constructing and inspecting the structures and/or piping they are to contain and for such sheeting, timbering, pumping, and drainage as may be required.
6. The Contractor shall be responsible for Dewatering as described in Section 02140, Dewatering, of these Specifications when necessary. Except for certain erosion and sedimentation control measures and other areas designated to impound water, all areas shall be graded to drain.
7. Excavation slopes shall be flat enough to avoid sloughs and slides that will cause disturbance of the subgrade or damage of adjacent areas. Slides and overbreaks which occur due to negligence, carelessness, or improper construction techniques on the part of the Contractor shall be removed and disposed of by the Contractor as directed by the Engineer at no additional cost to the Owner.
8. The intersection of slopes with natural ground surfaces, including the beginning and ending of cut slopes, shall be uniformly rounded. All protruding roots and other vegetation shall be removed from slopes.
9. The bottom of all excavations for structures and pipes shall be examined by the CQA Engineer for bearing value and the presence of unsuitable material. If, in the opinion of the CQA Engineer, additional Excavation is required due to the low bearing value of the subgrade material, or if the in-place materials are soft, yielding, pumping and wet, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted structural fill, or material directed by the CQA Engineer. No payment will be made for subgrade disturbance caused by inadequate Dewatering or improper construction methods.

10. Any areas excavated below design subgrade elevations by the Contractor, unless directed by the CQA Engineer, shall be brought back to design elevations at no cost to the Owner. The Contractor shall place and compact such material in accordance with Section 02223, Embankment, of these Specifications.
11. The Contractor shall dispose of excess or unsuitable excavation materials on-site at location(s) approved by the Owner.
12. The Contractor shall properly level-off bottoms of all excavations. Proof-rolling shall be conducted with appropriate equipment.
13. Upon reaching subgrade elevations shown in excavation areas, the Contractor shall scarify subgrade soils to a minimum depth of 6" and obtain the CQA Engineer's approval of quality. If unsuitable materials are encountered at the subgrade elevation, perform additional excavations as approved by the CQA Engineer to remove unsuitable materials.
14. Overexcavation and Backfill:
 - a. Where subgrade materials are determined to be unsuitable, such materials shall be removed by the Contractor to the lengths, widths, and depths approved by the Engineer and CQA Engineer in advance and backfilled with compacted Embankment in accordance with Section 02223, Embankment, of these Specifications.
 - b. No additional payment will be made for such overexcavation and backfill 1 foot or less than the finished subgrade (or pre-existing grades where pre-existing grades are lower than finished subgrade) as this is considered superficial.
 - c. Where overexcavation of unsuitable material is greater than 1 foot beneath the finished subgrade (or pre-existing grades where pre-existing grades are lower than finished subgrade), payment shall be made on a unit price basis for overexcavation and backfill and the measured quantity shall include the entire excavation quantity below the finished subgrade (or pre-existing grades where pre-existing grades are lower than finished subgrade) elevations. The unit price for overexcavation and backfill shall include disposal of unsuitable materials.
15. All cuts shall be brought to the grade and cross section shown or indicated on the Contract Drawings, or established by the Engineer, prior to final inspection.
16. The Contractor shall protect finished lines and grades of completed excavation against excessive erosion, damage from trafficking, or other causes and shall repair any damage at no additional cost to the Owner.
17. Trench Excavation:
 - a. All pipe Excavation and trenching shall be done in strict accordance with these Specifications, all applicable parts of the OSHA Regulations, 29 CFR 1926, Subpart P, and other applicable regulations. In the event of any conflicts in this information, safe working conditions as established by the appropriate OSHA guidelines shall govern.

- b. The minimum trench widths shall be as indicated on the Contract Drawings. Enlargements of the trench shall be made as needed to give ample space for operations at pipe joints. The width of the trench shall be limited to the maximum dimensions shown on the Contract Drawings, except where a wider trench is needed for the installation of and work within sheeting and bracing.
- c. Except where otherwise specified, excavation slopes shall be flat enough to avoid slides which will cause disturbance of the subgrade, damage to adjacent areas, or endanger the lives or safety of persons in the vicinity.
- d. Hand excavation shall be employed wherever, in the opinion of the Engineer, it is necessary for the protection of existing utilities, poles, trees, pavements, obstructions, or structures.
- e. No greater length of trench in any location shall be left open, in advance of pipe laying, than shall be authorized or directed by the Engineer and, in general, such length shall be limited to approximately one hundred (100) feet.
- f. Pipe Bedding: All pipe bedding shall be as shown on the Contract Drawings, unless otherwise specified herein, or shall be approved by the Engineer.

18. Sheeting and Bracing:

- a. The Contractor shall furnish, place, and maintain such sheeting and bracing which may be required to support sides of Excavation or to protect pipes and structures from possible damage and to provide safe working conditions in accordance with current OSHA requirements. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, they may order additional supports put in at the sole expense of the Contractor. The Contractor shall be responsible for the adequacy of all sheeting and bracing used and for all damage resulting from sheeting and bracing failure or from placing, maintaining, and removing it.
- b. The Contractor shall exercise caution in the installation and removal of sheeting to insure that excessive or unusual loadings are not transmitted to any new or existing structure. The Contractor shall promptly repair at their expense any and all damage that can be reasonably attributed to sheeting installation or removal.
- c. All sheeting and bracing shall be removed upon completion of the work.

19. If grading operations are suspended for any reason whatsoever, partially completed cut and fill slopes shall be brought to the required slope and the work of seeding and mulching or other required erosion and sedimentation control operations shall be performed at the Contractor's sole expense.

20. Excavations into Waste:

- a. The Contractor shall use caution when making excavations into or near waste. Excavation and backfilling activities in/near waste shall be performed such that the need for Contractor personnel to enter the excavation is minimized.
- b. In accordance with State landfill regulations, any exposed waste shall be covered with a minimum of 6 inches of soil (or approved alternate such as a tarp) at the end of each day to prevent exposure to vectors.
- c. Waste removed from excavation activities shall be disposed of in the active landfill area during regular landfill hours as directed by the Owner and Engineer. After regular hours, waste shall be adequately covered as described above or placed in a suitable roll-off container (which is covered) for disposal during the next operating day.

21. Surveying:

Upon completion of the landfill subgrade, the subgrade shall be surveyed on 100 foot centers and at slope breaks (including all tops and toes of slope, points of grade change, etc.) to ensure the top of the subgrade meets the grades specified on the Contract Drawings.

This work shall be performed at the Owner's cost by a registered surveyor.

END OF SECTION

SECTION 02223

EMBANKMENT

Embankment: Embankment is the on-site compacted fill that provides the foundation and the berms for the containment area, the subgrade for some access roadways and structures, and backfill around structures and piping.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete Embankment including borrowing, hauling, screening, discing, drying, compaction, control of surface and subsurface water, final grading, sealing, and all necessary and incidental items as detailed or required to complete the Embankment, all in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Erosion and Sedimentation Control	02270
Roadway Work	02500
CQA Manual	Attached

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these Specifications.

ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³).
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.
ASTM D 2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
ASTM D 2937	Standard Test Method for Density of Soil in Place by the Drive Cylinder Method.
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
ASTM D 4959	Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method.
ASTM D 6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

4. Quality Assurance:

Quality Assurance during placement of Embankment will be provided by the Owner as described in the accompanying Project CQA Manual.

5. Definitions:

- a. Embankment: Shall include construction of all site earthwork including roadways, subgrade, perimeter berm embankments, including preparation of the areas upon which materials are to be placed. Embankment may also be referred to as structural and/or controlled fill. All Embankment materials may be either (off-site) Select Borrow or (on-site) Borrow unless otherwise noted on Contract Drawings or specified by the Engineer.
- b. Prepared Subgrade: The ground surface after clearing, grubbing, stripping, excavation, scarification, and/or compaction, and/or proof rolling to the satisfaction of the CQA Engineer.
- c. Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes. Well-graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters. Well-graded is used to define a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.
- d. Unclassified Fill: The nature of materials to be used is not identified or described herein but must be approved by the Engineer prior to use.

B. Materials

- 1. Embankment materials shall consist of clean well-graded natural soil classified as SP, SW, SM, SC, ML, or CL (ASTM D 2487) containing no topsoil or other deleterious material. Additionally, for the upper 3 feet beneath the final wearing surface of roadways including shoulders, Embankment materials shall have a liquid limit less than 50%, a plasticity

index less than 20% (ASTM D 2487) and have a maximum standard Proctor dry density of at least 100 pounds per cubic foot (ASTM D 698).

Other material classifications may be approved by the Engineer.

2. Stones or rock fragments shall not exceed one half the maximum lift thickness as compacted in any dimension. Isolated rocks shall be a maximum of 24-inches in any dimension.

C. Construction

1. The Contractor shall conduct Embankment activities in such a manner that erosion of disturbed areas and off-site sedimentation is absolutely minimized as outlined in Section 02270, Erosion and Sedimentation Control, of these Specifications.
2. All placement and compaction of Embankment shall be performed only when the CQA Engineer is informed by the Contractor of intent to perform such work.
3. Embankment shall be placed and compacted to the lines and grades shown on the Contract Drawings. Placement of Embankment outside the construction limits shall occur only as directed and approved by the Engineer.

The Contractor will perform all surveys necessary to establish and verify lines and grades for all Embankment.

4. The Contractor shall protect all existing facilities including, but not limited to, utilities and monitoring wells.
5. Subgrade Preparation:
 - a. The CQA Engineer shall inspect the exposed subgrade prior to placement of Embankment to assure that all rocks, topsoil, vegetation, roots, debris, or other deleterious materials have been removed.
 - b. Prior to placement of Embankment, the exposed subgrade shall be proofrolled using a static smooth-drum roller, loaded tandem axle dump truck, or other suitable equipment in the presence of the CQA Engineer. Any soft or unsuitable materials revealed before or during the in-place compaction shall be removed as directed by the CQA Engineer and replaced with suitable Embankment.
6. Surfaces on which Embankment is to be placed, shall be scarified or stepped in a manner which will permit bonding of the Embankment with the existing surface.
7. The Contractor shall be responsible for preparing the materials for the Embankment, including but not limited to, in-place drying or wetting of the soil necessary to achieve the compaction criteria of these Specifications.
8. The Contractor shall be responsible for the control of surface and subsurface water, when necessary. Except for certain erosion and sedimentation control measures and other areas designated to impound water, all areas shall be graded to drain.

9. Embankment materials shall be placed in a manner permitting drainage and in continuous, approximately horizontal layers.
10. Compaction Requirements:
 - a. The Contractor shall compact Embankment in accordance with the requirements shown in Table 1 of this section. If Embankment does not meet the specified requirements, the Contractor shall rework the material, as may be necessary and continue compaction to achieve these requirements, or remove and replace the material to achieve the specified requirements, at Contractor's expense.
 - b. Each lift shall be compacted prior to placement of succeeding lifts. In confined areas, mechanical equipment, suitable for small areas and capable of achieving the density requirements, shall be required.
 - c. Lift compaction shall be performed with an appropriately heavy, properly ballasted, penetrating-foot or smooth-drum vibratory compactor depending on soil type. Compaction equipment shall be subject to approval by the CQA Engineer.
11. Embankment that becomes excessively eroded, soft, or otherwise unsuitable shall be removed or repaired by the Contractor as directed by the CQA Engineer, at no cost to the Owner.
12. The exposed surface of Embankment shall be rolled with a smooth-drum roller at the end of each work day to protect from adverse weather conditions.
13. Where Embankment is to be placed and compacted on slopes that are steeper than 3H:1V, the subgrade shall be benched to a minimum depth of 6 inches and the Embankment shall be placed in horizontal lifts.
14. Backfilling for Structures and Piping:
 - a. All structures, including manholes and pipes shall be backfilled with Embankment as shown in the Contract Drawings and as described in these Specifications.
 - b. Where sheeting is used, the Contractor shall take all reasonable measures to prevent loss of support beneath and adjacent to pipes and existing structures when sheeting is removed. If significant volumes of soil cannot be prevented from clinging to the extracted sheets, the voids shall be continuously backfilled as rapidly as possible. The Contractor shall thereafter limit the depth below subgrade that sheeting will be driven in similar soil conditions or employ other appropriate means to prevent loss of support.
 - c. When backfilling around structures, do not backfill until concrete has sufficiently cured (as determined by the CQA Engineer) and is properly supported. Place backfill in a manner to avoid displacement or damage of structures.

15. Surveying:

Upon completion of the landfill subgrade, the subgrade shall be surveyed on 50-foot centers and at slope breaks (including all tops and toes of slope, points of grade change, etc.) to ensure the top of the subgrade meets the grades specified on the Contract Drawings.

This work shall be performed at the Contractor's cost by a registered surveyor.

Table 1: Required Embankment Properties

Item	Required % Standard Proctor (ASTM D698) ²	Required Moisture Content ³	Maximum Lift Thickness (Compacted) (inches)
Embankment Beneath Structures and Roads ¹	100	+/- 2% of Optimum (std. Proctor)	8
Embankment	95	As Required for Compaction	8
Backfill Around Structures	95		8
Backfill in Pipe Trenches	95		6
Unclassified Fill	N/A	N/A	N/A

Notes:

1. Embankment beneath structures shall be considered to include a zone 10 feet out from the foundation of the structure extending down to the natural ground on a 45° slope. Embankment beneath roads shall be considered to include all embankment placed within 3 vertical feet of the final wearing surface and shall also include shoulders.
2. Determine field density using ASTM D 6938, ASTM D 1556, ASTM D 2167, or ASTM D 2937.
3. Determine field moisture content using ASTM D 6938, ASTM D 2216, ASTM D 4643, or ASTM D 4959.
4. The Engineer may allow exceptions to the above criteria for areas outside of the containment area which are not subject to significant long-term loads.

END OF SECTION

SECTION 02250

GEOLOGIC BUFFER

Geologic Buffer: The Geologic Buffer(s) serves as a hydraulic containment barrier in the base liner.

A. Description

1. General:

- a. The Contractor shall furnish all labor, material, and equipment to complete installation of the Geologic Buffer including borrowing, hauling, screening, mixing, stockpiling, discing, compacting, drying or wetting, removal of surface water, removal of all previously placed material affected by adverse weather conditions or construction disturbance, final grading and sealing, and all necessary and incidental items as detailed or required to complete the Geologic Buffer, all in accordance with the Contract Drawings and these Specifications.
- b. The Contractor shall provide suitable soil from an on-site borrow site that meets all requirements outlined in these Specifications for Geologic Buffer.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
CQA Manual	Attached

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these Specifications.

ASTM D 698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³).
ASTM D 1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
ASTM D 2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

ASTM D 2488	Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
ASTM D 2937	Standard Test Method for Density of Soil in Place by the Drive Cylinder Method.
ASTM D 4318	Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by the Microwave Oven Method.
ASTM D 4959	Standard Test Method for Determination of Water (Moisture) Content of Soil by Direct Heating Method.
ASTM D 5084	Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
ASTM D 6913	Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
ASTM D 6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
ASTM D 7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis.

4. Quality Assurance:

Quality Assurance during placement of Geologic Buffer will be provided by the Owner as described in the accompanying Project CQA Manual.

B. Materials

All material for Geologic Buffer shall conform to the requirements shown in Table 1 of this section.

C. Submittals

The Contractor shall submit the following to the CQA Engineer:

1. Before approval is given to proceed with test fill construction, the Contractor shall submit descriptive information on compaction equipment to be used for construction of the Geologic Buffer.
2. Survey Results:

Survey results for Geologic Buffer subgrade shall be submitted for review prior to placement of Geologic Buffer. After completion of a segment of Geologic Buffer, survey results shall be submitted for review prior to placement of overlying layers.

D. Construction

1. General:

- a. All placement and compaction of Geologic Buffer shall be performed only when the CQA Engineer is informed by the Contractor of intent to perform such work.
- b. The Contractor shall place and compact the Geologic Buffer to the lines and grades shown on the Contract Drawings with the exception that a 0.15 foot overbuild at the Contractor's expense is allowed. Thickness requirements are minimum values. The Contractor will perform all surveys necessary to establish and verify lines and grades for all Geologic Buffer.

2. Test Fill Construction:

The Contractor shall construct a test fill prior to construction of Geologic Buffer. The test fill shall be at least 20 feet wide by 50 feet long and shall be compacted in lifts to the full design thickness. The Contractor shall use materials and equipment for test fill construction that the Contractor intends to use during construction.

No Geologic Buffer construction may be performed until the test fill construction is confirmed to be adequate in accordance with the Project CQA Manual.

The Contractor shall amend construction techniques or equipment to meet all criteria outlined for Geologic Buffer in these Specifications at no cost to the Owner.

3. Subgrade Preparation:

- a. The CQA Engineer shall inspect the exposed subgrade prior to placement of Geologic Buffer to assure that all rocks, topsoil, vegetation, roots, debris, or other deleterious materials have been removed.
- b. Prior to placement of Geologic Buffer, the exposed subgrade shall be proof-rolled using a static smooth-drum roller, loaded tandem axle dump truck, or other suitable equipment in the presence of the CQA Engineer. Any soft or unsuitable subgrade materials revealed before or during the in-place compaction shall be removed as directed by the CQA Engineer and replaced with suitable materials.

6. Placement and Compaction:

- a. All Geologic Buffer shall be placed in loose lifts no greater than the height of the feet on compaction equipment to be used. The loose Geologic Buffer shall be free from clods or rocks which exceed the sizes in Table 1. Where excessive sized clods do occur, the Contractor shall break up the clods using methods approved by the CQA Engineer.

- b. Lift compaction shall be performed with an appropriately heavy, properly ballasted, penetrating-foot compactor. Compaction equipment shall be the same as used in the test fill, unless otherwise approved by the Engineer.

Each lift shall be compacted prior to placement of succeeding lifts. The maximum lift thickness shall be as shown in Table 2. In confined areas, mechanical equipment, suitable for small areas and capable of achieving the density requirements, shall be required.

- c. The exposed surface of Geologic Buffer shall be protected from adverse weather conditions or desiccation of the soil. This is commonly done by rolling the surface of the Geologic Buffer with a smooth-drum roller at the end of each work day. Alternative means of protecting the Geologic Buffer may be employed by the Contractor.
- d. The in-place Geologic Buffer shall conform to the requirements shown in Table 2 of this section. If Geologic Buffer does not meet the specified requirements, the Contractor shall rework the material, as may be necessary and continue compaction to achieve these requirements, or remove and replace the material to achieve the specified requirements, at Contractor's expense.
- e. Any Geologic Buffer surface which is smooth, has a moisture content outside of the specified moisture content range, as defined by ASTM D 698, or exhibits evidence of desiccation cracking $\frac{1}{2}$ inch deep or greater, shall be scarified to a depth of 1 to 3 inches and brought to a proper moisture content prior to placement of a subsequent lift. This includes any Geologic Buffer surface that was previously seal rolled for protection.
- f. No Geologic Buffer shall be placed or compacted when soil temperatures are so low as to produce ice lenses in the Geologic Buffer borrow soil.
- g. Geologic Buffer placed on side slopes shall be placed and compacted in lifts which are parallel to the slope. Lift criteria shall be as described herein.
- h. The Contractor shall maintain the surface of the Geologic Buffer, including removal of accumulated surface water runoff, until construction is complete.
- i. Surfaces not properly maintained shall be repaired by the Contractor at no cost to the Owner. A suitable surface for geosynthetics construction shall be a surface maintained at the specified compaction and moisture content criteria provided in these Specifications.
- j. Locations of control stakes, in-place density tests, or other samples in the Geologic Buffer shall be patched with compacted Geologic Buffer or sodium bentonite compacted and hydrated in the holes.

7. Surveying:

- a. Before placement of a segment of Geologic Buffer, the Geologic Buffer subgrade shall be surveyed on 50-foot centers and at slope breaks (including all tops and toes of slope, points of grade change, etc.) to ensure the top of the Geologic Buffer subgrade slopes at grades specified on the Contract Drawings.
- b. After completion of a segment of Geologic Buffer, but before installation of subsequent layers, the Geologic Buffer shall be surveyed on 50-foot centers and at slope breaks to ensure:
 - (1) The specified thickness has been achieved.
 - (2) The top of the Geologic Buffer slopes at grades specified on the Contract Drawings; and
 - (3) Geologic Buffer placed more than 0.20 feet beyond the limits of the lines and grades as shown on the Contract Drawings will not be accepted and must be removed at the Contractor's expense if required by the Engineer.

This work shall be performed at the Contractor's cost by a registered surveyor.

Table 1: Geologic Buffer Material Requirements

Property	Test Method	Value
Visual Classification	ASTM D 2488	Clean natural fine-grained soil free from organics, debris, or other detrimental material. Soil type as required to achieve the hydraulic conductivity criteria.
Clod Size	-----	Maximum = ¾ inch (or less if required to achieve hydraulic conductivity criteria)
Gradation	ASTM D 6913	Max. = 1½ inches
Atterberg Limits	ASTM D 4318	As required based on soil type.
Hydraulic Conductivity (Lab Remolded):	ASTM D 5084 ³	≤ 1 x 10 ⁻⁶ cm/s at a density of ≥ 95% maximum standard dry density and a moisture content ≥ optimum moisture content ⁴

Table 2: In-Place Geologic Buffer Requirements

Property	Test Method	Value
Density	ASTM D 6938 ¹	≥ 95% maximum standard dry density ⁴
Moisture Content	ASTM D 6938 ²	≥ optimum moisture content ⁴
Maximum Lift Thickness (Compacted):	-----	9 inches
Hydraulic Conductivity (Shelby Tube):	ASTM D 5084 ³	(See Tables 3 and 4)

Notes:

1. Optionally use ASTM D 1556, ASTM D 2167, or ASTM D 2937.
2. Optionally use ASTM D 2216, ASTM D 4643, or ASTM D 4959.
3. Maximum effective confining pressure and maximum hydraulic gradient as follows.
Backpressure as recommended by ASTM D 5084. Modifications of the maximum hydraulic gradient may be allowed by the Engineer depending on actual hydraulic conductivity values.
4. Or as otherwise determined by remolded samples to achieve hydraulic conductivity criteria.

Table 3. In-Place Geologic Buffer Hydraulic Conductivity and Thicknesses

Placement Area	Hydraulic Conductivity	Completed Thickness
Geologic Buffer in Phase 5	≤ 1 x 10 ⁻⁶ cm/s	60 inches
Geologic Buffer in Sediment Basin 5	≤ 1 x 10 ⁻⁶ cm/s	18 inches
Fire Debris Cover Soil	≤ 1 x 10 ⁻⁵ cm/s	18 inches

Table 4. Hydraulic Conductivity Testing Confining Pressure and Gradient

Material	Maximum Effective Confining Pressure (psi)	Maximum Hydraulic Gradient
Compacted Geologic Buffer (all types)	10	15

END OF SECTION

SECTION 02270

EROSION AND SEDIMENTATION CONTROL

Erosion and Sedimentation Control: Erosion and Sedimentation Control is a system of construction and engineered measures (devices, structures, practices, etc.) which act to minimize surface water induced erosion of disturbed areas and the resulting off-site sedimentation.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete installation of and maintain Erosion and Sedimentation Control measures and related work in accordance with the Contract Drawings and these Specifications.

All Erosion and Sedimentation Control work shall be in accordance with the latest edition of the Tennessee Erosion and Sediment Control Handbook as well as applicable regulations.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Geotextiles	02240
Rip Rap	02271
Rolled Erosion Control Products	02275
Precast Concrete Structures	02608
Stormwater Systems	02720
Revegetation	02930

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these specifications.

ASTM D 3786	Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method.
ASTM D 4355	Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
ASTM D 4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

ASTM D 4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
ASTM D 4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile.
ASTM D 4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

B. Materials

1. Permanent Sediment or Detention Basins:

Permanent sediment or detention basins shall be constructed as shown on the Contract Drawings.

2. Permanent Drainage Channels, Diversions, Swales, and Ditches:

Permanent drainage channels, diversions, swales, and ditches shall be constructed as shown on the Contract Drawings.

3. Silt Fence:

Silt fences shall be constructed as shown on the Contract Drawings and as needed, based on the Contractor's discretion and Engineer's approval. The silt fence is a permeable barrier erected within and downgradient of small disturbed areas to capture sediment from sheet flow. It is made of filter fabric buried at the bottom, stretched, and supported by posts and wire mesh backing. Silt fence shall conform to the following properties:

- a. Posts: Posts shall be 1.33 lb/linear foot steel (preferred) or wood with a minimum length of 5 feet. Steel posts shall be "U" or "T"-type. Wood posts shall have a minimum diameter of 4-inches.
- b. Filter Fabric: Filter fabric shall be a woven geotextile made specifically for sediment control. Filter fabric shall conform to the properties listed in Table 1 of this section.

4. Stone Filter Fence:

Stone filter fence shall be constructed as shown on the Contract Drawings.

5. Geotextiles:

Geotextiles shall conform to the requirements of Section 02240, Geotextiles, of these Specifications.

6. Stone Check Dams:

Stone check dams shall be constructed as shown on the Contract Drawings.

7. Temporary Fill Diversions and Slope Drains:

Temporary fill diversions and slope drains shall be constructed as shown on the Contract Drawings.

8. Rip Rap:

Rip Rap shall conform to the requirements of Section 02271, Rip Rap, of these Specifications.

9. Rolled Erosion Control Products (RECPs):

Rolled Erosion Control Products (RECPs) shall conform to the requirements of Section 02275, Rolled Erosion Control Products, of these Specifications.

10. Other Work:

In addition to the Erosion and Sedimentation Control measures shown on the Contract Drawings, the Contractor shall provide adequate means to prevent any sediment from entering any storm drains, drop inlets, ditches, streams, or bodies of water downstream of any area disturbed by construction. Excavation materials shall be placed upstream of any trench or other excavation to prevent sedimentation of off-site areas. In areas where a natural buffer area exists between the work area and the closest stream or water course, this area shall not be disturbed. All paved areas shall be scraped and swept as necessary to prevent the accumulation of dirt and debris. Work associated with this provision shall be considered incidental to the project and no separate payment will be made.

11. Temporary and Permanent Soil Stabilization:

The Contractor shall provide temporary or permanent ground cover (or other acceptable measure(s)) adequate to restrain erosion on erodible slopes or other areas within 21 calendar days following completion of any phase of grading. The Contractor shall provide permanent ground cover for all disturbed areas within 15 working days or 90 calendar days (whichever is shorter) following the completion of construction.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. Submit a certification and summary of all required test results, prior to installation, that all Erosion and Sedimentation Control materials manufactured for the project have been produced in accordance with these Specifications.
2. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into construction.

D. Construction

1. Establishment of Erosion and Sedimentation Control Measures:
 - a. All Erosion and Sedimentation Control measures will be constructed according to the Contract Drawings and these Specifications.
 - b. Due to the nature of the work required by this Contract, it is anticipated that the location and nature of the Erosion and Sedimentation Control measures may need to be adjusted to reflect the current phase of construction.
 - c. Erosion and Sedimentation Control measures shall be established prior to the work in a given area. Where such practice is not feasible, the Erosion and Sedimentation Control measure(s) shall be established immediately following completion of the clearing operation.
 - d. The construction schedule adopted by the Contractor will impact the placement and need for specific measures required for the control of erosion. The Contractor shall develop and implement such additional techniques as may be required to minimize erosion and prevent or correct the discharge of sediment outside the limits of construction (unless controlled by other on-site measure(s)).
 - e. The location and extent of Erosion and Sedimentation Control measures shall be revised at each phase of construction that results in a change in either the quantity or direction of surface runoff from construction areas. All deviations from the control provisions shown on the Contract Drawings shall have the prior approval of the Engineer.
2. Inspection and Maintenance of Erosion and Sedimentation Control Measures:
 - a. The Contractor shall furnish the labor, material, and equipment required for the inspection and maintenance of all Erosion and Sedimentation Control measures. Maintenance shall be scheduled as required for a particular measure to maintain the removal efficiency and intent of the measure.
 - b. All Erosion and Sedimentation Control measures shall be inspected at least once every seven calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period and appropriate maintenance conducted. A rain gauge shall be maintained on the site and a record of the rainfall amounts and dates shall be kept properly.
 - c. Maintenance shall include, but not be limited to:
 - (1) The removal and satisfactory disposal of trapped or deposited sediments from basins, traps, barriers, filters, and/or drainage features/devices;
 - (2) Replacement of filter fabrics used for silt fences upon loss of efficiency; and

- (3) Replacement of any other components which are damaged or cannot serve the intended use.
 - d. The Contractor shall accept and maintain any existing sediments that are included in existing sediment basins and traps that accept or will accept stormwater flow and or sediment accumulation from all areas within the Contractor's limits of construction. All of these sediment basins and/or traps shall be cleaned of sediments accumulated during the performance of this project.
 - e. Sediments removed from Erosion and Sedimentation Control measures shall be disposed of in locations that will not result in off-site sedimentation as approved by the Engineer.
 - f. All Erosion and Sedimentation Control measures shall be maintained to the satisfaction of the Engineer until the site has been stabilized.
3. Graded Slopes and Fills:
- The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetated cover or other adequate measures.
4. Finish Grading:
- All disturbed areas shall be uniformly graded to the lines, grades, and elevations shown on the Contract Drawings. Except for certain erosion and sedimentation control measures and other areas designated to impound water, all areas shall be graded to drain. Finished surfaces shall be reasonably smooth, compacted, and free from irregular surface changes. Unless otherwise specified, the degree of finish shall be that ordinarily obtainable from either blade or scraper operations. Areas shall be finished to a smoothness suitable for application of topsoil.
5. Revegetation:
- Revegetation shall conform to the requirements of Section 02930, Revegetation, of these Specifications.
6. Cleanup:
- a. The Contractor shall remove from the site all debris from their work including, but not limited to, branches, paper, and rubbish in all landscape areas, and remove temporary barricades as the work proceeds.
 - b. All areas shall be kept in a neat, orderly condition at all times. Prior to final acceptance, the Contractor shall clean up the entire landscaped area to the satisfaction of the Engineer.

Table 1: Required Silt Fence Filter Fabric Properties

Property	Test Method	Units	Value¹
Grab Tensile Strength ²	ASTM D 4632	lbs	90 x 90
Grab Elongation	ASTM D 4632	%	20 (Max.)
Ultraviolet Resistance (500 hrs)	ASTM D 4355	%	80
Apparent Opening Size (AOS)	ASTM D 4751	U.S. Sieve	30+
Permittivity	ASTM D 4491	sec ⁻¹	0.05

Notes:

1. Minimum Average Roll Value (MARV).
2. Values for machine and cross machine direction (MD x XD), respectively.

END OF SECTION

SECTION 02271

RIP RAP

Rip Rap: This section includes all rip rap aprons and channel protection.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete installation of Rip Rap for protection of earthen slopes against erosion as indicated, including all necessary and incidental items, in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Geotextiles	02240
Erosion and Sedimentation Control	02270

3. Reference Standards:

The latest revision of the following standards of the Tennessee Department of Transportation (TDOT) are hereby made a part of these Specifications.

TDOT Standard Specifications for Road and Bridge Construction

B. Materials

1. Rip Rap: Rip Rap shall be of the size indicated on the Contract Drawings and shall conform to TDOT Section 709, Rip Rap and Slope Pavement.

2. Geotextiles: Geotextiles shall conform to the requirements outlined in Section 02240, Geotextiles, of these Specifications.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. Submit a certification and summary of all required test results prior to installation, that all Rip Rap has been produced in accordance with these Specifications.

2. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into construction.

D. Construction

1. Surface Preparation:

- a. Trim and dress all areas to conform to the Contract Drawings as indicated with tolerance of 2 inches from theoretical slope lines and grades.
- b. Bring areas that are below allowable minimum tolerance limit to grade by filling with compacted Embankment material similar to adjacent material.
- c. Geotextiles shall be placed as shown on the Contract Drawings and in accordance with Section 02240, Geotextiles, of these Specifications.
- d. Do not place any stone material on the prepared surface prior to inspection and approval to proceed from the Engineer.

2. Placing Rip Rap:

Rip Rap shall be placed in accordance with TDOT Section 709, Rip Rap and Slope Pavement.

END OF SECTION

SECTION 02275

ROLLED EROSION CONTROL PRODUCTS

Rolled Erosion Control Products: Rolled Erosion Control Products (RECPs) include erosion control blankets (ECB) placed in channels and on slopes.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete installation of all RECPs in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Erosion and Sedimentation Control	02270
Revegetation	02930

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these specifications.

ASTM D 4355	Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).
ASTM D 6475	Standard Test Method for Measuring Mass per Unit Area of Erosion Control Blankets.
ASTM D 6524	Standard Test Method for Measuring the Resiliency of Turf Reinforcement Mats.
ASTM D 6525	Standard Test Method for Measuring Nominal Thickness of Permanent Erosion Control Products.
ASTM D 6566	Standard Test Method for Measuring Mass per Unit Area of Turf Reinforcement Mats.
ASTM D 6818	Standard Test Method for Ultimate Tensile Properties of Turf Reinforcement Mats.

B. Materials

1. General:

The materials supplied under these Specifications shall consist of new, first-quality products designed and manufactured specifically for the purpose of this work, which shall have been satisfactorily demonstrated, by prior use, to be suitable and durable for such purposes.

Labels on each RECP shall identify the length, width, product name, and name of Manufacturer.

2. Erosion Control Blanket (ECB) (Single Net):

ECB (single net) shall consist of a machine-produced mat of straw or wood excelsior fiber covered on the top side with a photodegradable extruded plastic or woven biodegradable netting and sewn together with degradable thread. ECB (single net) shall also conform to the properties listed in Table 1 of this section. ECB (single net) shall be EroNet S75, as manufactured by North American Green, CURLEX I, as manufactured by American Excelsior Company, LANDLOK S1, as manufactured by Propex GeoSolutions, or approved equal.

3. Anchors: Anchors for RECPs shall consist of machine made staples of No. 8 gauge new steel wire formed into a "U" shape. The size when formed shall be not less than 8 inches in length with a throat of not less than 1 inch in width. Longer anchors may be required for loose soils. Other anchors, such as metal pins or plastic pegs, may also be used if approved in advance by the Engineer.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. Mill Certificate and Sample: Prior to shipping to the site, the Contractor shall submit a mill certificate or affidavit signed by a legally authorized official of the Manufacturer for each RECP attesting that each RECP meets the physical and manufacturing requirements stated in these Specifications. The Contractor shall also submit a sample of each RECP to be used. The sample shall be labeled with the product name and be accompanied by the Manufacturer's specifications.
2. Installation Guidelines/Instructions: The Manufacturer's guidelines/instructions for installation shall be submitted for review.
3. Furnish copies of delivery tickets or other approved receipts as evidence for materials received that will be incorporated into the construction.

D. Construction

1. Shipping, Handling, and Storage:

All RECPs shall be shipped, handled, and stored in strict accordance with the Manufacturer's recommendations.

2. Installation - General:

- a. Placing of RECPs shall be done immediately following seeding. Seeding shall be performed in accordance with Section 02930, Revegetation, of these Specifications.
- b. RECPs shall be placed to the lines and grades shown on the Contract Drawings. The earth surface shall be smooth and free from stones, clods, or debris which will prevent the contact of the RECP with the soil. Care shall be taken to preserve the required line, grade, and cross section of the area.
- c. RECPs shall be unrolled in the direction of the flow of water and shall be applied without stretching so that it will lie smoothly but loosely on the soil surface.
- d. At the time of installation, RECPs shall be rejected, if they have defects, rips, holes, flaws, evidence of deterioration, or other damage.
- e. The Engineer may require adjustments in the installation requirements to fit individual conditions.

3. Installation - Channels:

RECPs installed in channels shall be unrolled parallel to the direction of water flow. The first roll shall be centered longitudinally in the channel and anchored with staples. Subsequent rolls shall be installed outward to the edges of the channel and be lapped to allow installation of a common row of anchors. RECP ends shall be overlapped with the upstream ends on top ("shingled"). Refer to the Contract Drawings and/or the Manufacturer's installation guidelines/instructions for installation details.

4. Installation - Slopes:

RECPs installed on slopes shall be oriented in vertical strips and anchored. Subsequent rolls shall be installed outward to the edge(s) of the original roll and be lapped to allow installation of a common row of anchors. RECP ends shall be shingled. Refer to the Contract Drawings and/or the Manufacturer's installation guidelines/instructions for installation details.

5. Maintenance:

Maintenance of RECPs shall be in accordance with Section 02270, Erosion and Sedimentation Control, of these Specifications.

Table 1: Required Rolled Erosion Control Product Properties

Property	Test Method	Units	Value ¹
Erosion Control Blanket (ECB) (Single Net)			
Mass per Unit Area	ASTM D 6475	lbs/yd ²	0.5 ± 10% (Straw) 0.7 ± 10% (Excelsior)
Tensile Strength ²	ASTM D 6818	lbs/ft	50 x 65
Tensile Elongation	ASTM D 6818	%	20
Maximum Permissible Shear Stress (Un-Vegetated)	-----	lbs/ft ²	1.55
Functional Longevity	-----	months	12

Notes:

1. Typical for ECB.
2. Values for machine and cross machine direction (MD x XD), respectively.

END OF SECTION

SECTION 02500

ROADWAY WORK

Roadway Work: ABC shall be constructed in accordance with TDOT Section 303.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment required to complete construction of all Roadway Work including gravel roads in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
Geotextiles	02240

3. Reference Standards:

The latest revision of the following standards of the Tennessee Department of Transportation (TDOT) are hereby made a part of these Specifications:

TDOT Standard Specifications for Road and Bridge Construction

B. Materials

1. Geotextiles:

Geotextiles shall conform to the requirements outlined in Section 02240, Geotextiles, of these Specifications.

2. Aggregate Base Course (ABC):

All materials and placement associated with ABC shall be in accordance with TDOT Section 303, Mineral Aggregate Base, and Section 903.05, Aggregate for Mineral Aggregate Base and Surface Courses. For this project, Class A (Grading C or D) aggregate shall be used.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. Submit a certification and summary of all required test results, prior to installation, that all materials for Roadway Work have been produced in accordance with these Specifications.
2. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into construction.
3. Submit copies of all quality control test results demonstrating compliance with project criteria.

D. Construction

1. General:

All Roadway Work including the replacement of portions of the existing roads shall be to the limits, grades, thicknesses, and types as shown on the Contract Drawings. Patches for pipe crossings and areas damaged during the construction work shall be asphalt or gravel, depending upon the material encountered, unless otherwise indicated.

2. Earthwork:

The earthwork for all Roadway Work shall be completed in accordance with Section 02222, Excavation, and Section 02223, Embankment, of these Specifications and as shown on the Contract Drawings.

3. Geotextiles:

Geotextiles shall be placed as shown on the Contract Drawings and in accordance with Section 02240, Geotextiles, of these Specifications. If overlapped seams are used, overlaps shall be a minimum of 12 inches.

4. Aggregate Base Course:

ABC shall be constructed in accordance with TDOT Section 303.

END OF SECTION

SECTION 02608

PRECAST CONCRETE STRUCTURES

Precast Concrete Structures: Precast Concrete Structures are used in the stormwater systems.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete installation of Precast Concrete Structures in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
Erosion and Sedimentation Control	02270
Stormwater Systems	02720

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM) are hereby made a part of these Specifications.

ASTM A 615	Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
ASTM C 443	Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
ASTM C 478	Standard Specification for Precast Reinforced Concrete Manhole Sections.
ASTM C 497	Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
ASTM C 990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
ASTM C 1433	Standard Specification for Precast Reinforced Concrete Box Sections for Culverts, Storm Drains, and Sewers.

B. Materials

1. Precast Concrete Boxes: All precast concrete boxes shall be constructed from non-shrink, 4,000 psi compressive strength concrete in conformance with ASTM C 1433 and as detailed on the Contract Drawings.
2. Joints: All joints shall be sealed with preformed plastic gaskets in conformance with ASTM C 990 or rubber gaskets in conformance with ASTM C 443.
3. Steps: All steps shall be constructed of 0.5 inch reinforcing rod completely encased in corrosion-resistant rubber or plastic. The upper surfaces of each step shall have a traction tread of self cleaning rubber cleats and guide lugs on both sides to prevent slippage.
4. Frames and Covers: Frames and covers shall consist of cast iron frames and covers (Vulcan Foundry, or equal) equipped with steel handles and shall be of the opening size as indicated on the Contract Drawings. Markings on the covers shall indicate the intended use of the structure and shall be acceptable to the Owner.
5. Markings: All Precast Concrete Structures shall include markings clearly identifying the date of manufacture, the name of the manufacturer, and any other pertinent information.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. The Contractor shall submit shop drawings for Precast Concrete Structures for approval at least 4 weeks prior to construction. Shop drawings shall show complete design, installation, and construction information in such detail as to enable the Engineer to determine the adequacy of the proposed units for the intended purpose. Details of steel reinforcement size and placement shall be included. The shop drawings shall include a schedule which will list the size and type of precast structure at each location where the precast structures are to be used.
2. Submit a certification and summary of all required test results, prior to installation, that all Precast Concrete Structures have been produced in accordance with these Specifications.

D. Construction

1. The Precast Concrete Structures shall be installed at the locations and to the elevations indicated on the Contract Drawings. The Contractor shall give the CQA Engineer sufficient notice so they may observe the field location and installation activities.
2. The Precast Concrete Structures will be bedded and backfilled as indicated on the Contract Drawings.
3. Precast Concrete Structures which are damaged or become damaged will be rejected or shall be repaired in a manner approved by the Engineer at the Contractor's sole expense.

END OF SECTION

SECTION 02720

STORMWATER SYSTEMS

Stormwater Systems: Stormwater Systems shall include all piping, pipe fittings, headwalls, flared end sections, drop inlets, manholes, and other appurtenances designated to convey stormwater.

A. Description

1. General:

The contractor shall furnish all labor, material, and equipment to complete installation of Stormwater Systems in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
Erosion and Sedimentation Control	02270
Rip Rap	02271
Precast Concrete Structures	02608

3. Reference Standards:

The latest revision of the following standards of the American Society of Testing and Materials (ASTM), the American Association of State Highway and Transportation Officials (AASHTO), and the Tennessee Department of Transportation (TDOT) are hereby made a part of these specifications.

ASTM C 76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
ASTM C 150	Standard Specification for Portland Cement.
ASTM D 1248	Standard Specification for Polyethylene Plastics Molding and Extrusion Materials For Wire and Cable.
ASTM D 2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
ASTM D 3350	Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
AASHTO M 36	Specification for Corrugated Steel Pipe.

AASHTO M 252	Specification for Corrugated Polyethylene Drainage Tubing, 3 to 10 Inch Diameter.
AASHTO M 294	Specification for Corrugated Polyethylene Pipe, 12 to 36 Inch Diameter.
TDOT	Standard Specifications for Roads and Bridge Construction

B. Materials

1. Reinforced Concrete Pipe (RCP):

- a. All reinforced concrete pipe shall be manufactured in accordance with ASTM C 76, Wall Type B or C, and shall be of the class that equals or exceeds the pipe class as shown on the Contract Drawings. All pipe shall be aged at the manufacturing plant for at least fourteen (14) days before delivery to the job site.
- b. Minimum pipe laying lengths shall be four (4) feet.
- c. Joints for reinforced concrete pipe shall have tongue and groove or bell and spigot ends with leak-resistant mastic joint sealant. Joint sealant shall be ConSeal type, or approved equal.

2. Flared End Sections:

Flared end sections shall be reinforced and shall be fabricated from the same materials meeting the same requirements as the pipe to which they are connected. All reinforced concrete and corrugated metal flared end sections shall meet the requirements of the TDOT. Corrugated polyethylene flared end sections shall be as recommended by the pipe manufacturer.

3. Precast Concrete Structures:

Precast Concrete Structures shall be constructed as shown in the Contract Drawings and in accordance with Section 02608, Precast Concrete Structures, of these Specifications.

C. Submittals

The Contractor shall submit the following to the CQA Engineer:

1. Submit a certification and summary of all required test results, prior to installation, that all Stormwater Systems have been produced in accordance with these Specifications.
2. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into construction.

D. Construction

1. All piping shall be installed by skilled workmen and in accordance with the best standards for piping installation. Proper tools and appliances for the safe and convenient handling and installation of the pipe and fittings shall be used.
2. All pieces shall be carefully examined for defects, and no piece shall be installed which is known to be defective. If any defective piece should be discovered after having been installed, it shall be removed and replaced at the Contractor's expense.
3. Prior to installation, the Contractor is responsible for checking the fit of design elevations for Stormwater Systems with existing conditions (i.e. conflicts with other structures, fit within existing drainage channels/features, ability to have minimum cover, etc.). The Contractor shall notify the Engineer of any conflicts and/or necessary field adjustments prior to installation for resolution or concurrence.
4. Excavation and backfilling of pipe trenches shall be as described in Section 02222, Excavation and Section 02223, Embankment, respectively, of these Specifications.
5. Following proper preparation of the trench subgrade, pipe and fittings shall be carefully lowered into the trench so as to prevent dirt and other foreign substances from gaining entrance into the pipe and fittings. Proper facilities shall be provided for lowering sections of pipe into trenches. No materials shall be dropped or dumped into the trench.
6. Water shall be kept out of the trench until jointing and backfilling are completed. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no water, earth, or other substance will enter the pipes, fittings, or valves. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored as required.
7. All Stormwater Systems shall be installed to accurate lines and grades with no abrupt changes in line or grade.
8. The full length of each section of pipe shall rest solidly upon the bed of the trench, with recesses excavated to accommodate bells, couplings, joints, and fittings. Before joints are made, each pipe shall be well bedded on a solid foundation. No pipe shall be brought into position until the preceding length has been thoroughly bedded and secured in place. Pipe that has the grade or joint disturbed after laying shall be taken up and re-laid by the Contractor at their own expense.
9. The laying of reinforced concrete pipe shall conform to the current recommendations of the American Concrete Pipe Association for Installation Type 1 or 2.

END OF SECTION

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SECTION 02782

GEOSYNTHETIC RAIN COVER

Geosynthetic Rain Cover (GRC): The Geosynthetic Rain Cover serves to minimize infiltration of precipitation within inactive portions of the landfill into the underlying leachate collection system. It is of great importance that the GRC be free from defects and installed free from damage.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to install GRC including all necessary and incidental items as detailed or required to complete the installation in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Geologic Buffer	02250

3. Reference Standards:

The latest revision of the following standards of the Geosynthetic Research Institute (GRI) are hereby made a part of these Specifications.

GRI GM22	Standard Specification for Test Methods, Required Properties, and Testing Frequencies for Scrim Reinforced Polyethylene Geomembranes Used in Exposed Temporary Applications.
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4. Quality Assurance:

Quality Assurance during installation of GRC will be provided by the Owner,

5. Manufacturers Qualifications:

The Manufacturer shall have previously demonstrated their ability to produce the required GRC by having successfully manufactured a minimum of 5,000,000 ft² of GRC (or similar material) for hydraulic containment purposes.

6. Installer Qualifications:

The GRC Installer shall have installed a minimum of 500,000 ft² of GRC (or similar material) in similar landfill installations.

7. Warranties:

- a. General: Should a defect occur, which is covered under warranty, the Warrantor shall bear all costs for repair and/or relocation and replacement of the GRC.
- b. Material Performance: The Contractor shall furnish the Owner a warranty from the Installer of the GRC which warrants the material performance on a non-prorata basis for one (1) year after the final acceptance of the Work. This warranty shall include but not be limited to defects related to workmanship and manufacturing and damage caused by exposure and wind.

B. Materials

1. General:

The materials supplied under these Specifications shall consist of first-quality products designed and manufactured specifically for the purpose of this work, which shall have been satisfactorily demonstrated, by prior use, to be suitable and durable for such purposes.

The GRC shall be supplied in panels which shall be of maximum size to provide the largest manageable sheet for the fewest seams. Labels on the panels shall identify the thickness, length, width, lot and panel numbers, and name of Manufacturer.

2. GRC Materials:

- a. GRC shall be manufactured to meet the following requirements:

- (1) GRC shall be a reinforced geomembrane composed of a polyethylene, polypropylene, or polyvinyl chloride (PVC) based material, or a woven coated polyethylene material. Properties of GRC shall meet or exceed the requirements of GRI GM22 (Category 1 – Severe — 20 mil nominal) or shall be an approved GRC as listed below.
- (2) GRC shall be impermeable and capable of repelling water with no absorption.

- b. Approved GRC:

- (1) Dura-Skrim R20BV as manufactured by Raven Industries of Sioux Falls, SD.
- (2) Approved equal material.

3. Seaming Materials:

Materials used for seaming GRC (if used) shall be as recommended by the Manufacturer and approved by the Engineer.

4. Ballast System:

The Contractor place Wind Defender as manufactured by Wind Defender, LLC, or approved equal, to ballast the GFC. Wind Defender shall be installed following the Manufacturer's recommendations and as approved by the Engineer.

The Contractor shall also locate and/or tie ballast such that ballast is not displaced by the flow of stormwater.

C. Submittals

The Contractor shall submit the following to the CQA Engineer:

1. Pre-Installation Requirements:

Prior to GRC installation the Contractor shall submit the following:

- a. Mill Certificate and Sample: Prior to shipping to the site, the Contractor shall submit a mill certificate or affidavit signed by a legally authorized official of the Manufacturer for the GRC attesting that the GRC meets the physical and manufacturing requirements stated in these Specifications. The Contractor shall also submit a sample of the GRC to be used. The sample shall be labeled with the product name and be accompanied by the Manufacturer's specifications.
- b. Shipping, Handling, and Storage Instructions: The Manufacturer's plan for shipping, handling, and storage shall be submitted for review.
- c. Installation Procedures: Submit installation procedures for carrying out the work. Installation procedures to be addressed shall include but not be limited to material installation, repair, and protection to be provided in the event of rain or strong winds. With regard to protection, the Contractor shall provide a plan of anchoring the GRC sufficient to satisfy the Contractor's Performance Warranty. At a minimum, this plan shall meet the criteria described in Paragraph B.4 above and shall indicate the selected spacing and weight of the ballast to be used. This plan shall be approved by the Engineer prior to construction.
- d. Furnish copies of the delivery tickets or other approved receipts as evidence for materials received that will be incorporated into the construction.

2. Post-Installation Requirements:

Upon completion of the GRC installation, the Contractor shall submit the following:

- a. Completed material performance warranty.

Finalization of payment for GRC installation shall not be made until the above submittals have been reviewed by the CQA Engineer.

D. Construction

1. Shipping, Handling, and Storage:

The GRC shall be shipped, handled, and stored in strict accordance with the Manufacturer's recommendations.

2. Subgrade Preparation:

The surface of the subgrade shall be smooth, uniform, free from sudden changes in grade (such as vehicular ruts), rocks or stones greater than 1/2 inch in maximum size (except for gravel columns), debris, and deleterious materials. During actual placing and seaming of the GRC, the subgrade shall be kept free of all standing water. If the subgrade below the GRC becomes excessively wet and unstable, as determined by the CQA Engineer it shall be dried and recompact, and replaced if needed.

3. GRC Placement:

a. Weather Conditions:

GRC placement shall not proceed at an ambient temperature below 32° F or above 100° F unless otherwise authorized, in writing, by the Engineer. GRC placement shall not be performed during precipitation, excessive moisture, in an area of ponded water, or in excessive winds. Any portion of GRC or subgrade damaged due to weather conditions shall be repaired at the Contractor's cost.

b. Method of Placement:

- (1) Each panel of the GRC shall be installed in accordance with the Manufacturer's recommendations.
- (2) The CQA Engineer shall inspect each panel, after placement and prior to seaming, for damage and/or defects. Defective or damaged panels shall be replaced or repaired, as approved by the CQA Engineer and as described in this section.
- (3) The Installer shall avoid dragging the GRC on rough soil subgrades.
- (4) Personnel working on the GRC shall not smoke, wear damaging shoes, or involve themselves in any activity that may damage the GRC, in the opinion of the CQA Engineer.
- (5) The GRC shall be properly weighted to avoid uplift due to wind.
- (6) Vehicular traffic across the GRC shall not be allowed.
- (7) The GRC shall be kept free of debris, unnecessary tools, and materials. In general, the GRC area shall remain neat in appearance.

4. Field Seams:

- a. Field seams shall be made according to the Manufacturer's recommendations and may include fusion welding, taping, chemical fusion, or other methods as appropriate for the selected material and as approved by the Engineer.
- b. Individual panels of GRC shall be laid out and overlapped by a minimum of 4 inches prior to seaming. The area to be seamed shall be cleaned and prepared in accordance with the Manufacturer's recommendations.
- c. All seams constructed on sloped surfaces shall be vertical seams. Where horizontal seams are required and no other option is available on sloped surfaces, the panels shall be placed such that the "upstream" panel forms the upper panel and overlaps the "downstream" panel in order to minimize infiltration potential.

5. Anchorage:

The Contractor shall anchor the GRC as shown or indicated on the Contract Drawings.

6. Ballasting:

The Contractor shall add ballasting in accordance with the approved plan.

7. Repair Procedures:

- a. Any portion of the GRC exhibiting signs of defect shall be repaired. Several procedures exist for the repair of these areas. The final decision as to the appropriate repair procedure shall be made by the CQA Engineer.
- b. Ballasting, which becomes displaced shall be repositioned.

7. No overlying material shall be placed over the GRC until approved by the CQA Engineer.

END OF SECTION

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SECTION 02930

REVEGETATION

Revegetation: Revegetation includes permanent Revegetation of all site areas disturbed by the Contractor whether inside the Contract Limits or not.

A. Description

1. General:

The Contractor shall furnish all labor, material, and equipment to complete Revegetation in accordance with the Contract Drawings and these Specifications.

2. Related Work:

Related Contract Work is described in the following sections of the Specifications:

<u>Work</u>	<u>Section</u>
Excavation	02222
Embankment	02223
Erosion and Sedimentation Control	02270
Rolled Erosion Control Products	02275

3. Correction Period:

The Contractor shall be responsible for the satisfactory establishment and growth of a permanent stand of vegetation for a period of one year following the final seeding as judged by the Engineer. During this period, the Contractor shall be responsible for the maintenance items described in Paragraph D.4 (Maintenance) of this Specification.

B. Materials

1. Limestone: Unless otherwise defined by specific soil tests, supply agricultural grade ground limestone conforming to the current "Rules, Regulations, and Standards of the Fertilizer Board of Control."

2. Fertilizer: Unless otherwise defined by specific soil tests, supply commercial fertilizer meeting applicable requirements of State and Federal law. Do not use cyanamic compounds of hydrated lime. Deliver fertilizer in original containers labeled with content analysis.

3. Grass Seed: Supply fresh, clean, new-crop seed. Do not use seed which is wet, moldy, or otherwise damaged. Deliver seed in standard sealed containers labeled with producer's name and seed analysis, and in accord with US Department of Agriculture Rules and Regulations under Federal Seed Act.

4. Mulch: Supply clean, seed-free, threshed straw of oats, wheat, barley, rye, beans, or other locally available mulch material.
 - a. Do not use mulch containing a quantity of matured, noxious weed seeds or other species that will be detrimental to seeding, or provide a menace to surrounding land.
 - b. Do not use mulch material which is fresh or excessively brittle, or which is decomposed and will smother or retard growth of grass.
5. Binder: Supply emulsified asphalt or synthetic binder.
6. Water: Supply potable, free of substances harmful to growth.
7. Application rates, seed types, and other requirements shall be in accordance with Table 1 of this section.

C. Submittals

The Contractor shall submit the following to the Engineer:

1. Results of soil tests performed and proposed modifications, if any, to the specified requirements.
2. Certificates for each grass seed mixture, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed. Certify that each container of seed delivered is fully labeled in accordance with Federal Seed Act and equals or exceeds specification requirements.
3. Copies of invoices for fertilizer, showing grade furnished and total quantity applied.

D. Construction

1. The Contractor shall establish a smooth, healthy, uniform, close stand of grass from the specified seed. Prior to Revegetation, the Contractor shall adequately test the soils to be revegetated to ensure the adequacy of the specified requirements. Any modifications to these requirements deemed necessary after the review of soil test results, shall be at the Contractor's sole expense. The Engineer will perform the observations to determine when successful Revegetation is achieved.
2. Soil Preparation:
 - a. Limit preparation to areas which will be planted soon after preparation.
 - b. Loosen surface to minimum depth of four (4) inches.
 - c. Remove stones, sticks, roots, rubbish and other extraneous matter over three (3) inches in any dimension.

- d. Spread lime uniformly over designated areas at the rate specified in Table 1 of this section.
- e. After application of lime, prior to applying fertilizer, loosen areas to be seeded with double disc or other suitable device if soil has become hard or compacted. Correct any surface irregularities in order to prevent pocket or low areas which will allow water to stand.
- f. Distribute fertilizer uniformly over areas to be seeded at the rate specified in Table 1 of this section.
 - (1) Use suitable distributor.
 - (2) Incorporate fertilizer into soil to depth of at least two (2) inches.
 - (3) Remove stones or other substances which will interfere with turf development or subsequent mowing.
- g. Grade seeded areas to smooth, even surface with loose, uniformly fine texture.
 - (1) Roll and rake, remove ridges and fill depressions, as required to meet finish grades.
 - (2) Fine grade just prior to planting.

3. Seeding:

- a. Use approved mechanical power driven drills or seeders, mechanical hand seeders, or other approved equipment.
- b. Distribute seed evenly over entire area at the rate specified in Table 1 of this section.
- c. Stop work when work extends beyond most favorable planting season for species designated, or when satisfactory results cannot be obtained because of drought, high winds, excessive moisture, or other factors.
- d. Resume work only when favorable condition develops, or as directed by the Engineer.
- e. Lightly rake seed into soil followed by light rolling or cultipacking.
- f. Immediately protect seeded areas against erosion by mulching or placing Rolled Erosion Control Products in accordance with Section 02275 of these Specifications, where applicable.
 - (1) Spread mulch in a continuous blanket at the rate specified in Table 1 of this section.

- (2) Immediately following spreading mulch, secure with evenly distributed binder at the rate specified in Table 1 of this section.
- (3) For slopes not steeper than 3H:1V and as an option to using binder to secure mulch, use a mulch anchoring tool operated along the contour of the slope.

4. Maintenance:

The Contractor shall be responsible for maintaining all seeded areas through the end of their warranty period. The Contractor shall provide, at their expense, protection of all seeded areas against damage at all times until acceptance of the work. Maintenance shall include, but not be limited to, the following items:

- a. Regrade and revegetate all eroded areas until adequately stabilized by grass.
- b. 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.
- c. Replant bare areas using same materials specified.

Table 1: Seeding Schedule

Material	Seed Type	Application Rate ¹
Lime	-----	4,000 lbs/acre
Fertilizer	-----	1,000 lbs/acre
Seed Permanent:	Refer to Section PS of TESCH Seasonal Nurse Crop ²	See Note 1 See Note 2
Temporary:	Refer to Section TS of TESCH ²	See Note 2
Mulch	-----	4,000 - 5,000 lbs/acre
Binder	-----	400 gallons/acre

Notes:

- 1. Application rates and/or chemical analysis shall be confirmed or established by a soil test(s).
- 2. Use seasonal nurse crop in accordance with Section TS (Disturbed Area Stabilization With Temporary Vegetation) of the Tennessee Erosion and Sediment Control Handbook.
- 3. From September 1 - March 1, use unscarified Sericea seed.

CONSTRUCTION QUALITY ASSURANCE PLAN

PREPARED FOR:

SEVIER SOLID WASTE INC.



RIDGE ROAD CLASS III LANDFILL

TDSWM PERMIT NUMBER DML-78-0126

REVISED JUNE 2023

PIGEON FORGE, TENNESSEE

PREPARED BY:



April 2015



RIDGE ROAD CLASS III LANDFILL
CONSTRUCTION QUALITY ASSURANCE PLAN



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RIDGE ROAD CLASS III LANDFILL
CONSTRUCTION QUALITY ASSURANCE PLAN



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RIDGE ROAD CLASS III LANDFILL CONSTRUCTION QUALITY ASSURANCE PLAN

1.0 INTRODUCTION

This Construction Quality Assurance/Quality Control Plan (QA/QC Plan) is prepared for the Sevier Solid Waste Inc. (SSWI) Class III Disposal Facility located at 2106 Ridge Road in Pigeon Forge, Tennessee. More specifically, the Class III Construction/Demolition waste landfill has been assigned permit number DML 78-0126 by the Tennessee Division of Solid Waste Management (TDSWM). The components of construction of the Class III disposal facility requiring field monitoring and documentation under this plan include but may not be limited to: subgrade/structural fill, geologic buffer layer, geosynthetic layers (if needed), and final cover system.

Recent geotechnical laboratory tests performed on undisturbed and remolded samples taken during the hydrogeologic investigation have revealed that the majority of the on-site soils are fine-grained, silty/clayey soils. The majority of the hydraulic conductivity tests performed on the on-site soils met or exceeded the TDSWM maximum hydraulic conductivity requirements for the compacted geologic buffer layer (a maximum hydraulic conductivity of 1×10^{-6} cm/sec).

This report details the activities required of the contractor and CQA personnel involved with the construction, installation, surveying, and testing activities for the construction of the Ridge Road Class III Construction/Demolition Landfill.

2.0 PURPOSE AND CONTENTS OF PLAN

The purpose of this construction quality assurance (CQA) plan is to ensure that the final cover, geologic buffer soils, and any geosynthetic layers installed as needed are constructed to meet or exceed the latest design criteria. The plan addresses the following elements:

- A. Qualifications, duties, and responsibilities of the CQA Engineer.
- B. Material selection standards.
- C. Construction observation and testing.
- D. Documentation and record keeping.



3.0 DEFINITIONS AND USE OF TERMS

This section provides definitions for terms used in the QA/QC Plan.

Acceptable Permeability Zone (APZ) - a range of moisture contents and densities that will provide a soil barrier layer with the desired hydraulic conductivity to satisfy the TDSWM regulations.

Owner — Sevier Solid Waste Inc.(SSWI)

Certification Engineer — individual appointed by the Owner who is responsible for performing tasks outlined in this QA/QC Plan. The Certification Engineer will be selected by SSWI and shall be a registered Professional Engineer in the state of Tennessee.

Construction Quality Assurance (CQA) Monitor – the official representative of the Owner responsible for quality assurance oversight of the project.

Contractor — the individual or firm who is responsible for disposal facility-related construction and operational activities. This definition applied to any party performing work defined in the construction documents.

Construction Manager — the official representative of the Contractor responsible for construction of the project.

Conformance Testing - includes testing that is performed by the Certification Engineer to conform and qualify material prior to their use.

Design Engineer — the individual(s) or firm(s) responsible for the preparation of design documents and significant design changes during construction as determined by the Certification Engineer. The design engineer shall be a registered Professional Engineer in the state of Tennessee.

Earthwork — an activity involving the use of soil or rock materials. It also includes activities involving the use of byproducts in the construction of waste disposal facilities.

Performance Testing — includes those activities that occur during and following material installation including dike raising activities during facility operation.

Project Design Drawings and Documents — all project related drawings and documents, including design modifications and record drawings.

Project Documents — includes Constructor submittals, construction drawings, record drawings, specifications, shop drawings, field inspection reports, and project schedule.

Quality Control (QC) — functions performed by the Contractor and material supplier to verify that work performed conforms to project design drawings and documents.

Quality Assurance (QA) — provides verification that QC functions have been performed in substantial compliance with the project design drawings and documents. This function will normally be provided by a Certification Engineer chosen by SSWI.

Record Drawings — drawings recording the locations, elevations, and details of the facility after construction is completed.

Surveyor — the individual responsible for preparation of as-constructed surveys of the completed subgrade, reconstructed geologic buffer, soil dike fill, final surface of waste materials, low permeability layer, and completed vegetation layer. The surveyor shall be a registered Surveyor in the state of Tennessee.

Testing Laboratory — one or more laboratories capable of conducting the required conformance and performance laboratory testing of soils and geosynthetics required by this QA/QC Plan.



4.0 CERTIFICATION ENGINEER / CQA MONITOR QUALIFICATIONS

The Certification Engineer / CQA Monitor (or personnel under his direct supervision) will closely monitor construction of the various components of the waste disposal facility which includes: structural fill, geologic buffer construction, geosynthetic materials (if necessary), and the construction of the soil components of the final cover system. The Certification Engineer will be a Professional Engineer licensed to practice in the state of Tennessee, who is knowledgeable in the field of soil mechanics and geosynthetics, and will have a good working knowledge of the equipment and procedures generally used in the construction of landfills. In addition, the Certification Engineer / CQA Monitor shall be an independent third party retained by the Applicant.

The Certification Engineer has the following duties:

- provide written, certified documentation attesting to conformance with the design requirements and the QA/QC Plan with respect to conditions of structural fill, soil dike fill, construction of the soils, and any alternate geosynthetic components that could be incorporated as an alternate to the presently proposed geologic buffer system, and the construction of the soil components of the final cover system;
- be present at appropriate intervals during construction of the soil components, perform appropriate tests, and obtain samples for laboratory analyses;
- observe material delivery and unloading;
- use the results of tests and laboratory analyses to document conformance with project requirements;
- provide to SSWI and the Constructor the results of observations and tests as the work progresses. Coordinate with Constructor when modifications to the plans are necessary to ensure compliance with the design drawings, specifications, and QA/QC Plan;
- schedule and coordinate inspection and testing activities; and
- reject defective work and verify that corrective measures have been implemented.

The Certification Engineer may utilize qualified field technicians to perform testing described and to provide, as necessary, additional oversight during construction.

5.0 PROJECT MEETINGS

5.1 DESIGN REVIEW MEETING (OPTIONAL)

Following the completion of the design and after review and approval by the State of Tennessee Department of Environment and Conservation (TDEC), Tennessee Division of Solid Waste Management (TDSWM), a design review meeting will be held. The purpose of this meeting, which the Owner, Construction Manager, and the Certification Engineer shall attend, is to accomplish the following activities:

- identify key personnel;
- provide all parties with relevant documents;
- review the project design drawings, documents, and QA/QC Plan;
- confirm responsibilities of each party;
- review reporting and documenting procedures;
- define lines of communication;
- establish work area procedures; and
- review sampling and testing procedures.

The meeting will be documented by the Certification Engineer or person designated by the Construction Manager. Copies of the minutes and relevant documents will be provided to all parties.



5.2 PRE-CONSTRUCTION MEETING

A pre-construction meeting will be held at the site prior to the start of construction. The Owner, Construction Manager, Certification Engineer, Constructor, and others designated by the Owner will attend this meeting. In certain cases, many, if not most of these functions, may be performed directly by the Owner. The purpose of the meeting is to accomplish the following activities:

- review the construction drawings and documents, QA/QC Plan, work area procedures, construction procedures, and other related issues;
- define lines of communication and authority;
- review the project schedule;
- review best management practices for erosion and sediment control and construction storm water management during each phase of construction;
- review testing procedures and procedures for correcting and documenting construction deficiencies, repairs, and retesting;
- review testing and record drawing documentation procedures; and
- conduct a site inspection to discuss work areas, work plans, stockpiling, equipment and material laydown areas, access roads, and related items.

This meeting will be documented by the CQA Monitor or authorized representative, and copies of the documentation will be distributed to all parties.

5.3 PROGRESS MEETINGS

Progress meetings shall be coordinated and conducted by the Certification Engineer and/or the Construction Manager. The primary purpose of these meetings shall confirm that all parties involved with construction activities are familiar with the design, required procedures, and associated QC objectives along with any safety issues related to landfill construction. Specific project safety issues shall be the responsibility of designated safety professionals. Minutes of each meeting shall be documented for inclusion with the project records.

Pre-construction meetings shall be held prior to initiating individual phases of construction. The Construction Manager and other parties that will actively participate in the construction activities shall attend this meeting.

5.4 MODIFICATIONS

General construction and QC modifications may be executed following approval of the Certification Engineer, the Owner, and the TDSWM Contact. Proposed modifications shall be developed by the Construction Manager and submitted to the Owner and Certification Engineer for review and comment and to the TDSWM Contact for approval prior to incorporation into the facility design. Documentation of any modifications shall be submitted to the TDSWM Contact with copies retained for inclusion with the project records.

5.5 CONTRACTOR SUBMITTALS

Contractor submittals shall be reviewed and approved by the CQA Monitor prior to delivery and/or use of the respective construction materials. Copies of all submittals shall be included with the project records.

5.6 CONFORMANCE TESTING

Conformance testing shall consist of periodic evaluation of materials and/or constructed products. Conformance testing shall be conducted and documented by the CQA Team. Results of testing shall be reviewed by the CQA Monitor to assess conformance with project requirements. Copies of all conformance testing results shall be included with the project records.



5.7 MONTHLY CONSTRUCTION REPORTS

During construction of selected construction elements the Certification Engineer shall prepare a summary report. This summary report shall include, but not be limited, to the following:

- Construction activities to be performed during the upcoming period;
- TDSWM and CQA/QC personnel on site during the subject period;
- TDSWM and CQA/QC personnel to be on site during the upcoming period;
- Contractors on site during the subject period;
- Contractors to be on site during the upcoming period; and
- Notification of scheduled construction activities that the TDSWM Contact has indicated will be observed.

5.8 DEFICIENCY MEETINGS

As required, meetings will be held to discuss problems or deficiencies. At a minimum, these meetings will be attended by the CQA Monitor, Certification Engineer, and the Constructor's on-site superintendent. If a problem requires a design modification, the Design Engineer and Constructor's project manager should also be present. The meeting will be documented by the Certification Engineer.

6.0 GEOLOGIC BUFFER CONSTRUCTION

6.1 INTRODUCTION

Prior to construction and installation of the geosynthetic liner components, the Design Engineer will investigate the underlying soils to ensure compliance with the compacted geologic buffer requirements outlined in the design drawings and documents. The following criterion for geologic buffer materials is taken verbatim from the TDSWM regulations and is provided as follows:

- (c) Class III and Class IV facilities must be located, designed, constructed, operated, and maintained such that there is immediately underlying all solid wastes a geologic buffer which shall have:
 1. A maximum hydraulic conductivity of 1.0×10^{-5} cm/s and measures at least ten (10) feet from the bottom of the liner to the seasonal high water table of the uppermost unconfined aquifer or the top of the formation of a confined aquifer; or
 2. A maximum hydraulic conductivity of 1.0×10^{-6} cm/s and measures not less than five (5) feet from the bottom of the liner to the seasonal high water table of the uppermost unconfined aquifer or top of the formation of confined aquifer; or
 3. Other equivalent or superior protection as defined in part 2 of this subparagraph.

6.2 GEOLOGIC BUFFER LAYER CONSTRUCTION PREPARATIONS

The Design Engineer (or his geologist) shall be responsible for determining the depth of the underlying soils of the cell. This may include test pits to collect samples of the underlying material.

6.3 COMPACTED GEOLOGIC BUFFER LAYER PLACEMENT AND TESTING PROTOCOLS

During any installation of new soils (or reworking existing soils) in the compacted geologic buffer layer, the CQA Monitor shall:

1. Require a moisture density relation of the soil by ASTM D1557 (Modified Proctor) or ASTM D698 (Standard Proctor), which shall be performed on a representative sample of the borrow source. The sample shall also be tested to determine its classification according to ASTM D2487. The compaction requirements for this soil borrow source shall be at least 90 percent of the maximum dry density determined by the Modified Proctor (ASTM D1557) or at least 95 percent of the maximum dry density determined by the Standard Proctor (ASTM D698), at a moisture content greater than optimum moisture.

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2. Monitor and document the placement and compaction of the soils used in the compacted geologic buffer layer. The following information shall be documented with respect to soil compaction:
 - The type and weight of compaction equipment;
 - The method of surface preparation;
 - The method of adjusting soil moisture, if any;
 - The method of controlling desiccation;
 - The thickness of each lift after compaction;
 - General observations of the number of passes and uniformity of compaction coverage;
 - Observation of the reduction in clod size; and
 - Documentation of geologic buffer repairs, including removal and replacement of frozen or desiccated soils.
3. For every 10,000 cubic yards of compacted clay material or when visual observations indicate that a change has occurred in the borrow soils, obtain a soil sample and perform the following tests:
 - Moisture-density relationship using Modified Proctor (ASTM D1557) or Standard Proctor (ASTM D698)
 - Atterberg Limits, ASTM D4318;
 - Grain Size Analysis by sieve, ASTM D422 or ASTM D1140;
 - Unified Soil Classification, ASTM D2487.

During construction of the compacted geologic buffer layer, the Earthwork Contractor shall:

1. Compact geologic buffers to the degree that no further appreciable consolidation is evidenced under the action of the compaction equipment. A minimum of four one-way passes with the compaction equipment will be performed on the lift of prepared sub-base.
2. Place and compact each lift with a general thickness of 9 inches after compaction.
3. Integrate each lift into the previous lift by techniques such as scarifying each lift and by using compaction equipment capable of penetrating the thickness of each compacted lift.
4. Protect the compacted geologic buffer layer from detrimental climatic effects during construction by doing all of the following:
 - Remove all ice, snow, and frozen soil during winter construction prior to placing a lift and not using any frozen soil in any part of the compacted soil liner system;
 - Re-compact any soil lift of which its integrity is so adversely affected by weather that it no longer meets the requirements of the CQA Plan, at the discretion of the Owner and CQA Monitor;
 - Cover to prevent frost penetration during and following placement of the soil layer during winter construction;
 - Provide measures to ensure that the compacted geologic buffer layer is protected from desiccation by covering the soil liner or by sprinkling the soil liner with water. Any compacted soil liner that has experienced significant desiccation cracking is to be repaired; and
 - Remove any observed debris, roots, and any angular or sharp rocks larger than two inches in diameter.

Any areas that require replacement/filling of the compacted geologic buffer layer will be surveyed on a minimum of a 50-foot by 50-foot survey grid system and at locations along the cell perimeter to verify proper line and grade in accordance with the engineering plans. Grade tolerance for the top of compacted clay is +0.0 to +0.2 feet from the engineering plans to ensure the minimum separation distance from the uppermost aquifer is achieved.



6.4 DOCUMENTATION

Sufficient documentation shall be provided in the construction report to verify to TDEC that the compacted geologic buffer layer is constructed to comply with Section 6.2 above. The documentation should include:

- Elevations of the top of the compacted geologic buffer layer; and
- Field and laboratory test results of constructed compacted geologic buffer layer soil.

7.0 SUBGRADE EARTHWORK PROTOCOLS

7.1 INTRODUCTION

Prior to construction of the compacted geologic buffer and/or installation of any alternate geosynthetic liner components, the Contractor will prepare the base grades, if required, to the subgrade elevations indicated in the engineering plans.

7.2 SUBGRADE PREPARATION

The Earthwork Contractor shall be responsible for preparing the soil subgrade surface for placement of overlying materials where geosynthetics are to be placed directly on the subgrade. Prior to placing GCL component over the subgrade, the contractor shall proof-roll the subgrade and repair or replace any soft or pumping areas. Upon completion of the subgrade preparation, the CQA Monitor and the Geosynthetics Installer shall jointly examine the subgrade surface and prepare a certificate of acceptance. The Subgrade Acceptance Certification shall verify that the subgrade is suitable for the installation of the overlying geosynthetic components.

During construction the CQA Monitor shall indicate to the Earthwork Contractor any subgrade locations which are not acceptable for placement of subsequent liner components. Any defects in the subgrade soil shall be repaired by the Earthwork Contractor such that the properties of the repaired areas meet the project specifications.

7.3 SUBGRADE SURVEYING

The surveyor will establish a 50-foot by 50-foot survey grid system on the landfill cell base and survey locations along the cell perimeter to verify proper line and grade in accordance with the engineering plans. Grade tolerance is +0.0 to +0.2 feet from the engineering plans.

The CQA Monitor will document the excavation and construction activities associated with the landfill cell subgrade.

7.4 SOIL PREPARATION FOR GCL/GEOSYNTHETIC INSTALLATION

The CQA Monitor shall:

1. Inspect the compacted soil subgrade surface for compliance with the requirements of this CQA Plan.
2. Identify areas that do not meet the requirements of the CQA Plan and need repair; the CQA Monitor will monitor and document the repairs made.

The Earthwork Contractor shall:

1. Prepare the top six inches of the landfill floor using a smooth drum roller with grades which meet the engineering plans with a tolerance of +0.0 to +0.2 feet with a minimum thickness of five feet from the seasonal high groundwater elevations in all locations.
2. Remove debris, organic materials, roots, any angular or sharp rocks larger than two inches in diameter, or other material which may damage the geosynthetic liner material.
3. Repair any geologic buffer which exhibits significant desiccation cracking as directed by the CQA Monitor. All backfill soils used to repair any areas of the low permeability soil liner system shall meet the applicable requirements of the CQA Plan.
4. Protect the prepared surface from damage due to desiccation, flooding, and freezing.



The Geosynthetic Contractor/Installer shall:

1. Inspect the soil surface.
2. Accept in writing that the subgrade surface is acceptable for deployment of the GCL material prior to installation.

THE FOLLOWING PROTOCOLS FOR THE CQA OF GCLs ARE PROVIDED IN THE EVENT AN ALTERNATE LINER/COVER SYSTEM IS PROPOSED.

8.0 GEOSYNTHETIC CLAY LINER

This section addresses the installation of a geosynthetic clay liner (GCL) used for construction in the event it is deemed necessary for an alternate liner system.

8.1 ON-SITE HANDLING

The Earthwork Contractor shall be responsible for unloading of the GCL. It should be recognized that the GCL rolls are extremely heavy and care should be taken to ensure that proper equipment and storage areas are prepared prior to delivery of the GCL. The unloading and storage area should be flat, dry, well-drained, stable, and located away from high-traffic areas. The GCL rolls are not be stored on end, and the maximum height of a stack of GCL is four rolls. The rolls should not be in direct contact with the ground. A tarpaulin or plywood should be placed beneath, and a tarpaulin should be placed on top of the rolls to protect the rolls from the elements.

8.2 MATERIALS

1. The GCL Manufacturer shall submit copies of the GCL roll Quality Control Certificates to the CQA Monitor for review and approval prior to delivery and acceptance of materials. These certificates shall, at a minimum, include the manufacturer's quality control test results for the properties listed in **Table 1**. The results of hydraulic conductivity testing shall be performed at a minimum frequency of one (1) per lot. The results reported on the GCL roll Quality Control Certificates shall, at a minimum, meet the property values detailed in **Table 1**. The GCL Manufacturer shall submit a signed statement that the material supplied meets or exceeds these specifications unless different values are approved by the Design Engineer.

Table 1 Geosynthetic Clay Liner (GCL) Roll Material Properties

Property	Test Method	Requirements
Fluid Loss	ASTM D5891	18 mL maximum
Bentonite Free Swell	ASTM D5890	24 mL/2 g minimum
Mass of Bentonite per Unit Area ⁽¹⁾	ASTM D5993	0.75 psf minimum
GCL Hydraulic Conductivity ⁽²⁾ , "or"	ASTM D5887	5 x 10 ⁻⁹ cm/sec maximum
GCL Index Flux ⁽²⁾	ASTM D5887	1 x 10 ⁻⁶ cm ³ /sec/cm ² maximum
Internal Shear Strength ⁽³⁾	ASTM D6243	500 psf Typical
<p>NOTES:</p> <ol style="list-style-type: none"> 1. The bentonite clay loading (mass/unit area) shall be determined after oven drying, per the stated test method. 2. Hydraulic Conductivity and Index flux testing with de-aired distilled water at 80 psi cell pressure, 77 psi headwater pressure, and 75 tailwater pressure. 3. Typical peak value for specimen hydrated for 48 hours and sheared under 200 psf normal stress. 		

The CQA Monitor shall review the submittals provided by the GCL Manufacturer to verify compliance with the requirements of the CQA Plan.



8.3 GCL/GEOSYNTHETIC CONTRACTOR SUBMITTALS

The Geosynthetic Contractor shall submit to the Owner the following information prior to the start of the geosynthetic clay liner installation:

1. Schedule of the GCL installation.
2. A panel drawing depicting the panel configuration, if requested by COA Monitor.
3. The COA Monitor shall verify that all submittals required of the Geosynthetic Contractor have been received and meet the requirements of the CQA Plan. The schedule and drawings submitted by the Geosynthetic Contractor, once approved by the COA Monitor, shall be the basis of the GCL deployment.

8.4 GCL DELIVERY AND STORAGE

The Geosynthetic Contractor shall perform the following:

1. Prepare the GCL roll storage area to protect the GCL from dirt, mud, dust, moisture, and damage at all times prior to deployment. The GCL rolls shall be protected against vandalism, adverse weather, and other hazards and should be stored to allow access for roll identification. The integrity and legibility of roll labels must be maintained during storage. The rolls must be protected from the elements by the application and maintenance of a proper cover.
2. Instruct all personnel of the proper handling techniques so as to not damage any of the GCL rolls.
3. Assure that the GCL rolls are packaged, shipped, and stored on-site in such a manner that the GCL rolls are not subjected to damage or moisture.
4. Identify and separate all damaged rolls from undamaged rolls and store these rolls at a location designated by the Owner until disposition of the damaged rolls is determined.
5. Store the GCL rolls per the GCL Manufacturer's recommendations.

The CQA Monitor shall perform the following:

1. Inspect the GCL roll storage area to verify compliance with the CQA Plan.
2. Visually inspect the surface of all GCL rolls for visible defects and/or damage.
3. Compare the roll number against the GCL Manufacturer's QC Certifications for compliance with the project's engineering plans and specifications and the CQA Plan.
4. Any damage detected shall be documented and the Geosynthetics Contractor will be notified. The Earthwork Contractor shall prepare a location, acceptable to Owner, for GCL storage. The Earthwork Contractor shall also be responsible for off-loading of the GCL in a manner that does not damage the GCL. This may or may not include rental and/or purchase of special equipment for off-loading.

8.5 GCL INSTALLATION

The GCL can be deployed on soil subgrade which has been inspected and accepted by the COA Monitor and the Geosynthetics Contractor. The installation shall conform to the manufacturer's recommendations and the project plans or specifications.

8.5.1 Weather Conditions

The Geosynthetic Contractor shall not deploy the GCL material during precipitation events or on areas with frost or precipitation accumulation. The GCL material shall not be deployed on softened or unstable subgrade.

8.5.2 Placement

GCL panels shall be placed in a controlled manner to prevent damage to the GCL or other in-place material. Any damage shall be repaired by the Geosynthetic Contractor.

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Personnel working on the GCL shall not smoke, wear damaging shoes, or engage in activities which could damage the material. Foot traffic on the GCL panels shall be minimized. The Geosynthetic Contractor shall provide protection of the GCL from equipment or concentrated personnel traffic associated with the project.

GCL panels shall be deployed in such a manner as to be in contact with the material directly beneath it and preclude folds, wrinkles which may become folds, and bridging. Any wrinkle, fold, or bridging observed shall be removed through realignment of the panel or cutting and repairing the GCL in accordance with the COA Plan.

Each adjoining GCL panel shall be overlapped a minimum of twelve (12) inches on each side and a minimum end-to-end overlap of twenty-four (24) inches (or greater if required by the Geosynthetic Contractor's Installation Quality Control Procedures). The minimum overlap shall be indicated by a line, or series of lines, spaced no more than fifty (50) feet on the exposed surface of the GCL panel. The overlap area shall be free of dirt, gravel, and debris. The overlap shall be maintained to prevent seam openings during the installation and covering process. The Geosynthetics Contractor is responsible for assuring that the GCL panels remain overlapped throughout the installation process and until the overlying material is placed. Bentonite clay powder shall be applied between the GCL layers in the overlap area if required by the GCL Manufacturer's specifications and the Geosynthetic Contractor's Installation Quality Control Procedures.

Orient GCL seams on sideslopes greater than 5% parallel to the fall of the slope, unless approved by the Design Engineer. Horizontal seams, if approved by the design engineer for slopes steeper than 7H:1V, shall be located in the lower half of the slope and staggered by a minimum distance of 25 feet.

Placement of the GCL shall be in such a manner as to reduce the risk of water infiltration into the bentonite clay portion of the GCL. The GCL shall be covered with a geomembrane and/or soil materials, as required by the project design, as soon as practical but no later than the end of the working day in which the GCL was deployed, to provide maximum protection against the elements. The Geosynthetic Contractor shall direct storm water drainage away from the GCL by construction of temporary storm water diversion berms or similar structures.

The GCL shall not come into contact with water or any other fluids which may cause hydration of the bentonite clay of the GCL. Premature hydration of the bentonite clay component of the GCL shall be cause for removal of the hydrated material at no expense to the Owner. Prematurely hydrated material includes material hydrated beneath a geomembrane prior to seaming.

The Geosynthetic Contractor shall not install more GCL panels than can reasonably be covered that same day. The Geosynthetic Contractor shall also limit the installation of GCL panels during periods of impending bad weather such that the amount of uncovered GCL panels is minimized.

The Geosynthetics Contractor shall clean the work area daily by removing scrap material and other debris associated with the Geosynthetic activities and disposing of it properly.

If the GCL material is manufactured with different geotextiles on the sides of the GCL, the orientation of the GCL shall be discussed and agreed upon by the appropriate parties in attendance at a Construction Meeting and approved by the Design Engineer. If a GCL with a geomembrane laminate is utilized, the geomembrane side will be placed down.

The COA Monitor shall observe and document the GCL deployment to verify that all provisions of the COA Plan have been followed.

8.5.3 Temporary Anchoring

The Geosynthetic Contractor is responsible for the temporary anchoring of the GCL during construction. The Geosynthetic Contractor shall use sand bags or other approved means necessary to restrain the GCL without damage and to prevent the material from being pulled from proper alignment. Areas of damage caused by improper or insufficient temporary anchoring shall, as determined by the COA Monitor and required by the Owner, be repaired or removed, disposed and replaced at the expense of the Geosynthetic Contractor. Scrap tires are not considered an acceptable method for temporary anchoring.



8.5.4 Permanent Anchoring

The Geosynthetic Contractor is responsible for overseeing the permanent anchoring of the GCL material by the Earthwork Contractor. Placement anchorage shall comply with the engineering plans and specifications, and shall be performed as soon as practicable following installation and repair of the GCL material and installation of the overlying materials.

8.5.5 Repairs

Holes, tears, or damage to the GCL material shall be repaired by placing a patch extending a minimum of one (1) foot in all directions beyond the edges of the defect. Bentonite clay powder or other supplement shall be applied between the GCL panel and the patch if required by the GCL Manufacturer's specifications or the Geosynthetic Contractor's Installation Quality Control Procedures. Patches and repairs shall not be allowed on slopes greater than 10%. Damaged GCL panels on slopes greater than 10% shall be replaced.

GCL panels with holes or tears extending more than 25% across the panel width shall be removed and replaced or covered by a single patch. GCL panels, or portions of panels which contain excessive patching, as determined by the Owner, shall be removed and replaced, or repaired with a single patch.

The CQA Monitor shall verify and document that GCL repairs are performed as required by the CQA Plan.

8.6 MATERIAL DELIVERY, HANDLING, AND STORAGE

The Geosynthetics Contractor shall perform the following:

1. Assure that the GCL rolls are packed, shipped, off-loaded, and stored by appropriate methods to prevent damage. The Geosynthetics Contractor shall be responsible for replacing any damaged or unacceptable material at no cost to the Owner.
2. Protect the materials from mud, dust, dirt, and other damaging conditions. The manufacturer's procedures for shipping, handling, and storage shall be followed.
3. Assure that the GCL rolls are clearly labeled with the manufacturer's name, roll number, lot number, and batch number. Information shall be provided by the manufacturer which clearly identifies the corresponding roll information for the GCL.

The CQA Monitor shall visually inspect the surface of all rolls for defects and/or damage, and document any observed damage to any of the rolls.

8.7 MATERIAL DEPLOYMENT

The Geosynthetics Contractor shall perform the following:

1. Assure that all geonet, geotextile, and bonded geocomposite materials are handled in a manner to prevent damage.
2. Assure that no materials are placed over the geomembrane until all required documentation regarding the geomembrane installation is complete and that all required certifications and testing for the materials complies with this CQA Plan.
3. Assure that the surfaces on which the materials are to be placed does not contain stones or excessive dust that could cause damage to any geosynthetic component.
4. In periods of high winds, weight all geosynthetic components with sandbags or similar material. The Geosynthetics Contractor shall be responsible for damage to the GCL resulting from wind damage.
5. Assure that no personnel working on the GCL shall smoke, wear damaging shoes, or engage in other activities that could damage the materials.

The CQA Monitor shall observe and document the deployment of GCL to verify that all provisions of the CQA Plan are met.



8.8 MATERIAL ACCEPTANCE

The Geosynthetics Contractor retains ownership and responsibility for the geonet, geotextile, and bonded geocomposite materials until accepted by the Owner.

The Owner will accept the geosynthetic components installation when:

1. All required documentation from the manufacturer and the Geosynthetic Contractor has been received and accepted.
2. The installation is complete.
3. Written certification documents, including drawings, sealed by the CQA Monitor have been received by the Owner.

9.0 PREPARED SUB-BASE (FINAL COVER)

The prepared sub-base is the 12" thick intermediate soil layer.

9.1 SOIL QUALIFICATION

The Earthwork Contractor shall identify to CQA Monitor the soils planned for use in construction of the prepared sub-base. The prepared sub-base must meet the following requirement:

At a minimum, the material shall be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557 (Modified Proctor) or 95 percent of the maximum dry density as determined by ASTM D698 (Standard Proctor), at a moisture greater than optimum as determined by the moisture-density relationship testing.

Borrow source samples for soil qualification shall be evaluated for every 10,000 cubic yards of prepared sub-base material or when visual observations indicate that a change has occurred in the borrow soils, obtain a soil sample and perform the following tests:

- Moisture-density relationship test using Modified Proctor (ASTM D1557) or Standard Proctor (ASTM D698);
- Atterberg Limits, ASTM D4318;
- Grain size analysis by sieve, ASTM D422 or ASTM D1140;
- Unified Soil Classification, ASTM D2487.

The CQA Monitor shall determine prepared sub-base suitability based on results of laboratory analyses.

9.2 BORROW SOURCE CONTROL

Earthwork Contractor shall remove unsuitable materials from borrow source prior to transport. Unsuitable material may include, but not be limited to:

Roots, rocks larger than 3-inches, debris, frozen soils, organic matter, topsoil, granular materials, and other deleterious materials.

9.3 MATERIAL PLACEMENT AND TESTING

Earthwork Contractor shall prepare the top surface of refuse for prepared sub-base construction by compacting the refuse, removing any large or bulky items that may interfere with construction, and prepare the area to a smooth and consistent grade.

The Earthwork Contractor shall be allowed to place approved prepared sub-base in one 12-inch lift (compacted). Compactor should be designed to have 6-inch minimum teeth length for soil compaction.

Earthwork Contractor shall compact prepared sub-base to the degree that no further appreciable consolidations is evidenced under the action of the compaction equipment. A minimum of four one-way passes with the compaction

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equipment will be performed on the lift of prepared sub-base. CQA Monitor shall assist Earthwork Contractor during the compaction by observing placement of the material.

Earthwork Contractor shall coordinate earthmoving activity to facility field testing. Earthwork Contractor shall assist CQA Monitor, as necessary, in accomplishing field testing and observation.

During prepared sub-base placement, the CQA Monitor shall:

1. Establish a relationship between moisture content, dry density, and hydraulic conductivity by laboratory testing of potential soil borrow prior to the placement of the soil. A moisture density relation of the soil by ASTM D1557 (Modified Proctor) or ASTM D698 (Standard Proctor), shall be performed on a representative sample of the borrow source. The sample shall be tested to determine its classification according to ASTM D2487. The compaction requirements for this soil borrow source shall be at least 90 percent of the maximum dry density determined by the Modified Proctor or at least 95 percent of the maximum dry density determined by the Standard Proctor, at a moisture content greater than optimum moisture.
2. Monitor and document the placement and compaction of the soils used in the prepared sub-base. The following information shall be documented with respect to soil compaction:
 - The type and weight of compaction equipment;
 - The method of surface preparation;
 - The method of adjusting soil moisture, if any;
 - The method of controlling desiccation;
 - The thickness of each lift after compaction;
 - General observations of the number of passes and uniformity of compaction coverage;
 - Observation of the reduction in clod size; and
 - Documentation of liner repairs, including removal and replacement of frozen or desiccated soils.
3. For every 10,000 cubic yards of prepared sub-base material or when visual observations indicate that a change has occurred in the borrow soils, obtain a soil sample and perform the following tests:
 - Moisture-density relationship test using Modified Proctor (ASTM D1557) or Standard Proctor (ASTM D698);
 - Atterberg Limits, ASTM D4318;
 - Grain Size Analysis by sieve, ASTM D422 or ASTM D1140;
 - Unified Soil Classification, ASTM D2487;
4. Determine the in-place moisture content and dry density of the prepared sub-base by nuclear methods following ASTM D2922, latest edition. In-place tests shall be performed at a minimum frequency of one test per acre per lift and a minimum of one test per day of construction, or lift of soil, to verify compliance with the requirements of item (1) above.
5. For every 5 acres per lift of soils placed, obtain an undisturbed sample of compacted soil and perform hydraulic conductivity testing using ASTM D5084. An alternate test method may be used if reviewed and approved by the TDEC.

Record the field moisture/density tests on appropriate form and plot approximate locations of all field tests and samples on a final cover plan. CQA Monitor shall document that the prepared sub-base layer has been properly installed and the grading conforms to the proposed final grading plan.



9.4 CERTIFICATION

All prepared sub-base segments shall be certified by CQA Monitor for compliance with the engineering design. Certification data shall include visual observations, compaction documentation, moisture documentation (at or above optimum moisture), thickness confirmation for completed prepared sub-base segments, and documentation of any deviations from the plan.

Prepared sub-base segment(s) rejected by CQA Monitor shall be reworked or removed by Earthwork Contractor. CQA Monitor will, at the request of the Earthwork Contractor, provide the basis for rejection and recommendations for procedures to achieve compliance. No additional lifts are to be placed on a rejected segment until compliance of that initial segment has been achieved to the satisfaction of the CQA Monitor.

9.5 SURFACE PREPARATION

During the preparation of the prepared sub-base, the CQA Monitor shall:

1. Observe that surfaces on which geomembrane is to be placed are at the design line and grade and have been rolled with a smooth steel wheel roller, pneumatic wheel roller, or other means to provide a surface free of irregularities, loose earth, and abrupt changes in grade.
2. Observe the prepared sub-base with the Geomembrane Contractor for approval. Receive an acceptance of the surface condition from the geomembrane installer.
3. Observe that prepared sub-base is maintained in a smooth, uniform, and compacted condition during installation of the geosynthetic lining system. If drying, cracking, erosion, or other damage has occurred, observe that it is repaired before installing the liner.
4. Observe that adequate drainage for the prepared sub-base is provided and maintained until the lining installation is completed. The geomembrane should not be placed if moisture prevents proper subgrade preparation, placement, or membrane seaming.

10.0 TOPSOIL AND VEGETATION

10.1 MATERIAL

The final cover system includes a 12-inch topsoil layer which will be placed over the protective cover layer soil. The topsoil layer shall meet the following requirements:

1. The topsoil layer will be free of debris, trash, stumps, or other deleterious materials. No sharp-edged rocks or other hard objects which could damage the geomembrane liner material will be allowed.
2. The topsoil shall be loam or sandy loam capable of supporting shallow rooted vegetation.

10.2 CONSTRUCTION/PLACEMENT

The CQA Monitor shall perform the following:

1. Observe and document the placement of the soil layers; visually inspect for material uniformity and the presence or absence of foreign materials.
2. At the direction of the CQA Monitor, the Earthwork Contractor may place the topsoil layer in one lift.
3. Certify that the soil layers have been placed in accordance with the engineering plans and specifications at the locations tested.
4. Observe and document the placement of sod or approved equal; visually inspect for soil preparation, material quality, and material installation.
5. Retain a Surveyor shall survey the thickness of the final cover soil components on a 50-foot by 50-foot grid system. Alternately, direct depth checks may be used to determine soil thickness. Settlement plates may be used



in conjunction with the survey to account for consolidation within the waste. Locations where soil thickness is less than specified in the engineering plans shall be corrected. The CQA Monitor will document these situations as described in the CQA Plan.

10.3 SURVEYING AND CONSTRUCTION TOLERANCES

The minimum thickness of the intermediate cover, compacted low permeability layer, and vegetative layer in the final cover shall be surveyed to verify that the minimum soil thicknesses specified in the Design Drawings are met. Other construction tolerances are as noted on the drawings.

Surveying will be performed under this section to document as-built conditions, and will be the responsibility of the Constructor. The as-built survey will be performed by a Surveyor registered in the state of Tennessee. Intermediate surveying for construction layout, slope staking, etc., may be performed by the Constructor's personnel.

The completed surfaces of subgrade, top of geologic buffer, top of soil dikes/berms, top of intermediate cover, top of low permeability soil layer, and the top of the vegetative cover layer will be surveyed. In the event GCL is used the panels shall be surveyed and this survey shall include as-built information of: seam intersections, cross seams, repair locations, and location of anchor trenches. In applicable cases, surveys will be performed before placement of the overlying drainage layer, to verify that grades and elevations are in accordance with the approved plans. At a minimum, survey points shall be established on a 50 ft. x 50 ft. grid. Survey grid points shall be located such that the same grid can be reused for subsequent as-built surveys as the completion of each layer progresses. Soil layer thickness shall be obtained to the nearest 0.1 ft. and reported to the nearest 0.1 ft.

The Certification Engineer may request additional survey information as required for certification.

11.0 REPORTING AND DOCUMENTATION

11.1 DEFICIENCIES

When deficiencies are discovered, the Certification Engineer shall immediately determine the nature and extent of the problem, notify the Constructor, and complete required documentation. In all cases, the Certification Engineer will notify the Constructor within one-half hour of discovering the deficiency. If the deficiency will cause construction delays of more than four hours or will necessitate substantial rework, the Certification Engineer shall also notify the Construction Manager.

The Constructor shall correct the deficiency to the satisfaction of the Certification Engineer. If the Constructor is unable to correct the problem, the Certification Engineer will prepare a nonconformance report and will develop and present suggested solutions to the Construction Manager for approval.

The corrected deficiency shall be re-tested before additional work is performed. All retests, and the steps taken to correct the problem, will be documented by the Certification Engineer.

11.2 DOCUMENTATION

The QA/QC Plan depends on thorough monitoring and documentation of construction activities. Therefore, the Certification Engineer shall document that Quality Assurance requirements have been addressed and satisfied. Documentation shall consist of daily record keeping, construction problem resolutions, photographic records, design revisions, weekly progress reports, and a certification and summary report.

11.3 DAILY RECORD KEEPING

At a minimum, daily records shall consist of field notes, summaries of the daily meetings with the Constructor, observations and data sheets, and construction problems and resolution reports. This information shall be submitted to the Construction Manager for review and approval.

A Daily Meeting Report will be prepared each day, summarizing discussions held with a Constructor.



This daily report will include the following items:

- a. date, project name, and location;
- b. names of parties involved in discussions;
- c. data on weather conditions;
- d. listing and location of construction activities underway during the time frame of the Daily Summary Report;
- e. equipment present on-site;
- f. descriptions of areas and/or activities being inspected and/or tested, and related documentation;
- g. description of off-site materials received;
- h. scheduled activities;
- i. items discussed;
- j. signature of the Certification Engineer and reporting personnel.

11.4 OBSERVATION AND TEST SHEETS

Observation and test data sheets shall include the following information:

- a. date, project name, and location;
- b. weather data;
- c. reduced-scale site plan showing work areas, including sample and test locations;
- d. description of ongoing construction;
- e. summary of test results identified as passing, failing, or in the event of a failed test, retest;
- f. calibration of test equipment;
- g. summary of decisions regarding acceptance of the work and/or corrective actions taken;
- h. signature of the Certification Engineer and reporting personnel.

11.5 CONSTRUCTION PROBLEM REPORTS

This report identifies and documents construction problems and resolutions. It is intended to document problems involving significant rework and is not intended to document items easily corrected unless the problems are recurring. At a minimum, this report shall include the following items:

- a. detailed description of the problem;
- b. location and cause of the problem;
- c. how the problem was identified;
- d. resolution of the problem;
- e. personnel involved;
- f. signature of the Certification Engineer and Construction Manager and reporting personnel.

11.6 SURVEY CONTROL

The following procedures will be followed with respect to the as-built survey of the components of the waste disposal facility.

- The subgrade, soil dikes/berms, compacted clay and soil layers, and vegetative soil layer will be surveyed to verify that grades and elevations are in accordance with the approved Design Drawings. A comparison of the

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pre- and post-component construction surveys will be conducted to verify construction thickness.

- The Surveyor shall promptly submit results of each survey to the Construction Manager. Survey results shall include: copy of any field notes, electronic and hard copy of the survey point file, and electronic and hard copy of survey drawing.
- The Certification Engineer will certify that the components meet the requirements in the Design Drawings and will submit approval to the Construction Manager.

11.7 DESIGN CHANGES

Design changes may be required during construction. In such cases, the Certification Engineer shall notify the Construction Manager, who will then notify the responsible State Agencies. Design changes shall only be made with written agreement of the Construction Manager.

11.8 WEEKLY PROGRESS REPORTS

The Certification Engineer will prepare weekly progress reports summarizing construction and quality control activities. At a minimum this report, submitted to the Construction Manager, shall contain the following information:

- a. date, project name, and location;
- b. summary of work activities;
- c. summary of deficiencies and/or defects and resolutions;
- d. signature of Certification Engineer.

11.9 CERTIFICATION REPORTS

The Certification Engineer will be required to submit the following certification reports. The first certification report will cover the construction of the base grade components for the disposal area including: subgrade/structural fill, compacted geologic buffer, and soil dikes/berms will be required prior to disposal of waste materials. A certification report will also be required for final cover system construction.

The final certification report will be required after the waste disposal facility has reached final permitted grades. This report will cover the capping phase of construction and will be required after closure of the facility. This report will address final waste fill slopes, compacted low permeability layer, and the vegetative layer.

At completion of each phase of construction, the Certification Engineer shall submit a certification report to the Construction Manager. This report shall certify that the work has been performed in substantial compliance with the approved Design Plans. At a minimum, this report shall contain the following information:

- a. summary of all construction activities;
- b. testing laboratory test results;
- c. observation and test data sheets;
- d. sampling and testing location plan;
- e. description of significant construction problems and their resolution;
- f. list of changes from the approved plans and the justification for these changes;
- g. record drawings; and
- h. a certification statement signed and sealed by the Certification Engineer.