

# TECHNICAL SPECIFICATIONS

for

## WATAUGA RIVER SLOPE STABILIZATION PLAN (LANDFILL REGRADING DESIGN PROJECT)

**Sycamore Shoals State Park  
(Former NARC Landfill)  
Elizabethton, Carter County, Tennessee**

**Revision 0  
May 2023**

*Prepared for:*



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**SECTION 01 11 00.1  
SUMMARY OF WORK**

**PART 1 GENERAL**

1.01 DEFINITION OF PARTIES

- A. OWNER: Tennessee Department of Environment and Conservation, and Bureau of Parks and Conservation & Division of Remediation.
- B. CONTRACTOR/CONSTRUCTOR: Individual, firm or corporation who has entered into contract with OWNER.
- C. SUBCONTRACTOR: Individual, firm or corporation supplying materials and/or performing work at the site pursuant to separate agreement with CONTRACTOR.
- D. ENGINEER/DESIGN ENGINEER: Individual, firm or corporation responsible for preparing the design documents including the Construction Drawings, Technical Specifications, and CQA Plan for the project (i.e., CEC and EIL (Civil & Environmental Consultants, Inc. and Environmental Information Logistics, LLC))
- E. CERTIFICATION ENGINEER: Individual appointed by the OWNER who is responsible for performing tasks outlined in the CQA Plan.
- F. CONSTRUCTION MANAGER: Official representative of the OWNER responsible for overseeing construction of the project.
- G. WORK AREA: Area used by CONTRACTOR in completing the project including staging areas and access roads to construction locations.

1.02 COORDINATION OF PARTIES

- A. OWNER may delegate all or some of its responsibilities listed in the Technical Specifications to ENGINEER OR CERTIFICATION ENGINEER OR OTHER DESIGNATED PARTY in accordance with mutually agreed terms and contracts. All subsequent references to OWNER implicitly assume the above relationship regarding ENGINEER or CERTIFICATION ENGINEER or other designated party.
- B. CONTRACTOR to contact OWNER for approvals required under these Technical Specifications. If any responsibility is unclear in performance of the Work, the CONTRACTOR is to request clarification from OWNER.
- C. OWNER delegated responsibilities and the party that will fulfill those obligations will be identified in the pre-construction meeting.

1.03 DESCRIPTION OF WORK

- A. Listed sections in this summary are included to provide a reference to applicable requirements. CONTRACTOR is responsible for all work described in all applicable sections of the Technical Specifications whether expressly listed or not in this part.
- B. The Scope of Work contained in this contract consists of the components of construction of the slope stabilization (including stockpile areas) requiring field monitoring and documentation under this plan including, but may not be limited to: erosion control features, clearing, site grading, geotextile placement, riprap placement, cover soil placement, topsoil with seeding, erosion control mat placement, live siltation/stakes, and surveying activities for the Watauga River Slope Stabilization Plan at the Sycamore Shoals State Park (former NARC Landfill) located in Elizabethton, Tennessee.
- C. The Work includes excavation and grading and covering necessary to facilitate construction of previously mentioned components of the facility referenced above.

- D. The Work is to be executed in strict accordance with the most current permits and supporting documents and as described below:
1. Clearing/Earthwork/Site Grading/Subgrade: All clearing, removing, stockpiling, re-spreading, and compaction of subsoil, rough grading and finish grading, berms and any other items necessary or appropriate to perform and complete the work shown on the Drawings.
  2. Geotextile: All stockpiling, handling, protection, placement, repair/replacement of defects, and documentation necessary or appropriate to perform and complete the work shown on the Drawings.
  3. Rock Riprap: All stockpiling, handling, placement, documentation, and survey of emplaced material and any other items necessary or appropriate to perform and complete the work shown on the Drawings.
  4. Cover Soil: All material approval, subgrade approval, Test Fill Construction, testing, stockpiling, handling, placement, compaction, repairs, and any other items necessary or appropriate to perform and complete the work shown on the Drawings.
  5. Topsoil & Seeding and mulching with live Siltation/Stakes: All survey and approval of underlying cover soil, handling, spreading and repair of Topsoil. All handling and placement of live siltation and live stakes. All handling and placement of sod or approved equal. Survey of emplaced topsoil components and any other items necessary and appropriate to perform and complete the work shown on the Drawings. Additional work, equipment, handling, spreading and any other items necessary to maintain suitable vegetation coverage for six months after end of construction activities.
  6. Erosion Control Mat: All subgrade soil inspection, subgrade preparation, material inspection/acceptance, material storage, erosion control mat installation, repairs of damaged areas and any other items necessary and appropriate to perform and complete the work shown on the Drawings.
  7. Surveying: All work, materials, equipment and any other items necessary for documentation of existing conditions, excavation quantities, emplaced soils quantities, emplaced rip-rap quantities, and as-built conditions.
- E. As previously described, construction of the various components of the facility include: erosion control features, clearing, site grading, geotextile placement, riprap placement, cover soil placement, topsoil with seeding, erosion control mat placement, live siltation/stakes, and surveying. At the onset of construction, the Constructor shall provide a proposed construction sequencing plan and schedule for review and approval by the Certification Engineer and OWNER. The general construction sequence envisioned to accomplish this project consists of the following major activities/items for the slope areas and the stockpile areas:
- Establishing erosion control features along river (and carried out for the facility);
  - Clearing trees, chipping and stockpiling or removing, as directed;
  - Establishing haul roads to stockpile areas;
  - Clearing stockpile areas;
  - Stripping and stockpiling removed soil and topsoil;
  - Initiating slope excavation, site grading, and subgrade preparation;
  - Placing geotextile;
  - Placing riprap;
  - Placing cover soil;
  - Placing topsoil;
  - Seeding;

- Erosion control mat placement;
  - Live staking; and
  - Surveying as required as the project progresses.
- F. OWNER will not be conducting landfill disposal activities simultaneously with the Work. The CONTRACTOR shall cooperate with OWNER and other CONTRACTORS so that the OWNER's work or work by other CONTRACTORS can be carried out smoothly without interfering or delaying the Work.
- G. The Work is to be constructed in accordance with the following schedule: Work will commence on or before \_\_\_\_\_.

#### 1.04 CONTRACTS

- A. The Work will be constructed under a Unit Price Contract for the items specified on the bid sheets according to the specifications, CQA Plan, and drawings. The unit price on the bid sheets shall include all materials, labor, equipment supervision, shipping, taxes, installation experts, and all incidentals necessary to satisfactorily complete the Work.
- B. CONTRACTOR shall limit his use of the premises for Work and for storage, to allow for:
1. OWNER's existing operations.
  2. Public use of streets.
  3. Private use of adjoining properties.
- C. CONTRACTOR shall coordinate use of premises under direction of OWNER or OWNER's Representatives. Any damage to existing monitoring points, structures, or piping not specifically called out in the drawings shall be replaced in kind by CONTRACTOR at no expense to OWNER.
- D. CONTRACTOR shall assume full responsibility for the protection and safekeeping of products under this Contract stored on the site.
- E. CONTRACTOR shall assume full responsibility for protection of the Work performed under this Contract.
- F. CONTRACTOR shall move any stored products, under CONTRACTOR's control, which interfere with operations of the OWNER or separate CONTRACTOR.
- G. CONTRACTOR shall obtain and pay for the use of additional storage or work areas needed for operations.
- H. CONTRACTOR's on-site activities shall not impact the private adjoining properties.
- I. CONTRACTOR shall be responsible for all stormwater management within and adjacent to project area for the duration of the project.

#### 1.05 REFERENCE DOCUMENTS

- A. The following reference documents apply to all the Technical Specifications and work for this project. Conflicts between the Drawings and Technical Specifications and CQA Plan prepared for the project and other standards referenced shall be brought to the attention of the OWNER prior to purchasing or constructing. OWNER is not responsible for the cost

of work not constructed in accordance with the standard specifications and details or as otherwise approved by OWNER.

- B. Engineering Design Drawings or Drawings - "Watauga River Slope Stabilization Plan – Construction Drawings", Sycamore Shoals State Park (Former NARC Landfill)", Elizabethton, Tennessee, March 2023. (Note, these may be referred to as Drawings or Construction Drawings or Engineering Drawings or Plans throughout these documents, but refer to the same set of Drawings).
- C. Construction Quality Assurance (CQA) Plan, Watauga River Slope Stabilization Plan, Sycamore Shoals State Park (Former NARC Landfill), April 2023.

#### 1.06 CODES AND REGULATIONS

- A. National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Stormwater Associated with Construction Activities CGP

#### 1.07 QUALITY ASSURANCE INSPECTION AND TESTING

- A. Tests called for in the Technical Specifications or Drawings, or as required by code or regulation, will be performed by CQA Team or its authorized representative except when indicated otherwise in the Technical Specifications.

#### 1.08 REFERENCE STANDARDS

- A. Use the latest version of referenced standards, unless otherwise noted in Contract Document.
- B. CONTRACTOR shall request clarification from ENGINEER before proceeding should specified reference standards conflict with Contract Documents.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### 1.09 WORK RESTRICTIONS

- A. Disposal of Waste Material:
  - 1. Burning will not be permitted on site, except as provided and authorized under Section 31 10 00.
  - 2. Remove all demolished and used material from site and dispose of properly in accordance with applicable environmental regulations.
- B. Fire Prevention and Protection: Extreme fire conditions may be present at project site. Perform all work in a fire-safe manner. Comply with applicable local and State fire prevention regulations.
- C. Temporary Electric Power: No electric power is immediately available at the facility. Make arrangements for electric power for use during construction period until final acceptance by OWNER and pay all costs for same.
- D. Sanitary Facilities: CONTRACTOR to provide and maintain sanitary facilities for its employees and subcontractor's employees.
- E. Temporary Telephone Service: No telephone service is available at the facility. It is the responsibility of the CONTRACTOR to ensure that it can communicate with its employees and SUBCONTRACTORS while on site during the project.
- F. Work Hours: Normal work hours at the facility are 7 am to 5 pm Monday through Friday (M-F). CONTRACTOR cannot work hours other than the site's standard work hours without approval of OWNER. CONTRACTOR is responsible for supplying lights if needed at no additional cost to OWNER.

- G. Traffic: CONTRACTOR to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from the OWNER.
- H. Parking: Space for parking at the project site is limited. CONTRACTOR to ensure that parking of employees including Subcontractor employees does not impact traffic or damage any existing space on OWNERS property. Damage caused by CONTRACTOR's employees shall be repaired by CONTRACTOR at no cost to OWNER.
- I. Other Controls:
  - 1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the CONTRACTOR shall prevent any material from being spilled onto the pavement.
  - 2. Wastewater shall not be discharged into existing streams, waterways, or drainage systems such as gutter and catch basins unless treated to comply with Department of Health pollution regulations.
    - a) No waste or foreign object shall be disposed in the stream or within the vicinity of the project.
  - 3. Trucks hauling materials to and from this project shall be constructed, covered or loaded so as to prevent any of its load from dropping, sifting, leaking, blowing, spilling, or otherwise escaping therefrom except as allowed under Tennessee regulation. Trucks hauling fine materials shall be covered.

#### 1.10 GENERAL CONSTRUCTION RESPONSIBILITIES AND PROCEDURES

- A. CONTRACTOR shall be held responsible for correctness of work and shall report errors or inconsistencies in the Drawings and Technical Specifications to ENGINEER before executing work.
- B. Responsibility for Damage to Existing Structures: Repair or replace structures or facilities damaged by CONTRACTOR at no additional cost to OWNER.
  - 1. The CONTRACTOR shall verify the locations and depths of utilities in the project area and exercise proper caution during excavation or trenching. CONTRACTOR shall notify OWNER immediately if any existing utility is damaged during construction. CONTRACTOR to repair existing utilities as expeditiously as possible at no cost to OWNER whether expressly identified on the Drawings or not.
- C. CONTRACTOR shall obtain all necessary building permits including electrical if necessary based on the scope of the project.

#### 1.11 PROTECTION OF EXISTING INFRASTRUCTURE

- A. Prior to beginning site work, locate all site infrastructure such as monitoring wells, piezometers, utility boxes, valve boxes, or other utilities in Work area or adjacent to on-site traffic routes. OWNER or ENGINEER can assist with locating these structures during the pre-construction meeting.
- B. Install markers identifying the location of these objects.
- C. Protect objects as necessary to prevent damage during Work, as approved by ENGINEER or OWNER.
- D. Repair or replace objects damaged during construction by CONTRACTOR at no cost to OWNER.

#### 1.12 DIMENSIONS AND MEASUREMENTS

- A. Figured dimensions marked with "ref." are for CONTRACTOR'S reference only and may vary.

- B. Verify dimensions shown and notify ENGINEER of discrepancies prior to proceeding with work.
- C. Properties and dimensions on the Drawings and in these Technical Specifications are expressed in U.S. units unless otherwise noted.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION



**SECTION 01 11 00.2**  
**INTENT OF DRAWINGS AND TECHNICAL SPECIFICATIONS**

**PART 1 GENERAL**

1.01 DRAWINGS AND TECHNICAL SPECIFICATIONS

- A. The intent of the Drawings and Technical Specifications is to describe work that CONTRACTOR shall perform in a manner acceptable to OWNER and in full compliance with the terms of Contract, and applicable Rules and Regulations.
  - 1. They are to be the basis for the preparation of shop and field drawings as appropriate.
- B. CONTRACTOR shall provide OWNER with a complete and operable system, even though the Drawings and Technical Specifications may not specifically call out all items of work required of CONTRACTOR to complete his tasks, install incidental appurtenances, materials, and the like.
- C. CONTRACTOR is to perform work in accordance with lines, grades, cross sections, and dimensions shown on the Drawings. Deviations shall be approved in writing by OWNER or ENGINEER prior to making deviation.
- D. Dimensions on the Drawings are presumed to be correct, but CONTRACTOR shall check dimensions prior to beginning Work. If errors or omissions are discovered by CONTRACTOR, CONTRACTOR shall immediately notify ENGINEER in writing.

1.02 CHANGES TO DRAWINGS

- A. It is inherent in the nature of construction that some changes in the Drawings and Technical Specifications may be necessary during the course of construction to adjust them to field conditions, and it is the essence of the Contract to recognize a normal and expected margin of change. OWNER shall have the right to make such changes, from time to time, in the Drawings and Technical Specifications, in the character of the work as may be necessary or desirable to ensure the completion of the work in the most satisfactory manner without invalidating the Contract.

1.03 COORDINATION AND INTERPRETATION OF DRAWINGS AND TECHNICAL SPECIFICATIONS

- A. Drawings, Technical Specifications, General Conditions, Supplementary Conditions, Contract Change Orders, and all supplementary documents are essential parts of Contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be coordinated, complementary, and to describe and provide for a complete Work.
- B. Should it appear that the Work or other matters relative thereto are not sufficiently detailed or explained in Contract Documents, CONTRACTOR shall apply to ENGINEER for such further explanations in the form of a Request for Information (RFI) as may be necessary and shall conform to OWNER's response as part of the Contract.
- C. In the event of a doubt or question arising regarding the true meaning of the Contract Documents, reference shall be made to OWNER, whose decision thereon shall be final.
- D. In the event of a discrepancy between a Drawing and the figures and or dimensions written thereon, the figures and or dimensions shall be taken as correct. Figured dimensions shall govern over scaled dimensions. Scaled dimensions shall not be used in the performance of the Work. Cross sections and details take precedent over general plan views.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION

**SECTION 01 20 00  
MEASUREMENT AND PAYMENT**

**PART 1 GENERAL**

1.01 MEASUREMENT

- A. Performed according to United States Standard measure.
- B. Based on actual units installed or neat line dimensions of work completed.
- C. Compute all quantities of Work performed, or of materials and equipment delivered to the site for final payment purposes. Calculation of final quantities will be as described in the Bid Schedule provided with Bid Form. OWNER or OWNER's designated representative for this purpose may verify all quantities.
- D. All linear and area measurements for payment are to be based on horizontal (2D) dimension measurements.

1.02 PAYMENT

- A. In accordance with unit prices and amounts shown on the Bid Schedule provided with Bid Form and attached to the Agreement.
- B. Includes all costs for overhead and profit and for supplying materials, labor, equipment, and tools, necessary to complete the Work in accordance with the Technical Specifications, Drawings, and Contract Conditions.

1.03 VALUES OF UNIT PRICES

- A. The number of units and quantities listed in the Bid Schedule are approximate only, and final payment will be made for the actual number of units and quantities incorporated in the work or made necessary to complete the project.
- B. In the event that work and materials or equipment are required to be furnished to a greater or lesser extent than is indicated in the Bid Schedule, such work and materials or equipment will be furnished in greater or lesser quantities.

1.04 CHANGES AND EXTRA WORK

- A. Changes and extra work will be measured and paid for in accordance with the requirements of written Change Orders.

1.05 REJECTED MATERIALS

- A. Quantities of material wasted or disposed in a manner not called for in the Technical Specifications; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the CONTRACTOR to conform to the provisions of the Technical Specifications; material not unloaded from the transporting vehicle; material placed outside the limits indicated by the Drawings or established by OWNER; or material remaining on hand after completion of the Work, will not be paid for, and such quantities will not be included in the final total unit price quantities. No compensation will be permitted for loading, hauling, and disposing of rejected material.

1.06 GENERAL PAYMENT INFORMATION

- A. Payment for Lump Sum Bid Items
  - 1. Total final payment for Lump Sum Bid Items and accepted Optional Lump Sum Bid Items shall be the value listed in "Lump Sum Bid Item Amounts" on the Bid Schedule provided with Bid Form and attached to Agreement.

B. Payment for Unit Price Bid Items

1. Total payment for unit price bid items shall be the unit price stated in Bid Schedule/Agreement multiplied by the final number of units installed or completed.

C. Progress payments shall be made in accordance with unit prices stated in the Bid Schedule/Agreement multiplied by the number of units completed during that pay period.

D. Payment includes cost for Division 1 Work with the exception of those Division 1 items listed in the Bid Schedule/Agreement.

E. Payment includes costs for overhead and profit, and for supplying materials, labor, equipment, tools and other incidentals necessary to complete Work in accordance with Contract Documents.

1.07 BID ITEM MEASUREMENT AND PAYMENT INFORMATION

A. See Bid Schedule provided with Bid Form and attached to Agreement for descriptions of work included in each pay item and for the method that various units of unit price work will be measured.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION

**SECTION 01 31 00  
PROJECT COORDINATION**

**PART 1 GENERAL**

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
  - 1. Construction Drawings.
  - 2. Administrative and supervisory personnel.
  - 3. General installation provisions.
  - 4. Cleaning and protection.
- B. Related Sections include the following:
  - 1. Progress meetings, coordination meetings and pre-installation conferences are included in Part 1.6 of this Section.
  - 2. Requirements for CONTRACTOR's Construction Schedule are included in Section 01 32 00 "Construction Schedule".

1.3 DEFINITIONS

- A. RFI: Request from CONTRACTOR seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included under different Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other CONTRACTORS to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- B. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for OWNER and separate CONTRACTORS where coordination of their Work is required.
  - C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
    1. Preparation of CONTRACTOR's Construction Schedule.
    2. Installation and removal of temporary facilities and controls.
    3. Delivery and processing of submittals.
    4. Progress meetings.
    5. Project closeout activities.
  - D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
    1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work. Refer to other sections for disposition of salvaged materials that are designated as OWNER's property.
- 1.5 SUBMITTALS

- A. Coordination Drawings: Prepare and submit Coordination Drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.
  1. Show the interrelationship of components shown on separate Shop Drawings.
  2. Indicate required installation sequences.
  3. Comply with requirements contained in Section "Submittals."
- B. Key Personnel Names: Within 15 days of Notice to Proceed, submit a list of CONTRACTOR's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.
  1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
  1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify OWNER and Resident Construction Manager (RCM) of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including OWNER and RCM, within three days of the meeting.

- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to OWNER, RCM, and Engineer, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of OWNER, RCM, Engineer, and their consultants; CONTRACTOR and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss items of significance that could affect progress, including the following:
    - a. Tentative construction schedule.
    - b. Phasing (removal of scrim).
    - c. Critical work sequencing and long-lead items.
    - d. Designation of key personnel and their duties.
    - e. Procedures for processing field decisions and Change Orders.
    - f. Procedures for RFIs.
    - g. Procedures for testing and inspecting.
    - h. Procedures for processing Applications for Payment.
    - i. Distribution of the Contract Documents.
    - j. Submittal procedures.
    - k. Preparation of Record Documents.
    - l. Use of the premises.
    - m. Work restrictions.
    - n. OWNER's occupancy requirements.
    - o. Responsibility for temporary facilities and controls.
    - p. Construction waste management and recycling.
    - q. Parking availability.
    - r. Office, work, and storage areas.
    - s. Equipment deliveries and priorities.
    - t. First aid.
    - u. Security.
    - v. Progress cleaning.
    - w. Working hours.
    - x. Safety Measures.

3. Minutes: Record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at weekly intervals. Coordinate dates of meetings with preparation of payment requests.
1. Attendees: In addition to representatives of OWNER, RCM, and Engineer, each CONTRACTOR, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. CONTRACTOR's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to CONTRACTOR's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      - 1) Review schedule for next period.
    - b. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Work hours.
      - 10) Hazards and risks (Safety Measures).
      - 11) Progress cleaning.
      - 12) Quality and work standards.
      - 13) Status of correction of deficient items.
      - 14) Field observations.
      - 15) RFIs.
      - 16) Status of proposal requests.
      - 17) Pending changes.
      - 18) Status of Change Orders.



- 19) Pending claims and disputes.
  - 20) Documentation of information for payment requests.
3. Minutes: Record the meeting minutes.
  4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
    - a. Schedule Updating: Revise CONTRACTOR's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- D. Daily Meetings: Conduct brief daily meetings at 8:00 a.m. or other time designated by OWNER or OWNER's Rep each morning Monday through Friday to discuss the proposed day's events. In the event of a holiday or non-working day, the meeting may be omitted.
1. Attendees: Representatives of OWNER, CONTRACTOR of superintendent level or higher, and CQA shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  2. Agenda: Discuss day's events, safety issues, and new issues. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
    - a. Review present and future needs of each entity present, including the following:
      - 1) Interface requirements.
      - 2) Sequence of operations.
      - 3) Status of submittals.
      - 4) Deliveries.
      - 5) Off-site fabrication.
      - 6) Access.
      - 7) Site utilization.
      - 8) Temporary facilities and controls.
      - 9) Work hours.
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      - 13) Status of correction of deficient items.
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      - 15) RFIs.
      - 16) Status of proposal requests.
      - 17) Pending changes.

- 18) Status of Change Orders.
- 19) Pending claims and disputes.
- 20) Documentation of information for payment requests.

3. Minutes: Record the meeting minutes.
4. Reporting: Include minutes of the meeting in daily reports.

#### 1.7 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
  1. RFIs shall originate with CONTRACTOR. RFIs submitted by entities other than CONTRACTOR will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in CONTRACTOR's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
  1. Project name.
  2. Date.
  3. Name of CONTRACTOR.
  4. Name of Engineer and RCM.
  5. RFI number, numbered sequentially.
  6. Specification Section number and title and related paragraphs, as appropriate.
  7. Drawing number and detail references, as appropriate.
  8. Field dimensions and conditions, as appropriate.
  9. CONTRACTOR's suggested solution(s). If CONTRACTOR's solution(s) impact the Contract Time or the Contract Sum, CONTRACTOR shall state impact in the RFI.
  10. CONTRACTOR's signature.
  11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    - a. Supplementary drawings prepared by CONTRACTOR shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Hard-Copy RFIs: [Form at end of this Section].
  1. Identify each page of attachments with the RFI number and sequential page number.
- D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- E. Engineer's and Construction Manager's Action: Engineer and Construction Manager will review each RFI, determine action required, and return it. Allow seven working days for Engineer's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Engineer's actions on submittals.
    - f. Incomplete RFIs or RFIs with numerous errors.
  2. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again.
  3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for CONTRACTOR to submit Change Order Proposal according to Bid Package
    - a. If CONTRACTOR believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer and Construction Manager in writing within 10 days of receipt of the RFI response.
- F. On receipt of Engineer's and Construction Manager's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer and Construction Manager within seven days if CONTRACTOR disagrees with response.
- G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
  2. Name and address of CONTRACTOR.
  3. Name and address of Engineer and Construction Manager.
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Engineer's and Construction Manager's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION

**SECTION 01 31 10  
PROJECT MEETINGS**

**PART 1 GENERAL**

1.01 AUTHORITY OF ATTENDEES

- A. Representatives of CONTRACTOR, ENGINEER (via conference call if appropriate), OWNER, subcontractors, and suppliers attending meetings shall be authorized to act on behalf of entity each represents.

1.02 PRE-CONSTRUCTION MEETING

- A. Meeting will be held at location and time selected by OWNER.
- B. Attendance:
  - 1. CONTRACTORS' Office Representative and Superintendent.
  - 2. Subcontractors or supplier's representatives whom CONTRACTOR may invite or OWNER may request.
- C. The agenda will include, but not be limited to, the following subjects:
  - 1. Proposed construction schedule.
  - 2. Required bonds and insurance certifications prior to Notice to Proceed.
  - 3. Procedures for handling submittals such as substitutions and shop drawings.
  - 4. Arrangement for progress meetings for involved parties.
  - 5. Requirements for laboratory testing of materials.
  - 6. Applications for payment, and progress payment procedures.
  - 7. OWNER'S site rules.

1.03 PROGRESS MEETINGS AND AGENDA

- A. CONTRACTOR shall schedule and administer progress meetings.
- B. Meetings to be held weekly, or more frequently, if requested by OWNER.
- C. Attendance:
  - 1. CONTRACTOR's Superintendent.
  - 2. Subcontractors and suppliers as appropriate to agenda.
  - 3. ENGINEER
  - 4. OWNER
- D. Meeting requirements:
  - 1. Perform the following general requirements for progress meetings:
    - a) Prepare agenda for meetings.
    - b) Make physical arrangements for meetings.

- c) Preside at meetings.
- d) Record significant proceedings and decisions of meeting.
- e) Reproduce and distribute copies of meeting record within 3 days after each meeting to participants in meeting and to parties affected by decisions made at meeting.

E. Suggested Agenda:

1. Review progress of Work since previous meeting.
2. Field observations, problems, and conflicts.
3. Revisions to construction schedule.
4. Planned progress during work period.
5. Review submittals; expedite as required.
6. Maintenance of quality and safety standards.
7. Pending changes and substitutions.
8. Review proposed changes for effect on construction schedule and completion date, and on other contractors.
9. Update of the Drawings and Technical Specifications.
10. Health and Safety.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION

## **SECTION 01 32 00 CONSTRUCTION SCHEDULE**

### **PART 1 GENERAL**

#### 1.1 REQUIREMENTS

- A. CONTRACTOR to provide OWNER a proposed schedule and construction sequencing attached to the bid including an estimated start date and finish date. Promptly after award of the Contract, CONTRACTOR shall prepare and submit to OWNER's Representative a final construction progress schedule for the Work, with sub-schedules of related activities that are essential to its progress. This final schedule will become part of the contract.
- B. CONTRACTOR shall prepare revised progress schedules and submit to OWNER on a weekly basis.

#### 1.2 FORM OF SCHEDULES

- A. CONTRACTOR shall prepare schedules in the form of a horizontal bar chart with the following provisions:
  - 1. Separate horizontal bar for each trade or operation.
  - 2. Horizontal time scale identifying the first workday of each week.
  - 3. Scale and spacing sufficient to allow space for notations and future revisions.
  - 4. Minimum sheet size: 8-1/2" x 11".
- B. Format of listings shall be the chronological order of the start of each item of work.
- C. Identification of listings shall be by major specification section numbers.

#### 1.3 CONTENT OF SCHEDULES

- A. The Construction Progress Schedule shall show:
  - 1. The complete sequence of construction by activity.
  - 2. The calendar dates for the beginning and completion of each major element of construction. Where applicable, specifically list:
    - a. Site Clearing.
    - b. Site Grading
    - c. Cover Construction
    - d. Rip Rap Placement
    - e. Observation Area Construction
    - f. Erosion Control and Seeding
    - g. Projected percentage of completion for each item, as of the first day of each month.
- B. Submittals Schedule for Shop Drawings, Product Data and Samples shall show:
  - 1. The dates for CONTRACTOR's submittals.

2. The dates approved submittals will be required from Resident Construction Manager (RCM).
  - C. CONTRACTOR shall prepare and submit sub-schedules for, at a minimum, each separate stage of work specified in Section 01 11 00.1.
  - D. CONTRACTOR shall provide sub-schedules to define critical portions of prime schedules.
- 1.4 PROGRESS REVISIONS
- A. CONTRACTOR shall indicate progress of each activity to date of submission.
  - B. CONTRACTOR shall show changes occurring since previous submission schedule including:
    1. Major changes in scope.
    2. Activities modified since previous submission.
    3. Revised projections of progress and completion.
    4. Other identifiable changes.
  - C. CONTRACTOR shall provide a narrative report as needed to define:
    1. Problem areas, anticipated delays, and the impact on the schedule.
    2. Corrective action recommended, and its effect.
    3. The effect of changes on schedules of other CONTRACTORS.
- 1.5 SUBMISSIONS
- A. CONTRACTOR shall submit initial schedules with the bid. CONTRACTOR shall submit final schedules within 7 days after the bid is awarded or prior to mobilization to the site.
    1. RCM will review schedule and return reviewed copy within 7 days after receipt.
    2. If required, CONTRACTOR shall resubmit within 7 days after return of reviewed copy.
  - B. Revised progress schedules shall be submitted with each application for payment.
  - C. CONTRACTOR shall submit the number of opaque reproductions that CONTRACTOR requires, plus two copies that will be retained by RCM.
- 1.6 DISTRIBUTION
- A. CONTRACTOR shall distribute copies of the reviewed schedules to:
    1. Job site files
    2. Subcontractors
    3. Other concerned parties
  - B. CONTRACTOR shall instruct recipients to report promptly, in writing, to CONTRACTOR any problems anticipated by the projections shown in the schedules.

## **PART 2 PRODUCTS**

Not Used



**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 33 00  
SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

1.01 SECTION INCLUDES

- A. Where required by the TECHNICAL SPECIFICATIONS, CONTRACTOR shall submit descriptive information that will enable ENGINEER to determine whether CONTRACTOR's proposed materials, equipment, and WORK methods are in general conformance to the design concept and in accordance with the DRAWINGS and TECHNICAL SPECIFICATIONS. The information submitted may consist of drawings, specifications, descriptive data, certificates, samples, test results, product data, and such other information, all as specifically required in the DRAWINGS and TECHNICAL SPECIFICATIONS. In some instances, specified submittal information describes some, but not all features of the material, equipment, or WORK method.

1.02 PROCEDURES

- A. Direct all submittals to ENGINEER unless specified otherwise.
- B. Transmittal of Submittal:
1. CONTRACTOR shall be responsible for the accuracy and completeness of the information contained in each submittal and shall ensure that the material, equipment, or WORK method shall be as described in the submittal.
    - a) CONTRACTOR shall verify that all features of all products conform to the requirements of the DRAWINGS and TECHNICAL SPECIFICATIONS.
    - b) CONTRACTOR shall ensure that there is no conflict with other submittals and notify ENGINEER in each case where its submittal may affect the work of OWNER or others.
    - c) CONTRACTOR shall ensure coordination of submittals among the SUBCONTRACTOR(s).
  2. Unless a different number is called for in the individual TECHNICAL SPECIFICATION sections, one (1) copy of each submittal is required.
    - a) Faxed submittals will not be accepted.
  3. CONTRACTOR shall complete, sign, and transmit with each submittal package, one Transmittal of CONTRACTOR's Submittal form in format meeting the following.
  4. Submittal Identification shall include:
    - a) A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted.
    - b) Original submittal numbers shall have the following format: "XXX-Y;" where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for resubmittals (for example, A, B, or C being the first, second, and third resubmittals, respectively). Submittal 25B, for example, is the second resubmittal of Submittal 25.
    - c) TECHNICAL SPECIFICATION section and paragraph to which submittal applies.
    - d) PROJECT name and PROJECT number, and references to applicable DRAWINGS and TECHNICAL SPECIFICATIONS.
    - e) Date of transmittal.
    - f) Names of CONTRACTOR, SUBCONTRACTOR, or supplier, and manufacturer as appropriate.

5. If CONTRACTOR proposes to provide materials, equipment, or WORK methods that deviate from the DRAWINGS and TECHNICAL SPECIFICATIONS, it shall be indicated under "deviations" on the transmittal form accompanying the submittal copies.

C. Format:

1. Submittals regarding material and equipment shall be presented directly to ENGINEER and be accompanied by a transmittal form.
  - a) A separate form shall be used for each specific item, class of material, equipment, and items specified in separate TECHNICAL SPECIFICATIONS for which the submittal is required.
  - b) Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.
2. Submittals that are related to or affect each other shall be forwarded simultaneously as a package to facilitate coordinated review. Uncoordinated submittals will be rejected.
3. Any comments by CONTRACTOR shall be duplicated on all copies submitted.
4. When catalog pages are submitted, applicable items must be clearly identified.
5. Submittals that do not have all the information required, including deviations, are not acceptable and will be returned without review.

D. Timelines: Schedule and submit in accordance with the requirements of the individual TECHNICAL SPECIFICATION sections or as necessary.

E. Resubmittals: Clearly identify each correction or change made.

F. Review Procedure:

1. Submittals are required for those materials, equipment, and WORK methods that can be selected based on CONTRACTOR's judgment of their conformance to the DRAWINGS and TECHNICAL SPECIFICATIONS.
  - a) Other materials, equipment, and WORK methods are specified in a manner that enables CONTRACTOR to determine acceptable options without submittals.
2. The review procedure is based on CONTRACTOR's guarantee that all materials, equipment, and WORK methods not requiring submittals conform to the DRAWINGS and TECHNICAL SPECIFICATIONS.
3. Review will not extend to means, methods, techniques, sequences, or procedures of construction or to verifying quantities, dimensions, weights or gages, or fabrication processes (except where specifically indicated or required by the DRAWINGS and TECHNICAL SPECIFICATIONS) of separate items, and as such, will not indicate approval of the assembly in which the item functions.
4. ENGINEER will review submittals for overall design intent and returned to CONTRACTOR with suggested or necessary revisions.
5. Deviations from CONTRACT requirements:
  - a) Deviations from CONTRACT requirements will be reviewed by ENGINEER.
  - b) CONTRACTOR shall describe such variations in writing, separate from the appropriate submittal at time of submission.
  - c) If ENGINEER approves any such variations, an appropriate CONTRACT MODIFICATION may be issued unless the variation is minor and does not involve a change in price or in time of performance.

6. If the items or system proposed are acceptable, but the major part of the individual drawings or documents are incomplete or require revision, the submittal will be returned with requirements for completion.
7. The right is reserved for ENGINEER to require submittals in addition to those called for in the individual TECHNICAL SPECIFICATION sections.
8. The returned submittal will indicate one of the following:
  - a) If the review determines that the material, equipment, or WORK method complies with the DRAWINGS and TECHNICAL SPECIFICATIONS, submittal copies will be marked "NO EXCEPTIONS TAKEN." In this event, CONTRACTOR may begin to implement the WORK method or incorporate the material or equipment covered by the submittal.
  - b) If the review determines limited corrections are required, copies will be marked "FURNISH AS NOTED." CONTRACTOR may begin implementing the WORK method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in Operation and Maintenance data, a corrected copy shall be provided.
  - c) If the review indicates that the submittal is insufficient or contains incorrect data, copies will be marked "REVISE AND RESUBMIT." Except at its own risk, CONTRACTOR shall not undertake WORK covered by this submittal until it has been revised, resubmitted, and returned marked either "NO EXCEPTIONS TAKEN" or "FURNISH AS NOTED."
  - d) If the review indicates that the material, equipment, or WORK method does not comply with the TECHNICAL SPECIFICATIONS, copies of the submittal will be marked "REJECTED." Submittals with deviations that have not been identified clearly may be rejected. Except at its own risk, CONTRACTOR shall not undertake the WORK covered by such submittals until a new submittal is made and returned marked either "NO EXCEPTIONS TAKEN" or "FURNISH AS NOTED."
9. It shall be CONTRACTOR's responsibility to ensure that required items are corrected and resubmitted. Any WORK done before approval shall be at CONTRACTOR's own risk.
10. Processing Time: Unless otherwise specified, ENGINEER will review the submittal and return copies with comments/required actions within seven (7) calendar days after receipt of the submittal.

G. Effect of Review of CONTRACTOR's Submittals:

1. Review of SHOP DRAWINGS, data, WORK methods, or information regarding materials or equipment CONTRACTOR proposes to provide shall not relieve CONTRACTOR of the responsibility for errors therein and will not be regarded as an assumption of risks or liability by ENGINEER or OWNER, or by any officer or employee thereof; and CONTRACTOR shall have no claim under the CONTRACT on account of the failure or partial failure of the WORK methods, materials, or equipment so reviewed.
2. A mark of "NO EXCEPTIONS TAKEN" or "FURNISH AS NOTED" will mean that OWNER has no objection to CONTRACTOR, upon its own responsibility, using the WORK method proposed, or providing the materials or equipment proposed.

1.03 SHOP DRAWINGS (Not expected)

- A. CONTRACTOR shall coordinate all SHOP DRAWINGS and review them for legibility, accuracy, completeness, and compliance with CONTRACT requirements and shall indicate this approval thereon as evidence of such coordination and review.
  1. SHOP DRAWINGS submitted to ENGINEER without evidence of CONTRACTOR's approval will be returned for resubmission.

- B. CONTRACTOR shall stamp approval on SHOP DRAWINGS prior to submission to ENGINEER as an indication that dimensions and coordination with interrelated items have been checked and verified. Stamp shall read:
  - 1. "(CONTRACTOR's Name) represents that we have determined and verified all field dimensions and measurements, field construction criteria, materials, catalog numbers and similar data, and that we have checked with the requirements of the DRAWINGS and TECHNICAL SPECIFICATIONS, the CONTRACT DOCUMENTS, and GENERAL CONDITIONS."
- C. CONTRACTOR's comments on SHOP DRAWINGS shall not be in red ink.
- D. Should CONTRACTOR propose any item on the SHOP DRAWINGS or incorporate an item into the WORK which subsequently proves to be defective or otherwise unsatisfactory, (regardless of ENGINEER's preliminary review) CONTRACTOR shall, at CONTRACTOR's own expense, replace the item with another item that will perform satisfactorily.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

## **SECTION 01 33 10 SUBMITTALS**

### **PART 1 GENERAL**

#### 1.01 SUMMARY

- A. Section includes procedural requirements for Work-related submittals:
  - 1. Construction Progress Schedules.
  - 2. Product/Material Data.
  - 3. Samples.
  - 4. Survey data.
  - 5. Schedule of values.
  - 6. Other miscellaneous submittals.
- B. Proceed in accordance with Section 01 33 00, Submittal Procedures. Direct all submittals to ENGINEER unless specified otherwise.

#### 1.02 DEFINITIONS

- A. Submittal for Review:
  - 1. Submittal to OWNER for review in accordance with Contract Documents.
- B. Submittal for Record:
  - 1. Submittal for inclusion into OWNER'S records prior to Substantial Completion. Submittal will be reviewed by OWNER'S REPRESENTATIVE.

#### 1.03 CONSTRUCTION PROGRESS SCHEDULES

- A. Prepare and submit Construction Progress Schedule to OWNER'S REPRESENTATIVE for review, in accordance with Section 01 32 00.
- B. Prepare schedules in form of horizontal bar chart.

#### 1.04 SHOP DRAWINGS AND PRODUCT DATA

- A. Scheduling:
  - 1. CONTRACTOR is not required to submit preliminary or final schedule of Shop Drawing submissions.
- B. CONTRACTOR'S Responsibilities:
  - 1. Review Shop Drawings and Product Data prior to submittal.
  - 2. Determine and verify following.
    - a. Field measurements.
    - b. Field construction criteria.
    - c. Conformance with Specifications.

3. Coordinate each submittal with requirements of Work and Contract Documents.
  4. Notify OWNER'S REPRESENTATIVE in writing, at time of submittal, of deviations in submittals from requirements of Contract Documents.
  5. Begin no Work requiring submittals until return of submittals with OWNER'S REPRESENTATIVE approval.
  6. Submittals received but not requested in Specifications shall be returned without review.
  7. Submit 4 copies unless specified otherwise.
- C. Submittals shall contain:
1. Date of submittal and dates of previous submittals.
  2. Project title and number.
  3. Contract identification.
  4. Names of:
    - a. CONTRACTOR.
    - b. Supplier.
    - c. Manufacturer.
  5. Identification of product, with identification numbers, and Drawing and Specification section numbers.
  6. Field dimensions, clearly identified.
  7. Manufacturer and model number, dimensions, and clearances.
  8. Relation to adjacent or critical features of Work or materials.
  9. Applicable standards, such as ASTM. Identification of deviations from Contract Documents.
  10. Identification of revisions on resubmittals.
- D. Resubmittal Requirements:
1. Comply with submittal requirements.
  2. Make corrections or changes in submittals required by OWNER'S REPRESENTATIVE. Resubmit until approved.
  3. Identify on transmittal form that submittal is resubmission.
  4. Shop Drawings and Product Data:
    - a. Revise initial Drawings or data and resubmit as specified for initial submittal.
    - b. Indicate changes made other than those requested by OWNER'S REPRESENTATIVE.

E. Distribute reproductions of approved Product Data to following.

1. Job site file.
2. Record documents file.
3. Other affected CONTRACTORS.
4. Subcontractors.

F. OWNER'S REPRESENTATIVE Duties:

1. Review submittals in accordance with schedule.
2. Sign and indicate requirements for resubmittal or approval of submittal.
3. Return submittals to CONTRACTOR.

#### 1.05 SAMPLES

A. Submit full-size, fully fabricated Samples as specified and physically identical with material or product proposed. Samples include partial sections of manufactured or fabricated components, and cuts or containers of materials.

1. Include the following:
  - a. Generic description of sample.
  - b. Sample source.
  - c. Product name or name of manufacturer.
  - d. Compliance with recognized standards.

B. Refer to Specifications for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

C. Samples may be used, as approved, for quality comparisons during construction.

#### 1.06 TEST RESULTS

A. Submit test results required in Specification sections.

B. Test results are submitted for review of conformance with specified requirements and information.

#### 1.07 GUARANTEE, WARRANTIES, MAINTENANCE AGREEMENTS, AND WORKMANSHIP BONDS

A. Refer to Specification sections for requirements. Submittal is considered final when submittal is received by OWNER'S REPRESENTATIVE.

#### 1.08 QUALITY CONTROL CERTIFICATIONS

A. Submit certifications required in Specification sections.

B. Identify test values and testing laboratory.

#### 1.09 SURVEY DATA

A. Copies of survey logs and drawings of surveys performed.



1.10 HEALTH AND SAFETY PLAN (HASP)

- A. Comply with the requirements of Section 01 70 40.

1.11 SCHEDULE OF VALUES

- A. Comply with the requirements of Section 01 20 00.

1.12 EROSION CONTROL PLAN

- A. Comply with the requirements of Section 01 55 00.

1.13 ACTION ON SUBMITTALS

- A. Proceed in accordance with Section 01 33 00, Submittal Procedures. Direct all submittals to ENGINEER unless specified otherwise.

- B. OWNER'S Representative's Action:

- 1. General:

- a. Except for submittals for record and similar purposes, where action and return on submittal is required or requested, OWNER'S REPRESENTATIVE will review each submittal, mark with appropriate action, and return. Where submittal must be held for coordination, OWNER'S REPRESENTATIVE will so advise CONTRACTOR without delay.
    - b. OWNER'S REPRESENTATIVE will stamp each submittal with action stamp, appropriately marked with submittal action.

- 2. Notification of Insufficient Information:

- a. If information submitted is not sufficient to complete review of submittal, OWNER'S REPRESENTATIVE will send transmittal to CONTRACTOR notifying CONTRACTOR that additional information is required.
    - b. Submittal will not be returned. Submittal will be placed in an "on hold" status until CONTRACTOR provides additional information.

- C. Action Stamp:

- 1. Marking: NO EXCEPTIONS TAKEN.

- a. Final Unrestricted Release: Where submittals are marked as "NO EXCEPTIONS TAKEN," Work covered by submittal may proceed provided it conforms with the design concept of the project and complies with Contract Documents. Acceptance of Work depends on that compliance.

- 2. Marking: Approved With Noted Exceptions.

- a. Final-But-Restricted Release: When submittals are marked as "FURNISH AS NOTED," Work covered by submittal may proceed provided it complies with OWNER'S REPRESENTATIVE'S notations or corrections on submittal and with Contract Documents. Acceptance of Work depends on that compliance. Resubmittal is not required.

- 3. Marking: Not Approved.

- a. Submittal Not Accepted: When submittals are marked as "REJECTED," do not proceed with Work covered by submittal. Work covered by submittal does not comply with Contract Documents.

- b. Prepare new submittal for different material or equipment supplier or different product line or material of same supplier complying with Contract Documents.
- 4. Marking: Revise and Resubmit.
  - a. Returned for Resubmittal: When submittals are marked as "Revise and Resubmit," do not proceed with Work covered by submittal. Do not permit Work covered by submittals to be used at Project site or elsewhere where Work is in progress.
  - b. Revise submittal or prepare new submittal in accordance with OWNER'S REPRESENTATIVE'S notations. Resubmit without delay. Repeat if required to obtain different action marking.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 40 00**  
**QUALITY ASSURANCE AND QUALITY CONTROL**

**PART 1 GENERAL**

1.1 Section Includes

- A. Quality assurance and control of installation.
- B. Inspection and testing laboratory services.

1.2 Related Sections

- A. Section 01 60 00 – “Material and Equipment: Requirements for material and product quality.”

1.3 Measurement and Payment

- A. Payment for this item will be considered incidental to Work performed under this contract. No separate payment will be made.

1.4 References (Not Applicable)

1.5 Quality Control of Installation

- A. Comply fully with manufacturers’ instructions, including each step in sequence.
- B. Should manufacturers’ instructions conflict with Contract Documents, request clarification from Resident Construction Manager (RCM) before proceeding.
- C. Comply with specified testing standards as a minimum quality for Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise Workmanship.

1.6 Inspection and Testing Laboratory Services

- A. OWNER will appoint, employ, and pay for services of an independent RCM and Construction Quality Assurance Officer (CQA Officer) to perform observation and testing.
- B. RCM or CQA Officer will perform observations, tests, and other services specified within the Construction Quality Assurance Plan (CQA Plan) as well as in individual specification sections.
- C. Reports will be submitted by RCM to OWNER indicating observations and results to tests and indicating compliance or non-compliance with Contract Documents.

- D. Assist RCM as requested.
- E. Furnish samples of materials, equipment, and tools as requested.
- F. Notify RCM 24 hours prior to expected time of operations requiring services.
- G. Retesting required because of non-conformance to specified requirements will be performed by RCM. Any retesting required due to non-conformance will be completed at no additional cost to OWNER and will be borne by the CONTRACTOR.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

Not used

END OF SECTION

## SECTION 01 50 00

### TEMPORARY FACILITIES AND CONTROLS

#### PART 1 GENERAL

##### 1.1 REQUIREMENTS

- A. CONTRACTOR shall furnish, install and maintain required construction aids and barriers as required to prevent public entry, and to protect the Work, existing facilities, trees and plants from construction operations and other temporary facilities required to complete the Work.
- B. CONTRACTOR shall provide and maintain methods, equipment and temporary construction, as necessary to provide controls over environmental conditions at the construction site and related areas under CONTRACTOR's control.
- C. CONTRACTOR shall remove all temporary facilities at completion of Work or when no longer necessary.

##### 1.2 DUST CONTROL

- A. CONTRACTOR shall provide positive methods and apply dust control water to minimize raising dust from construction operation, and provide positive means to prevent airborne dust from dispersing into the atmosphere. Chemical dust suppressant shall not be used. Only water will be used for dust control. Water can be obtained from adjacent river or from on-site hydrant if available and approved for use. The CONTRACTOR will be required to meter and log the water used. The OWNER or his representative will be responsible for paying the cost for the utility.

##### 1.3 WATER CONTROL

- A. CONTRACTOR shall provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties. CONTRACTOR shall control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.
- B. CONTRACTOR shall provide, operate and maintain hydraulic equipment of adequate capacity to control surface erosion.
- C. CONTRACTOR shall dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

##### 1.4 DEBRIS CONTROL

- A. All areas under CONTRACTOR's control shall be maintained free of extraneous debris.
- B. CONTRACTOR shall initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
  - 1. OWNER will provide containers and disposal services for all debris generated from the work. CONTRACTOR will not overload containers and coordinate with OWNER when container is full and needs to be emptied and/or replaced.
  - 2. CONTRACTOR shall prohibit overloading of trucks to prevent spillages on access and haul routes. Traffic areas shall be periodically inspected to enforce requirements.

3. All soil and aggregate delivery trucks entering the project from off-site locations shall be properly tarped when entering the property.

C. CONTRACTOR shall schedule periodic collection and disposal of debris. Additional collections and disposal of debris shall be provided whenever the periodic schedule is inadequate to prevent accumulation.

D. CONTRACTOR shall provide dirt, soil and/or clay control for public roads to prevent tracking of sediment /material.

#### 1.5 POLLUTION CONTROL

A. CONTRACTOR shall provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. CONTRACTOR shall provide equipment and personnel to perform emergency measures required to contain any spillages and to remove contaminated soils or liquids; and, shall excavate and dispose of any soil contaminated by the construction operations off-site, and replace with suitable compacted fill, topsoil and vegetation as directed by RCM.

C. CONTRACTOR shall take special measures to prevent harmful substances from entering public waters; and, shall prevent disposal of wastes, effluents, chemicals, sediments, or other such substances adjacent to streams, or in sanitary or storm sewers.

D. CONTRACTOR shall provide systems for control of atmospheric pollutants and shall:

1. Prevent toxic concentrations of chemicals and
2. Prevent harmful dispersal of pollutants into the atmosphere.

#### 1.6 EROSION CONTROL

A. CONTRACTOR shall plan and execute construction and earthwork using methods to control surface drainage from cuts and fills and from borrow and waste disposal areas in order to prevent erosion and sedimentation; and shall:

1. Hold the number and size of areas of bare soil exposed at one time to a minimum and
2. Provide temporary control measures such as berms, dikes, silt fence, silt dams, drains, etc., as shown on the Drawings and as directed by RCM.

B. CONTRACTOR shall construct fills and waste areas by selective placement to eliminate erodible surface soils.

C. CONTRACTOR shall periodically inspect earthwork to detect any evidence of the start of erosion, and apply corrective measures as required to control erosion.

#### 1.7 REMOVAL AND RESTORATION

A. Remove temporary materials, equipment, signs, utilities, and structures after final completion of WORK, including operations and maintenance period. If material, equipment, structure, etc., is not necessary during operations and maintenance period, remove upon Substantial Completion.

B. Restore areas used for parking, trailers, and other disturbed areas in accordance with Section 32 50 10 – Stabilization/Seeding.

#### 1.8 DAMAGE TO EXISTING PROPERTY

- A. Replace or repair damage to roads, adjacent property, and any damage to any element of WORK during Contract Time.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 55 00  
PROTECTION OF ENVIRONMENT**

**PART 1 GENERAL**

1.01 SUMMARY

- A. CONTRACTOR, in executing Work, shall maintain Work areas on- and off-site free from environmental pollution that would be in violation of federal, state or local regulations.

1.02 STORMWATER CONTROL

- A. As a minimum CONTRACTOR is required to comply with the following documents to be completed by the OWNER or OWNER'S REPRESENTATIVE.
  - 1. Notice of Intent (NOI).
  - 2. Storm Water Pollution Prevention Plan.

1.03 EROSION AND SEDIMENT CONTROL

- A. Apply appropriate soil conservation measures to protect project area and adjacent lands. These measures may include, but not be limited to, mulching, rapid growth vegetation, fabric mat, hay bales, filter barriers, sediment traps, and basins.
- B. CONTRACTOR to provide Erosion Control Plan (ECP) for review and approval prior to onset of construction.

1.04 DISPOSAL OF SPECIAL/UNEXPECTED WASTE MATERIALS

- A. Dispose of PCB-contaminated wastes and other special wastes in accordance with applicable regulatory requirements.
- B. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.
- C. If unexpected waste materials (as determined by OWNER) are discovered during Construction, CONTRACTOR to discuss appropriate plan for handling with OWNER or OWNER'S REPRESENTATIVE prior to proceeding.

1.05 LITTER CONTROL

- A. Provide litter control to keep exposed waste from blowing off-site. Collect litter present on site and grade into landfill as part of grading activities. Maintain site free of litter generated by CONTRACTOR'S employees.

1.06 PROTECTION OF AIR QUALITY

- A. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use.
- B. Do not burn trash or other material on construction site.

1.07 USE OF CHEMICALS



- A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall be approved by U.S. EPA or U.S. Department of Agriculture or any other applicable regulatory agency.
- B. Use and dispose of chemicals and residues in compliance with manufacturer's instructions and applicable regulations.

1.08 NOISE AND ODOR CONTROL

- A. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.
- B. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
- C. Conduct WORK in a manner to minimize odors to residences in the vicinity of work. If odors become a problem, as determined by the OWNER'S REPRESENTATIVE, Provide an odor control material or procedure acceptable to OWNER'S REPRESENTATIVE.

1.09 DUST CONTROL

- A. Maintain temporary site roadways and existing roads used during construction operations in clean, dust free condition.
- B. Control dust during operations on landfill to prevent dust blowing off-site and impacting neighboring property owners.
- C. Comply with local environmental regulations for dust control. If CONTRACTOR'S dust control measures are considered inadequate by the OWNER'S REPRESENTATIVE, OWNER'S REPRESENTATIVE may require CONTRACTOR to take additional dust control measures.

1.10 FUELS AND LUBRICANTS

- A. Comply with local, state and federal regulations concerning transportation and storage of fuels and lubricants.
- B. Fuel storage area and fuel equipment shall be approved by OWNER'S REPRESENTATIVE prior to installation.
- C. Report spills or leaks from fueling equipment or construction equipment to OWNER'S REPRESENTATIVE and cleanup as required.
- D. OWNER'S REPRESENTATIVE may require CONTRACTOR to remove damaged or leaking equipment from Project site.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 60 00  
MATERIALS AND EQUIPMENT**

**PART 1 GENERAL**

1.1 REQUIREMENTS

- A. Material and equipment incorporated into the Work shall:
  - 1. Conform to applicable specifications, codes and standards.
  - 2. Comply with size, make, type and quality specified, or as specifically approved in writing by CONSTRUCTION MANAGER (CM).
  - 3. Manufactured and Fabricated Products shall be:
    - a. Designed, fabricated and assembled in accord with the best engineering and shop practices.
    - b. Like parts of duplicate units to standard sizes and gages, shall be manufactured to be interchangeable.
- B. Two or more items of the same kind shall be identical, by the same manufacturer.
- C. Products shall be suitable for service conditions.
- D. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by CM. Material or equipment shall not be used for any purpose other than that for which it is designed or is specified.

1.2 MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, CONTRACTOR shall obtain and distribute copies of such instructions to parties involved in the installation, including two copies to CM. CONTRACTOR shall maintain one set of complete instructions at the job site during installation and until completion.
- B. CONTRACTOR shall handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
  - 1. Should job conditions or specified requirements conflict with manufacturer's instructions, CONTRACTOR shall consult with CM for further instructions.
  - 2. CONTRACTOR shall not proceed with work without clear instructions.
- C. CONTRACTOR shall perform work in accord with manufacturer's instructions. No preparatory step or installation procedure shall be omitted unless specifically modified or exempted by Contract Documents.

1.3 TRANSPORTATION AND HANDLING

- A. CONTRACTOR shall arrange deliveries of Products in accord with construction schedules, and coordinate deliveries to avoid conflict with Work and conditions at the site.
  - 1. Products shall be delivered in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.

2. Immediately upon delivery, CONTRACTOR shall inspect shipments to assure compliance with requirements of Contract Documents, and to determine that Products are properly protected and undamaged.
- B. CONTRACTOR shall provide equipment and personnel to handle Products by methods that will prevent soiling or damage to Products or packaging.

#### 1.4 STORAGE AND PROTECTION

- A. Products shall be stored in accord with manufacturer's instructions with seals and labels intact and legible.
1. Products subject to weather damage shall be stored in weather tight enclosures.
  2. Temperature and humidity shall be maintained within the ranges required by manufacturer's instructions.
- B. Exterior Storage:

CONTRACTOR shall:

1. Store fabricated products above the ground, on blocking or skids, and prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
  2. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. CONTRACTOR shall arrange store in a manner to provide easy access for inspection; make periodic inspections of stored Products to assure that Products are maintained under specified conditions, and are free from damage or deterioration.
- D. CONTRACTOR shall provide substantial coverings as necessary to protect installed Products from damage caused by traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

#### 1.5 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Within 15 days after Contract Date, CONTRACTOR shall submit to CM a complete list of major products proposed to be used, with the name of the manufacturer and the installing Subcontractor.
- B. CONTRACTOR's Options:
1. For Products specified only by reference standard, selection of any product meeting that standard.
  2. For Products specified by naming several products or manufacturers, selection of any one of the products or manufacturers named, which complies with the specifications.
  3. For Products specified by naming one or more Products or manufacturers and "or equivalent", CONTRACTOR must submit a request for substitutions for any Product or manufacturer not specifically named.
  4. For Products specified by naming only one Product and manufacturer, there is no option.
- C. Substitutions:

1. For a period of 15 days after Contract Date, CM will consider written requests from CONTRACTOR for substitution of Products.
  2. CONTRACTOR shall submit a separate request for each Product, supported with complete data, with drawings and samples as appropriate, including:
    - a. Comparison of qualities of the proposed substitution with that specified.
    - b. Changes, if any, required in other elements of the work because of the substitution.
    - c. Effect on the construction schedule.
    - d. Cost data comparing the proposed substitution with the Product specified.
    - e. Any required license fees or royalties.
    - f. Availability of maintenance service, and source of replacement materials.
  3. CM shall be the judge of the acceptability of the proposed materials.
- D. The request for a substitution constitutes a representation that CONTRACTOR:
1. Has investigated the proposed Product and determined that it is equal to or superior in all respects to that specified.
  2. Will provide the same warranties or bonds for the substitution as for the Product specified.
  3. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects.
  4. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.
- E. CM will review requests for substitutions with reasonable promptness, and notify CONTRACTOR, in writing, of the decision to accept or reject the requested substitution.

## **PART 2 PRODUCTS**

Not Used

## **PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 70 00  
PROJECT RECORD DOCUMENTS**

**PART 1 GENERAL**

1.1 REQUIREMENTS

- A. Maintain at the site for OWNER one record copy of:
  - 1. Drawings
  - 2. Specifications
  - 3. Addenda
  - 4. Change Orders and other Modifications to the Contract
  - 5. Field Orders or Written Instructions by Resident Construction Manager (RCM)
  - 6. Reviewed Shop Drawings, Product Data and Samples
  - 7. Applicable Manufacturer's Instructions
  - 8. Field Test Records
  - 9. Record Drawings
  - 10. CQA Plan
  - 11. Construction Photographs
  - 12. Relevant Permits

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Documents shall be maintained by CONTRACTOR in a clean, dry, legible condition and in good order. Record documents shall not be used for construction purposes.
- B. CONTRACTOR shall make documents and samples available at all times for inspection by RCM.

1.3 SUBMITTAL

- A. At Contract close-out, CONTRACTOR shall deliver Record Documents to RCM for OWNER.
- B. CONTRACTOR shall accompany submittal with transmittal letter in duplicate, containing:
  - 1. Date
  - 2. Project title and number
  - 3. CONTRACTOR's name and address
  - 4. Title and number of each Record Document
  - 5. Signature of CONTRACTOR or his authorized representative

## **PART 2 PRODUCTS**

Not Used

## **PART 3 EXECUTION**

### **3.01 GENERAL**

- A. Maintain one (1) complete set of Drawings and Project Manual, including Addenda, legibly annotated to show changes made during construction.
- B. Label each document "PROJECT RECORD" in neat, large printed letters.
- C. Record information concurrently with construction progress:
  - 1. Do not cover Work until information is recorded.
  - 2. Record changes made by Change Order, Construction Change Directive or order for minor change in Work and identify document number.
- D. Give particular attention to concealed equipment and materials that would be difficult to measure and record at later date.

### **3.02 DRAWINGS**

- A. Graphically depict changes by modifying or adding to plans, details, sections, elevations, or schedules.
- B. Make changes on each sheet affected by changes.
- C. Dimensions:
  - 1. Horizontal and vertical locations of underground piping and appurtenances, referenced to permanent surface improvements.

### **3.03 SPECIFICATIONS**

- A. Mark Specification sections to show substantial variations in actual Work performed in comparison with text of Specifications and modifications.
- B. Include variations in products delivered to site.
- C. Give particular attention to substitutions and selection of options and similar information.
- D. Note related record drawing information and Product Data.

END OF SECTION

**SECTION 01 70 10  
CONTRACT CLOSEOUT**

**PART 1 GENERAL**

1.1 Section Includes

- A. Closeout procedures.
- B. Final cleaning.

1.2 Measurement and Payment

- A. Payment for this item will be considered incidental to Work performed under this contract. No separate payment will be made.

1.3 Closure Procedures

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Resident Construction Manager's inspection.
- B. Provide submittals to OWNER that are required by governing or other authorities.
- C. Submit final Application for Payment in accordance with Contract Agreement.

**PART 2 PRODUCTS**

Not Used

**PART 3 – EXECUTION**

Not Used

END OF SECTION

**SECTION 01 70 20  
CLEANING**

**PART 1 GENERAL**

1.1 REQUIREMENTS

- A. Execution of cleaning, during progress of the Work, and at completion of the Work, as required by General Conditions.

1.2 DISPOSAL REQUIREMENTS

- A. CONTRACTOR shall conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

**PART 2 PRODUCTS**

2.1 MATERIALS

- A. Only those cleaning materials that will not create hazards to health or property and that will not damage surfaces shall be used.
- B. Only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned shall be used.
- C. Cleaning materials shall be used only on surfaces recommended by material manufacturer.

**PART 3 EXECUTION**

3.1 DURING CONSTRUCTION

- A. CONTRACTOR shall execute periodic cleaning to keep the Work, the site and adjacent properties free from accumulation of waste materials, rubbish and windblown debris, resulting from construction operations.
- B. OWNER will provide on-site roll off containers for the collection of waste materials, debris and rubbish. CONTRACTOR will not overload containers and coordinate with OWNER when container is full and needs to be emptied and/or replaced.

3.2 DUST CONTROL

- A. Operations shall be scheduled so that dust and other contaminants resulting from the cleaning process will not fall on wet or newly-coated surfaces.

3.3 FINAL CLEANING

- A. CONTRACTOR shall employ skilled workers for final cleaning.
- B. CONTRACTOR shall remove grease, mastic, adhesive, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed exterior surfaces.
- C. CONTRACTOR shall broom clean exterior paved surfaces and rake clean other surfaces of the grounds.
- D. Prior to final completion, CONTRACTOR shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify that the entire Work is clean.

END OF SECTION



**SECTION 01 70 30  
MOBILIZATION AND DEMOBILIZATION**

**PART 1 GENERAL**

1.01 SECTION INCLUDES

- A. This section includes CONTRACTOR requirements for mobilization, staging and demobilization from the project site.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

3.01 MOBILIZATION

- A. Perform preparatory work and operations, including but not limited to, the following:
  - 1. Move personnel, equipment, supplies, and incidentals to project site.
  - 2. Establish offices, buildings and other facilities necessary to complete Work.
  - 3. Procure bonds and insurance for Work, as required by OWNER.
  - 4. Attend coordination, pre-construction, and other meetings as requested.
  - 5. Coordinate subcontractors and suppliers.
  - 6. Perform other activities that must begin before Work and which are not covered in other bid items.

3.02 STAGING

- A. CONTRACTOR shall provide ALL labor and equipment to manage ALL materials used in the construction including offloading, loading and relocation to and from staging area during the entire duration of the project.
- B. An area will be set aside on property for CONTRACTOR'S use as a staging area for personnel, equipment, and materials.
  - 1. OWNER will define location of staging area on the project site. The staging area location will be confirmed during the project pre-construction meeting with the CONTRACTOR.
  - 2. CONTRACTOR shall maintain all materials and equipment within this defined staging area except as required to complete construction.
    - a) If at any time after this meeting, the agreed upon designated area is not sufficient for the activities defined in the project scope, the CONTRACTOR shall notify Engineer and OWNER. To the extent practical, an alternative temporary staging area will be agreed upon prior to the CONTRACTOR using such area. Note that the OWNER does not guarantee that such an alternative area is available and reserves the right to restrict expansion of the staging area if insufficient space is available.

3.03 DEMOBILIZATION

- A. Perform demobilization work and operations, including but not limited to, the following:
  - 1. Move personnel, equipment, excess materials, and incidentals off project site.

2. Re-grade, clean, and restore staging, storage, and access roads, and other areas to pre-mobilization conditions.
3. Complete contract closeout activities in accordance with Section 01 70 00.1 – Contract Closeout.

END OF SECTION

**SECTION 01 70 40  
ON-SITE HEALTH AND SAFETY**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Construction activities at landfills may place CONTRACTOR'S personnel, personnel of other CONTRACTORS hired by OWNER to perform Work at site, and public in potentially hazardous situations due to exposure to landfill refuse, leachate, and gases.
- B. CONTRACTOR is responsible for implementation and enforcement of safe Work practices including, but not limited to, personnel exposure to refuse, leachate, and gases; use of trenching, sheeting, and shoring; scaffolding; and materials handling; operation of equipment; and safety of public during progress of Work.

1.02 PAYMENT

- A. Include in Bid, cost for Work performed in OSHA Level D protection.
- B. Work specified in this section is considered incidental and cost shall be included as part of appropriate lump sum or unit prices specified in Bid Form.
- C. If an upgrade of protection is required, CONTRACTOR is to contact OWNER prior to engaging in work requiring the upgraded protection and specifically request approval. CONTRACTOR must identify the extent of the higher-level usage and define the work and quantities of material affected.

1.03 REGULATORY REQUIREMENTS

- A. CONTRACTOR shall plan for and ensure personnel comply with basic provisions of OSHA Safety and Health Standards (29 CFR 1910) and General Construction Standards (29 CFR 1926) as appropriate.
- B. Comply with applicable laws and regulations of any public body having jurisdiction for safety of persons or property.

1.04 OPERATIONS AND EQUIPMENT SAFETY

- A. CONTRACTOR is responsible for initiating, maintaining, and supervising safety precautions and programs in connection with Work. CONTRACTOR shall take necessary precautions for safety of employees on Project site and other persons and organizations who may be affected by Project.
- B. CONTRACTOR'S duties and responsibilities for safety in connection with Work shall continue until such time as Work is complete and OWNER has issued notice to CONTRACTOR that Work is complete.

1.05 HEALTH AND SAFETY

- A. CONTRACTOR is responsible for implementation and enforcement of health and safety requirements and shall take necessary precautions and provide protection for the following.
  - 1. Personnel working on or visiting Project site, irrespective of employer.
  - 2. Work and materials or equipment to be incorporated in Work area on- or off site.
  - 3. Other property at or adjacent to Project site.
  - 4. Public exposed to job related operations or potential release of toxic or hazardous materials.

- B. CONTRACTOR shall prepare site specific health and safety plan (HASP). If CONTRACTOR does not have capability to prepare HASP, CONTRACTOR shall employ consultants with appropriate capability. CONTRACTOR is solely responsible for adequacy of HASP's preparation, monitoring, management, and enforcement. At minimum, CONTRACTOR'S HASP shall address the following.
  - 1. Site description and history.
  - 2. Project activities and coordination with other CONTRACTORS.
  - 3. Hazard evaluation.
  - 4. On-site safety responsibilities.
  - 5. Work zones.
  - 6. Personnel training.
  - 7. Atmospheric monitoring.
  - 8. Personal protection, clothing, and equipment.
  - 9. Emergency procedures.
- C. CONTRACTOR's HASP should be consistent with the OWNER's HASP if available. CONTRACTOR shall notify OWNER of differences that would impact safety at the project.

1.06 SUBMITTALS

- A. Submit copies of HASP to OWNER within 10 days after Notice to Proceed. Work on site shall not proceed until HASP has been submitted to OWNER.

**PART 2 PRODUCTS**

Not Used

**PART 3 EXECUTION**

Not Used

END OF SECTION

**SECTION 01 73 10  
FIELD ENGINEERING**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall provide field layout (lines and grades) of the Work and maintain and preserve all stakes and other markers as required to complete the Work.
- B. OWNER will identify existing control points as indicated on the Drawings.

1.2 QUALIFICATIONS OF SURVEYOR

- A. Field layout shall be performed by or under the supervision of a licensed engineer or land surveyor registered in the state of Tennessee (the Surveyor), acceptable to Owner.

1.3 SUBMITTALS

- A. CONTRACTOR shall submit name and address of the Surveyor.
- B. On request of Construction Manager (CM), CONTRACTOR shall submit documentation to verify accuracy of field engineering work.

**PART 2 PRODUCTS**

Not used

**PART 3 EXECUTION**

3.1 SURVEY REFERENCE POINTS

- A. Existing horizontal and vertical control points (baseline survey) for the Project shall be identified by Owner.
- B. CONTRACTOR shall locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
- C. CONTRACTOR shall make no changes or relocations to control points without prior written approval from OWNER.
- D. CONTRACTOR shall report to CM when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- E. CONTRACTOR shall replace Project control points which may be lost or destroyed at no additional cost to OWNER. Replacements shall be re-established based on original survey control.

3.2 PROJECT SURVEY REQUIREMENTS

- A. Establishment of lines and levels, located and laid out, by instrumentation and similar appropriate means for all Work indicated by the Drawings, CQA Plan, or Specifications.
- B. As construction proceeds, check every element for line, level and plumb.
- C. Locations of existing sewers, culverts and other utilities shown on the Drawings are approximate and shall be field-verified by CONTRACTOR prior to construction as required to complete the Work.

- D. From time to time, layouts shall be verified by same methods.
- E. As-built drawings will be prepared by the CONTRACTOR and approved by the CERTIFICATION ENGINEER.

3.3 RECORDS

- A. CONTRACTOR shall maintain a complete, accurate log of all control and survey work as it progresses.
- B. On request of CM, the Surveyor shall submit documentation to verify accuracy of field engineering work.

END OF SECTION

**SECTION 01 73 50  
SURVEY CONTROL**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Staking for Construction Activities
- B. Record surveys of top of subgrade, top of cover soil, and top of topsoil.

1.02 PRIMARY CONTROL MONUMENTS

- A. Benchmarks, property corners, monuments or references provided by OWNER to establish primary vertical control for Work are indicated on Drawings. Elevations are referenced to North American Vertical Datum of 1988.
- B. Protect and maintain from damage during WORK.
- C. If monuments are damaged by CONTRACTOR, replace by Registered Land Surveyor at CONTRACTOR'S expense.

1.03 QUALIFICATIONS OF SURVEYOR

- A. Registered professional land surveyor, licensed in the State of Tennessee.

1.04 RECORDS

- A. Maintain a complete, accurate log of all control and survey work as it progresses. The documents will become part of the as-built records.
- B. All field books, notes, and other data developed by CONTRACTOR in performing surveys required as part of the work shall be available to the OWNER'S REPRESENTATIVE for examination throughout the construction period.

1.05 SUBMITTALS

- A. Schedule
  - 1. Provide as-built data to OWNER'S REPRESENTATIVE within one working day of when surveying was performed.
  - 2. Submit survey data and final survey (or portion thereof) to OWNER'S REPRESENTATIVE for approval before covering a layer of material with a subsequent layer. For example, do not place cover soil material above subgrade until the final survey for that portion of the subgrade has been submitted and approved by OWNER'S REPRESENTATIVE.
  - 3. Timing for approval and acceptance by Certification Engineering and/or Design Engineer prior to proceeding with subsequent overlying soils placement is expected to be within (3) calendar days following submittal of data for review. If a response or approval is not provided within that timeframe, CONTRACTOR shall contact Certification Engineer for clarification and further direction.
  - 4. Format:
    - a. Paper:
      - i. Surveys shall be same size as Drawings unless otherwise approved by OWNER'S REPRESENTATIVE.

- ii. Each final survey shall be sealed by a registered professional land surveyor.
- b. Electronic:
  - i. Submit data described in this Section in ASCII, AutoCad and PDF format, unless otherwise approved by OWNER'S REPRESENTATIVE.

#### 1.06 MEASUREMENT AND PAYMENT

- A. Payment for this item will be in accordance with Section 01 20 00 – Measurement and Payment.

### **PART 2 PRODUCTS**

Not Used

### **PART 3 EXECUTION**

#### 3.01 CONSTRUCTION STAKING

- A. Perform construction staking necessary to meet specifications of the project.
- B. Remove stakes set in subgrade prior to placing any materials over subgrade.
- C. Remove stakes set in cover soil prior to placing any materials over cover soil.

#### 3.02 MEASUREMENT POINTS

- A. Measure tolerances at the following points:
  - a. Elevations on a 50-foot grid pattern covering WORK area. Measure elevations to nearest 0.1 feet.
  - b. Elevations at 50-foot intervals along breaks in slope. Measure elevations to nearest 0.1 feet.
  - c. Elevations at 50-foot intervals along road and ditch centerlines. Measure elevations to nearest 0.1 feet.

#### 3.03 FINAL RECORD SURVEYS

- A. Provide an as-built verification survey for the following layers within five working days after construction of the layer has been completed.
  - a. Existing conditions after clearing/grubbing
  - b. Top of excavation limit (side slopes and stockpiles)
  - c. Top of cover soil/clay-like material (side slopes and stockpiles)
  - d. Top of topsoil
- B. At a minimum, provide the following information on each survey:
  - a. Data described in Article 3.02 of this Section
  - b. Data for underlying layer (to calculate thickness of layer placed)



- c. Data allowing northing and easting of points to be determined

END OF SECTION

**SECTION 31 10 00  
SITE CLEARING**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. Clearing, grubbing, chipping, grinding, stockpiling, and removal and disposal of vegetation, roots and debris within the limits of the work except objects designated on the Drawings to remain.
- B. Preservation from injury or defacement all vegetation and objects to remain.
- C. Installation of erosion control measures.

1.2 LIMITS OF WORK

- A. Rights-of-way established by OWNER.
- B. Construction area including the area bounded by lines five feet outside the construction lines established by OWNER. At no time shall the CONTRACTOR perform work outside of the property boundary.

1.3 PROTECTION

- A. CONTRACTOR shall protect living trees not marked for removal within the construction area and those outside the construction area. Cut or scarred surfaces of trees or shrubs shall be treated with a paint prepared especially for tree surgery.
- B. Benchmarks and existing structures, roads, sidewalks, paving and curbs shall be protected against damage from vehicular or foot traffic.
- C. Designated temporary roadways, walkways and detours for vehicular and pedestrian traffic shall be maintained.

**PART 2 PRODUCTS**

2.1 EROSION CONTROL

- A. Erosion control measures and devices as specified on the Drawings or as required to comply with applicable laws and regulations.

**PART 3 EXECUTION**

3.1 PREPARATION

- A. CONTRACTOR shall maintain benchmarks, monuments and other reference points and re-establish at no cost to OWNER if disturbed or destroyed. CONTRACTOR shall also furnish all labor, materials, supervision and equipment to complete site preparation for the proposed construction, including, but not limited to final grading, hauling, scraping, stockpiling, and drainage during construction.

3.2 EROSION CONTROL

- A. Erosion and sediment control measures shall be performed in a timely manner following clearing and grubbing. The measures shall be in accordance with the Drawings, Specifications, and all applicable federal, state, and local regulations.

### 3.3 UTILITY LOCATION / PROTECTION

- A. Protect existing utilities against damage.
- B. Contact local utility locating clearinghouse before beginning on-site excavation or excavation in borrow areas.
- C. If undocumented utilities are encountered during excavation, stop work and notify OWNER'S REPRESENTATIVE.
- D. Repair damaged utilities at CONTRACTOR's expense.

### 3.4 CLEARING AND GRUBBING

- A. CONTRACTOR shall clear of brush, trees, and stumps areas for construction including stockpile areas.
- B. Trees and stumps shall be cut to within six inches of the ground surface where construction work is to be performed provided undercutting or other corrective measures are not stipulated.
- C. Low hanging, unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed by Construction Manager.
- D. The construction area shall be grubbed of protruding obstructions except sound undisturbed stumps and roots six inches or less above the ground which will be a minimum of 5 feet below subgrade or embankment slope provided undercutting, topsoil stripping or other corrective measures are not stipulated.
- F. CONTRACTOR shall perform clearing and grubbing in conjunction with and with consideration for minimizing erosion during construction or material removal activities.
- G. The clearing and grubbing CONTRACTOR shall not cut or injure any trees or other vegetation outside the limits of the areas on which work is to be done without permission and he shall guard against like action by his employees and subcontractors. Existing vegetation or landscaping beyond clearing limits shall be protected by orange plastic fencing or other clearly visible approved means.
- H. Review with the Construction Manager or OWNER's Technical Representative whether chipping/grinding and/or piling of cleared material is preferred prior to removal/disposal.
- I. Review with the Construction Manager or OWNER's Technical Representative the location, limits, and methods to be used prior to commencing the Work under this section.

### 3.5 BACKFILLING AND SURFACE PREPARATION

- A. CONTRACTOR shall prepare areas designated on the Drawings or by Construction Manager for construction activities.
- B. CONTRACTOR shall prepare areas designated on the Drawings or by Construction Manager to receive erosion control materials to smooth surfaces that have been shaped, fertilized, and seeded.

### 3.6 DEBRIS REMOVAL

- A. All material collected in the course of the clearing and grubbing shall be disposed of in a manner consistent with applicable State and County regulations. Such disposal shall be carried on after removal of the materials in the clearing and grubbing operations and shall not be left until the final clean up period.

- B. Trees and brush generated during site clearing to be staged on-site in a location approved by the OWNER.
- C. Burning shall be done only at approved times and at approved locations and in conformity with all local and state regulations and requirements including those requirements of the governing air pollution control authority. CONTRACTOR shall make all necessary arrangements and pay for all necessary permits. CONTRACTOR shall take all precautions necessary to prevent the spread of fire outside the immediate areas where burning is being done. No material shall be transported from off-site locations and burned on OWNER's property.
- D. Prior to depositing surplus material at any off-site location, the clearing and grubbing CONTRACTOR shall obtain a written agreement between himself and the OWNER of the property on which the disposal is proposed. The agreement shall state that the OWNER of the property gives permission for CONTRACTOR to enter and deposit the material at no expense to OWNER. A copy of the agreement shall be furnished to OWNER prior to removing any material from the site.

END OF SECTION

**SECTION 31 20 00  
GENERAL EARTHWORK**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to perform all related work as specified herein, as shown in the Drawings and Specifications.
- B. The work of this Section shall include, but not necessarily be limited to: excavation, loading and hauling, processing, stripping, stockpiling, backfilling, compacting, and grading of soils. The work of this Section may pertain in whole or in part to construction of the following: site clearing and preparation, earthwork and grading construction, aggregate placement, surface water management structures construction, and excavation. The work of this Section also includes protection of the Work. CONTRACTOR shall conform to the dimensions, lines, and grades specified on the Drawings.

1.2 REFERENCES

- A. Other related sections of the Specifications.
- B. Drawings or Engineering Design Drawings - "Watauga River Slope Stabilization Plan - Construction Drawings", Sycamore Shoals State Park (Former NARC Landfill)", Elizabethton, Tennessee, March 2023.
- C. Latest version of American Society for Testing and Materials (ASTM) standards:
  - 1. ASTM D 422, Standard Test Method for Particle-Size Analysis of Soils.
  - 2. ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
  - 3. ASTM D 1557, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>)).
  - 4. ASTM D 2216, Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock.
  - 5. ASTM D 2487, Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
  - 6. ASTM D 2922, Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
  - 7. ASTM D 3017, Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
  - 8. ASTM D 4220, Standard Practices for Preserving and Transporting Soil Samples.
  - 9. ASTM D 4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

### 1.3 SUBMITTALS AND QUALIFICATIONS

- A. If requested by OWNER, CONTRACTOR shall submit to the OWNER and Construction Manager (CM) for review a letter describing the proposed methods of construction, including stripping, excavation, stockpiling, filling, compaction, and backfilling for the various portions of the Work. The review shall be for method only. CONTRACTOR shall remain responsible for the adequacy and safety of the methods.
- B. CONTRACTOR shall notify OWNER and CM in writing at least 5 days in advance of intention to perform the work of this Section.
- C. If work is interrupted for reasons other than inclement weather, CONTRACTOR shall notify OWNER and CM a minimum of 24 hours prior to the resumption of work.

### 1.4 CONSTRUCTION QUALITY ASSURANCE

- A. CONTRACTOR shall be aware of the activities outlined in the CQA Plan and account for these CQA activities in the construction schedule.

### 1.5 PROTECTION

- A. CONTRACTOR shall contact utility companies to locate and mark all utilities before commencement of the Work as necessary to protect existing utilities during the Work.
- B. CONTRACTOR shall protect trees, shrubs, lawns, and other features remaining as part of final landscaping.
- C. CONTRACTOR shall protect benchmarks, survey markers, fences, roads, sidewalks, paving, curbs and other existing structures from damage due to the CONTRACTOR's activities.
- D. CONTRACTOR shall repair damage caused by the construction operations.

## **PART 2 PRODUCTS**

### 2.1 STRUCTURAL FILL

- A. Structural fill will be used to achieve grades to base of the proposed cover soil as specified on the Drawings.
- B. Structural fill material shall consist of soil from on-site sources and materials removed from on-site excavation, or other materials, as approved by CM. The material shall be free of debris, foreign objects, roots, organics, and other materials considered deleterious by CM.
  - 1. Visual gradation: 100% passing 6-inch sieve.
  - 2. The fill shall be constructed with loose lifts of 12 inches or less.
  - 3. The compacted density of the structure fill shall be at least 95 percent of the maximum Standard Proctor Density. Field compaction testing shall be performed at a frequency of at least five tests per acre per lift.
- C. CONTRACTOR shall protect all structures from damage during backfilling and compacting activities.

## **PART 3 EXECUTION**

### 3.1 FAMILIARIZATION

- A. Prior to implementing any work described in this Section, CONTRACTOR shall become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this Section and the Drawings.
- B. Inspection:
  - 1. Prior to implementing any of the work in this Section, CONTRACTOR shall carefully inspect the installed work of all other Sections and verify that all work is complete to the point where the installation of this Section may properly commence without adverse impact.
  - 2. If CONTRACTOR has any concerns regarding the installed work of other Sections, he/she should immediately notify OWNER and CM in writing within 48 hours of becoming aware of the problem.

### 3.2 PREPARATION

- A. CONTRACTOR shall establish and identify required lines and grades.
- B. CONTRACTOR shall maintain benchmarks, monuments, and other reference points and re-establish any disturbed or destroyed reference points, at no cost to OWNER.
- C. Before start of grading, CONTRACTOR shall locate utilities and subsurface structures within the work areas.
- D. CONTRACTOR shall develop access to the construction area as needed and in accordance with the requirements of the Drawings.
- E. CONTRACTOR shall establish permanent and temporary storm water management controls according to the Drawings and as needed immediately down-slope of each area to be disturbed prior to the beginning of the work area. CONTRACTOR shall maintain the silt fence for the duration of construction. Accumulated sediment behind the silt fence shall be disposed on-site by CONTRACTOR in a manner approved by OWNER's Representative and CM.
- F. Diversion ditches, either permanent or temporary, shall be constructed in accordance with the Construction Drawings and Specifications. CONTRACTOR shall be responsible for construction diversion ditches as required to divert runoff around the construction area. The construction of temporary ditches not shown on the Drawings shall not be undertaken until the CONTRACTOR's plan for constructing the ditches is approved by OWNER's Representative and CM.

### 3.3 STOCKPILING

- A. Stockpiles shall be no steeper than 1.5:1 (horizontal:vertical) graded to drain, sealed by tracking parallel to the slope with a dozer or other means approved by OWNER's Representative and CM, and dressed daily during periods when soil is taken from the stockpile.
- B. Excavated and stripped soil materials shall be classified and stockpiled as needed in designated areas free of incompatible soil, clearing debris, or other objectionable materials. Stockpiling is only permitted in designated areas approved by OWNER's Representative and CM.

### 3.4 EXCAVATION - GENERAL

- A. Excavation shall be performed to the lines and grades indicated on the Drawings. Over-excavation may be required in some areas to remove soft or saturated soil or waste. Over-excavated areas will be backfilled with structural fill to achieve a stable working base or to "bridge" over weak materials. The limits of additional excavation shall be determined by CM. All excavated materials generated from the work shall be placed in designated stockpile areas for potential reuse in site grading and/or topsoil as determined acceptable by OWNER'S Representative or Certification Engineer.
- 3.5 COVER SOIL AND TOPSOIL EXCAVATION
- A. Excavate existing cover soil in areas where cover soil is not mixed with waste. Cooperate with OWNER'S REPRESENTATIVE to identify areas to be excavated.
  - B. Excavate until waste is encountered and/or design subgrade elevations are achieved. Do not allow waste to mix with excavated soil.
  - C. Segregate soils that are suitable for re-use as cover material and topsoil and soils that are not suitable for re-use as cover material or topsoil, or segregate as directed by OWNER'S REPRESENTATIVE.
  - D. Stockpile in accordance with Article 3.3 of this Section.
- 3.6 EXCAVATION OF UNSUITABLE SOILS
- A. Excavate unsuitable soils from areas within the Limits of Construction shown on the Drawings and from the access roads to the site.
  - B. Backfill unsuitable areas in accordance with Section 31 40 00 – Site Grading.
- 3.7 EXCAVATION OF UNEXPECTED MATERIAL
- A. Excavate contaminated material from approximate area shown on Drawings and as directed by OWNER'S REPRESENTATIVE.
  - B. Transport material off-site in accordance with applicable regulations.
  - C. Dispose of contaminated material at a licensed special waste facility.
  - D. Backfill excavated area in accordance with Section 31 40 00 – Site Grading.
- 3.8 EXCAVATION OF WASTE
- A. Excavate waste from areas shown on Drawings and relocate to fill areas shown on Drawings.
  - B. Stop work immediately if hazardous materials are encountered. Notify OWNER'S REPRESENTATIVE.
  - C. Do not allow excavated waste to enter river.
  - D. Do not stockpile waste in intermediate locations. Move directly to permanent placement location.
  - E. Control odors and dust in accordance with Section 01 55 00 – Protection of Environment.
  - F. Place and compact waste in fill areas in accordance with Section 31 40 00 – Site Grading.
  - G. When excavation is complete in an area, compact surface of waste in accordance with Section 31 40 00 – Site Grading.
- 3.9 UNAUTHORIZED EXCAVATION



- A. All excavation outside or below the proposed lines and grades shown on the Drawings shall be considered unauthorized excavation.
  - B. CONTRACTOR shall backfill areas of unauthorized excavation with the type material necessary in accordance with this Section at no cost to OWNER, to insure the stability of the structure or construction involved.
- 3.10 OBSTRUCTIONS
- A. Obstructions shown on the Drawings are for information only and do not guarantee their exact locations, nor do they exclude the presence of other obstructions.
  - B. CONTRACTOR shall exercise care in excavating adjacent to existing obstructions and shall not disturb same.
  - C. In the event obstructions are disturbed, CONTRACTOR shall repair or replace them as quickly as possible to the condition existing prior to their disturbance at no cost to OWNER. If an obstruction owned by another party is disturbed that requires the party to perform repairs, CONTRACTOR shall be responsible for the repair costs.
  - D. If replacement or repair of disturbed obstructions is not performed after a reasonable period, OWNER may have the necessary work done and deduct the cost of same from payments to CONTRACTOR.
- 3.11 CLEAN-UP AND DISPOSAL OF DEBRIS
- A. CONTRACTOR shall remove surplus materials and debris from site, placing usable material in the stockpile in locations designated by the OWNER and disposing of debris off-site.
  - B. CONTRACTOR shall satisfactorily dispose of all excess excavated material that cannot be used and return it to the stockpile in locations designated by the OWNER.
- 3.12 SURVEY CONTROL
- A. CONTRACTOR shall provide all layout surveying.
- 3.13 FINISH GRADING
- A. All earthwork shall be shaped to the lines and grades indicated on the Drawings. All grading shall be blended into the surrounding, existing terrain.
- 3.14 FIELD QUALITY CONTROL
- A. The minimum frequency and details of quality assurance testing are provided in the Specifications and Construction Quality Assurance (CQA) Plan. CONTRACTOR shall be aware of all field quality assurance activities, as these may affect his schedule.
  - B. If a defective area is discovered in the earthwork, OWNER's Representative and CM shall immediately determine the extent and nature of the defect.
  - C. Additional testing shall be performed to verify that the defect has been corrected before any additional work is performed by CONTRACTOR in the area of the deficiency.
  - D. CONTRACTOR shall correct the deficiency encountered at his expense to the satisfaction of OWNER's Representative and CM.
- 3.15 PRODUCT PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior work, including all materials and completed work of other Sections.
- B. In the event of damage, CONTRACTOR shall immediately make all repairs and replacements necessary to the approval of OWNER's Representative and CM at no additional cost to OWNER.
- C. At the end of each day, CONTRACTOR shall verify that the entire work area was left in a state that promotes surface drainage off and away from the area and from finished work. If threatening weather conditions are forecast, compacted surfaces shall be seal-rolled to protect finished work.

END OF SECTION

**SECTION 31 40 00  
SITE GRADING**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. Excavating and grading of the site.
- B. Excavating selected material which is required for specific use in the construction.

1.2 EXISTING CONDITIONS

- A. Known underground, surface and aerial utility lines, and buried objects are indicated on the Drawings. CONTRACTOR is to verify the exact location of all existing utilities before commencement of construction.

1.3 PROTECTION

- A. CONTRACTOR shall protect trees, shrubs, lawns, rock outcroppings and other features remaining as part of final landscaping.
- B. CONTRACTOR shall protect benchmarks, and existing structures, fences, roads, sidewalks, paving, and curbs against damage from equipment and vehicular traffic.
- C. CONTRACTOR shall protect aerial, surface, or underground utility lines or appurtenances which are to remain.
- D. CONTRACTOR shall repair damage caused by the construction operations.
- E. Erosion control must be maintained. Erosion control measures shall be as noted on the Drawings or as directed by OWNER's Representative and Construction Manager (CM).

**PART 2 PRODUCTS**

2.1 CLEAN FILL

- A. Soil obtained from on-site sources, off-site sources if necessary.
- B. Free of organic material and other debris such as waste, cinders, slag, or glass.
- C. Maximum particle dimension – 3 inches.
- D. Free of frozen material, ice, snow, or excessive moisture.
- E. For areas outside Limit of Relocated waste, use only clean fill for grading activities.

2.2 MIXED FILL

- A. Soil mixed with other debris such as waste, ash, cinders, slag, or glass.
- B. For areas below Cover Soil, use Mixed Fill or Clean Fill.

2.3 UNSUITABLE MATERIAL

- A. Topsoil, peat, organic soils, and materials containing slag, cinders, foundry sand, debris, rubble, or waste materials (other than ash) such as drums, barrels, or metal debris, or soil with less than required bearing capacity as determined by OWNER'S REPRESENTATIVE.

**PART 3 EXECUTION**

3.1 PREPARATION

- A. CONTRACTOR shall establish and identify required lines, levels, contours, and datum.
- B. CONTRACTOR shall maintain benchmarks, monuments, and other reference points and re-establish if disturbed or destroyed, at no cost to OWNER.
- C. Before start of grading, CONTRACTOR shall establish the location and extent of utilities in the work areas.
- D. CONTRACTOR shall maintain, protect, reroute, or extend as required existing utilities to remain which pass through the work area.
- E. CONTRACTOR to excavate areas to promote drainage. Final surfaces will be graded and vegetated as indicated on the Drawings. Any low areas will require filling to drain.

3.2 EXAMINATION

- A. Examine surfaces to receive fill or be graded to determine existence of areas loosened by frost action, softened by flooding or weather, or containing unsuitable materials.
- B. Excavate or compact unsuitable materials to meet specifications.
  - 1. If excavating, excavate in accordance with Section 31 20 00.
  - 2. If compacting, compact material in accordance with Article 3.6 of this Section.

3.3 REMOVAL OF TOPSOIL AND POTENTIAL COVER SOIL

- A. CONTRACTOR shall remove topsoil of horticultural value and soil for potential use as cover soil layer from areas to be excavated/stripped and stockpile in an area designated by OWNER. Topsoil will be used for the upper layer of the cover. Cover soil will be used for the 2-foot-thick soil layer placed above the re-graded slopes.
- B. CONTRACTOR shall not permit topsoil or cover soils to be mixed with subsoil.
- C. Soil shall not be stripped when wet.

3.4 ROUGH GRADING

- A. CONTRACTOR shall rough grade site to required levels, profiles, contours and elevations ready for finish grading and surface treatment. Rough grading shall be to elevations as shown on the Drawings.
- B. Prior to placing cover soil material, the subsoil shall be recompacted with a sheep's foot roller to 95% of the ash's maximum dry density as per ASTM D 698 (Standard Proctor).

3.5 MISCELLANEOUS GRADING

- A. Grade ditches and other features shown on Drawings to lines and grades shown on Drawings.
- B. Finish grade to ensure free drainage.

3.6 PLACEMENT AND COMPACTION

- A. Scarify subgrade to a minimum depth of 6 inches.

- B. Compact subgrade to a minimum of 95% of maximum dry density, or proof roll areas to receive fill material to detect soft or loose zones prior to placing fill.
  - C. Place fill in loose lifts. Loose fill lift thickness not exceeding 8 inches for Clean Fill and not exceeding 12 inches for Mixed Fill and Waste.
  - D. Compact each lift to a minimum of 95% of maximum dry density.
  - E. Grade finished surface of fill areas in accordance with Drawings. Remove any protruding objects from surface. Grade areas not defined on Drawings to be free draining.
- 3.7 FINISH GRADING DISTURBED AREAS
- A. Upon completion of work, regrade disturbed areas to meet pre-disturbance contours, or finish grade to be free draining with approval of OWNER'S REPRESENTATIVE.
- 3.8 TOLERANCES
- A. Grade surface smooth and to drain, to the lines and grades shown on Drawings. Tolerances are to be as indicated in the CQA Plan.
  - B. Grade surface to eliminate abrupt changes in grade.
- 3.9 SURVEY CONTROL
- A. Surveying shall be performed in accordance with the Specifications, Drawings, and the Construction Quality Assurance (CQA) Plan.
  - B. CONTRACTOR shall survey the location and elevation of the prepared surface. Surveying shall be performed in general accordance with the CQA Plan.
  - C. CONTRACTOR shall provide Record Drawings of the location and elevation of the prepared surface. CONTRACTOR may submit a partial Record Drawing to obtain approval for a portion of work. CM will define the minimum requirements for a partial submittal.
- 3.10 CLEAN-UP AND DISPOSAL OF DEBRIS
- A. CONTRACTOR shall remove surplus materials and debris from site, or stockpile in locations designated by the OWNER. OWNER will provide on-site roll off containers for the collection of waste materials, debris and rubbish. CONTRACTOR will not overload containers and coordinate with OWNER when container is full and needs to be emptied and/or replaced.
  - B. No combustible materials to be landfilled on site as part of the project. Combustible items (plastics, paper, wood, etc.) need to be cut-up or broken down and disposed of in OWNER-supplied roll off containers. Rock, steel corrugated metal pipe (CMP) and soils can be landfilled as part of structural fill upon approval of the OWNER's Representative.
  - C. Any vegetation that requires removal will be stockpiled at a location designated by OWNER.
  - D. CONTRACTOR to remove all tires and stockpile in a location designated by OWNER. CONTRACTOR is responsible for covering and securing tires with scrim reinforced geomembrane.

END OF SECTION

**SECTION 32 10 00  
COVER SOIL**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary to perform all earthwork related to construction of the cover soil as specified herein, and as shown on the Drawings.
- B. Contractor shall be prepared to construct the cover soil in conjunction with other construction activities.
- C. The work of this Section shall include, but not necessarily be limited to: excavating, hauling, backfilling, and grading of soils. Contractor shall conform to the dimensions, lines, and grades specified on the Drawings.

1.2 REFERENCES

- A. Drawings or Engineering Design Drawings - "Watauga River Slope Stabilization Plan – Construction Drawings", Sycamore Shoals State Park (Former NARC Landfill)", Elizabethton, Tennessee, March 2023.
- B. Latest version of American Society for Testing and Materials (ASTM) standards:
  - 1. ASTM D 422 - Standard Method for Particle-Size Analysis of Soils.
  - 2. ASTM D 698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using a 5.5-lb (2.49- kg) Rammer and 12-in. (305 mm) Drop.
  - 3. ASTM D 1556 - Standard Test Method for Density of Soil In Place by the Sand-Cone Method.
  - 4. ASTM D 2216 - Standard Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures.
  - 5. ASTM D 2487 - Standard Test Method for Classification of Soils for Engineering Purposes.
  - 6. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate In Place by Nuclear Density Methods (Shallow Depth).
  - 7. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock In Place by Nuclear Methods (Shallow Depth).
  - 8. ASTM D 4220 - Standard Practices for Preserving and Transporting Soil Samples.
  - 9. ASTM D 2937 - In-Place Density as a Check on Nuclear Densometer Measurements.
  - 10. ASTM D 5084, Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.

### 1.3 SUBMITTALS AND QUALIFICATIONS

- A. Contractor shall submit to OWNER's Representative and Construction Manager (CM) for review a letter describing the proposed methods of construction, including stripping, , excavation, filling, compaction, and backfilling for the various portions of the work. The review shall be for method only. Contractor shall remain responsible for the adequacy and safety of the methods.
- B. Contractor shall notify OWNER's Representative and CM in writing at least 5 days in advance of intention to perform the work of this Section.
- C. If work is interrupted for reasons other than inclement weather, CONTRACTOR shall notify OWNER's Representative and CM a minimum of 24 hours prior to the resumption of work.
- D. CONTRACTOR shall abide by all qualification requirements of the Bid Package.

### 1.4 CONSTRUCTION QUALITY ASSURANCE

- A. All earthwork relating to the cover construction shall be performed in accordance with the requirements of this Section.
- B. CONTRACTOR shall be aware of the CQA activities outlined in this Section and account for these CQA activities in the construction schedule.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS

- A. The 2-foot-thick cover soil to be placed and compacted over the sideslope area and the stockpiles, as indicated in the Drawings, is to be a "clay-like" soil as defined in the project specifications. It is to meet the following requirements, per defined soil index tests:
  - Be of a quality to be "clay-like", be easily managed, and have sufficient clay content to provide an adequate seal,
  - Have a Plasticity Index (PI) > 15, per ASTM D4318,
  - Have a grain-size distribution with > 40% clay material, per ASTM D422, and
  - Be obtained from on-site sources and/or off-site imported material.

Testing as indicated in CQA Plan shall be conducted to approve material for use. Refer to CQA Plan for complete details and related information.

- B. Soil shall be imported from off-site sources or on-site sources shall be used provided they meet the specifications outlined in this Section and in the CQA Plan, as approved by the OWNER's Representative.
- C. Cover soil removed and stockpiled under Sections 31 10 00 and 31 2000 may be used if it meets above requirements.
- D. Soil shall be limited in ash content to 2% as discussed and directed by OWNER's Representative.

### **PART 3 EXECUTION**

#### **3.1 FAMILIARIZATION**

- A. Prior to implementing any work described in this Section, CONTRACTOR shall become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this Section.
- B. Inspection:
  - 1. Prior to implementing any of the work in this Section, CONTRACTOR shall carefully inspect the installed work of all other Sections and verify that all work is complete to the point where the installation of this Section may properly commence without adverse impact.
  - 2. If CONTRACTOR has any concerns regarding the installed work of other Sections, he/she should immediately notify OWNER's Representative and CM in writing within 48 hours of the site visit. Failure to notify OWNER's Representative and CM or continuance with the soil cover will be constructed as CONTRACTOR's acceptance of the related work of all other Sections.

#### **3.2 FIELD QUALITY CONTROL**

- A. The minimum frequency and details of quality control testing are provided in the CQA Plan. CONTRACTOR shall take this testing frequency into account in planning his construction schedule.
- B. Sampling locations shall be selected by CQA Officer. If necessary, the location of routine in-place moisture content and dry density test shall be determined using a non-biased sampling plan.
- C. A special testing frequency shall be used at the discretion of CQA Officer and the approval of CM when observations of construction performance indicate a potential problem.
- D. All perforations resulting from testing the cover soil shall be filled with soil to the satisfaction of CQA Officer.
- E. If a defective area is discovered in the cover soil, CQA Officer shall immediately determine the extent and nature of the defect. If the defect is indicated by an unsatisfactory test result, CQA Officer shall determine the extent of the defective area by additional tests, observations, a review of records, or other means that CQA Officer deems appropriate. If the defect is related to adverse site conditions, such as overly wet soils or surface desiccation, Engineer shall define the limits and nature of the defect.
- F. After determining the extent and nature of a defect, CONTRACTOR shall correct the deficiency to the satisfaction of CQA Officer. The corrective actions shall be at no additional cost to OWNER.
- G. Additional testing shall be performed to verify that the defect has been corrected before any additional work is performed by CONTRACTOR in the area of the deficiency.

#### **3.3 SITE PREPARATION**

- A. CONTRACTOR shall develop access to the construction area in accordance with the requirements of the Drawings and Specifications.
- B. Temporary access roads to the construction area shall be constructed and maintained.



### 3.4 COVER SOIL CONSTRUCTION

- A. The cover soil shall be constructed to the lines and grades shown on the Drawings.
- B. The fill shall be placed in a loose lift that results in a compacted lift thickness of 1 foot.
- C. Thickness of Cover Soil Layer not to be below 2.0 feet. Tolerance of thickness 0.0+0.2 feet. CONTRACTOR will not be paid for fill above 2.0 feet.
- D. Placement of the cover soil layer may be performed using a low ground-pressure dozer (Caterpillar D-6 or equivalent). The tracked equipment shall operate only over previously placed Rip Rap or cover soil. CONTRACTOR shall not operate equipment directly on geosynthetic materials. CONTRACTOR shall employ means necessary to minimize wrinkles in the underlying geosynthetics.
- E. Each lift shall be compacted to at least 90 percent of the maximum dry density at moisture contents dry of optimum moisture content, as measured according to ASTM D 698. The dry density and moisture content shall be measured in accordance with ASTM D 2922, Method B, and ASTM D 3017, respectively.
- F. If the moisture content of the fill is not suitable for proper compaction, the soil shall be moisture conditioned and reworked, as appropriate. During wetting or drying, the soil shall be regularly disked or otherwise mixed so that uniform moisture conditions are obtained.
- G. CONTRACTOR shall moisture-condition the fill in either the stockpile area or work area. Any delays in progress due to the latter, however, are the responsibility of CONTRACTOR.
- H. CONTRACTOR shall not place frozen fill, nor shall he place fill on frozen ground.
- I. If the fill freezes during construction, CONTRACTOR shall remove the frozen fill, scarify the remaining unfrozen fill, and then place and compact new fill in accordance with this Section. The frozen fill shall not be reused until it has thawed, been disked, and then reworked to an acceptable moisture content.
- J. All work shall be performed in accordance with the CQA Plan.

### 3.5 SURVEY CONTROL

- A. Surveying shall be performed in accordance with the Specifications, Drawings, and the Construction Quality Assurance (CQA) Plan.
- B. CONTRACTOR shall survey the location and elevation of the cover soil. Surveying shall be performed in general accordance with the CQA Plan.
- C. CONTRACTOR shall provide Record Drawings of the location and elevation of the cover soil. CONTRACTOR may submit a partial Record Drawing to obtain approval for a portion of work. OWNER's Representative and CM will define the minimum requirements for a partial submittal.

### 3.6 FIELD QUALITY CONTROL

- A. CQA Officer will perform soil moisture, dry unit weight, and lift thickness tests in the field on each lift of fill material to evaluate compliance with this Section. Testing will be carried out in accordance with the CQA Plan.
- B. If CQA Officer's tests indicate work does not meet the requirements of the Specifications or the CQA Plan, CQA Officer will establish the extent of the nonconforming area. The nonconforming area shall be reworked by CONTRACTOR at his own expense until acceptable test results are obtained.

- C. CONTRACTOR shall be aware of all field CQA testing activities, as these may affect his schedule.

### 3.7 PROTECTION OF WORK

- A. CONTRACTOR shall use all means necessary to protect all materials and all partially-completed and completed work of this Section.
- B. In the event of damage, CQA Officer will identify areas requiring repair, and CONTRACTOR shall make all repairs and replacements necessary to the approval of OWNER's Representative and CM and at no additional cost to OWNER.
- C. At the end of each day, CONTRACTOR shall verify that the entire work area was left in a state that promotes surface drainage off and away from the area and from finished work. If threatening weather conditions are forecast, compacted surfaces shall be seal-rolled to protect finished work.

### 3.8 PUMPING AND DRAINAGE

- A. At all times during construction, CONTRACTOR shall provide and maintain proper equipment and facilities to remove all water entering the fill area and keep such areas dry so as to obtain a satisfactory subgrade to allow the construction of the cover soil.
- B. Drainage shall be disposed of only in an area approved by OWNER's Representative and CM. Drainage shall be disposed of in a manner which prevents flow or seepage back into the excavated area.

### 3.9 PRODUCT PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior work, including all materials and completed work of other Sections.
- B. In the event of damage, CONTRACTOR shall immediately make all repairs and replacements necessary to the approval of OWNER's Representative and CM and at no additional cost to OWNER.
- C. Small perforations in the cover soil resulting from in-situ density testing (e.g., all perforations above except sand cone locations) shall be backfilled by the CQA Officer.

### 3.10 SURPLUS MATERIAL

- A. Any materials not used in construction of the cover soil, CONTRACTOR shall remove from the site, unless otherwise directed by OWNER's Representative and CM.

END OF SECTION

**SECTION 32 50 10  
TOPSOIL AND SEEDING**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of topsoil, seeding, and live staking as specified herein, as shown on the Drawings and in accordance with the Construction Quality Assurance (CQA) Plan.

1.2 REFERENCES

- A. Construction Quality Assurance (CQA) Plan.

1.3 WARRANTY

- A. CONTRACTOR shall furnish Construction Manager (CM) written warranties obtained from the manufacturer and the installer against defects in materials and workmanship in accordance with applicable ASTM standards. Warranty conditions proposed by the manufacturer or installer concerning limits of liability will be evaluated and must be acceptable to OWNER.

**PART 2 PRODUCTS**

2.1 SEED MATERIALS

- A. Seed shall be inspected and tested for germination and purity to mixing.
- B. Seed shall be uniformly mixed.
- C. Seed shall be as specified herein, and as shown on the Drawings. This includes both Temporary Seed Mixture and Permanent Seed Mixture.
- D. Seed shall be used as specified on the Drawings or otherwise approved.
- E. All seed shall meet the requirements of the Tennessee Department of Agriculture.
- F. CONTRACTOR shall furnish OWNER's Representative and Construction Manager (CM) a certified laboratory report showing the analysis of the seed to be furnished. The report shall bear the signature of a senior seed technologist.
- G. Inoculant for Legumes shall be:
  - 1. Nitrogen fixing bacteria cultures adapted to the particular seed to be treated.
  - 2. Furnished in containers of a size sufficient to treat the specified quantity of seed to planted.

2.2. MULCH MATERIALS

- A. Mulch materials, when applicable, shall be:
  - 1. Hay composed of approved stalks from grasses, sedges, or legumes; or straw composed of stalks from rye, oats, wheat, or other approved grains.
  - 2. Air dried and reasonably free from noxious weeds, weed seeds, and other detrimental plant growth.

3. Suitable for spreading with mulch blower machinery.

B. Wood fiber mulch, when used, shall meet the following specifications:

1. Moisture Content..... 10.0%  $\pm$  2.0%
2. Organic Matter..... 99.4%  $\pm$  0.2%
3. Ash Content ..... 0.6%  $\pm$  0.2%
4. Water Hold Capacity (per hundred grams of oven dry fiber) ..... 1050 Grams (Min.)

C. Mulch Binders, when applicable, shall be either:

1. Cut back asphalt, Grade RC-70 or RC-250 conforming to AASHTO M-81, M-82, M-141, for the type and grade specified.
2. Emulsified asphalt, Type SS-1 conforming to AASHTO M-140. In addition to Type 55-1, a special mixing material AE-3 or a special priming material AE-P may be specified by OWNER's Representative and CM.

### 2.3 COMMERCIAL FERTILIZERS/STABILIZATION

- A. Unless otherwise specified, fertilizer shall be inorganic 6-12-12 nitrogen, phosphoric acid, and potash for areas to be seeded, and 15-15-15 for areas to be sodded.
- B. Fertilizer shall be furnished in standard containers with the brand name, weight and guaranteed analysis of the contents clearly marked.
- C. All fertilizer shall comply with Federal, State, and local laws.
- D. Ammonium Nitrate shall be a standard commercial product, having a minimum of 33.5 percent nitrogen.
- E. Agricultural limestone shall contain a minimum of 85% of calcium carbonate and magnesium carbonate combined, and be of particular size that 85% will pass a No. 10 mesh sieve.

### 2.4 WATER

- A. Water shall be free from harmful organisms or other objectionable materials.

### 2.5 TOPSOIL

- A. Topsoil shall be as specified herein, and as shown on the Drawings.
- B. Topsoil shall be:
  1. The topsoil will be free of debris, trash, stumps, or other deleterious materials.
  2. The topsoil shall be loam or sandy loam capable of supporting shallow rooted vegetation.
  3. Natural, friable fertile, fine sandy loam possessing characteristics of representative topsoils in the vicinity which produce heavy growths of vegetation.
  4. Free from subsoil, noxious weeds, stones larger than one inch in diameter, lime, cement, ashes, slag, or other deleterious matter.
  5. Well drained in its original position and free from toxic quantities of acid or alkaline elements.

- 6. Thickness of Topsoil/Vegetative Layer not to be below 1.0 feet. Tolerance of thickness 0.0+0.2 feet. CONTRACTOR will not be paid for fill above 1.0 feet.
- C. Topsoil removed and stockpiled under Sections 31 10 00 and 31 20 00 may be used if it meets above requirements.
- 2.6 SEED
  - A. Seed shall be as specified herein, and as shown on the Drawings. This includes both Temporary Seed Mixture and Permanent Seed Mixture.
- 2.7 LIVE STAKES
  - A. Live staking shall be as specified herein, and as shown on the Drawings.
- 2.8 LIVE SILTATION
  - A. Live siltation shall be as specified herein, and as shown on the Drawings.

### **PART 3 EXECUTION**

- 3.1 PREPARATION
  - A. Finish grade areas to be seeded to be smooth, well drained, and free of debris and trash.
- 3.2 SEEDING
  - A. CONTRACTOR shall install seed in accordance with the Drawings and the Construction Quality Assurance (CQA) Plan.
  - B. CONTRACTOR shall scarify, disc, harrow, rake or otherwise work each area to be seeded until it has been loosened and pulverized to a depth of 4 to 6 inches.
  - C. Fertilizer shall be uniformly incorporated into the soil for a depth of approximately 4 to 6 inches at the rate of:
    - 1. Not less than 20 lbs. per 1,000 square feet for grade 6-12-12.
    - 2. Not less than 100 lbs. per 1,000 square feet for agricultural limestone.
  - D. Fertilizer need not be incorporated in the soil as specified above when mixed with seed in water and applied with power sprayer equipment.
  - E. CONTRACTOR shall sow seed of the specified group as soon as preparation of the seed bed has been completed and placement of topsoil layer has been approved.
  - F. Seed shall be sown uniformly by means of a rotary seeder, hydraulic equipment, or other satisfactory means at the rate of eight pounds per 1,000 square feet, unless otherwise specified.
  - G. Seed and seeds of legumes shall be inoculated, when sown alone, before sowing in accordance with the recommendations of the manufacturer of the inoculant.
  - H. CONTRACTOR shall not perform seeding during windy weather, or when the ground surface is frozen, wet or otherwise non-tillable. No seeding shall be performed during December through February unless indicated otherwise in the Drawings or otherwise permitted.
  - I. When seeding with mulch is specified, CONTRACTOR shall:

1. Spread hay or straw mulch evenly over the seeded area at an approximate rate of 75 pounds per 1,000 square feet immediately following the seeding operations. This rate may be varied by RCM, depending on the texture and condition of the mulch material and the characteristics of the area seeded.
  2. Hold hay or straw mulch in place by the use of a mulch binder applied at the approximate rate of 4 gallons per 1,000 square feet as required.
  3. Cover bridges, guardrails, signs and appurtenances, if the mulch binder is applied in such a way that it would come in contact with or discolor the structures.
  4. When wood fiber mulch is used, uniformly apply at the rate of 28 to 35 pounds per 1,000 square feet with hydraulic mulching equipment.
- J. Seeding is to be in accordance with Drawings, which details specifications associated with both Temporary Seeding and Permanent Seeding. General details regarding these types of seed applications are provided below:
- Temporary seeding: operations will be implemented to inhibit erosion within areas which will not be filled on or capped for over 90 days. Permanent seeding will be implemented on all areas of the disposal facility, which have been completed.
  - Permanent seeding: seeding shall only be performed between March 15 and May 15 or between August 15 and October 15. At other times, sodding or seeding with temporary seed shall be made until the desired spring or late summer seeding time. Seeding shall not be performed on frozen or muddy grounds or when prevailing winds exceed five (5) miles per hour. Grass seed shall be clean, fresh stock, and labeled in accordance with the federal seed act and shall be produced by a recognized manufacturer and guaranteed by the dealer. The seed shall have the state of Tennessee certification. Recommended seed mixtures as well as rates and time of application are provided in the Drawings.
  - Fertilizer may be applied with the use of a bulk spreader, drop type spreader, hydro-seeder, or any other equipment capable of providing even coverage. The application shall result in an even spreading of the fertilizer over the entire area. Care shall be taken as not to spill the fertilizer in the areas to be seeded during the loading and spreading of the fertilizer.
  - Lime may be applied with the use of a bulk spreader, drop type spreader, hydro seeder or any other equipment capable of providing even coverage. The application shall result in an even spreading of the li me over the entire area.
  - The application of Erosion Control Mat will take place no more than 24 hours after the seeding operation of an area.

### 3.3 TOPSOIL

- A. CONTRACTOR shall install topsoil in accordance with the Drawings and the Construction Quality Assurance (CQA) Plan.
- B. CONTRACTOR shall prepare stabilization slope and stockpile areas to receive topsoil in accordance with the lines and grades shown on the Drawings.
- C. CONTRACTOR shall supply material from off-site sources or on-site sources as necessary and place topsoil at depths and locations specified and shown on the Drawings.

### 3.4 WATERING

- A. CONTRACTOR shall maintain seeded areas by watering for a time sufficient for proper growth of the grass.

3.5 LIVE STAKES

- A. CONTRACTOR shall install live staking in accordance with the Drawings and the Construction Quality Assurance (CQA) Plan.

3.6 LIVE SILTATION

- A. CONTRACTOR shall install live siltation in accordance with the Drawings and the Construction Quality Assurance (CQA) Plan.

3.7 SURVEY CONTROL

- A. Surveying shall be performed in accordance with the Specifications, Drawings, and the Construction Quality Assurance (CQA) Plan.
- B. CONTRACTOR shall survey the location and elevation of the topsoil. Surveying shall be performed in general accordance with the CQA Plan.
- C. CONTRACTOR shall provide Record Drawings of the location and elevation of the topsoil. CONTRACTOR may submit a partial Record Drawing to obtain approval for a portion of work. OWNER's Representative and CM will define the minimum requirements for a partial submittal.

END OF SECTION

**SECTION 32 60 00  
RIP RAP**

**PART 1 GENERAL**

1.0 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 Drawings and these Specifications.

2.0 Related Work:

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

<u>Work</u>	<u>Section</u>
Geotextile	32 70 00

3.0 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 (January 2021).
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4.0 Submittals:

- A. 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.

**PART 2 PRODUCTS**

1.0 Rip Rap: Rip Rap shall be of the size indicated on the Drawings and shall conform to TDOT Section 709.03, Rip Rap - Classification.

2.0 Riprap shall be Class A-1, machined riprap, as specified in the Drawings and these specifications. Material shall be in accordance with the CQA Plan.

3.0 Geotextile: Geotextile shall conform to the requirements outlined in Section 32 70 00, Geotextiles, of these Specifications.

**PART 3 EXECUTION**

1.0 Surface Preparation:

- A. Trim and dress all areas to conform to the 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. Geotextile shall be placed as shown on the Drawings and in accordance with Section 32 70 00, Geotextile, of these Specifications.



- D. Do not place any stone material on the prepared surface prior to inspection and/or approval to proceed from the ENGINEER.

2.0 Placing Rip Rap:

Rip Rap shall be placed in accordance with TDOT Section 709, Rip Rap. Riprap placement shall also be in accordance with the Drawings and the CQA Plan.

END OF SECTION

**SECTION 32 70 00  
GEOTEXTILE**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for the installation of geotextiles, as specified herein, as shown on the Drawings, and in accordance with the Construction Quality Assurance (CQA) Plan.

1.2 REFERENCES

- A. Drawings or Engineering Design Drawings - "Watauga River Slope Stabilization Plan - Construction Drawings", Sycamore Shoals State Park (Former NARC Landfill)", Elizabethton, Tennessee, March 2023.
- B. Construction Quality Assurance (CQA) Plan.
- C. Latest version of American Society for Testing and Materials (ASTM) standards:
  - 1. ASTM D 3786, Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabric -Diaphragm Bursting Strength Tester Method.
  - 2. ASTM D 4355, Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
  - 3. ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity
  - 4. ASTM D 4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
  - 5. ASTM D 4632, Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method).
  - 6. ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
  - 7. ASTM D 4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.
  - 8. ASTM D 5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles
  - 9. ASTM D 6241, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe
- D. Daniel, D.E. and R.M. Koerner, (1993), Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities, EPA/600/R-93/182.

1.3 RESPONSIBILITY

- A. CONTRACTOR shall provide the services of a Geotextile Manufacturer, and Installer, who shall meet the following qualifications. CONTRACTOR shall, however, accept and retain full responsibility for all materials and installation and shall be held responsible for any defects in the completed system.

- B. The Geotextile Manufacturer shall be responsible for the production of geotextile rolls and shall be a well-established firm with more than two years experience in the manufacture of geotextiles. The Manufacturer shall submit a statement to Construction Manager (CM) and Certification Engineer listing:
    - 1. Certified minimum property values of the proposed geotextiles and the tests used to determine those properties.
    - 2. Production capacity available and projected delivery dates for this project.
  - C. Installer shall be responsible for field handling, storing, deploying, seaming or connecting, temporary restraining (against wind), anchoring, and other site aspects of the geotextiles. Installer shall be trained and qualified to install geotextiles. Installer's qualifications will require the OWNER's Representative and CM's approval.
  - D. CONTRACTOR and Installer may be the same entity.
- 1.4 SUBMITTALS
- A. CONTRACTOR shall submit to OWNER's Representative and CM the following information on geotextile production:
    - 1. Manufacturing quality control certificates for each batch of resin and each shift's production. The certificates shall be signed by responsible parties employed by the Manufacturer (such as the production manager), and notarized.
    - 2. The quality control certificate shall include:
      - a. lot, batch, or roll numbers and identification;
      - b. sampling procedures; and
      - c. results of quality control tests, including a description of the test methods used.
- 1.5 CONSTRUCTION QUALITY ASSURANCE
- A. The installation of geotextiles shall be monitored as specified in this section and as outlined in the Construction Quality Assurance (CQA) Plan.
  - B. CONTRACTOR shall be aware of the activities outlined in the CQA Plan and shall account for these CQA activities in the installation schedule.

## **PART 2 PRODUCTS**

### 2.1 GEOTEXTILE PROPERTIES

- A. All Manufacturers must be approved by CM and OWNER.
- B. Unless otherwise noted on the Drawings, geotextile suppliers shall furnish materials whose Minimum Average Roll Values meet or exceed the criteria specified in Table 1 and in the CQA Plan. The Manufacturer shall provide test results for these procedures, as well as a certification that the material properties meet or exceed the specified values. Test shall be performed at least as frequently as shown on Table 1 and in the CQA Plan. The geotextiles provided by the supplier shall be stock products. The supplier shall not furnish products specifically manufactured to meet the specifications of this project unless authorized by OWNER and CM.

- C. Minimum Average Roll Value (MARV) shall be based on Manufacturer's data and shall be calculated as the mean value of the property of interest plus or minus two standard deviations, as appropriate. Where material properties vary among the machine and cross-machine directions, the MARV shall apply to the direction providing the lowest value (when a minimum is specified) or the highest value (when a maximum value is specified).
- D. In addition to the property values listed in Table 1, the geotextiles shall retain their structure during handling, placement, and long-term service.
- E. CONTRACTOR shall supply documentation demonstrating the in-ground durability of the proposed geotextile. This documentation shall be submitted to OWNER's Representative and CM fourteen (14) days prior to the start of construction, unless otherwise approved by OWNER's Representative and CM. Approval of the geotextile products based on the documentation is at the discretion of OWNER and CM.

## 2.2 MANUFACTURING QUALITY CONTROL

- A. The Manufacturer shall sample and test the geotextile material to demonstrate that the material conforms to the requirements in Part 2.1 of this Section. As a minimum, CONTRACTOR shall comply with the submittal requirement of Part 1.4 of this Section and CQA Plan.
- B. Sampling shall, in general, be performed on sacrificial portions of the material such that repair of the material is not required.
- C. Samples that do not meet the specified properties shall result in rejection of the applicable rolls.
- D. At the Manufacturer's discretion and expense, additional testing of individual rolls may be performed to more closely identify the non-complying rolls and/or to qualify individual rolls.

## 2.3 PACKING AND LABELING

- A. Geotextiles shall be supplied in rolls wrapped in relatively impermeable and opaque protective covers.
- B. Geotextile rolls shall be marked or tagged with the following information:
  - 1. manufacturer's name;
  - 2. product identification;
  - 3. lot or batch number;
  - 4. roll number; and
  - 5. roll dimensions.
- C. If any special handling is required, it shall be so marked on the geotextile itself; e.g., "This Side Up" or "This Side Against Soil to be Retained".

## 2.4 TRANSPORTATION

- A. Transportation of the geotextiles is the responsibility of CONTRACTOR. CONTRACTOR shall be liable for all damages to the materials incurred prior to and during transportation to the site.

**SECTION 32 90 00  
EROSION CONTROL MAT**

**PART 1 GENERAL**

1.1 DESCRIPTION OF WORK

- A. CONTRACTOR shall furnish all labor, materials, tools, supervision, transportation, and installation equipment necessary for installation of NAG VMax 350 coconut-fiber matrix erosion control mat as specified herein, as shown on the Drawings and in accordance with the Construction Quality Assurance (CQA) Plan.
- B. CONTRACTOR shall be prepared to install mat in conjunction with other features being constructed at the site.

1.2 REFERENCES

- A. Drawings or Engineering Design Drawings - "Watauga River Slope Stabilization Plan – Construction Drawings", Sycamore Shoals State Park (Former NARC Landfill)", Elizabethton, Tennessee, March 2023.
- B. Construction Quality Assurance (CQA) Plan.
- C. Latest version of the American Society for Testing and Materials (ASTM) standards:
  - 1. ASTM D6525, Thickness (0.62 in. (18.54 mm))
  - 2. ASTM D6524, Resiliency (90.0%)
  - 3. ASTM D792, Density (0.917 g/cm<sup>3</sup>)
  - 4. ASTM D6566, Mass/Unit Area (18.36 oz/sy (624 g/sm))
  - 5. ASTM D4355/1000HR, UV Stability (86%)
  - 6. ECTC Guidelines, Porosity (99%)
  - 7. ASTM D1388, Stiffness (0.24 in.-lb)
  - 8. ASTM D6567, Light Penetration (7.2%)
  - 9. ASTM D6818, Tensile Strength – MD (585.8 lbs/ft (8.70 kN/m))
  - 10. ASTM D6818, Elongation – MD (45.3%)
  - 11. ASTM D6818, Tensile Strength – TD (687.6 lbs/ft (10.20 kN/m))
  - 12. ASTM D6818, Elongation – TD (19.5%)
  - 13. ASTM D7322, Biomass Improvement (380%)

1.3 WARRANTY

- A. CONTRACTOR shall furnish OWNER's Representative and Construction Manager (CM) written warranties obtained from the manufacturer and the installer against defects in materials and workmanship in accordance with applicable ASTM standards. Warranty conditions proposed by the manufacturer or installer concerning limits of liability will be evaluated and must be acceptable to OWNER.

## **PART 2 PRODUCTS**

### 2.1 DESCRIPTION

- A. The NAG VMax 350 coconut-fiber matrix erosion control mat shall be a machine-produced mat of 100% coconut fiber matrix in accordance with the Drawings. All mats shall be manufactured with colored thread stitched along both outer edges as an overlap guide for adjacent mats.
- B. The material shall meet Type 5A, 5B, and 5C specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.18.

## **PART 3 EXECUTION**

### 3.1 INSTALLATION

- A. General:
  - 1. The NAG VMax 350 coconut-fiber matrix erosion control mat shall be installed in accordance with the Manufacturer's instructions, where indicated on the Drawings.
  - 2. The NAG VMax 350 coconut-fiber matrix erosion control mat shall be installed in accordance with these specifications, with the Drawings, and in accordance with the CQA Plan.
  - 3. CONTRACTOR shall carefully examine the erosion control mat for damage or defects before installation. Defective materials shall be immediately removed from the site and replaced at no cost to OWNER.

END OF SECTION

## 2.5 HANDLING AND STORAGE

- A. Handling, storage, and care of the geotextiles prior to and following installation at the site, is the responsibility of CONTRACTOR. CONTRACTOR shall be liable for all damages to the materials incurred prior to final acceptance of the lining system by OWNER.
- B. CONTRACTOR shall be responsible for storage of the geotextile material at the site.
- C. The geotextiles shall be protected from sunlight, moisture, excessive heat or cold, puncture, or other damaging or deleterious conditions. The geotextile shall be protected from mud, dirt and dust. Any additional storage procedures required by the Manufacturer shall be CONTRACTOR's responsibility.

## **PART 3 EXECUTION**

### 3.1 FAMILIARIZATION

- A. Prior to implementing any of the work described in this Section, CONTRACTOR shall become thoroughly familiar with all portions of the work within this Section or related sections, as necessary for successful completion of the Work.
- B. Inspection
  - 1. Prior to implementing any of the work in this Section, CONTRACTOR shall carefully inspect the installed work of all other Sections and verify that all work is complete to the point where the installation of this section and the CQA Plan may properly commence without adverse impact.
  - 2. If CONTRACTOR has any concerns regarding the installed work of other Sections, he/she shall notify OWNER's Representative and CM in writing within 48-hours of his site inspection. Failure to inform OWNER's Representative and CM in writing or installation of the geotextile will be construed as CONTRACTOR's acceptance of the related work of all other Sections.

### 3.2 CONFORMANCE TESTING

- A. The need for conformance testing shall be determined by Engineer or CM.
- B. Upon delivery to the site or at the location of the manufacturer, samples of the geotextile shall be removed by CQA Officer or his designee and sent to a laboratory selected by OWNER for testing to ensure conformance to the requirements of this Section.
- C. Samples shall be selected by CQA Officer in accordance with this Section and the procedure outlined in the CQA Plan.
- D. Samples shall be taken at the rate of one sample per lot or one per 100,000 square feet, whichever is less.
- E. OWNER's Representative and CM may increase the frequency of sampling as outlined in the CQA Plan in the event that test results do not comply with requirements specified in Part 2.1 of this Section. This additional testing shall be performed at the expense of CONTRACTOR.
- F. Any geotextiles that are not certified in accordance with Part 1.4 of this Section, or that conformance testing indicates do not comply with Part 2.1 of this Section shall be rejected and replaced with new material in accordance with the Specifications, at no additional cost to OWNER.

### 3.3 HANDLING AND PLACEMENT

- A. CONTRACTOR shall handle all geotextile in such a manner as to ensure they are not damaged in any way.
- B. CONTRACTOR shall take any necessary precautions to prevent damage to underlying layers during placement of the geotextile.
- C. After unwrapping the geotextile from its opaque cover, the geotextile shall not be left exposed for a period in excess of 20 days unless a longer exposure period is approved by OWNER's Representative and CM, based on a formal demonstration from CONTRACTOR that the geotextile is stabilized against U.V. degradation for the proposed period of exposure.
- D. CONTRACTOR shall weight all geotextiles with sandbags, or the equivalent, in the presence of wind. Such sandbags shall be installed during placement and shall remain until replaced with protective soil cover or other components of the liner system.
- E. CONTRACTOR shall examine the entire geotextile surface located above water after installation to ensure that no potentially harmful foreign objects are present. CONTRACTOR shall remove any such foreign objects and shall replace any damaged geotextile.
- F. Geotextile placement shall be in accordance with the Drawings and the CQA Plan.

### 3.4 SEAMS AND OVERLAPS

- A. All non-woven geotextiles shall be either overlapped or continuously sewn (i.e., spot sewing is not allowed) as directed by the Technical Representative or the Engineer. Non-woven geotextiles shall be overlapped one to three feet as directed by CM or Engineer. If sewn, geotextiles shall be overlapped a minimum of 6 inches prior to seaming. No horizontal seams shall be allowed on slopes steeper than 5 horizontal to 1 vertical (i.e., seams shall be along, not across, the slopes). Other seaming techniques may be approved by OWNER's Representative and CM.
- B. Polymeric thread, with chemical resistance properties equal to or exceeding those of the nonwoven geotextile, shall be used for all sewing. The seams shall be sewn to provide a flat (prayer) seam, "J" seam, or "butterfly-folded" seam and shall be a two-thread, double-lock stitch or a double row of single-thread, chain stitch.
- C. When sewing a flat seam, the stitching shall be approximately 1-1/2 inches (+ 1/4") from the outside edge of the fabric (not in the selvage or at the selvage edge). The "J" fold and Butterfly fold seams require a fold 1-1/4 inches to 2 inches from the fabric edge with the stitching approximately 1 inch from the folded edge.

### 3.5 REPAIR

- A. Any holes or tears in the geotextile shall be repaired as follows:
  - 1. On slopes steeper than 5 horizontal to 1 vertical, a patch made from the same geotextile shall be double seamed into place (with each seam 0.5 inch apart and no closer than 2 inches from any edge). Should any tear exceed 10 percent of the width of the roll, that roll shall be removed from the slope and replaced with new material.
  - 2. On slopes flatter than or equal to 5 horizontal to 1 vertical, a patch made from the same geotextile shall be spot-seamed in place with a minimum of 2 feet overlap in all directions.
- B. Care shall be taken to remove any soil or other material which may have penetrated the torn geotextile.



3.6 PLACEMENT OF SOIL MATERIALS

- A. CONTRACTOR shall place all soil materials on top of a geotextile, in such a manner as to ensure that:
1. the geotextile and underlying materials are not damaged;
  2. minimum slippage occurs between the geotextile and underlying layers; and
  3. excess stresses are not produced in the geotextile.

3.7 PRODUCT PROTECTION

- A. CONTRACTOR shall use all means necessary to protect all prior work and materials and completed work of other Sections.
- B. In the event of damage, CONTRACTOR shall immediately make all repairs and replacements necessary to the approval of OWNER's Representative and CM and at no additional cost to OWNER.

3.8 FIELD QUALITY CONTROL

- A. CQA Officer / Engineer shall document that the geotextile installation is in accordance with these specifications, the engineering drawings, and the CQA Plan.
- B. See Construction Quality Assurance (CQA) Plan for more information.

<b>TABLE 1</b>				
<b>GEOTEXTILE SEPARATOR (NEEDLEPUNCHED NONWOVEN)</b>				
<b>PROPERTIES</b>	<b>QUALIFIER</b>	<b>UNITS</b>	<b>SPECIFIED VALUES<sup>(1)</sup></b>	<b>TEST METHOD</b>
Type	---	---	nonwoven	---
Weight	minimum	%/yd <sup>2</sup>	12	ASTM D 5261
Grab Tensile	minimum	lb	300	ASTM D 4632 (2)
Tear Strength	minimum	lb	115	ASTM D 4533 (2)

Notes: (1) All values represent minimum average roll values (i.e., any roll in a lot should meet or exceed the values in this table).

(2) Minimum value measured in machine and cross machine direction.

END OF SECTION