SUPPLEMENTAL TECHNICAL SPECIFICATIONS
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The following revisions and/or additions to the Technical Specifications of the Standard Specifications are hereby made a part of the Contract Documents.

A. ALL WORK DETAILED IN THIS PROJECT IS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED IN THE SUPPLEMENTAL SPECIFICATIONS WHICH IS PROVIDED HEREIN, IN ACCORDANCE WITH THE MARICOPA ASSOCIATION OF GOVERMENTS UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORK CONSTRUCTION.

1. The Maricopa Assoication of Goverments Uniform Standard Specifications for Public Works Construction is available at https://azmag.gov/Programs/Public-Works/Specifications-and-Details.

B. If alternative manufacturers other than the pre-approved manufacturers are proposed for any specified equipment, the CONTRACTOR must supply a submittal; refer to STS 01 33 00 for requirements after the effective date of the agreement. Although the brands listed herein are the preferred brands, it is not the intent of the OWNER for these specifications to be proprietary; equals will be evaluated in accordance with comparable quality, construction, strength, durability, and suitability for the purpose intended, and are listed for the purpose of describing the standard of quality perfomance and characteristics.

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 11 00
SUMMARY OF WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. The Work of this Contract is located at the Coalmine Canyon Chapter Wastewater Treatment Plant in Tuba City, Arizona. The project scope of work includes the following:

1. Removal and disposal of the existing sludge and existing liner.
2. Site earthwork and grading.
3. Installation of a new berm splitting existing lagoon 2.
4. Installation of a new 60-mL HDPE liner within the new lagoons.
5. Installation of new sewer lines and manholes.

B. The work of this Contract generally consists of furnishing all labor, materials, equipment and incidentals required and performing all construction, installation and testing of all improvements, modifications and additions, all as shown on the drawings and specified in these Specifications.

C. Owner: Navajo Tribal Utility Authority

D. Engineer: Smith Engineering Company

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction(MAG), etc., is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. The following definitions shall apply to the Work:

1. Technical Specifications shall refer to the Sections included under Divisions 1 through 48. The individual Technical Specifications may be referred to as “Supplemental Specifications,” “Specification Sections,” “Section,” “STS,” “Spec,” “Standard Specification,” or “Technical Specifications.”

2. Standard Specifications shall refer to the Uniform Standard Specifications for Public Works Construction by the Maricopa Association of Governments. The individual Technical Specifications may be referred to as "Standard Specifications," "Specification Sections," "Section," "Std. Spec," or "Technical Specifications."

B. NTUA: Navajo Tribal Utility Authority

C. EPA: Environmental Protection Agency

D. NPDES: National Pollution Discharge Elimination System

E. Engineer: As referenced in these specifications, Engineer shall refer to the project design, engineer of record, and/ or owners representative engineer

1.5 REGULATORY REQUIREMENTS

A. Comply with all federal and local laws, regulations, codes and ordinances applicable to the Work, including stormwater pollution prevention requirements.

B. References in the Contract Documents to local codes shall mean the latest edition of the appropriate code having jurisdiction including the following:

1. International Building Code
2. International Mechanical Code
3. National Electrical Code
4. International Plumbing Code
5. International Existing Buildings Code
6. International Energy Conservation Code
7. International Fire Code

C. Other standards and codes, which apply to the work, are designated in the Contract Documents.

D. Soils: Best management practices (BMPs) shall be applied in order to curtail wind and water erosion of exposed soils during construction (see STS 01 74 00: Cleaning and Waste Management). To avoid soil pollution impacts during construction, any polluting materials generated will not be dumped in the project area but will be managed in accordance with STS 01 74 00 and appropriate guidelines. Contractor shall submit to Engineer BMPs intended to be used for review and approval, when applicable. BMPs may include, but are not limited to, the following:

1. Silt Fencing
2. Straw Bale Fencing
3. Sediment Traps

E. Water Quality: The EPA requires a NPDES Construction General Permit for all storm water discharges from construction permits that will result in the disturbance of one or more acres of total land. Provide a Storm Water Pollution Prevention Plan (SWPPP) and implement and maintain BMPs to the extent practicable to prevent pollutants such as sediment, oil and grease, and construction material from entering storm water runoff. Refer to STS 01 57 23: Temporary Storm Water Control.

F. Air Quality – (see STS 01 74 00: Cleaning and Waste Management) The following measures, bit not limited to, are recommended to reduce disturbance of particulate matter, including emissions caused by strong winds as well as machinery and trucks tracking soil off the construction site.

1. Suppress dust on traveled paths which are not paved through wetting, use of water trucks, chemical dust suppressants, or other reasonable precautions to prevent dust entering ambient air;
2. Cover trucks when hauling soil;
3. Minimize soil track-out by washing or cleaning truck wheels before leaving construction site;
4. Stabilize the surface of soil piles;
5. Create windbreaks.
    a. Site restoration
    b. Remove un-used material;
    c. Remove soil piles via covered trucks.

1.6 OWNER OCCUPANCY

A. The NTUA personnel may occupy areas of the site during performance of the Work. Coordinate all construction operations to facilitate NTUA personnel usage, including securing the project site, if necessary, see STS 01 14 00: Work Restrictions.

1.7 PERFORMANCE REQUIREMENTS

A. The Contractor shall coordinate use of the premises, for storage and the operations of the Contractor's workforce, with the Owner to minimize conflict and to facilitate Owner usage.

B. The Contractor shall maintain access and utilities to the existing structures within the project area.

C. Contractor staging/laydown areas shall be as identified at the preconstruction meeting. Obtain written permission from Owner if additional storage or work areas are needed to perform the work.

D. The Contractor shall provide spill containment for all regulated materials and NFPA rated containment for all flammable materials.

E. Contractor shall assume full responsibility for security of all his own and his subcontractors, materials and equipment stored on the site.

F. If directed by the Owner, the Contractor shall move any stored items which interfere with operations of Owner or other Contractors.

G. Additional Contractors may be onsite during construction of this project; Contractor shall coordinate with each other as needed.

H. The Contractor will have access to the site to conduct pre-construction potholing and dewatering investigations if needed. Contractor is required to coordinate with Owner prior to accessing the site.

I. Contractor shall continue to be allowed access to all facilities constructed to perform testing and adjustments as needed until final completion is issued.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 11 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 14 00
WORK RESTRICTIONS

PART 1– GENERAL

1.1 SECTION INCLUDES

A. This specification is to notify the Contractor of construction constraints that may affect the scheduling and performance of the work by the Contractor.

1. This specification shall not dictate the means, methods, techniques, and procedures of the construction by the Contractor.

B. The construction constraints indicated herein are not intended to prevent the Contractor from completing work concurrently and shall not be construed as a reason of failure for the Contractor to perform the work within the contract times and the time constraints listed herein.

C. Work may be scheduled simultaneously but must be done under the requirements herein.

D. The Contractor's proposed progress schedule shall reflect all coordination efforts of the work of this contract. The progress schedule shall identify points in time when any utility service (sewer, water, gas, electric, etc.) shutdowns shall need to occur, and the duration of those shutdowns.

E. The Contractor shall modify the progress schedule as required, prior to the start of construction, to eliminate potential conflicts, delays, and disruption of utility service activities to the satisfaction of the Engineer and the Owner personnel.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc., standard is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

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

B. Shut Down – component/equipment/system not in active service.

C. Start Up – a new component/equipment/system is placed into service per the specifications.

D. Restart – an existing component/equipment/system is placed back into service per the specifications.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with Specification 01 33 00: Submittal Procedure.

B. Construction Schedule: submit and maintain construction schedules pursuant to the General Conditions of the contract. See STS 01 32 00: Construction Progress Documentation.

1. A detailed schedule shall be submitted, beginning with Notice to Proceed through Final Completion.

2. Show activities including, but not limited to, the following:

   a. Notice to Proceed.

   b. Permits.

   c. Submittals, with review time (in agreement with the submittal schedule).

   d. Early procurement activities for long lead equipment and materials.

   e. Initial site work.

   f. Earthwork.

   g. Specified work sequences and construction constraints.

   h. Contract Milestone and Completion Dates.

   i. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work.

   j. System startup and training summary.

   k. Substantial completion walkthrough.

   l. Final completion walkthrough.

   m. Project close-out summary.

   n. Demobilization summary.

3. Schedule shall conform with the work items identified in the contractor's schedule of values.

4. Format

   a. Gantt Chart format showing an orderly progression of work from start to finish.

   b. Critical path analysis showing critical work items to the completion of the project within the contract times.

   c. Chart shall show continuous activity form left to right.

   d. The duration, start date, and end date shall be shown for each task.

C. Safety and Environmental Submittals:

1. Hazard Communication Program with information on labels, Safety Data Sheets, an inventory of hazardous chemicals on site, and employee training, as applicable.

2. Chemical and Fuel Storage and Spill Response Plan, in the format of a Spill Prevention Control and Countermeasures Plan, including spill response supplies and spill response Personal Protective Equipment on site.

   a. In the event of a sanitary sewer, chemical, fuel, or other accidental spill, refer to STS 01 35 29.13: Health, Safety, and Emergency Response for Contaminated Sites.

3. Site Specific Safety Plan, with special emphasis on Personal Protective Equipment to be used for construction activities.

D. Construction Schedule Constraints

1. No Work shall be done before 7:00 AM or after 7:00 PM, local time, Monday through Saturday, on Sunday, or on legal holidays, except as necessary for the proper care and protection of work already performed, or during emergencies.

2. Contractor may not begin to take any existing utilities out of service until the Engineer has given written permission to begin abandoning or removing existing utilities.

1.6 SUSPENSION OF WORK

A. Prior to suspension for any cause, take necessary precautions to protect the work during the period of suspension from any factors which would contribute to its deterioration from weather conditions or vandalism.

B. Time elapsed during suspension of the Work shall not count as contract time. The Contractor shall make no claim for damages due to delay, additional mobilization/demobilization charges, nor any additional costs that may be incurred solely due to the suspension of work.

C. Upon return of favorable conditions or remediation of hazards or environmental damage, Owner will issue a Notice to Proceed to resume work.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 14 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 22 00
UNIT PRICES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This section includes specifications for measurement and payment as they apply to the work, and includes provisions applicable to Lump Sum Prices, Unit Prices, and allowances, as included.

B. The following explanation of the Measurement and Payment for the Bid Schedule items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the Bid Schedule or relieve the Contractor of the necessity of furnishing such as a part of the Contract.

C. The Engineer will be the final judge of all measurements and compute quantities accordingly.

D. The Contractor shall assist the Engineer by providing necessary equipment, workers, and survey personnel as necessary.

1.2 RELATED SECTIONS

A. General, Supplemental General Conditions, Special Provisions, Supplemental Special Provisions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Arizona Maricopa Association of Governments Standard Specifications for Public Work Construction (MAG), etc., standard is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. Measurement: The quantities set forth in the Bid Schedule are approximate and are given to establish a uniform basis for the comparison of bids. The Owner reserves the right to increase or decrease the quantity of any class or portion of the work during the progress of construction in accordance with the terms and conditions of the Contract.

1. The Engineer shall be the final judge as to the amount or extent of the work completed. The Engineer's determination of the quantity of work installed will be used as the basis of payment.

B. Payment: Payment for the items listed on the Bid Schedule on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, clean up, restoration of disturbed areas, and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications.

1. Unit prices are used as a means of computing the final figures for bid and Contract purposes, for periodic payments for work performed and for determining value of additions or deletions.

C. Schedule of Values: The Contractor's schedule of values is a detailed schedule apportioning the original contract sum and all change orders, among all cost code divisions or portions of the Work. The schedule of values shall be based on the approved budget or the approved fixed price or cost-plus contract type.

D. Typical units of measurements:

1. SF – Square Feet
2. CY – Cubic Yard(s)
3. SY – Square Yard(s)
4. LF – Linear Feet
5. EA – Each
6. LS – Lump Sum
7. TON – U.S. Ton or 2,000 LBS
8. LBS – Pounds
9. LOT – An Asphalt Measurement (see the Standard Specifications)
10. ACRE – Acre

1.5 SUBMITTAL

A. Schedule of Values: Submit for approval a preliminary schedule of values, in duplicate, for all of the Work. Prepare preliminary schedule in accordance with the Supplemental Terms and Conditions. Submit preliminary schedule of values within 10 calendar days after the Effective Date of the Agreement. Submit final schedule of values in accordance with the Supplemental Terms and Conditions.

1. Format: Utilize a format similar to the Table of Contents of the Project Specifications. Identify each line item with number and title of the major specification items. Identify site mobilization, bonds, and insurance. Include within each line item, a direct proportional amount of Contractor's overhead profit.
2. Revisions: With each Application for Payment, revise schedule to list approved Change Orders.

PART 2– PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 MEASUREMENT AND PAYMENT

A. A general description of each bid item is included in the Supplemental Conditions of the Contract. The work description may not include all components required to complete the work required by the contract documents.

B. Bid Items Number:

1. 104150 Project Signs (New)

   a. Description: Work includes furnishing, installing, maintaining, and protecting the project information sign and shall include all posts, hardware, etc. to erect the sign(s) at the location determined by the Owner. Separate payment will not be made for screening of the project sign.

   b. Measurement: Project sign(s) will be measured by the numerical count of signs authorized to be installed.

   c. Payment Unit: Payment will be made at the unit price bid for each sign.

2. 105801: Construction Surveying

   a. Description: Contractor to perform all necessary surveying and construction staking, complete.

   b. Measurement: No measurement will be made for bid item.

   c. Payment: Payment will be made at the lump sum price provided upon the completion of the work or in accordance with the accepted schedule of values.

3. 105820: As-Builts (Including Survey)

   a. Description: Contractor to redline record drawings in accordance to the specifications, and an as-built survey of the improvements.

   b. Measurement: No measurement will be made for bid item.

   c. Payment: Payment will be made at the lump sum price provided upon the completion of the work or in accordance with the accepted schedule of values.

4. 106000: Construction Material Testing, complete.

   a. Description: All construction materials to be used on the work or incorporated into the work, equipment, plant, tools, appliances or methods to be used on the work shall be subject to the inspection and approval or rejection of the Engineer.

   b. Measurement: No measurement will be made for bid item.

c. Payment: Payment will be made at allowance price provided upon the completion of the work or in accordance with the accepted schedule of values.

5. 107001: Permits and Fees

a. Description: The Contractor is responsible for identifying the permits and fees applicable to the completion of the work, and shall cover costs associated with obtaining permits and fees.

b. Measurement: No measurement will be made for bid item.

c. Payment: Payment will be made at the lump sum price provided upon the completion of the work or in accordance with the accepted schedule of values.

6. 201005: Clearing and Grubbing

a. Description: Clearing and grubbing shall include the removal of debris and obstructions, natural and manmade, in accordance with standard specification 201. Separate payment will not be made for the removal of trees if necessary.

b. Measurement: No measurement will be made for clearing and grubbing.

c. Payment: Payment will be made at the lump sum price provided upon completion of work or in accordance with the accepted schedule of values.

7. 211001 Fill Construction, complete.

a. Description: Fill construction shall consist of constructing embankments except as may otherwise be specified, including the preparation of the areas upon which they are to be placed; the construction of dikes; the placing and compacting of approved material within areas where unsuitable material has been removed; and the placing and compacting of material in holes, pits, and other depressions.

b. Measurement: Measurement will be made by the nearest cubic yard of material removed from the emergency storage pond as determined from the stockpile survey of the stored riprap provided by the contractor's licensed surveyor and reviewed by the engineer.

c. Payment: Payment will be made in accordance with standard specification 211.6.

8. 301201: Subgrade Preparation

a. Description: Subgrade Preparation includes the compaction of the subgrade in accordance with standard specification 301.

b. Measurement: Measurement will be by the nearest square yard of material utilized as subgrade preparation.

c. Payment: Payment will be made at the unit price bid per square yard.

9. 310104 4” Aggregate Basecourse

   a. Description: The furnishing and installation of basecourse shall be in accordance with standard specification 310.

   b. Measurement: Measurement will be made to the nearest square yard of aggregate base course in place as measured by the Engineer.

   c. Payment: Payment will be made at the unit price bid per square yard.

10. 350201: Remove Pipes (Less than 24” Dia.)

   a. Description: Removal and disposal shall include trenching and compacted backfill, and all necessary materials, labor, and equipment, per Standard Specification 350.2.1. Disposal includes haul and any associated fees.

   b. Measurement: Measurement is made at the nearest lineal foot of pipe removed.

   c. Payment: Payment will be made at the unit price bid per lineal foot.

11. 515250: Furnish and install stationary pipe bollards.

   a. Description: Furnishing and installation includes the pipe bollard, concrete base, retroreflective tape and any associated grading.

   b. Measurement: Measurement will be made by the numerical count of bollards installed.

   c. Payment: Payment will be made at the unit price bid per pipe bollard.

12. 615200: Furnish and install 8-inch HDPE piping.

   a. Description: HDPE pipe furnished shall be in accordance with standard specification 738. Pipe to be installed in accordance with standard specification 615.

   b. Measurement: Measurement will be made to the nearest linear foot.

   c. Payment: Payment will be made Payment will be made in accordance with standard specification 615.16(A).

13. 615208: Furnish and install 8-inch PVC piping.

   a. Description: PVC pipe furnished shall be in accordance with standard specification 745. Pipe to be installed in accordance with standard specification 615.

   b. Measurement: Measurement will be made to the nearest linear foot.

   c. Payment: Payment will be made in accordance with standard specification 615.16(A).

14. 615850: Furnish and Install 8-inch Plug Valve and Cast Iron Valve Box.

    a. Description: Furnishing and installation includes the plug valve, cast iron valve box, valve cover, HDPE MJ fused transition, concrete valve support, concrete collar, and associated grading.

    b. Measurement: Measurement will be made by the numerical count of valves installed.

    c. Payment: Payment will be made at the unit price bid per valve.

15. 615900: Existing lagoon 2 liner removal and disposal.

    a. Description: This item includes any costs associated with removing liner from Existing Lagoon 2 and transporting it to a landfill.

    b. Measurement: No measurement will be made for liner removal.

    c. Payment: Payment will be made at the lump sum price provided upon completion of work or in accordance with the accepted schedule of values.

16. 615901: Existing lagoon 1 liner removal and disposal.

    a. Description: This item includes any costs associated with removing liner from Existing Lagoon 1 and transporting it to a landfill.

    b. Measurement: No measurement will be made for liner removal.

    c. Payment: Payment will be made at the lump sum price provided upon completion of work or in accordance with the accepted schedule of values.

17. 615902 Sludge Removal and Surface Disposal.

    a. Description: This item includes any costs associated with the removal of sludge from Existing Lagoons 1 and 2 to the designated sludge stockpile area, and with the surface disposal of the sludge.

    b. Measurement: Measurement will be made by the nearest cubic yard of sludge removed from Existing Lagoons 1 and 2 as determined from the stockpile survey of the stored sludge as provided by the contractor's licensed surveyor and reviewed by the engineer.

    c. Payment: Payment will be made at the unit price bid per cubic yard.

18. 615903: Furnish and install textured 60-mil HDPE liner

    a. This item includes the furnish and install of 60-mL HDPE liner, base preparation, liner vents, safety escapes, and pipe penetrations for Facultative Lagoons 1 and 2.

    b. Measurement: Measurement shall be made to the nearest visible, above grade square foot in place as measured by the engineer. Measurement will not include nonvisible liner placed for the anchor trench or additional liner placed for reinforcement or pipe boots, and escapes.

    c. Payment Unit: Payment will be made at the unit price bid per square foot.

19. 615904: Furnish and install textured 60-mil HDPE liner

    a. Description: This item includes the furnishing and install of 60-mL HDPE liner, base preparation, liner vents, safety escapes, and pipe penetrations for Storage Lagoon 3.

    b. Measurement: Measurement shall be made to the nearest visible, above grade square foot in place as measured by the engineer. Measurement will not include nonvisible liner placed for the anchor trench or additional liner placed for reinforcement or pipe boots, and escapes.

    c. Payment Unit: Payment will be made at the unit price bid per square foot.

20. 625001: 4' Dia. Manhole to 10' Depth

    a. Description: Includes excavation, backfill, base, lid and ring to construction in accordance with the drawings and specifications. Shall include all costs associated with the testing of the manholes.

    b. Measurement: Measurement shall be made at the numerical count of manholes installed.

    c. Payment: Payment per MAG specification 625.5.

21. 625100 Manhole Protective Lining

    a. Description: Installation of interior coating shall include all labor, materials, testing, and equipment needed.

    b. Measurement: Measurement shall be made to the nearest square foot of interior coating installed as calculated by the Engineer.

    c. Payment: Payment will be made at the unit price bid per square foot.

22. 800001: Mobilization

    a. Measurement: No measurement for mobilization or demobilization will be made.

    b. Payment: Shall be in accordance to Standard Specification 109.10.

END OF SECTION 01 22 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1– GENERAL

1.1 SECTION INCLUDES

A. Section includes the procedures to be followed for substituting products specified in the contract documents.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 PERFORMANCE REQUIREMENTS

A. Formal requests from the Contractor will be considered by the Engineer for substitution of products and methods in place of those specified. Acceptance of substitute products and methods shall be only for the characteristics and use named in the acceptance and shall be interpreted neither as a modification to the Specification and Drawing requirements nor to establish acceptance of products and methods for other portions of the project. The Engineer shall judge the quality and suitability of the substitute product and method and his decision shall be final. Where use of a substitute product and method involves redesign of other parts of the Work, the cost and time required to affect that redesign will be considered in evaluating the suitability of the substitute product and method.

B. A request for a substitution constitutes a representation that the 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.

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

D. The application:

1. will certify that the proposed substitute item will:
   a. performs adequately the functions and achieve the results called for by the general design,

b. be similar in substance to that specified, and

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

2. will state:

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

b. whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

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

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

E. Qualification Packages for Substitution Listings: The qualification package for the substitution of equipment items or products the Contractor proposes to furnish shall include but not be limited to, the following information appropriate for the particular item:

1. Manufacture's Experience: The manufacturers shall certify that their experience includes a minimum of ten installations where identical equipment has been in operation successfully in a similar process for a minimum of five years.

2. Manufacture's Certification: As a minimum, the manufacturer shall certify that the supplier is the manufacturer of the equipment to be substituted.

3. Equipment Requirements: A complete set of drawings, specifications catalogue, cut sheets and detailed descriptive material of proposed major equipment items or products. This information shall identify all technical and performance requirements stipulated in the specifications.

4. Equipment Details: Detailed information shall be submitted for all items.

5. Materials of Construction: List showing materials of construction of all components.

6. Recommended Spare Parts: List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage for a minimum of one year.

7. Maintenance Materials: Provide:

a. Lubrication for all equipment and facilities sufficient for three months' normal usage.

b. Any non-standard tool required to adjust, or service equipment supplied.

8. Erection Requirements: Information on equipment field erection requirements.
9. Maintenance Requirements: A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period.
10. Electrical Requirements: Process equipment electrical requirements and schematic diagrams.
11. List of Deviations: Detailed written documentation with discussion of all deviations of equipment from the contract documents.
12. Operations & Maintenance Manual: One representative O & M Manual.
13. Installation List: Complete Past Experience Installation List complete with project location, design criteria, design engineer, firm, owners, manager, operator, superintendent, and telephone number for each. Identify which plants on the installation list meet the experience requirements of the Specification.
14. Guarantee: Copy of the supplier's guarantee of the proposed substitute equipment for one year starting after successful completion of start-up.
15. Process Design Analysis (if applicable)

F. Substitute Construction Methods or Procedures:

1. If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer.
2. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents.

G. Engineer's Evaluation:

1. The Engineer will determine whether the material or article submitted is equal to the named material or article. The Engineer's decision regarding evaluation of substitutions shall be final and binding. Request for time extensions and additional costs based on rejection of substitutions will not be allowed.
2. Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability.
3. No "or equal" or substitute will be ordered, installed, or incorporated into the work until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

1.4 SUBMITTALS

A. Contractor to Submit written application to Engineer for review of a proposed product or method. (see section above)

B. Contractor to submit a Qualification Package for Substituting. (see section above)

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 25 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 26 13
REQUESTS FOR INTERPRETATION

PART 1– GENERAL

1.1 SECTION INCLUDES

A. This specification includes the procedures for reporting and resolving discrepancies or clarification of the contract documents though requests for interpretation.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Maricopa Association of Governments Uniform Standard Specification for Public Works Construction(MAG), etc., standard is incorporated by reference in these specifications, the referenced specification shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. RFI: Request for Interpretation or Request for Information

1.5 REPORTING AND RESOLVING DISCREPANCIES

A. In the event Contractor, or Sub-Contractor or any Supplier, or other persons or entities performing portions of the Work determines, after exercising due diligence to determine the intent of the Contract Documents, that some portion of the Contract Documents require clarification or interpretation by Engineer, Contractor shall submit an RFI in writing to Engineer in a format provided by the Engineer, see Attachment A.

   1. RFIs may only be submitted by Contractor and shall only be submitted in the form required by Engineer, to the Engineer.

B. An oral RFI or an RFI presented on an unapproved form may not be accepted. Any project delay caused by Engineer's refusal to accept an oral RFI or an RFI presented on an unapproved form will be attributed solely to Contractor.

C. Each RFI shall be limited to a single item.

D. Information that is discernable from the Contract Documents, including the Construction Drawings, and issues concerning construction means, methods, techniques, sequences, or procedures; or construction site safety will not be addressed by Engineer in responding to an RFI.

E. The RFI process shall not be used by Contractor to seek approval for proposed "or-equal" or substitute materials or equipment. Refer to STS 01 25 00: Substitution Procedures.

F. Contractor shall clearly and concisely set forth the item for which clarification or interpretation is sought and why a response is needed. In the RFI, Contractor shall set forth its understanding or interpretation of the requirement, along with reasons why such and understanding or interpretation was reached.

G. Engineer's review of or responses to RFIs will not change any requirements of the Contract Documents. In the event Contractor believes that a response to an RFI will cause a change to the requirements of the Contract Documents, Contractor shall give written notice to Owner and Engineer before proceeding with the Work, stating that Contractor considers the response to be a change to the Contract Documents.

H. If Contractor wishes to make claim for an adjustment of the Contract Price or an extension of Contract Times, or both, written notice shall be given no later than 30 days after the start of the event giving rise thereto, or after such initial decision. Failure to give such notice shall waive Contractor's right to seek an adjustment on the Contract Price or an extension of the Contract Times.

I. The Contractor shall not submit excessive RFIs, submit RFIs with the intent to create conflicting information to provide the grounds for changes in Work or an extension of the Contract Times, or both, submit incomplete RFIs, or submit RFIs that is apparent from fiddle observations or can be reasonably inferred from the Contract Documents in the opinion of the Engineer.

J. The Contractor shall be liable to the Owner for all reasonable costs charged by the Engineer to the Owner for evaluating and responding to RFIs that are identified in the above paragraph "H" of this specification.

K. Engineer will review and respond to RFIs within seven calendar days of receipt of the RFI or will provide written notice why the RFI cannot be responded to within seven days. RFIs marked urgent will be prioritized over other RFIs. In no case shall the Contractor be entitled to additional time for the Engineers review and response to an RFI.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 26 13

Attachment A

Request for Interpretation (RFI) No. ____

Date Submitted:		**RFI Subject:**
Project: Coalmine Canyon Chapter WWTP Lagoon Rehabilitation	**Owner:** Navajo Tribal Utility Authority	**Submitted To:** Smith Engineering Company **Attention:**
C**ontractor:**		R**esponse Required By:**
Submitted By (*name & title)*:		**Number of Pages:**
Submitted Via: ☐ Email/ Electronic Copy ☐ USPS ☐ Facsimile		

REFERENCE:

Specification Reference:_____

Drawing/Detail Reference:_____

REQUEST: ☐ Interpretation ☐ Clarification ☐ Additional Information

Contractors Certification:

The undersigned Contractor certifies that (1) due diligence was used to determine the intent of the contract documents prior to submitting this RFI; (2) Contractor has read and understand the requirements set for in STS 01 26 13: Request for Interpretation; and (3) Contractor understands that the Engineer's written response to this RFI is a written decision and final decision.

Signature Name & Title (Printed) Date

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 31 00
PROJECT MANAGEMENT COORDINATION

PART 1– GENERAL

1.1 SECTION INCLUDES

A. Section includes procedures for preparing and conducting the project construction meetings:

1. Preconstruction meeting
2. Construction progress meetings
3. Pre-installation meetings
4. Closeout meeting

B. Procedures for modification to contract times.

C. Procedures for notifying Engineer and Owner of events which may affect or be caused by construction activities.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

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

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

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

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

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

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

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

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Meeting Participants: Representatives of entities participating in meetings shall be qualified and authorized to act on behalf of entity each represents.

1.5 PRECONSTRUCTION MEETING

A. Owner or Engineer may schedule and preside over a preconstruction meeting after or before the issuance of the Notice of Award.

B. Attendance Required: Engineer, Owner, Contractor, RPR, major Subcontractors, applicable utility representative, and funding agency representatives, as applicable.

C. Location: TBD

D. Minimum agenda outline may include, but not limited to:

1. Owner-Contractor Agreement, where applicable
    a. Execution
    b. Submission of executed bonds and insurance certificates
    c. Distribution
2. Submission Progress Schedule
3. Submission of Schedule of Submittals
4. Designation of Contract Authority and channels of communication
5. Procedures and processing of:
    a. Field orders
    b. Submittals
    c. Change Orders
    d. Request for Information/Interpretations
    e. Applications for Payment
    f. Record Documents
    g. Contract closeout procedures
6. Scheduling
7. Critical Work sequencing
8. Use of project site:
    a. Office and storage areas
    b. Security
    c. Housekeeping
    d. Owner's requirements

9. Major equipment lead times, deliveries, and priorities
10. Permits required for construction
11. Utilities required for construction
12. Outline responsibilities for RPR
13. Selection of Materials Testing firm and Special Inspection firm
14. Procedures for testing
15. Use of premises by Owner and Contractor
16. Owner's requirements and partial occupancy
17. Construction facilities and controls
18. Temporary utilities provided by Owner, if applicable
19. Survey and site layout
20. Procedures for maintaining record documents
21. Requirements for startup of equipment
22. Inspection and acceptance of equipment put into service during construction period

E. Engineer: Record minutes and distribute copies to participants after meeting

1.6 CONSTRUCTION PROGRESS MEETING

A. Attend meetings throughout progress of the Work at periodic intervals as determined during the pre-construction meeting.

1. Contractor will:
   a. Schedule and administer meetings throughout progress of the Work
   b. Make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings
2. Attendance, as appropriate, to discuss agenda topics for each meeting:
   a. Job superintendent
   b. Major Sub-Contractors
   c. Contractor
   d. Engineer
   e. Owner
   f. Additional invitees: Owner utility companies when the Work affects their interests, and others necessary to agenda

B. Minimum Agenda:

1. Review Contract time and budget

2. Review of submittal schedule and status of submittals
3. Request for information (RFIs) status
4. Change order management status
5. Review of Schedule
    a. Planned progress during succeeding work period
6. Field observations, problems, and decisions
7. Maintenance of quality and work standards
8. Action items
9. Next meeting

C. Engineer: Record minutes and distribute to participants within two (2) business days after meeting and those affected by decisions made.

1.7 PREINSTALLATION MEETINGS

A. When required in individual Specification Sections, pre-installation meetings will be held at the Project Site before starting Work of specific Sections.

B. Require attendance of parties directly affecting, or affected by, Work of specific Section.

C. Notify Engineer no less than seven (7) calendar days in advance of meeting date as specified in the specific Section.

D. Contractor to prepare agenda and preside over meeting:

1. Review conditions of installation, preparation, and installation procedures
2. Review coordination with related Work

E. Contractor: Record minutes and distribute to participants within two (2) business days after meeting and those affected by decisions made.

1.8 QUALITY CONTROL MEETINGS

A. Contractor will schedule and administer meetings throughout progress of the Work at maximum weekly intervals.

B. Contractor will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: Construction Manager and staff, Contractor's Quality Control Manager and staff. Engineer and Owner may attend as necessary.

D. Agenda:

1. Review minutes of previous meetings
2. Review of Work progress and schedule
3. Review of out-of-compliance inspection or test results

4. Field observations, problems, and decisions
5. Review of offsite fabrication and delivery schedules
6. Planned progress during succeeding work period
7. Coordination of required inspections and tests
8. Review 3-week schedule report with upcoming inspections and special tests
9. Maintenance of quality and work standards
10. Other business relating to Work

E. Contractor will record minutes and distribute electronic copies within seven (7) calendar days after meeting to participants, and those affected by decisions made.

1.9 SUBSTANTIAL COMPLETION WALKTHROUGH

A. Contractor shall submit a request for substantial completion. Substantial completion walkthrough will be scheduled after receipt of the Contractors request.

B. Walkthrough will be attended by Contractor, Owner, and Engineer, at a minimum.

C. Refer the general conditions of the contract for additional requirements.

1.10 CLOSE-OUT MEETING

A. Engineer will schedule close-out meeting.

B. Engineer will make arrangements for meeting, prepare agenda with copies for participants, and preside over the meeting.

C. Attendance required: Owner, Engineer, RPR, Contractor, Contractor's Project Manager, Superintendent.

D. Agenda:

1. Review punch list completion
2. Transfer of record documents
3. Finalize payment

E. Engineer will record minutes and distribute copies to participants.

1.11 POST CONSTRUCTION MEETING

A. Contractor shall:

1. Meet with Owner and Engineer and inspect the Work for the 11th Month Warranty Walkthrough approximately 11 months after date of Substantial Completion with Owner and Engineer.
2. Notify Owner and Engineer at least 7 days before meeting.
3. Meet in Owner's office or project site.
4. Inspect the Work and draft list of items to be completed or corrected.

5. Review service and maintenance contracts and take appropriate corrective action when necessary.

6. Complete or correct defective work and extend correction period accordingly.

B. Require attendance of Contractor, Project Manager, or Superintendent, appropriate manufacturers and installers of major units of constructions, and affected subcontractor.

1.12 MODIFICATIONS TO CONTRACT TIMES

A. Requests for additional time to be added after the "contract completion date" due to delays or extra work shall be made to the Engineer and Owner in writing by the Contractor within thirty (30) calendar days after the time the Contractor was made aware of an event which causes a delay. Such requests shall be substantiated and shall include justification for the request of additional time.

B. Additional contract time, if approved by Engineer and Owner, shall then be in full force and effect, the same as though it were the original date for completion, and will be shown as the completion date plus a number of additional days. Any time required to complete the work beyond the contract time or additional contract time will result in the assessment of liquidated damages, as specified in the Contract.

1.13 NOTIFICATIONS

A. Job site safety is the sole responsibility of the Contractor.

B. Immediately notify the Engineer and Owner of the following events in or near the construction area or related to construction.

1. Injury to employees, subcontractors, or NTUA personnel.

2. Accidents or hazardous natural events, such as flash floods, tornados, or other weather occurrences.

3. Fuel, oil, sanitary sewer, or chemical spills. See STS 01 35 29.13: Health, Safety, and Emergency Response for Contaminated Sites.

4. Incidents involving wildlife.

5. Any open burning. Burning of any construction material or debris on site is prohibited.

6. Any findings of an artifact. Work shall immediately stop to allow for archaeological evaluation.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 31 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 32 00
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1– GENERAL

1.1 SECTION INCLUDES

A. Section includes general information and execution for construction progress documentation.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc., standard is incorporated by reference in these specifications, the references standards shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. CPM: Critical Path Method

1.5 SUBMITTAL

A. Contractor shall prepare and submit a detailed progress schedule, to the Engineer for approval in accordance with the project requirements and General Conditions.

1. A detailed schedule shall be submitted, beginning with Notice to Proceed through Final Completion.
2. Show activities including, but not limited to, the following:
    a. Notice to Proceed
    b. Permits
    c. Submittals, with review time (in agreement with the submittal schedule)
    d. Early procurement activities for long lead equipment and materials
    e. Initial site work
    f. Earthwork
    g. Specified work sequences and construction constraints
    h. Contract milestone and completion dates
    i. Any system downtimes for connection or removal and disposal

j. Major structural, mechanical, equipment, electrical, architectural, and instrumentation and control Work

k. System startup and training summary

l. Substantial completion walkthrough

m. Final completion walkthrough

n. Project close-out summary

o. Demobilization summary

3. Schedule shall conform with the work items identified in the contractor's schedule of values.

4. Format

a. Gantt Chart format showing an orderly progression of work from start to finish.

b. Critical path analysis showing critical work items to the completion of the project within the contract times.

c. Chart shall show continuous activity form left to right.

d. The duration, start date, and end date shall be shown for each task.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Schedule:

1. The Contractor shall prepare a fully developed, CPM chart or spreadsheet type bar graph of Contractor's construction schedule.

2. The scheduling of construction is the responsibility of the Contractor and Contractor management personnel shall actively participate in development of the schedule so that intended sequences and procedures are clearly understood. An orderly progression of work is demonstrated by:

a. Provide a separate task for each significant construction activity. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".

b. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.

c. The schedule shall show a continuous activity flow from left to right. The activity or event numbers, description, duration, and value shall be shown on the diagram.

d. Dates shall be shown on the diagram for start of the project, any milestones required by the contract, and contract completion.

e. The critical path shall be clearly identified.

f. Submittal, review, procurement, fabrication, delivery, installation, start-up, and testing of special or long lead-time materials and equipment shall be included in the schedule.

g. Other agency activities shall be shown. These include but are not limited to notice to proceed, approvals, inspections, and utility tie in for phasing requirements.

B. Work Stages:

1. Indicate important stages of construction for each major portion of the Work, including testing and installation.

END OF SECTION 01 32 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 32 36
VIDEO MONITORING AND DOCUMENTATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This work shall consist of video recording existing conditions of the construction area, structures, and areas adjacent to the limits of construction before work commences. Special attention shall also be paid to items such as structures and properties abutting the project limits, and watercourses and other areas subject to damage or erosion, and as directed by the Engineer.

B. The Contractor is directed to include video recording of existing fences, walls, landscaping, access roads, and other conditions along the project corridor.

C. The video records will be used to determine any impacts on structures and areas due to the Contractor's operations.

D. The Contractor shall furnish all labor, tools, equipment, material, and other appurtenances necessary to complete the work and shall be considered incidental to the completion of the project.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc., standard is incorporated by reference in these specifications, the referenced standard shall be the latest edition and revision.

1.4 SUBMITTALS

A. Pre-Construction video documentation for each area on the project shall take place not more than five (5) days prior to beginning construction in that area or as directed by the Engineer.

B. Post-Construction video documentation for each area on the project shall take place not more than five (5) days following the completion of the construction activities in that area or as directed by the Engineer.

1.5 QUALITY ASSURANCE

A. Quality of Finished Video Documentation: The quality of the visual and audio portions of the video, and the method of indexing of locations on the recording media, shall be acceptable to the Engineer. Recordings or portions of recordings deemed defective or substandard shall be re-recorded. Failure to provide pre-construction video documentation that meets the standards identified in this supplemental specification will result in a $1,000.00 deduction to final project payment.

PART 2- PRODUCTS

2.1 MATERIALS

A. Recording Equipment: The Contractor shall furnish at least one video camera and appurtenances for the duration of the project. The color video camera equipment shall be equipped with audio capabilities and have the following minimum criteria:

1. EIA Standard: NTSC-type color, 1.0 volt, 75 ohms
2. Horizontal resolution of 350 lines at center
3. 8:1 zoom, minimum
4. Recording Media: The Contractor shall supply sufficient recording media to document the entire construction area and adjacent areas before construction commences and as required or directed by the Engineer during and after construction. Recording media shall be either high quality DVD or standard portable USB type hard drive.

B. If use of a video camera is not available, Contractor may utilize modern cellular phone(s) capable of providing pre and post construction videos as acceptable to Owner and Engineer.

PART 3 – EXECUTION

3.1 RECORDING

A. Equipment Operator Requirements: The video camera equipment operator shall be familiar with and have experience using the video recording equipment.

B. Features to be recorded: The Contractor shall video record all drainage structure inlets and outlets, adjacent channels upstream and downstream, adjacent building structures, and areas and locations where construction will be performed. The Contractor shall record in both directions along the roadway corridor and along roadways to be reconstructed. The Contractor shall ensure that these video records pick up existing utilities within the corridor as well as existing drainage patterns.

C. The maximum speed of camera movement shall not exceed 4 ft per second.

D. During all recording, the Contractor shall provide an audio explanation of significant features observed.

E. Any notification to the Contractor of any damages or any concerns/remedies resulting from construction activities shall be relayed to the Engineer.

F. Building Structure Documentation: The Contractor shall record front and side views, including close-ups of each view both interior and exterior, for any features or facilities that may be affected by construction. Where cracks exist on building structures, the Contractor shall place a scale next to the crack and record to show existing crack size. Such building features may include, but are not limited to, all structures, fences and landscaping adjacent to the project limits.

G. Drainage Documentation: The Contractor shall record the construction area immediately following rainfall over the area to ascertain drainage patterns if rainfall occurs at the project site within the required pre-construction video timeframe. Video documentation shall take place before commencing construction when possible.

3.2 AVAILABILITY

A. Availability for Video Documentation: Recording equipment and operator shall be on-site within ½ hour at the Engineer's request.

B. Availability for Video Viewing: The video viewing system and the appropriate recording media shall be available for meetings as scheduled, and at the request of the Engineer.

END OF SECTION 01 32 36

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1- GENERAL

1.1 SUMMARY

A. Section includes procedures for preparing and transmitting submittals and resubmittals required by specification sections for a product, material, or construction method:

1. Shop drawings
2. Product data
3. Manufacturer's certificates
4. Design data and calculations
5. Manufacturer's instructions
6. Manufacturer's field service reports
7. Samples
8. Field Testing

B. It is the responsibility of the General Contractor to convey the requirements of this Section to their Sub-Contractors and their suppliers and vendors.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specification for Public Works Construction, etc., standard specification is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 SUBMITTALS

A. Wherever submittals are required hereunder, or as required by each specification section, all such documents shall be furnished to the Engineer.

B. Within 30 Days of the Notice to Proceed, the Contractor shall submit a complete list of anticipated submittals which includes Specification and Drawing references. The list shall be updated with “early start” submittal date within 15 Days of submittal of the Contractor’s construction schedule. The submittal dates shall be updated whenever the schedule is updated.

C. Schedule submittals with such promptness as to cause no delay in Work. Unless otherwise indicated in this Section, submittals shall be provided in accordance with the accepted submittal schedule.

D. Preparation:

1. Provide separate submittal for each specification section requiring submittals. Where multiple sections relate to the same system or element and are being provided from the same source, a single joint submittal is acceptable.

2. Coordinate submission of related items. Group submittals of related products in a single transmission.

3. Include all submittal material requested for that Section.

4. Identify variations or deviations from requirements of Contract Documents. State product and system limitations which may adversely affect Work.

5. Mark or show dimensions and values in same units as specified.

6. Contractor to include a Cover Transmittal form (Attachment A) with each separate submittal. Contractor to fill out form in its entirety.

E. Contractor responsibilities:

1. It is the Contractors responsibility to note any and all deviations to the original contract documents and the reason the deviation is requested in the submittal cover transmittal form.

2. The Contractor shall be responsible for the accuracy, completeness, and coordination of all submittals, including but not limited to, submittals of or from an item, product, service, person, or firm which is specified in the Contract Documents; such specified submittals shall not be presumed to be acceptable to the Owner and shall be subject to the same approval process as all other submittals. The Contractor shall not delegate this responsibility in whole or in part to any Subcontractor. Submittals may be prepared by the Contractor, Subcontractor, or Supplier, but the Contractor shall ascertain that each submittal meets the requirements of the contract and the project. The Contractor shall ensure that there is no conflict with other submittals and shall notify the Engineer in each case where its submittals may affect the work of another Contractor or the Owner. The Contractor shall ensure coordination of submittal of related crafts and Subcontractors.

3. Review submittals prior to transmittal. Verify compatibility with field conditions and dimensions, product selections and designations, quantities, and conformance of submittal with requirements of Contract Documents. Return non-conforming submittals to prepare for revision rather than submitting for review.

4. Coordinate submittals to avoid conflicts between items of work.

5. Submittal transmittal form:

a. Include with each submittal a transmittal form. Sample copy of an acceptable form is attached to this section as Attachment A.

b. Identify Project, Contractor, subcontractor, supplier, manufacturer, pertinent drawing sheet and detail numbers, and associated Specification Section numbers, as applicable.

c. Each Submittal shall be assigned a unique number. Submittals shall be numbered sequentially. The Submittal numbers shall be clearly noted on the transmittal. Original Submittals shall be assigned a numeric Submittal number. Resubmittals shall bear an alpha-numeric system which consists of the number assigned to the original Submittal for that item followed by a letter of the alphabet to represent that it is a subsequent Submittal of the original. For example, if Submittal 25 requires a resubmittal, the first resubmittal will bear the designation “25-A” and the second resubmittal will bear the designation “25-B” and so on.

6. Failure to make timely submittals in accordance with the requirements of the specifications shall constitute grounds for the Owner to withhold compensation for the equipment to which the submittal is related, or, in the case of information lists, record drawings, investigation findings, safety plans, quality plans, and similar items, the Owner may withhold the value of the information in the submittal.

7. Incomplete, improperly packaged, and submittals from sources other than Contractor will not be accepted.

F. Transmittal: Where possible, transmit all submittals electronically. Where an electronic submittal is not possible, submit three (3) paper copies for Engineer retention plus as many copies as Contractor desires returned after review.

1. Exception: Retained quantities for samples, color charts, and manufacturer’s equipment manuals shall be as specified elsewhere herein.

G. Review: Engineer will review and return submittals with comments.

H. Do not fabricate products or begin work which requires submittals until return of reviewed submittal with Engineer acceptance.

I. On return, promptly distribute reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

J. Resubmission:

1. Revise and resubmit submittals as required within 14 calendar days of return from initial review.

2. Make re-submittals under procedures specified for initial submittals.

3. Identify all changes made since previous submittal.

1.5 QUALITY ASSURANCE

A. Where required by Specification Sections, provide quality assurance submittals:

1. Qualification data: Written information demonstrating capabilities and experience of firm or person. Include lists of complete projects with names and contact information for references.

2. Manufacturer's certificates: Submit reference data, affidavits, and certifications on manufacturer's letterhead certifying that products conform to or exceed specified requirements. Certificates may be based on recent or previous test results supplied by manufacturer and accepted by Engineer.

3. Installer approval: Certification on manufacturer's letterhead that installer complies with requirements and is approved for installing manufacturer's products.

4. Welding certificates: Written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specifications (WPS) and Procedure Qualification Record (PQR) on American Welding Society (AWS) forms. Include names of firms and personnel certified.

5. Field test reports: Written reports from qualified testing agency indicating and interpreting results of field tests performed either during or after installation for compliance with specified requirements. The Contractor shall perform field testing as required by specifications.

1.6 SUBMITTAL REVIEW

A. Intent of Submittal Review: Engineer will review submittals for the sole purpose of verifying general conformance with design intent and general compliance with Contract Documents. Approval of submittal by Engineer does not relieve Contractor of responsibility for correcting errors which may exist in submittal or from meeting requirements of Contract Documents.

B. Except as may otherwise be indicated herein, the Engineer will return each Submittal to the Contractor, with its comments noted thereon, within 14 calendar days following their receipt by the Engineer. For resubmittal of Submittals, the Engineer will be allowed the same review period as for the original Submittal. It is considered reasonable that the Contractor shall make a complete and acceptable Submittal to the Engineer by the second submission of a Submittal item. Should the Engineer, if applicable, be required to review third and subsequent submittals, Owner will withhold from Contractor’s next payment request an amount based on Engineer’s current fee schedule, including applicable miscellaneous expenses, so that Owner may reimburse Engineer for such reviews.

This submittal has been reviewed for compliance with general requirements of design and arrangement only and is not a contract document. Acknowledgement of compliance does not relieve Contractor of responsibility for performance of the work in compliance with all provisions and requirements of the contract documents. Job measurements and coordination of all dimensions for proper fit of all parts of the work and performance of all equipment supplied to meet specification requirements are and remain specific responsibilities of the Contractor.	
☐ Compliance acknowledged subject to the foregoing: Distribute	☐ Compliance acknowledged as noted and subject to the foregoing: Distribute
☐ Compliance acknowledged as noted and subject to the foregoing: Revise and Resubmit for record: Distribute	☐ Rejected – Revise and resubmit for review

C. If a submittal is returned to the Contractor marked “COMPLIANCE ACKNOWLEDGED”, formal revision and resubmission of said Submittal will not be required.

D. If a submittal is returned to the Contractor marked “COMPLIANCE ACKNOWLEDGED AS NOTED”, formal revision and resubmission of said Submittal will not be required.

E. If a submittal is returned to the Contractor marked “COMPLIANCE ACKNOWLEDGED AS NOTED – REVISE AND RESUBMIT FOR RECORDS”, the Contractor shall revise said Submittal and resubmit the required number of copies for Engineer’s records. The Contractor shall submit a full executed submittal addressing all comments for records only.

F. If a submittal is returned to the Contractor marked “REJECTED – REVISE AND RESUBMIT FOR REVIEW,” the Contractor shall revise said submittal and resubmit the required number of copies. Resubmittal of portions of multi-page or multi-drawing submittals will not be allowed. For example, if a Shop Drawing submittal that consists of ten drawings contains only (one) drawing that is rejected and needs to be resubmitted, the submittal as a whole is deemed as “REJECTED – REVISE AND RESUBMIT FOR REVIEW,” and all ten drawings of the submittal are required to be resubmitted.

G. Any changes made on a resubmittal, other than those made or requested by the Engineer, shall be identified and flagged on the resubmittal.

H. Fabrication of an item shall commence only after the Engineer has reviewed the pertinent submittals and has returned copies to the Contractor marked either “COMPLIANCE ACKNOWLEDGED”, “COMPLIANCE ACKNOWLEDGED AS NOTED”, or “COMPLIANCE ACKNOWLEDGED AS NOTED – REVISE AND RESUBMIT FOR RECORDS”. Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the Contract requirements.

I. All Contractor submittals shall be carefully reviewed by an authorized representative of the Contractor prior to submission. Each submittal shall be dated and signed with the following: "I have verified that the equipment or material in this submittal meets all the requirements specified or shown in the Contract Documents without exceptions." In the case of Shop Drawings, each sheet shall be so dated, signed, and certified. No consideration for review of any submittals will be made for any items which have not been so certified. All non-certified submittals will be returned without action taken, and any delays caused thereby shall be the total responsibility of the Contractor.

J. The Engineer's review of submittals shall not relieve the Contractor of the entire responsibility for the correctness of details and dimensions and for compliance with the Contract Documents. The Contractor shall assume all responsibility and risk for any problem due to any errors in submittals. The Contractor shall be responsible for the dimensions and the design of adequate connections and details.

K. No changes in the Contract times will be considered for schedule delays resulting from non-complaint submittals.

L. Any additional submittals identified after the initial submittal shall be included in the updates.

M. If the Contractor submits an incomplete submittal, the submittal may be returned without review. A complete submittal shall contain sufficient data to demonstrate that the items contained therein comply with the Contract Documents, meet the minimum requirements for submittals as described in the Contract Documents, and include all corrections as required from previous submittals.

1.7 DRAWINGS

A. Where required by specifications or otherwise needed, prepare drawings illustrating portion of Work for use in fabricating, interfacing with other work, and installing products. Contract Drawings shall not be reproduced and submitted as shop drawings.

B. When construction is complete, prepare and submit red-lined as-built copies of the Contract Drawings showing clearly how construction deviated from the design, along with the authority for the deviation or change.

C. Electronic Format:

1. Size printable to 8-1/2 by 11 inches minimum and 24 by 36 inches maximum.
2. Present in a clear and thorough manner. Title each drawing with Project name. Identify each element of drawing with reference number.
3. Plans, elevations, sections, and detail shop drawings shall be to scale with scale indicated.
4. Indicate field verified dimensions. Show relationship of products to adjacent work. Note coordination requirements.
5. Schematics and diagrams shall be logically arranged and presented in a clear understandable manner with all items labeled.

6. Internal wiring diagrams: Provide internal wiring and elementary ladder diagrams for factory pre-wired equipment.

7. Control diagrams: Show relative positions of each component as a system diagram.

1.8 SHOP DRAWINGS

A. Wherever called for in the Contract Documents, furnish to the Engineer for review, three (3) copies or one (1) electronic copy of each Shop Drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication, and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and related items. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of a professional engineer registered in Arizona unless otherwise directed.

B. All Shop Drawing submittals shall be accompanied by a submittal transmittal form, Attachment A. Any Shop Drawing Submittal not accompanied by such form, or where all applicable items on the form are not completed, said submittal will be returned to Contractor without Engineer's review for resubmittal.

C. Organization

1. A single Shop Drawing submittal transmittal form shall be used for each technical specification section, item, class of material, or equipment for which a submittal is required. A single submittal covering multiple sections will not be acceptable unless the primary specification references other sections for components. Example: If a pump section references other sections for the motor, protective coating, anchor bolts, local control panel, and variable frequency drive, a single Submittal would be accepted; a single submittal covering vertical turbine pumps and horizontal split case pumps would not be acceptable.

2. On the transmittal form, index the components of the submittal and insert tabs in the submittal to match components. Relate the submittal components to specification paragraph and subparagraph, drawing number, detail number, schedule title, or room number or building name, as applicable.

3. Unless otherwise approved by Engineer, terminology and equipment names and numbers used in submittals shall match the Contract Documents.

D. Format

1. Minimum sheet size shall be 8-1/2 by 11 inches. Maximum sheet size shall be 24 inches by 34 inches. Every page in a submittal shall be numbered in sequence. Each copy of a submittal shall be collated and stapled or bound, as appropriate. The Owner or Engineer will not collate copies.

2. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with all pertinent data, capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Sufficient level of detail shall be presented for assessment of compliance with the Contract Documents.

1.9 SUBMITTAL CHECKLIST

A. The Contractor shall provide a log of submittals provided, the date submitted to the Engineer and the date received from the Engineer, and other pertinent information. The log shall be updated by the Contractor for construction meetings and at the request of the Engineer. See Attachment B.

1.10 PRODUCT DATA

A. Provide product data such as manufacturer's brochures, catalog pages, illustrations, diagrams, tables, performance charts, and other material which describe appearance, size, attributes, code and standard compliance, ratings, and other product characteristics.

1. Provide all critical information such as reference standards, performance characteristics, capacities, power requirements, wiring and piping diagrams, controls, component parts, finishes, dimensions, and required clearances.

2. Submit only data which is pertinent. Mark each copy of manufacturer's standard printed data to identify products, models, options, and other data pertinent to project.

3. Modify manufacturer's standard schematic drawings, diagrams and supplement standard data to provide specific information applicable to project. Delete or cross-out information not applicable.

4. Colors and patterns: Unless color and patterns are specified for product, submit accurate color and pattern charts or samples illustrating manufacturer's full range for selection by Owner.

B. Provide all passwords and instructions for control panels and PLCs with initial submittal.

1.11 DESIGN DATA AND CALCULATIONS

A. Where required by specification sections, provide basic calculations, analyses, and data to support design decisions, and demonstrate compliance with specified requirements. State assumptions and define parameters. Give general formulas and references. Provide sketches as required to illustrate design method and application.

B. Arrange calculations and data in a logical manner with suitable text to explain procedures and order.

C. Whenever the Contractor is required to submit design calculations as part of a submittal, such calculations shall bear the signature and seal of a professional engineer registered in Arizona unless otherwise directed.

1. Indicate name, title, and telephone number of individuals performing design calculations and include professional seal of designer where applicable or required.

1.12 MANUFACTURER'S INSTRUCTIONS

A. Where required by specification sections, provide manufacturer's instructions for activities such as delivery, storage, assembly, installation, wiring, start-up, adjusting, and finishing.

B. Indicate pertinent portions and identify conflicts between manufacturer's instructions and Contract Documents.

C. Where appropriate, include preparation procedures, service connection requirements, critical ambient conditions, foundation requirements, special precautions, adjustment requirements, alignment procedures, leveling, purging, charging, lubrication, and cleaning prior to operation and/or Owner’s acceptance.

D. Installation (e.g., assembly, mounting, or wiring) and start-up instructions shall be submitted and available for review in the field prior to scheduled material or equipment installation.

1.13 SAMPLES

A. Whenever samples are required, submit not less than three samples of each item or material, including color charts, to the Engineer for acceptance at no additional cost to the Owner.

B. Samples, as required herein, shall be submitted for acceptance a minimum of 21 days prior to ordering such material for delivery to the jobsite, and shall be submitted in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the Work.

C. All samples shall be individually and indelibly labeled or tagged, indicating thereon all specified physical characteristics and Manufacturer’s name for identification. Upon receiving acceptance of the Engineer, one set of the samples will be stamped and dated and returned to the Contractor, and one set of samples will be retained, and one set of samples shall remain at the job site until completion of the Work.

D. Unless indicated otherwise, all color and textures of specified items presented in sample submittals shall be from the manufacturer’s standard colors and standard materials, products, or equipment lines. If the samples represent non-standard colors, materials, products, or equipment lines and their selection will require an increase in contract time or price, clearly indicate same on the transmittal page of the submittal.

1.14 SURVEY DATA

A. Refer to STS 01 71 23: Field Engineering, if appliable.

1.15 UTILITY INVESTIGATION

A. The Contractor shall submit the findings of all utility investigations performed.

1.16 MANUFACTURER'S FIELD SERVICE REPORTS

A. When an individual specification section requires services of manufacturer's field representative, submit report of observations, site decisions, and instructions given to installers.

B. Form:

1. Present complete information in clear concise manner
2. Bind with titled cover in folder or binder

C. Report shall include:

1. Time, location, conditions, and duration of activity
2. Names of persons performing and witnessing activity
3. Equipment used
4. Description of activity, data recorded, and results
5. Deficiencies found, corrective measures, and results of retesting
6. Other pertinent data

D. Submit report within 30 days of construction site service visit.

1.17 OPERATION AND MAINTENANCE DATA

A. See STS 01 78 23: Operations and Maintenance Data.

1.18 WARRANTIES AND BONDS

A. See Standard General Conditions of the Contract.

B. Submittals

1. Submit written warranties to the Engineer with original submittals for review and provide final warranties prior to Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Engineer.
2. When a special warranty is required to be executed by the Contractor, a sub-Contractor, supplier, or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Engineer for approval prior to final execution.
3. Refer to individual Sections for specific content requirements, and particular requirements for submittal of special warranties.
4. With the final application for payment, the Contractor shall compile copies of each required warranty and bond properly executed by the Sub-Contractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of these Specifications.

5. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2 by 11-inch paper.

    a. Table of Contents: Typed, in the sequence of the Table of Contents of these Specifications, with each item identified with the number and title of the Section in which specified and the name of the product or work item.

    b. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of the installer, supplier, and manufacturer.

    c. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", and the project title. On the front cover provide a listing of the name, address, and telephone number of the equipment supplier(s).

    d. When operation and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

C. Equipment

1. All equipment shall be warranted for a minimum period of one (1) year by the manufacturer and the Contractor. The warranty period shall commence upon Substantial Completion.

2. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced at no expense to the Owner.

3. The manufacturer’s warranty period shall run concurrently with the Contractor’s warranty period.

4. The replacement or repair (including the cost of parts and labor) of those items normally consumed in service, such as pump packing, oil, grease, and the like, shall be considered as part of routine preventive maintenance.

D. Additional Requirements

1. See Standard Conditions of the Contract.

2. Related Damages and Losses: When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work, at no cost to the Owner.

3. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

4. Replacement Cost: Upon determination that work covered by a warranty has failed, replace, or rebuild the work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life. The replacement work shall be warranted as new.

5. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

6. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

7. The Owner reserves the right to refuse work for the project where a special warranty, certification, or similar commitment is required on such work or part of the work, until evidence is presented that entities required to countersign such commitments are willing to do so.

E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.19 SUBSTITUTIONS

A. See STS 01 25 00: Substitution Procedures.

1.20 MEASUREMENT AND PAYMENT

A. All costs associated with the preparation of submittals is considered incidental to the cost of construction. No additional compensation will be rendered for preparation, submission and re-submission of submittals."

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 33 00

Project Title:	Submittal No.:	
	Date:	
	Sub Nos. & Dates of Previous Subs:	
Contractor Name:	Sub: / No.:	Date(s):
Contractor Street Address:	Sub: / No.:	Date(s):
Contractor City, State, ZIP:	Sub: / No.:	Date(s):
Supplier:	Manufacturer:	
Specification No.:	Bid Item No.:	
List Deviations to Contract Documents:		

CONTRACTOR COMMENTS

☐ NO EXCEPTIONS TAKEN ☐ COMMENTS ABOVE ☐ NOTE MARKING

- Submittal has been reviewed and it is complete and conforms with requirements of Contract Documents except as noted.
- Required dimensions have been field verified and are acceptable for installation of proposed products and construction of proposed work.
- Required quantities for products and materials covered by this submittal have been verified as correct.
- Fabrication processes and construction methods proposed in this submittal are acceptable for this Project and will result in a complete, functional installation.
- Submittal has been coordinated with other submittals and work and proposed products and construction will properly interface with other construction.

BY: _____ DATE: _____

_____
(Contractor)

Received On:	No. of Copies:

ENGINEER REVIEW

This submittal has been reviewed for compliance with general requirements of design and arrangement only and is not a contract document. Acknowledgement of compliance does not relieve Contractor of responsibility for performance of the work in compliance with all provisions and requirements of the contract documents. Job measurements and coordination of all dimensions for proper fit of all parts of the work and performance of all equipment supplied to meet specification requirements are and remain specific responsibilities of the Contractor.

☐ Compliance acknowledged subject to the foregoing: Distribute	☐ Compliance acknowledged as noted and subject to the foregoing: Distribute
☐ Compliance acknowledged as noted and subject to the foregoing: Revise and Resubmit for record: Distribute	☐ Reject - Revise and resubmit for review

Reviewed By: Date:

COMMENTS:

SUBMITTALS FOR:

Submittal No.	Submittal Description	Date Submitted to Engineer	Date Returned to Contractor	Engineer Review Comments	Other Notes

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 35 29.13
HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURE FOR CONTAMINATED SITES

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This section is related to overflows of sanitary sewer outside of a septic tank, a manhole, cesspool, pipeline, or similar facility.

B. This section is also related to overflows or accidental discharges of any chemical, fuel, or other spill waste, at the project site.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. SSO: Sanitary Sewer Overflow or Spillage

1.4 PERFORMANCE REQUIREMENTS

A. The Contractor shall immediately notify the Owner, of a sanitary sewer overflow or spillage event of any volume within the contractors work zone/area resulting from the Contractor's work or construction activities. At a minimum, the Contractor shall provide the following information at the time of notification:

1. Address or exact location of the spill
2. Time and date of the spill
3. Source or cause of the spill
4. Name of Contractor and individual providing the notification with contact phone number(s)

B. The Contractor shall make direct verbal contact with the appropriate Systems Superintendent, Owner, or Owner's Representative to provide the information required in paragraph A above. Voicemail or email messages are not considered acceptable means of compliance with the notification requirement specified.

C. Within 24 hours, the Contractor shall provide to the Engineer and Owner a detailed written initial report of the SSO or spillage event. The written report shall include, in addition to the required information set forth in paragraph A above, a detailed description of the source and cause, estimated quantity (including quantity contained and quantity uncontained), methods used for containment and clean up, and any other relevant information related to the incident. The Contractor shall also complete the OVERFLOW REPORT FORM (ATTACHMENT A).

D. Within five (5) days, the Contractor shall provide to the Owner a detailed written final report of the SSO or spillage event. The written report shall include any additional information regarding the overflow. It shall also Include any steps taken or planned to prevent a recurrence. The Contractor shall also complete the remaining sections of the OVERFLOW REPORT FORM (ATTACHMENT A).

E. A penalty will be assessed per occurrence in the form of a deduction from the Contractors pay application if repeat SSOs are caused by the contractor or any sub-contractors under the Contractor. Below is the penalty assessment per occurrence as a deduct from the progress payment:

1. First Occurrence: $500 Penalty + COST OF ANY REPAIRS NECESSARY
2. Second Occurrence: $1000 Penalty + COST OF ANY REPAIRS NECESSARY
3. Third Occurrence: $3,000 Penalty + COST OF ANY REPAIRS NECESSARY
4. Fourth Occurrence: $9,000 Penalty + COST OF ANY REPAIRS NECESSARY

1.5 REPORTING

A. Reporting to state or federal agencies may be required, and shall be completed by the contractor or as directed by the owner.

PART 2 – PRODUCTS [NOT USED]

PART 3 – EXECUTION [NOT USED]

END OF SECTION 01 35 29.13

Appendix A

Smith Engineering Company

NAVAJO TRIBAL UTILITY AUTHORITY
COALMINE CANYON CHAPTER WWTP LAGOON REHABILITATION
OVERFLOW REPORT FORM

1. General Information

Contractor Name: _____

Authorized representative filing this form:

Name: _____

Title: _____

E-mail Address: _____

Type of filing report: (check one)

☐ Initial
☐ Final

Date of filing report: (check one)

☐ Initial / /
☐ Final / /

2. Reporting of Spill/SSO Summary of Oral Report Provided to Owner IMMEDIATELY

Owner Contact: _____

Phone Number: _____

Date of phone notification: ____/____/____

Address or exact location of the SSO/spill _____

Time and date of the SSO/spill _____

Source or cause of the SSO/spill; _____

_____

Name of Contractor and individual providing the notification with contact phone number(s) _____

_____

Spill/SSO Location and Description

Address or Landmark: _____

_____

Discharge Location: *(check one)*

☐ *Directly to receiving ground water*
☐ *Ground*

- ☐ *Receiving water via storm drain*
- ☐ *Building*
- ☐ *Other* _____

_____

_____

_____

3. Reporting of Spill/SSO - OVERFLOW RESPONSE PLAN (SORP) 24 hours

Type of overflow *(check one)*

- ☐ *Gravity sewer manhole*
- ☐ *Pump Station*
- ☐ *Chemical/Fuel*
- ☐ *Other* _____

_____

_____

_____

Time of Spill/SSO Incident

- When did the incident begin? Date: ____/____/____

- Was the overflow/bypass event ongoing at the time of report: *(check one)*

☐ Yes ☐ No

If yes, how long is the incident expected to continue? _____

_____

If no, when did event end? Date: ____/____/____

Time: _____

Cause of overflow/bypass:

_____

_____

_____

General Information about Overflow at this Location

Estimated volume of overflow released at time of report: _____

_____

Method of estimating volume: _____

_____

Estimated total volume of overflow released at end of incident: _____

_____

Were photos taken: *(check one)* ☐ Yes ☐ No

Corrective measures taken: *(check one)*

- ☐ *No action*
- ☐ *Removed blockage*
- ☐ *Repair pump station*
- ☐ *Other* _____
  _____
  _____
  _____

4. Reporting of Spill/SSO - FIVE DAY WRITTEN INCIDENT REPORT

Complete this notification form and use the space below to include any additional information regarding the overflow. Include any steps taken or planned to prevent a recurrence. Submit this form to the Owner office within five days of becoming aware of the incident. _____

_____

_____

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Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 41 26
PERMIT REQUIREMENTS

PART 1– GENERAL

1.1 SECTION INCLUDES

A. The CONTRACTOR shall comply with conditions of all permits issued by utility companies and regulatory agencies in connection with all work under the contract. Copies of all permits obtained by the OWNER will be available form the ENGINEER. All other permits are the responsibility of the CONTRACTOR to obtain.

B. This section includes permits associated with the project. It is the contractor's responsibility make sure all permits required are obtained. Permits included in this section does not give the CONTRACTOR relief from obtaining other permits not specified in this section.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 SUBMITTALS

A. CONTRACTOR to submit a copy of all associated permits for this project.

1.4 PERMITS

A. National Pollutant Discharge Elimination System Permit (NPDES)

1. CONTRACTOR to have at all time NPDES and Storm Water Pollution Prevention Plan SWPPP at all times

2. Refer to The Office of Wastewater Management, NPDES Storm Water Program: http://www.epa.gov/npdes/stormwater

B. Dredge and fill (Section 404) permits

1. Refer to U.S. EPA Office of Wetlands, Oceans, and Watersheds (OWOW): http://www.epa.gov/owow/

C. RCRA hazardous and non-hazardous solid waste requirements

1. Refer to EPA's Office of Solid Waste and Emergency Response: http://www.epa.gov/epawaste/inforesources/online/index.htm

D. Oil spill requirements for construction activities

1. Refer to EPA Oil Program web site: http://www.epa.gov/oilspill/

E. Hazardous substances (Superfund Liability) requirements for construction activities

1. Refer to EPA's Superfund website: http://www.epa.gov/superfund/index.htm

F. Polychlorinated Biphenyl (PCB) waste requirements

1. Refer to EPA's Polychlorinated Biphenyl (PCB) Homepage: http://www.epa.gov/pcb/

G. Air quality requirements for construction activities

1. Refer to EPA'S Air Program Mobile Sources Page: http://www.epa.gov/ebtpages/airmobilesources.html

H. Asbestos requirements for construction activities

1. Refer to EPA's Asbestos Management and Regulatory Requirements Website: http://www.epa.gov/asbestos/

I. National Environmental Policy Act (NEPA) requirements for construction activities

J. Endangered Species Act

1. Refer to The US Fish and Wildlife Service Endangered Species Program: http://endangered.fws.gov/

K. National Historic Preservation Act

L. State and Local Environmental Regulatory Requirements: Comply with applicable regulations.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION 01 41 26

Smith Engineering Company

QSSUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 57 23
TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This section includes compliance with the U.S. Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES) Regulations for Storm Water Discharges Phase II Regulations from construction sites.

B. The Owner has in force a Storm Water Pollution Prevention Plan (SWPPP), Per the General and Special Conditions of the Contract, the Contractor shall familiarize themselves with the requirements in the SWPPP and investigate the effects of the proposed project design with regard to downstream erosion and water quality improvements which may be required. This work shall be incorporated into the 50% design stage and refined into 100% design. In addition, the Contractor shall evaluate the feasibility of Low Impact Development (LID) features into the design and maintain a list of all LID features incorporated into the design.

C. The NPDES General Permit, issued by the EPA requires a Storm Water Pollution Prevention Plan (SWPPP) and submittal of Notice of Intent (NOI) and Notice of Termination (NOT) for construction projects with 1 acre or more of earth disturbance.

D. This work consists of developing and implementing and maintaining this plan to control erosion, pollution, sediment and runoff throughout the entire construction of the project.

E. The Contractor shall be responsible for fulfilling all necessary NPDES requirements including, but not limited to, obtaining an NPDES permit prior to construction, filling out the NOI application, and filling out the NOT application.

F. The Contractor shall also be responsible for the implementation of inspection reports for the SWPPP.

G. The Contractor shall submit the SWPPP with the proposed construction staging area and temporary sanitary facilities clearly shown to the Engineer. Any check dams, silt fences, or other Best Management Practices (BMPS) that are required in the approved SWPPP shall be included in and are incidental to the SWPPP bid amount.

H. The Contractor shall maintain a copy of the approved SWPPP on-site at all times and shall comply with the requirements indicated on that plan.

I. The Contractor shall conform to all Arizona and Federal dust and erosion control regulations. The Contractor shall prepare and obtain any necessary dust or erosion control permits form the regulatory agencies.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, New Mexico Standard Specifications for Public Works Construction, City of Artesia Design and Construction Standards for Infrastructure, etc. is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS

A. SWPPP: Storm Water Pollution Prevention Plan

B. BMP: Best Management Practices

C. EPA: Environmental Protection Agency

D. LEW: Low Erosivity Waiver

E. NOI: Notice of Intent

F. NOT: Notice of Termination

G. NPDES: National Pollutant Discharge Elimination System

H. ADOT: Arizona Department of Transportation

I. TESCP: Temporary Erosion and Sediment Control Plan

J. WWTP: Wastewater Treatment Plant

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with STS 01 33 00.

B. Reports: The Contractor shall submit one copy each of the SWPPP, the NOI, site inspection reports, rain event reports and the NOT to the Owner and Engineer as they are completed.

1. The Contractor shall submit, at least seven (7) days prior to ground disturbance, a hard copy of the completed NOI form or a hard copy of the Low Erosivity Waiver (LEW) form and one (1) copy of the SWPPP to the Engineer and Owner.

C. Shop Drawings: Submit clear, concise drawing showing model number, size, arrangement and configuration of all products specified. Minimum sheet size is 8.5” X 11”.

D. Reports: The Contractor shall submit one copy each of the SWPPP, the NOI, site inspection reports, rain event reports and the NOT to the Owner and Engineer as they are completed.

1.6 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall be responsible for the safe storage of the equipment until it is incorporated in the completed project.

B. The material and equipment shall be stored and handled per the manufacturer's recommendations.

PART 2–PRODUCTS

2.1 MATERIALS

A. General: Provide materials for erosion and sediment control measures that consist of siltation fences, socks, rock, riprap, soil retention blankets, or other acceptable BMP.

B. Slope Drains: Provide materials for slope drains that consist of pipe, flexible pipe, and riprap.

C. Riprap: Provide riprap and rock plating in accordance with NMDOT's Section 602, "Slope and Erosion Protection Structures."

D. Mulch Socks or Composted Mulch Socks

1. Core Material (Mulch): See AZDOT's Section 805, "Seeding" for mulch and composted mulch specifications.

2. Core Material (woodchips): The Material must be 100% untreated wood chip and free of inorganic debris, such as plastic, glass, metal, etc. Manufacturer shall certify that the material is free of noxious weeds.

    a. Woodchip size shall not be smaller than 1-inch and shall not exceed 3-inches in diameter; shavings shall not be more than 5% of the total mass.

3. Containment Mesh: containment mesh shall be 100% biodegradable, photodegradable such as burlap, twine, UV photodegradable plastic, polyester, or other acceptable Material. The mesh should not exceed 1/2 inches in diameter.

4. Furnish biodegradable or photodegradable containment mesh when the socks will remain in place as part of the permanent or temporary vegetative plan. The containment mesh shall be greater than 9 inches in height after being packed; the containment mesh shall be densely packed so that the socks do not deform.

PART 3– EXECUTION

3.1 NOI/NOT

A. The Contractor shall complete an electronic EPA NOI for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit, Form 3510 9, or a Low Erosivity Waiver (LEW) form, if applicable, as directed on the EPA website:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

B. A LEW is applicable to short-term (generally less than 8 months) construction projects that disturb an area of 1 to 5 acres during the dry season (mid-October to mid-June). Submission of a LEW exempts Contractors from preparation of a SWPPP. Contractors may use the calculation tool on the EPA website to determine whether or not the site is eligible for a LEW:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#waivers

C. Note that routine maintenance projects, regardless of size, are exempt from submission of either a LEW or NOI as well as preparation of a SWPPP. Routine maintenance projects are classified as those activities performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site. Such activities include water/sewer line breaks, street millings and overlays, replacement of water meter boxes, replacement of curb and gutter, etc.

D. By completing an NOI, the Contractor is certifying to the Owner that a SWPPP has been completed as per the NPDES Permit and is in the Contractor's possession and one copy has been submitted.

E. The Contractor is the designated "Operator" of the NPDES Permit and is solely responsible for execution of the project construction in conformance with NPDES Permit condition(s) and requirement(s), including work performed by any Subcontractor(s). The Contractor shall immediately correct conditions related to the project that are in violation of NPDES permit requirements.

1. Failure by the Contractor to correct such conditions in a timely manner may subject the Contractor to fines and/or penalties.

F. The Contractor shall be responsible for fines or penalties issued for violations of NPDES Permit conditions. Should the Owner be fined or penalized, an equitable amount will be deducted from payment or reimbursed to the Owner and shall cover any professional service fees, or legal fees that may have been incurred by the Owner.

G. In the event the Contractor fails to comply with NPDES Permit requirements, the Owner retains the right to enter upon the project site and perform corrective measures.

1. Any costs associated with corrective measures shall be the responsibility of, and shall be paid by, the Contractor.

2. The Owner shall be entitled to deduct such costs from remaining contract amounts, and if insufficient contract amounts exist, the Contractor shall reimburse the Owner for any deficiency.

H. An electronic EPA NOT of coverage under a NPDES General Permit for Storm Water Discharges Associated with Construction Activity, will be completed by the Contractor at the website in Paragraph 3.1.A, and a copy shall be provided to the Engineer and Owner.

I. Temporary Erosion and Sediment Control Plan: The Contractor shall develop a Temporary Erosion and Sediment Control Plan (TESCP) which depicts the location and type of temporary erosion control measures.

J. The Contractor shall construct the control facilities and maintain them until project completion.

3.2 SWPPP

A. Before disturbing any soil, submit to the Engineer a SWPPP based on the planned construction phasing and schedule.

B. Prepare amendments to the SWPPP as Work progresses or as phasing or scheduling changes are made. Specifically define control measures for each construction phase, comply with provisions of the NPDES General Permit.

C. Retention of Records: Retain and maintain SWPPP changes as required by the NPDES General Permit. Include copies of the permit language and inspection and maintenance reports in the SWPPP. Prepare inspection and maintenance reports from commencement of earthwork activities to project completion.

D. Deliver the final SWPPP to the Engineer at project completion. Ensure that these records are available to the public at all times.

E. The Contractor shall either promptly remove any material excavated within the project site or install BMPS identified in the approved SWPPP to prevent discharge of excavated material within the project site during a rain or wind event.

F. Construction areas shall be watered for dust control in compliance with government ordinances.

1. The Contractor shall be responsible for locating and supplying water as required. Watering, as required for construction and dust control, shall be considered incidental to construction and no measurement or payment shall be made, therefore.

G. The Contractor shall implement the approved SWPPP and ensure that no soil erodes from the site into public right-of-way or onto private property.

3.3 INSTALLATION

A. Install temporary erosion and sediment control features for the duration of the construction period. Incorporate erosion and sediment control measures into the project at the earliest practical time.

B. Keep construction areas in an orderly condition and promptly dispose of refuse and discarded materials.

C. Repair damaged erosion and sediment control installations within three days of damage.

D. Maintain erosion and sediment control features until the project is completed.

E. Remove and dispose of erosion and sediment control installations at Substantial Completion of the project.

3.4 FIELD QUALITY CONTROL

A. Inspection Frequency: The Contractor must conduct inspections in accordance with one of the two schedules listed below and submit to the Engineer a report within 5 calendar days of each inspection. The Contractor must specify in your SWPPP which schedule you will be following.

1. At least once every 7 calendar days, OR
2. At least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

END OF SECTION 01 57 23

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 58 13
TEMPORARY PROJECT SIGNAGE

PART 1- GENERAL

1.1 SECTION INCLUDES

A. The Contractor shall provide, erect, and maintain for the duration of the construction project one identification sign at the construction site.

B. The Contractor shall also provide, erect and maintain for the duration of the construction project the sign(s), as necessary, for SWPPP and labor notification.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Water Works Association (AWWA), Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc., standard is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. SWPPP: Storm Water Pollution Prevention Plan

B. EPA: Environmental Protection Agency

C. NOI: Notice of Intent

1.5 PERFORMANCE REQUIREMENTS

A. SWPPP Sign (incidental to construction)

1. If a SWPPP is required, a sign or other notice must be posted conspicuously near the main entrance of the construction site. The sign or other notice must contain the following information.

    a. A copy of the completed Notice of Intent (NOI) as submitted to the EPA Stormwater Notice Processing Center; and

2. If the location of the SWPPP or the name and telephone number of the contact person for scheduling SWPPP viewing times has changed (i.e., is different than that submitted to EPA in the NOI), the current location of the SWPPP and name and telephone number of a contact person for scheduling viewing times.

3. For linear projects, the sign or other notice must be posted at a publicly accessible location near the active part of the construction projects (e.g., where a pipeline project crosses a public road).

B. Labor Sign (incidental to construction)

1. A sign shall also include all notification and sign requirements from the following so that they are weather tight.

   a. Equal employment opportunity poster

   b. Federal and State wage rate information

   c. Safety posters

   d. Official announcements and notices

C. Project Sign

1. Sign Dimensions: 4’ x 8’ x ¾” (approx. 1200 mm x 2400 mm x 19 mm) Plywood Panel (APA RATED A-B GRADE–EXTERIOR)

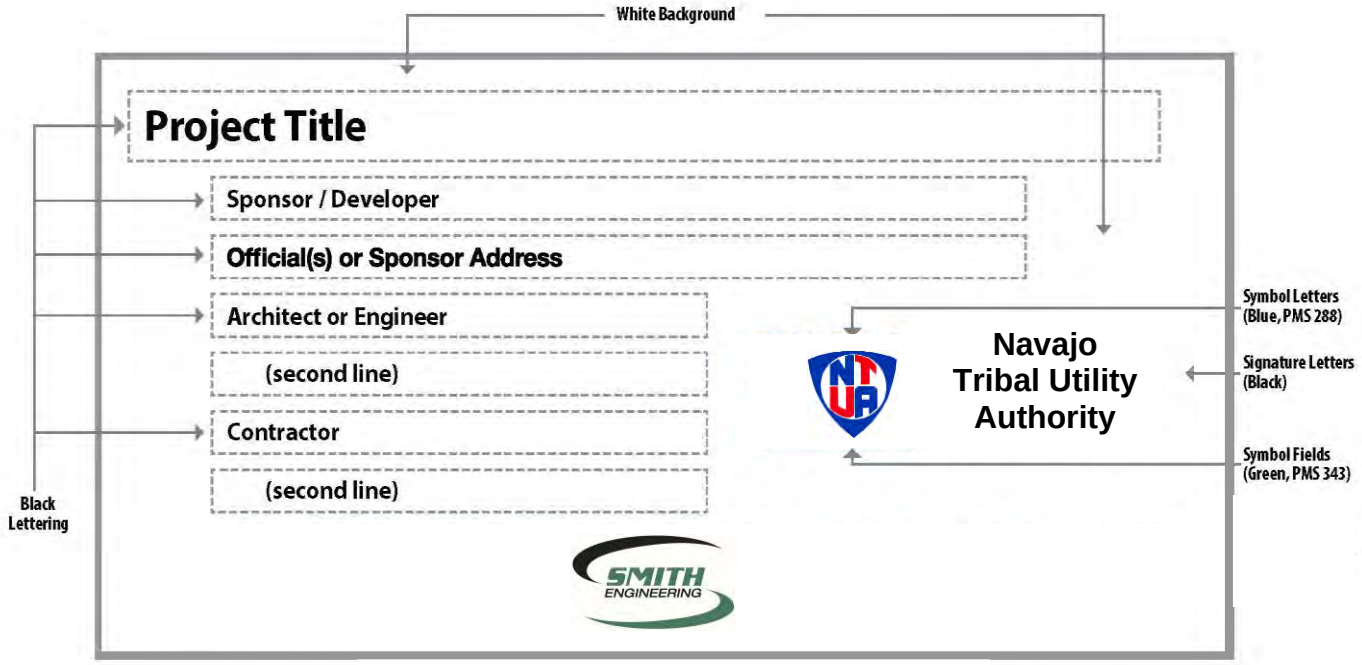
2. Sign shall be white background with black letters.

3. Final information regarding Contractor will be supplied after the project has been awarded.

4. Contractor’s logo may be incorporated into the project sign.

TEMPORARY CONSTRUCTION SIGN FOR
Navajo Tribal Utility Authority

Recommended Fonts: Helvetica, Arial, or Myriad Pro



SIGN DIMENSIONS: 4' X 8' X ¾" (approx. 1200 mm x 2400 mm x 19 mm)

PLYWOOD PANEL (APA RATED A-B GRADE-EXTERIOR

1.6 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and STS 01 33 00: Submittal Procedures.

B. Shop drawings: Submit clear, concise drawing showing model number, size, arrangement and configuration of all products specified. Minimum sheet size is 8.5" X 11".

1.7 QUALITY ASSURANCE

A. Sign Paint (Primer, Paint and Finishes): The paint used for the sign shall be specifically designated for exterior use. It shall resist weathering and fading for the indicated construction schedule.

1.8 DELIVERY, STORAGE AND HANDLING

A. The Contractor is responsible for the safe storage of the equipment until it is incorporated in the completed project.

B. The material and equipment shall be stored and handled per the manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The sign(s) shall be painted on one side with a background color of white not smaller than 4' x 8', marine grade plywood.

PART 3 - EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITY

A. The Contractor is responsible for furnishing and installing the project sign(s) including all site preparation, and other items necessary for the proper installation and operation of the project sign(s).

3.2 EXAMINATION

A. Examine all products for compliance with this section.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Immediately correct all deficiencies and conditions which would cause improper execution of Work specified in this Section and subsequent Work.

C. Verify that the Product dimensions are correct and project conditions are suitable for installation. Do not proceed with installation until conditions deficiencies have been corrected.

D. Proceeding with Work specified in this Section shall be interpreted to mean that all conditions were determined to be acceptable prior to start of Work.

3.3 INSTALLATION

A. The sign shall be mounted on two 4" x 4" posts, with the bottom of the sign at least four feet above grade. The identification sign shall be mounted level and at the location designated by the Engineer or the Owner.

B. Keep sign and supports clean. Repair deterioration and damage.

C. Remove sign, framing, supports, and foundations to a depth of 2 feet upon completion of the project. Restore the area to a condition equal to or better than before construction.

D. The sign may be salvaged to the Owner at the end of the construction project.

END OF SECTION 01 58 13

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 71 13
MOBILIZATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This work shall consist of preparatory and final work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to and from each work order project site; for the establishment of all offices, buildings and other facilities necessary for work on the project; and, for all other work and operations which must be performed, for costs incurred prior to beginning work on the project, and subsequent to the completion of such work.

B. Mobilization and demobilization shall consist of obtaining all required insurance, bonds, and permits; preparatory Work and operations necessary for the movement of personnel, equipment, supplies, and incidentals to and from the Project site; this item shall also include the establishment of offices, buildings, and other facilities necessary for the Project, before beginning Work on the Project. It does not include mobilization and demobilization for specific items of Work for which payment is provided elsewhere in the Contract.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

PART 2– PRODUCTS [NOT USED]

PART 3 – EXECUTION [NOT USED]

END OF SECTION 01 71 13

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 71 23
FIELD ENGINEERING

PART 1– GENERAL

1.1 SECTION INCLUDES

A. This section defines and describes the proper construction staking procedures to be performed in the field during project construction activities.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc. is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. BOP: Beginning of Project

B. EOP: End of Project

C. PC: Point of Curvature

D. PI: Point of Intersection

E. POC: Point on Curve

F. PT: Point of Tangent

G. For the purposes of these specifications the terms "grade sheet", and "cut sheet" shall be used interchangeably.

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with STS 01 33 00.

B. Contractor shall submit a pre and post construction survey as described herein.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine Project conditions and completed Work.

B. Immediately correct all deficiencies and conditions which would cause improper execution of Work specified in this Section and subsequent Work.

C. Proceeding with Work specified in this Section shall be interpreted to mean that all conditions were determined to be acceptable prior to start of Work.

3.2 CONSTRUCTION STAKING BY ENGINEER

A. All surveys shall be based upon the horizontal and vertical control shown in the Construction Drawings or established in the field by the Engineer prior to or during construction.

3.3 CONSTRUCTION STAKING BY CONTRACTOR

A. The Contractor shall provide stakeout in accordance with the following:

1. The Contractor shall perform all stakeout from control points established on the drawings or as provided by the Engineer during construction. The Contractor shall employ only qualified and experienced personnel to provide the stakeout. The Contractor shall certify to the competency and qualifications of said employees and shall furnish such certification to the Engineer prior to starting the work.

2. The Contractor shall preserve and maintain in proper position all baselines and benchmarks provided by the Engineer. If any such are disturbed by vandalism, the Contractor's employees, equipment or his neglect to give them proper protection, those so disturbed shall be reset by the Contractor at his expense. If, in the opinion of the Engineer, the replacement of any disturbed control point necessitates the use of the Engineer's survey party, arrangements for such resetting will be made by the Engineer and the costs therefore will be deducted from monies due, or which may become due the Contractor.

3. If the Contractor finds that conditions in the field are not those indicated on the Drawings he shall notify the Engineer immediately and shall not proceed with the work until the Engineer authorizes him to do so.

4. For utility construction, the Contractor's minimum responsibilities shall also include the following:

    a. Stake out test pits and provide the Engineer with actual utility locations and elevations if required by the Engineer.

b. Offset hub and cut-stake at 50-foot intervals along new storm sewer and liquid waste sewer lines between manholes, lift stations, drop inlets and/or ends of lines and two (2) offset hubs and cut-stakes at each manhole, lift station and drop inlet.

c. Stake out centerlines at 250-foot intervals along new water, electrical or gas lines.

d. Stake out intermediate points (P.I., P.C., P.T., BOP, EOP, structures, topographic changes) as required to complete the construction or deemed necessary by the Engineer.

e. Prepare and submit grade sheets showing for each alignment, or each day's staking. As a minimum the grade sheets shall provide the following information at the top of the page: project name, Contractor name, location, sheet number, total number of sheets in the set, name of person performing the calculations, date. The information required in the body of the cut sheet shall include the following: station, ground elevation, hub elevation, grade, cut/fill, pay cut, % grade, offset distance, remarks. The cut sheets shall be provided to the Engineer in both hard copy format (paper) and electronic format (Microsoft Excel).

f. Provide flag stakes for protection of all stakes installed to aid in their preservation and maintenance.

5. For roadway construction and drainage ditches/ swales, the Contractor's minimum responsibilities shall also include the following:

a. Offset hub and cut-stake at 50-foot intervals along new curb and gutter and valley gutter. Three offset hubs shall be set at EACH curb return (PC, POC and PT).

b. Offset hubs and stakes to establish all vertical and horizontal curves shown on the drawings.

c. A subgrade and a finished base course blue top at 50-foot intervals along the centerline of the roadways to be improved.

d. Stake out centerlines at 50-foot intervals along new drainage ditches and swales for sufficient distances to properly drain, or as required on the drawings.

e. Stake out intermediate points (P.I., P.C., P.T., BOP, EOP, structures, topographic changes) as required to complete the construction or deemed necessary by the Engineer.

f. The Contractor shall also field survey the location of all permanent signage prior to installation. The Owner and/or Engineer will review the locations prior to installation and make changes, if required, prior to installation by the Contractor.

g. Prepare and submit grade sheets showing for each alignment, or each day's staking. As a minimum the grade sheets shall provide the following information at the top of the page: project name, Contractor name, location, sheet number, total number of sheets in the set, name of person performing the calculations, date. The information required in the body of the cut sheet shall include the following: station, ground elevation, hub elevation, grade, cut/fill, pay cut, % grade, offset distance, remarks. The cut sheets shall be provided to the Engineer in both hard copy format (paper) and electronic format (Microsoft Excel).

h. Provide flag stakes for protection of all stakes installed to aid in their preservation and maintenance.

6. For site excavations, open land leveling, embankments, and grading, the contractor shall provide all engineering and stakeout necessary for the setting of batter boards, forms, string line and finished grade control, slope stakes and other controls which may be required for the proper construction of the work in this contract.

7. For site excavations and grading that have swales and embankments for dikes, dams or other retention or diverting structures, staking of the swales and embankment shall be in accordance with the requirements identified in 3.3.A.5 of this specification.

8. For site excavations and grading that have vertical tolerances less than 6", the Contractor will be required to stake the rough grade ("red tops") and the finished grade ("blue tops"). For site excavations and grading with tolerances 6" or greater, only "red tops" are required.

9. Prepare and submit grade sheets showing for each alignment, or each day's staking. As a minimum the grade sheets shall provide the following information at the top of the page: project name, Contractor name, location, sheet number, total number of sheets in the set, name of person performing the calculations, date. The information required in the body of the cut sheet shall include the following: station, ground elevation, hub elevation, grade, cut/fill, pay cut, % grade, offset distance, remarks. The cut sheets shall be provided to the Engineer in both hard copy format (paper) and electronic format (Microsoft Excel).

10. As a minimum as-built surveys for lagoons, borrow pits, and dikes (embankments) shall include the following:

a. The Contractor shall provide to the Engineer an electronic text file (.txt) of all the as-built points surveyed. This text file shall include the northing, easting, elevation, and description, either comma or space delimited to allow insertion into a CADD program. In addition, a hard copy (paper) print-out of the text file, the survey control data including coordinate system, etc., and a certification by the licensed responsible surveyor in charge shall be delivered to the Engineer.

b. If an alignment is provided for the construction of the lagoon, borrow pit, or dike, the as-built survey shall be completed by cross sections perpendicular to the alignment extending from daylight point to daylight point. For alignments that are less than 200 feet in length a cross section shall be completed every 25 feet as measured along the alignment. For alignments 200 feet to 5,000 feet in length a cross section shall be completed every 50 feet as measured along the alignment. For alignments greater than 5,000 feet a cross section shall be completed every 100 feet as measured along the alignment. For straight alignments that are over 5,000 feet in length in terrain that has an average slope less than 2% in any direction the Contractor may, with the approval of the Engineer, survey a cross section every 200 feet as measured along the alignment. The daylight points, top of slopes, toe of slopes, and ground points with a spacing not to exceed 25 feet shall be surveyed. as a minimum for cross sections less than 200 feet in width (as measured from daylight to daylight). The daylight points, top of slopes, toe of slopes, and ground points with a spacing not to exceed 50 feet shall be surveyed as a minimum for cross sections more than 200 feet in width (as measured from daylight to daylight). Additional cross sections shall be completed at all PI, PT, PC and locations where there is a sudden change in the finished surface or alignment geometry as required by the Engineer.

c. If an alignment is not provided for the construction of the lagoon, borrow pit, or dike the as-built survey shall be completed by performing a survey grid on the bottom, top, and side slopes. Additionally, survey points along grade breaks (toes, tops), and along the daylight points shall be measured. For lagoons, borrow pits, and embankments, that the greatest dimension (as measured from daylight to daylight in any direction) is less than 200 feet, the spacing of survey points shall not exceed 25 feet as measured by survey point to the closest neighboring survey point. For lagoons, borrow pits, and embankments, with the least dimension (as measured from daylight to daylight) less than 200 feet and the greatest dimension (as measured from daylight to daylight) 200 feet or greater the spacing of survey points shall not exceed 25 feet in the direction of the least dimension, and 50 feet in the direction of the greatest dimension. For lagoons, borrow pits, and embankments least dimension (as measured from daylight to daylight) is greater than 200 feet, the spacing of survey points shall not exceed 50 feet as measured by survey point to the closest neighboring survey point.

d. If the Engineer cannot model the finished surface with the survey data as provided to the Engineer because of surface features, inconsistent grid pattern, or other items which may cause inaccuracies, the Engineer may require that the Contractor provide additional survey information to correct the problems at no additional cost to the Owner.

e. As-built surveys shall include all pipe locations, valves, inlets and outlets installed by the Contractor, that are defined in the area to be surveyed in the construction drawings.

11. For other types of construction, the Contractor shall provide necessary stakeout as required and as deemed necessary by the Engineer.

12. Construction shall not begin in any given area until grade sheets (if required) have been submitted to the Engineer and the Engineer has received one copy of all field notes.

13. Work done without lines and grades or without submittal of grade sheets, will not be measured or paid for.

14. Construction staking shall be completed under the responsible charge of a licensed surveyor in the State of Arizona.

END OF SECTION 01 71 23

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 71 33
PROTECTION OF ADJACENT CONSTRUCTION

PART 1– GENERAL

1.1 SECTION INCLUDES

A. Section includes requirements for protection of existing facilities, structures, infrastructure, etc. in and near the project area.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc. is incorporated by reference in these specifications, the reference standard shall be the latest editions and revision.

1.4 EXISTING UTILITIES AND IMPROVEMENTS

A. Notify Arizona 811 prior to excavating in the public right of way areas so that utility companies may be advised of the work and may field mark or otherwise protect and warn the Contractor of their existing utility lines. Contact Arizona 811, 1405 W Auto Dr, Tempe, AZ 85284, telephone (800) 782-5348, or refer to NM 811 website for more information at: http://www.arizona811.com.

1. Provide reasonable access and do not hinder or otherwise interfere with any company or agency having underground facilities in removing, relocating, or protecting such facilities.

B. Verify the actual locations and depths of all utilities indicated or field marked. Make a sufficient number of exploratory excavations at Contractor's expense of all utilities that may interfere with the work sufficiently in advance of construction to avoid potential delays.

1. Notify the Engineer and Owner if such exploratory excavations show the utility location as shown or as marked to be in error. Contractor to note actual locations on as-built drawings when utilities are uncovered.

2. When utility lines are encountered within the area of Contractor's operations, notify the Engineer, Owner, and owner(s) of the utility lines sufficiently in advance for the necessary protection measures to be taken to prevent interruption of service or delay to Contractor's operations.

C. The Contractor shall protect all existing utilities, facilities, and structures, public or private, and will be held responsible for all damages caused by the Contractor not exercising due care to avoid such damage.

D. Overhead Contract System: Work on or under the overhead contact system shall be performed with lines and feeders energized unless shutdown of the system is granted. Notify the Engineer and Owner at least 10 days prior to performing work on energized overhead trolley wires, feeder circuits, or at substations, to arrange for any necessary clearances and inspections.

    1. Take precautions to avoid accidents and damage to the overhead contact wires, and risers and feeder cables.

E. Survey Monuments and Benchmarks: Contractor shall bring to the attention of the Engineer and Owner all survey monuments, benchmarks, property line marks and the like, encountered on the work. Survey monuments, benchmarks, or other survey marks or points shall not be removed or disturbed until referenced or relocated by the Owner or other agency or party having an interest herein, and then removed only at the time and in the manner specifically approved by the Owner. The Contractor shall bring all Owner monument frames within the limits of work to grade, with the express provision that any and all work associated with the removal and relocation of such frames with their covers, shall be under the direct supervision to the Owners representative, and all such work shall be considered Incidental Work. The cost of re-establishing and resetting survey monuments, benchmarks or other survey marks or points lost or destroyed through the carelessness or negligence of, or inadvertently by, the Contractor or his employees, shall be at the sole expense of the Contractor.

1.5 SAFEGUARDING OF EXISTING FACILITIES

A. The Contractor shall perform all work, including dewatering operations, if necessary, in such a manner as to avoid damage to existing fire hydrants, power poles, roadway, lighting standards, and all other existing utilities, facilities, trees and vegetation, and structures. The Contractor will be held responsible for any damage due to its failure to exercise due care.

B. All permanent work shall be performed in areas free from water. The Contractor shall construct and maintain all dikes and drainage ditches necessary for the elimination of water from work areas and shall furnish, install, maintain, and operate all necessary pumping and other dewatering equipment required for dewatering the various work areas. The Contractor is responsible for monitoring weather and sequencing work.

C. The Contractor is responsible for the adequacy of the scheme or plans, or for furnishing all equipment, labor, and materials necessary for dewatering the work areas and breaking up and removing such ice or snow as may have formed or settled in the work area. The Contractor shall be fully responsible for all dewatering operations, and the cost of all dewatering operations shall be incidental to the work. The Contractor shall also be responsible for removal of any sediment deposited by storm and nuisance water, and the cost of sediment removal work shall be incidental to the work.

D. In the event that storm flow, snowmelt or other water flows overtop the Contractor’s diversion method, the Contractor will be responsible for any and all damage, including damage to the existing flow processes and any damage to new work and is responsible for immediate resolution and repair in a manner acceptable to the Engineer and Owner.

1. Diversion methods may be by use of sandbag diversion channels, sandbag dams, pumping or piping around or over the work areas, or any method or combination.

E. Broken concrete, debris, etc., shall be immediately removed from the property site as the Contractor's property and shall be disposed of in a legal manner. Refer to STS 01 74 00: Cleaning and Waste Management.

F. The Contractor shall take adequate measures to prevent the impairment of the WWTP and to prevent construction material, pavement concrete, earth or other debris from entering process pipelines and structures. The Contractor shall restore damaged utilities and facilities to a condition equal to or better than they were prior to such damage.

1.6 JOINT SURVEY TO ESTABLISH AUTHENTICITY OF POSSIBLE CLAIMS

A. The Contractor shall use such methods and shall take adequate precautions to prevent damage to existing buildings, structures, and other improvements during construction.

B. The Contractor shall perform a preconstruction examination and post-construction survey of all nearby structures. The survey shall be made using a video recording device. The survey shall be considered incidental work and no separate payment will be made therefore, see STS 01 32 36: Video Monitoring and Documentation.

C. After the Contract is awarded and before the commencement of work, the Engineer or Owner may arrange for a joint examination of existing buildings, structures, and other improvements in the vicinity of the work, as applicable, which might be damaged by the Contractor's operations. This examination may be combined with the Pre-Construction meeting.

D. The examination of the exterior of existing buildings, structures, and other improvements located within fifty (50) feet of the construction excavation will be made jointly by authorized representative of the Contractor, Engineer, and Owner. The scope of each examination shall include, but no limited to, recording of cracks in structures, settlement, leakage, and the like.

E. Records in duplicate of all observations will be prepared by the Contractor, including photographs when deemed necessary or prudent. Copies shall be provided to Engineer. The Contractor may be required to attest to the fact that he took the video/pictures; however, in no case, will he determine the cause for cracks, settlement, leakage, or like conditions nor is he being retained for the purpose of engineering evaluation.

F. The above records and documentation are intended for use as indisputable evidence in ascertaining the extent of any damage which may occur as a result of the Contractor's operations and are for the protection of the adjacent property owners, the Contractor, and the Owner, and will be a means of determining whether and to what extent damage, resulting from the Contractor operations, occurred during the Contract Work.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION [NOT USED]

END OF SECTION 01 71 33

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section includes cleaning and disposal requirements necessary during construction and at completion of the Work.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, etc., specification is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 DISPOSAL AND CLEANING

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

1.5 DISPOSAL REQUIREMENTS

A. Dispose of all excess material, waste, vegetation, trash, debris, overburden, etc., off-site in an approved or permitted facility, unless otherwise indicated in the Construction Drawings or approved by the Engineer. Submit receipts, manifests, photographs, or other documentation to the Engineer to validate and record proper disposal.

B. Make arrangements for disposal. Contractor is fully responsible for the safe transportation and disposal of all waste.

1. The Contractor shall provide watertight conveyance of any liquid, semi-liquid, or saturated solids which tend to bleed or leak during transport. No liquid loss from transported materials will be permitted whether being delivered to the construction site or being hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at the selected disposal site.

C. The Contractor shall comply with all necessary permits, licenses and authorizations regarding the removal, transport, and disposal of waste as are required by all applicable Federal, State, and local laws and regulations.

D. Burning or incineration of any material at the construction site will not be permitted.

E. Report and clean spills associated with the project in accordance with STS 01 35 29.13: Health, Safety, and Emergency Response for Contaminated Sites.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property, and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.

PART 3– EXECUTION

3.1 DURING CONSTRUCTION

A. Execute daily cleaning at project site to ensure it is free from accumulations of waste materials, rubbish, and windblown debris resulting from construction operations, at no additional cost to the Owner.

B. Provide on-site containers for the collection of waste materials, debris, and rubbish.

3.2 DUST CONTROL

A. Dust shall be minimized by the following:

1. Suppress dust on traveled paths which are not paved through wetting, use of water trucks, chemical dust suppressants, or other reasonable precautions to prevent dust entering ambient air
2. Cover trucks when hauling soil
3. Minimize soil track-out by washing or cleaning truck wheels before leaving construction site
4. Stabilize the surface of soil piles
5. Create windbreaks
    a. Site restoration
    b. Remove un-used material
    c. Remove soil piles via covered trucks

B. The operation of dumping rock and of carrying rock away in trucks shall be so conducted as to cause a minimum of noise and dust.

C. Vehicles carrying rock, concrete, or other material shall be routed over such streets as will cause the least annoyance to the public.

D. All unpaved streets, roads, detours, or haul roads used in the construction area shall be given an approved dust-preventative treatment or periodically watered to prevent dust as directed by the Engineer.

E. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

F. Schedule operations so that resulting from the cleaning process will not fall on wet or newly coated surfaces.

3.3 FINAL CLEANING

A. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels and other foreign materials from sight-exposed interior and exterior surfaces.

B. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

C. Prior to final completion, or Owner occupancy, 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 01 74 00

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1– GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:

1. Record Drawings
2. Record Specifications
3. Record Product Data

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, New Mexico Standards for Public Works Construction, City of Artesia Design and Construction Standards for Infrastructure, etc., standard specification is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 SUBMITTALS

A. Submit marked-up As-Built set to Engineer for review at least five (5) working days prior to inspection for Certification of Substantial Completion. Submittal shall include:

1. One (1) hard copy set of As-Built documents including all Specifications, Full Size Drawings, Addenda, Modifications, and Shop Drawings. The set shall clearly mark any deviations from the construction drawings.

B. Miscellaneous Record Submittals

1. Operation and Maintenance Manuals per STS 01 78 23: Operating and Maintenance Data.
2. Assemble Certifications, Lab Test Reports, and Field Test Reports required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.5 QUALIFICATIONS

A. Licensed Professional: Professional Engineer or Professional Surveyor experienced in performing specified Work and licensed in the State of New Mexico.

PART 2– PRODUCTS [NOT USED]

PART 3– EXECUTION

3.1 FINAL AS-BUILT SURVEY

A. Contractor shall survey the final installed product using a professional surveyor licensed in the State of New Mexico. Final as-built survey shall obtain coordinates (Northing, Easting, Elevation, and Description) of all new features including but not limited to:

1. All new and existing inverts in and out of the following structures:
    a. Outlet structures
    b. manholes
2. pipes at centerline on finished grade and exposed inverts
3. all fittings at finished grade
4. bollards
5. pond and grading
    a. limits of exposed liner
    b. edges on aggregate base course
    c. swale flowlines and PC's, PI's, and PT's
6. See STS 01 73 23: Field Engineering for additional requirements

3.2 RECORD DRAWINGS

A. Record Prints: Maintain one set of all Specifications, Drawings, Addenda, Modifications, and Shop Drawings on site and in good order for marking as-built information.

1. This set shall be annotated/updated at least once a week and will be reviewed for verification of updates by the construction observer on a regular basis, depending on the length of the contract.

B. Preparation: Mark prints with as-built information to show the actual installation and removals where installation and removals vary from that shown on the Construction drawings. Actual surveyed points shall be marked, with the point numbers, on the as-built set pointing to item surveyed. Record individual or entity who obtained as-built data, whether individual or entity is Installer, Subcontractor, or similar entity, that marked-up As-Built set.

1. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
2. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
3. The record drawings shall clearly and neatly show all changes.

C. Mark As-Built set with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

D. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely, clearly, and accurately. If Shop Drawings are marked, show cross-references on the Contract Drawings.

E. Mark As-built set with erasable, red-colored pencil/pen. Use other colors to distinguish between changes for distinct categories of the Work at same location.

1. Additions marked in red.
2. Deletions marked in green.
3. Comments marked in blue.
4. Installed systems in yellow.

F. Note Construction Change Directive numbers (field orders or Request for Information changes), alternate numbers, Change Order numbers, and similar identification, where applicable.

G. Verification of as-built status will be included in the monthly payment approval process that will be noted in the field reports.

3.3 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.
4. Note related change orders, field order notes, request for information (RFI) notes, record product data, and record drawings where applicable.

3.4 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to the Project site and changes in manufacturer’s written instructions for installation.
3. Note related change orders, record specifications, and record drawings where applicable.

3.5 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble Certifications, Lab Test Reports, and Field Reports required other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

3.6 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. It is not advisable to use Project Record Documents for construction purposes. Provide access to Project Record Documents for Engineer's reference on the project site.

3.7 PROTECTION

A. The location of existing utilities is unknown. Existing utilities on the Construction drawings are shown per historic drawings as provided by the Owner. Contractor shall pothole as necessary in an effort to avoid conflicts with new construction.

1. Where existing utilizes are encountered in differing locations than shown on the Construction drawings, Contractor shall note the actual utility location on the as-built drawings.

2. Where existing utilities are encountered as differing material and/or size than shown on the Construction drawings, Contractor shall not the actual utility, size, and material on the as-built drawings.

END OF SECTION 01 78 39

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 02 41 00
DEMOLITION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This section specifies demolition and removal or abandonment of existing buildings, portions of buildings, utilities, other structures as indicated on Drawings and/or required for completion of Work.

B. Contractor shall take extra care to ensure the protection of existing structures, utilities, and other items not scheduled for removal or abandonment.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, New Mexico Standard Specifications for Public Works Construction, City of Artesia Design and Construction Standards for Infrastructure etc. is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

1.4 SUBMITTALS

A. Contractor shall submit a demolition and removal plan or abandonment plan as part of the project schedule. The plan shall indicate demolition and removal sequence and location of salvageable items and location of temporary work.

B. Contractor shall submit actual as-built locations of capped utilities and equipment abandoned in place.

C. Submit proposed fill material soil classifications, Proctor Analysis, as necessary for abandonment procedures.

PART 2- PRODUCTS [NOT USED]

PART 3 – EXECUTION

3.1 GENERAL

A. During demolition, Contractor must take extra care to protect all existing utilities and adjacent construction, see STS 01 71 33: Protection of Adjacent Construction.

B. Document conditions of project area prior to start of work and after completion of work, see STS 01 32 36: Video Monitoring and Documentation.

C. Carry out demolition work to cause as little inconvenience to the ongoing use of the existing facilities as possible.

D. Remove and dispose all concrete debris, mechanical equipment, interior piping, and electrical equipment, as indicated in Drawings and required to complete the Work, unless otherwise shown in the Drawings or directed by the Engineer.

E. Plug all exposed pipelines remaining in place with grout.

F. Fill all structures and excavations with compacted, clean, in-situ material.

G. Leave site in a lean, orderly, neat-appearing manner.

H. Do not close or obstruct, City, County, or NMDOT roadways without required permit(s).

I. Erect and maintain temporary barriers and security devices at locations indicated on traffic control plan, including warning signs and lights, and similar measures if required.

J. Protect existing landscaping materials, trees, appurtenances, and structures indicated to remain.

3.2 EXAMINATION

A. Prevent movement or settlement of adjacent structures. Provide bracing and shoring where required.

B. Examine existing buildings and structures indicated to be demolished before demolition.

C. Determine where removals may result in structural deficiency or unplanned building collapse during demolition. Coordinate demolition sequence and procedures to prevent structures from becoming unstable.

D. Determine where demolition may affect structural integrity or weather resistance of adjacent buildings indicated to remain.

1. Identify measures required to protect existing buildings and structures from damage.

2. Identify remedial work including patching, repairing, bracing, and other work required to leave buildings indicated to remain in structurally sound, weathertight and watertight conditions.

E. Verify hazardous material abatement, if applicable, is complete before beginning demolition.

F. Cease operations immediately when adjacent structures appear to be in danger. Notify Engineer. Do not resume operations until directed.

G. Conduct operations with minimum interference to public or private access to occupied adjacent structures. Maintain egress and access from adjacent structures and private properties at all times.

H. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property.

3.3 ABANDON IN PLACE

A. Abandoned building sewer, disposal fields, or part thereof, shall be plugged or capped within five (5) feet of the property line using a cap or plug prescribed by the New Mexico plumbing code.

B. After the successful capping or plugging of a sewer line, disposal field, etc., the unit may be abandoned in place or decommissioned.

3.4 DECOMMISIONING OF EXISTING SEWER INFRASTRUCTURE

A. For decommissioning of existing sewer infrastructure components, arrange for a licensed septic hauler to empty the tanks or piping. Properly dispose of the septage.

B. Plug any existing lines that will be abandoned.

C. The bottom of the unit shall be ruptured or opened, or the entire unit collapsed to prevent the unit from retaining water.

D. The unit shall be completely filled with earth, sand, gravel concrete, or other approved material. Fill material shall consist of material less than three inches in diameter and free of organic debris.

E. Remove or collapse the top cover or arch over the unit before filling.

F. The filling shall not extend above the top of the vertical portions of the sidewalls or above the level of any outlet pipe until inspection by the Owner's representative.

G. After such inspection, the unit shall be filled to the level of the top of the ground.

3.5 DEMOLITION

A. Use of explosives is prohibited.

B. Use of blasting is prohibited.

C. Demolish in an orderly and careful manner as required to accommodate the new Work.

D. Repair all demolition performed in excess of that required, at no additional cost to the Owner.

E. Onsite disposal or burning of materials shall not be permitted.

3.6 DEMOLITION OF EXISTING UTILITIES

A. Remove existing utilities as indicated or uncovered by work and terminate in a manner conforming to the national recognized code covering the specific utility and approved by the Engineer. When utility lines are encountered that are not indicated on the drawings, the Engineer shall be notified prior to further work in that area.

3.7 FIELD QUALITY CONTROL

A. If it is determined during demolition work that the existing structures, buildings, and/or utilities contain hazardous materials, Contractor shall notify Engineer immediately and stop demolition work.

B. Hazardous materials include, but are not limited to the following:

1. Asbestos
2. Lead Paint
3. Polychlorinate Biphenyl

3.8 REMOVAL OF DEBRIS

A. Remove demolished materials, debris, and rubbish from the site and dispose of in compliance with applicable Federal, State, or local permits, rules and regulations.

B. Remove tools and equipment from the site upon completion of the Work. Leave site in a condition acceptable to the Owner.

C. Debris, including brick, concrete, metals, and similar materials, unless otherwise stated, shall become property of Contractor and shall be disposed of by Contractor daily, off the site to avoid accumulation at the demolition site. Materials that cannot be removed daily shall be stored in areas specified by the Engineer. Break up concrete slabs below grade that do not require removal from present location into pieces not exceeding 24 inches square to permit drainage.

3.9 REMOVAL OF SLUDGE

A. The existing reuse storage pond is anticipated to contain settled solids/ sludge from the wastewater treatment process.

B. Contractor shall remove and store the sludge on site in an area determined during the pre-construction meeting. Contractor shall not dispose of any sludge without the Owner, Engineer, and New Mexico Environment Department prior approval.

3.10 DISPOSAL

A. See Section 01 74 00: Cleaning and Waste Management for disposal requirements.

B. Conduct cleaning and disposal operation to comply with codes, ordinances, regulations, and anti-pollution laws.

C. Location and method for the disposal of refuse and abandoned equipment shall be at a permitted solid waste disposal facility.

D. Disposal of such matter is the Contractor’s full responsibility.

3.11 PROTECTION

A. Perform demolition in such manner as to eliminate hazards to persons and property; to minimize interference with use of adjacent areas, utilities and structures or interruption of use of such utilities; and to provide free passage to and from such adjacent areas of structures.

B. Provide safeguards, including warning signs, barricades, temporary fences, warning lights, and other similar items that are required for protection of all personnel during demolition and removal operations.

C. Maintain fences, barricades, lights, and other similar items around exposed excavations until such excavations have been completely filled.

D. Provide enclosed dust chutes with control gates from each floor to carry debris to truck beds and govern flow of material into truck. Provide overhead bridges of tight board or prefabricated metal construction at dust chutes to protect persons and property from falling debris.

E. Prevent spread of flying particles and dust. Sprinkle rubbish and debris with water to keep dust to a minimum. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution.

F. No wall or part of wall shall be permitted to fall outwardly from structures.

G. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Instruct all possible users in use of fire extinguishers.

H. Keep hydrants clear and accessible at all times. Prohibit debris from accumulating within a radius of 15 feet of fire hydrants.

I. Before beginning any demolition work, the Contractor shall survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take necessary precautions to avoid damages to existing items to remain in place, to be reused, or to remain the property of the Owner; any damaged items shall be repaired or replaced as approved by Engineer.

J. The Contractor shall coordinate the work of this section with all other work and shall construct and maintain shoring, bracing, and supports as required. The Contractor shall ensure that structural elements are not overloaded and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under this Contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition or removal works. Repairs, reinforcement, or structural replacement must have Engineer's approval.

3.12 SALVAGE

A. Coordinate with Owner to identify components and equipment required to be removed and salvage/deliver to Owner.

B. Tag components and equipment Owner designates to salvage.

C. Protect designated salvage items from demolition operations until item can be removed.

D. Carefully remove components and equipment indicated to be salvaged.

E. Disassemble as required to permit removal.

F. Package small and loose parts to avoid loss.

G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.

H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attached to each disassembled salvaged item.

I. Deliver salvaged items to Owner in orderly and labelled packaging. Obtain signed receipt from Owner.

3.13 SCHEDULE

A. Existing items to be removed, stored, and protected for reinstallation include:

1. None

B. Existing items to be removed and salvaged/delivered to Owner include:

1. Existing pond side slope rip-rap.

END OF SECTION 02 41 00

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 18, 2023

Cody Sipes

Smith Engineering
2201 San Pedro Drive, NE
Building #4, Suite 200
Albuquerque, NM 87110
TEL: (505) 884-0700
FAX: (505) 884-2376

RE: Coal Mine Canyon OrderNo.: 2309970

Dear Cody Sipes:

Hall Environmental Analysis Laboratory received 1 sample(s) on 9/18/2023 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Smith Engineering
Client Sample ID: Fabric Sample #1
Project: Coal Mine Canyon
Collection Date: 8/29/2023 12:00:00 PM
Lab ID: 2309970-001 **Matrix:** SOLID
Received Date: 9/18/2023 2:09:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 7470A: TCLP MERCURY						Analyst: **tem**	
Mercury	ND	0.020		mg/L	1	9/26/2023 1:19:01 PM	77725
EPA METHOD 6010B: TCLP METALS						Analyst: **VP**	
Arsenic	ND	5.0		mg/L	1	9/23/2023 11:16:31 AM	77714
Barium	ND	100		mg/L	1	9/23/2023 11:16:31 AM	77714
Cadmium	ND	1.0		mg/L	1	9/23/2023 11:16:31 AM	77714
Chromium	ND	5.0		mg/L	1	9/23/2023 11:16:31 AM	77714
Lead	ND	5.0		mg/L	1	9/23/2023 11:16:31 AM	77714
Selenium	ND	1.0		mg/L	1	9/23/2023 11:16:31 AM	77714
Silver	ND	0.25		mg/L	1	9/23/2023 11:16:31 AM	77714
EPA METHOD 8081: PESTICIDES TCLP						Analyst: **SB**	
Chlordane	ND	0.030	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Endrin	ND	0.020	H	mg/L	1	10/4/2023 1:17:58 PM	77792
gamma-BHC (Lindane)	ND	0.40	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Heptachlor	ND	0.0080	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Heptachlor epoxide	ND	0.0080	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Methoxychlor	ND	10	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Toxaphene	ND	0.50	H	mg/L	1	10/4/2023 1:17:58 PM	77792
Surr: Decachlorobiphenyl	77.5	20.1-147	H	%Rec	1	10/4/2023 1:17:58 PM	77792
Surr: Tetrachloro-m-xylene	53.8	15-114	H	%Rec	1	10/4/2023 1:17:58 PM	77792
EPA METHOD 8151: HERBICIDES TCLP						Analyst: **mb**	
2,4,5-TP (Silvex)	ND	1.0	H	mg/L	1	10/9/2023 11:22:52 PM	77691
2,4-D	ND	10	H	mg/L	1	10/9/2023 11:22:52 PM	77691
Surr: 2,4-Dichlorophenylacetic acid	74.7	70-130	H	%Rec	1	10/9/2023 11:22:52 PM	77691
EPA METHOD 8270C TCLP						Analyst: **JME**	
2-Methylphenol	ND	200	H	mg/L	1	10/16/2023 8:21:20 PM	77782
3+4-Methylphenol	ND	200	H	mg/L	1	10/16/2023 8:21:20 PM	77782
2,4-Dinitrotoluene	ND	0.13	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Hexachlorobenzene	ND	0.13	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Hexachlorobutadiene	ND	0.50	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Hexachloroethane	ND	3.0	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Nitrobenzene	ND	2.0	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Pentachlorophenol	ND	100	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Pyridine	ND	5.0	H	mg/L	1	10/16/2023 8:21:20 PM	77782
2,4,5-Trichlorophenol	ND	400	H	mg/L	1	10/16/2023 8:21:20 PM	77782
2,4,6-Trichlorophenol	ND	2.0	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Cresols, Total	ND	200	H	mg/L	1	10/16/2023 8:21:20 PM	77782
Surr: 2-Fluorophenol	57.1	15-70.1	H	%Rec	1	10/16/2023 8:21:20 PM	77782

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Smith Engineering
Client Sample ID: Fabric Sample #1
Project: Coal Mine Canyon
Collection Date: 8/29/2023 12:00:00 PM
Lab ID: 2309970-001 **Matrix:** SOLID **Received Date:** 9/18/2023 2:09:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8270C TCLP						Analyst: **JME**	
Surr: Phenol-d5	44.5	15-52.5	H	%Rec	1	10/16/2023 8:21:20 PM	77782
Surr: 2,4,6-Tribromophenol	87.1	15.7-103	H	%Rec	1	10/16/2023 8:21:20 PM	77782
Surr: Nitrobenzene-d5	69.6	22.3-87.1	H	%Rec	1	10/16/2023 8:21:20 PM	77782
Surr: 2-Fluorobiphenyl	61.0	18.2-76.2	H	%Rec	1	10/16/2023 8:21:20 PM	77782
Surr: 4-Terphenyl-d14	83.5	41-126	H	%Rec	1	10/16/2023 8:21:20 PM	77782
EPA METHOD 8260B: TCLP COMPOUNDS						Analyst: **JR**	
Benzene	ND	0.50	H	ppm	5	9/20/2023 3:22:38 PM	77607
1,2-Dichloroethane (EDC)	ND	0.50	H	ppm	5	9/20/2023 3:22:38 PM	77607
2-Butanone	ND	200	H	ppm	5	9/20/2023 3:22:38 PM	77607
Carbon tetrachloride	ND	0.50	H	ppm	5	9/20/2023 3:22:38 PM	77607
Chlorobenzene	ND	100	H	ppm	5	9/20/2023 3:22:38 PM	77607
Chloroform	ND	6.0	H	ppm	5	9/20/2023 3:22:38 PM	77607
1,4-Dichlorobenzene	ND	7.5	H	ppm	5	9/20/2023 3:22:38 PM	77607
1,1-Dichloroethene	ND	0.70	H	ppm	5	9/20/2023 3:22:38 PM	77607
Tetrachloroethene (PCE)	ND	0.70	H	ppm	5	9/20/2023 3:22:38 PM	77607
Trichloroethene (TCE)	ND	0.50	H	ppm	5	9/20/2023 3:22:38 PM	77607
Vinyl chloride	ND	0.20	H	ppm	5	9/20/2023 3:22:38 PM	77607
Surr: 1,2-Dichloroethane-d4	103	64.8-147	H	%Rec	5	9/20/2023 3:22:38 PM	77607
Surr: 4-Bromofluorobenzene	102	62.1-144	H	%Rec	5	9/20/2023 3:22:38 PM	77607
Surr: Dibromofluoromethane	102	73-145	H	%Rec	5	9/20/2023 3:22:38 PM	77607
Surr: Toluene-d8	99.7	70-130	H	%Rec	5	9/20/2023 3:22:38 PM	77607

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **MB-77792**	SampType: **MBLK**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **PBW**	Batch ID: **77792**	RunNo: **100229**
Prep Date: **9/27/2023**	Analysis Date: **10/4/2023**	SeqNo: **3669610** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Endrin	ND	0.020								
gamma-BHC (Lindane)	ND	0.40								
Heptachlor	ND	0.0080								
Heptachlor epoxide	ND	0.0080								
Methoxychlor	ND	10								
Toxaphene	ND	0.50								
Surr: Decachlorobiphenyl	0.0014		0.002500		54.3	20.1	147			
Surr: Tetrachloro-m-xylene	0.00067		0.002500		26.7	15	114			

Sample ID: **LCS-77792**	SampType: **LCS**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **LCSW**	Batch ID: **77792**	RunNo: **100229**
Prep Date: **9/27/2023**	Analysis Date: **10/4/2023**	SeqNo: **3669611** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Endrin	0.00041	0.00010	0.0005000	0	82.8	49.8	129			
gamma-BHC (Lindane)	0.00032	0.00010	0.0005000	0	64.9	37.7	117			
Heptachlor	0.00018	0.00010	0.0005000	0	36.3	23.2	99.2			
Heptachlor epoxide	0.00033	0.00010	0.0005000	0	66.0	47.1	120			
Methoxychlor	0.00038	0.00010	0.0005000	0	75.9	49.8	136			
Surr: Decachlorobiphenyl	0.0019		0.002500		75.9	20.1	147			
Surr: Tetrachloro-m-xylene	0.00088		0.002500		35.4	15	114			

Sample ID: **MB-77792**	SampType: **MBLK**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **PBW**	Batch ID: **77792**	RunNo: **100229**
Prep Date: **9/27/2023**	Analysis Date: **10/4/2023**	SeqNo: **3669618** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chlordane	ND	0.030								
Endrin	ND	0.020								
gamma-BHC (Lindane)	ND	0.40								
Heptachlor	ND	0.0080								
Heptachlor epoxide	ND	0.0080								
Methoxychlor	ND	10								
Toxaphene	ND	0.50								
Surr: Decachlorobiphenyl	0.0014		0.002500		55.8	20.1	147			
Surr: Tetrachloro-m-xylene	0.00063		0.002500		25.0	15	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **LCS-77792**	SampType: **LCS**	TestCode: **EPA Method 8081: Pesticides TCLP**
Client ID: **LCSW**	Batch ID: **77792**	RunNo: **100229**
Prep Date: **9/27/2023**	Analysis Date: **10/4/2023**	SeqNo: **3669619** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Endrin	0.00036	0.00010	0.0005000	0	72.1	49.8	129			
gamma-BHC (Lindane)	0.00030	0.00010	0.0005000	0	59.8	37.7	117			
Heptachlor	0.00017	0.00010	0.0005000	0	33.6	23.2	99.2			
Heptachlor epoxide	0.00030	0.00010	0.0005000	0	59.9	47.1	120			
Methoxychlor	0.00036	0.00010	0.0005000	0	72.7	49.8	136			
Surr: Decachlorobiphenyl	0.0019		0.002500		76.3	20.1	147			
Surr: Tetrachloro-m-xylene	0.00083		0.002500		33.1	15	114			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **LCS-77691**	SampType: **LCS**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **LCSW**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/9/2023**	SeqNo: **3674162** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	0.0088	0.00010	0.007500	0	118	70	130			
2,4-D	0.0086	0.00010	0.007500	0	114	70	130			
Surr: 2,4-Dichlorophenylacetic aci	0.011		0.01000		111	70	130			

Sample ID: **MB-77691**	SampType: **MBLK**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **PBW**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/9/2023**	SeqNo: **3674164** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	ND	1.0								
2,4-D	ND	10								
Surr: 2,4-Dichlorophenylacetic aci	0.013		0.01000		132	70	130			S

Sample ID: **2309970-001AMS**	SampType: **MS**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **Fabric Sample #1**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/9/2023**	SeqNo: **3674165** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	0.0046	0.00010	0.007500	0	61.8	70	130			SH
2,4-D	0.011	0.00010	0.007500	0	143	70	130			SH
Surr: 2,4-Dichlorophenylacetic aci	0.0061		0.01000		61.3	70	130			SH

Sample ID: **2309970-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **Fabric Sample #1**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/10/2023**	SeqNo: **3674166** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	0.0045	0.00010	0.007500	0	59.9	70	130	3.11	20	SH
2,4-D	0.011	0.00010	0.007500	0	144	70	130	0.119	20	SH
Surr: 2,4-Dichlorophenylacetic aci	0.0056		0.01000		56.4	70	130	0	20	SH

Sample ID: **MB-77691**	SampType: **MBLK**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **PBW**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/9/2023**	SeqNo: **3674173** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	ND	1.0								
2,4-D	ND	10								
Surr: 2,4-Dichlorophenylacetic aci	0.011		0.01000		111	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **LCS-77691**	SampType: **LCS**	TestCode: **EPA Method 8151: Herbicides TCLP**
Client ID: **LCSW**	Batch ID: **77691**	RunNo: **100328**
Prep Date: **9/28/2023**	Analysis Date: **10/9/2023**	SeqNo: **3674174** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2,4,5-TP (Silvex)	0.0080	0.00010	0.007500	0	106	70	130			
2,4-D	0.0052	0.00010	0.007500	0	69.4	70	130			S
Surr: 2,4-Dichlorophenylacetic aci	0.0095		0.01000		95.1	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **lcs-77607**	SampType: **LCS**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **LCSS**	Batch ID: **77607**	RunNo: **99866**
Prep Date: **9/19/2023**	Analysis Date: **9/20/2023**	SeqNo: **3650930** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	1.2	0.050	1.000	0	121	60.8	141			
Chlorobenzene	1.1	0.10	1.000	0	112	60.6	133			
1,1-Dichloroethene	1.1	0.070	1.000	0	108	34.4	140			
Trichloroethene (TCE)	1.1	0.050	1.000	0	107	58.3	134			
Surr: 1,2-Dichloroethane-d4	0.56		0.5000		112	64.8	147			
Surr: 4-Bromofluorobenzene	0.49		0.5000		97.1	62.1	144			
Surr: Dibromofluoromethane	0.50		0.5000		100	73	145			
Surr: Toluene-d8	0.48		0.5000		96.1	70	130			

Sample ID: **mb-77607**	SampType: **MBLK**	TestCode: **EPA Method 8260B: TCLP Compounds**
Client ID: **PBS**	Batch ID: **77607**	RunNo: **99866**
Prep Date: **9/19/2023**	Analysis Date: **9/20/2023**	SeqNo: **3650931** Units: **ppm**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
2-Butanone	ND	20								
Carbon tetrachloride	ND	0.050								
Chlorobenzene	ND	10								
Chloroform	ND	0.60								
1,4-Dichlorobenzene	ND	0.75								
1,1-Dichloroethene	ND	0.070								
Tetrachloroethene (PCE)	ND	0.070								
Trichloroethene (TCE)	ND	0.050								
Vinyl chloride	ND	0.020								
Surr: 1,2-Dichloroethane-d4	0.54		0.5000		108	64.8	147			
Surr: 4-Bromofluorobenzene	0.49		0.5000		98.4	62.1	144			
Surr: Dibromofluoromethane	0.53		0.5000		106	73	145			
Surr: Toluene-d8	0.49		0.5000		98.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **MB-77782**	SampType: **MBLK**	TestCode: **EPA Method 8270C TCLP**
Client ID: **PBS**	Batch ID: **77782**	RunNo: **100373**
Prep Date: **9/27/2023**	Analysis Date: **10/10/2023**	SeqNo: **3676419** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	ND	200								
3+4-Methylphenol	ND	200								
2,4-Dinitrotoluene	ND	0.13								
Hexachlorobenzene	ND	0.13								
Hexachlorobutadiene	ND	0.50								
Hexachloroethane	ND	3.0								
Nitrobenzene	ND	2.0								
Pentachlorophenol	ND	100								
Pyridine	ND	5.0								
2,4,5-Trichlorophenol	ND	400								
2,4,6-Trichlorophenol	ND	2.0								
Cresols, Total	ND	200								
Surr: 2-Fluorophenol	0.11		0.2000		55.1	15	70.1			
Surr: Phenol-d5	0.085		0.2000		42.4	15	52.5			
Surr: 2,4,6-Tribromophenol	0.13		0.2000		63.8	15.7	103			
Surr: Nitrobenzene-d5	0.059		0.1000		59.1	22.3	87.1			
Surr: 2-Fluorobiphenyl	0.054		0.1000		54.4	18.2	76.2			
Surr: 4-Terphenyl-d14	0.084		0.1000		83.9	41	126			

Sample ID: **LCS-77782**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSS**	Batch ID: **77782**	RunNo: **100373**
Prep Date: **9/27/2023**	Analysis Date: **10/10/2023**	SeqNo: **3676420** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Methylphenol	0.065	0.00010	0.1000	0	64.6	19.5	95			
3+4-Methylphenol	0.13	0.00010	0.2000	0	66.7	17.2	102			
2,4-Dinitrotoluene	0.051	0.00010	0.1000	0	50.6	16	75			
Hexachlorobenzene	0.065	0.00010	0.1000	0	64.8	23.7	94.6			
Hexachlorobutadiene	0.041	0.00010	0.1000	0	41.5	15	67.8			
Hexachloroethane	0.040	0.00010	0.1000	0	39.9	15	79.8			
Nitrobenzene	0.064	0.00010	0.1000	0	64.3	18.2	89.2			
Pentachlorophenol	0.066	0.00010	0.1000	0	65.7	15	98.1			
Pyridine	0.044	0.00010	0.1000	0	43.7	15	65.9			
2,4,5-Trichlorophenol	0.073	0.00010	0.1000	0	73.4	15	106			
2,4,6-Trichlorophenol	0.070	0.00010	0.1000	0	70.0	15	102			
Cresols, Total	0.20	0.00010	0.3000	0	66.0	18.7	99.6			
Surr: 2-Fluorophenol	0.11		0.2000		54.0	15	70.1			
Surr: Phenol-d5	0.084		0.2000		41.9	15	52.5			
Surr: 2,4,6-Tribromophenol	0.12		0.2000		61.8	15.7	103			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **LCS-77782**	SampType: **LCS**	TestCode: **EPA Method 8270C TCLP**
Client ID: **LCSS**	Batch ID: **77782**	RunNo: **100373**
Prep Date: **9/27/2023**	Analysis Date: **10/10/2023**	SeqNo: **3676420** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Nitrobenzene-d5	0.063		0.1000		62.8	22.3	87.1			
Surr: 2-Fluorobiphenyl	0.055		0.1000		55.3	18.2	76.2			
Surr: 4-Terphenyl-d14	0.095		0.1000		94.8	41	126			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **MB-77725**	SampType: **MBLK**	TestCode: **EPA Method 7470A: TCLP Mercury**
Client ID: **PBW**	Batch ID: **77725**	RunNo: **100005**
Prep Date: **9/25/2023**	Analysis Date: **9/26/2023**	SeqNo: **3658429** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020								

Sample ID: **LCSLL-77725**	SampType: **LCSLL**	TestCode: **EPA Method 7470A: TCLP Mercury**
Client ID: **BatchQC**	Batch ID: **77725**	RunNo: **100005**
Prep Date: **9/25/2023**	Analysis Date: **9/26/2023**	SeqNo: **3658431** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.0001500	0	86.9	50	150			

Sample ID: **LCS-77725**	SampType: **LCS**	TestCode: **EPA Method 7470A: TCLP Mercury**
Client ID: **LCSW**	Batch ID: **77725**	RunNo: **100005**
Prep Date: **9/25/2023**	Analysis Date: **9/26/2023**	SeqNo: **3658433** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.020	0.005000	0	91.2	85	115			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2309970**

18-Oct-23

Client: Smith Engineering

Project: Coal Mine Canyon

Sample ID: **MB-77714**	SampType: **MBLK**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **PBW**	Batch ID: **77714**	RunNo: **99931**
Prep Date: **9/22/2023**	Analysis Date: **9/23/2023**	SeqNo: **3654605** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0								
Barium	ND	100								
Cadmium	ND	1.0								
Chromium	ND	5.0								
Lead	ND	5.0								
Selenium	ND	1.0								
Silver	ND	0.25								

Sample ID: **LCSLL-77714**	SampType: **LCSLL**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **BatchQC**	Batch ID: **77714**	RunNo: **99931**
Prep Date: **9/22/2023**	Analysis Date: **9/23/2023**	SeqNo: **3654606** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	0.2500	0	110	50	150			
Barium	ND	100	0.2500	0	100	50	150			
Cadmium	ND	1.0	0.2500	0	106	50	150			
Chromium	ND	5.0	0.2500	0	99.0	50	150			
Lead	ND	5.0	0.2500	0	97.3	50	150			
Selenium	ND	1.0	0.2500	0	117	50	150			
Silver	0.26	0.25	0.2500	0	104	50	150			

Sample ID: **LCS-77714**	SampType: **LCS**	TestCode: **EPA Method 6010B: TCLP Metals**
Client ID: **LCSW**	Batch ID: **77714**	RunNo: **99931**
Prep Date: **9/22/2023**	Analysis Date: **9/23/2023**	SeqNo: **3654607** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	5.0	2.500	0	98.2	80	120			
Barium	ND	100	2.500	0	96.7	80	120			
Cadmium	2.5	1.0	2.500	0	102	80	120			
Chromium	ND	5.0	2.500	0	94.5	80	120			
Lead	ND	5.0	2.500	0	89.7	80	120			
Selenium	2.5	1.0	2.500	0	101	80	120			
Silver	2.5	0.25	2.500	0	102	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Smith Engineering | Work Order Number: 2309970 | RcptNo: 1

Received By: Cheyenne Cason 9/18/2023 2:09:00 PM

Completed By: Cheyenne Cason 9/18/2023 3:36:34 PM

Reviewed By: JN 9/18/23

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☐	No ☑	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☑	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑ (Not required)	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: SCM 9/18/23

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	24.6	Good	Not Present	Morty		

Chain-of-Custody Record

Client: Smith Engineering

Mailing Address: 2201 San Pedro NE
Alb. NM 87110

Phone #: 1-505-884-0700 Mathew

email or Fax#:

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other
☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: Coal Mine Canyon

Project #: 123107

Project Manager: Cody Sipes

Sampler:

On Ice: ☐ Yes ☒ No Mary

# of Coolers: 1

Cooler Temp(including CF): 24.6 - 0 = 24.6 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2309970
8/29	12:00 pm	S	Fabric / Sample #1			001

Analysis Request

BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	TCLP Full List & Ra Mathew on file				
										X				

Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time
9/18	14:10		CMC	CBO	9/18/23	1404
Date:	Time:	Relinquished by:	Received by:	Via:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 40 05 62
PLUG VALVES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Furnish all labor, materials, equipment, and appurtenances to provide plug valves, valve boxes, actuators, and appurtenances as shown on the plan set. All work shall be done in strict accordance with the drawings and related specifications (supplemental and standard) and the manufacturer's recommendations.

B. The valve shall be used to manage flow within piping containing raw, partially treated, and treated municipal wastewater and municipal wastewater sludge.

1.2 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works, etc. is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

B. Related Work Specified Elsewhere:

1. Section 01 33 00: Submittal Procedures General and Supplemental General Conditions of the Contract and Division 1.

1.3 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with Specification 1502 and 01 33 00.

B. Product Data: Submit product data, including manufacturer’s specifications, installation instructions, and general recommendations for installation. Also include manufacturer’s certification or other data substantiating that products comply with requirements of Contract Documents. Clearly identify product/model to be used.

1. Dimensions
2. Size
3. Materials or Construction
4. Weight
5. Protection Coating

C. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that product conforms to performance characteristics and testing requirements specified herein.

D. Shop drawings: Submit clear, concise drawing showing model number, size, arrangement and configuration of all products specified. Minimum sheet size is 8.5" X 11".

E. Submit evidence of meeting the requirements of Section 4.0 QUALITY ASSURANCE.

F. Instructions: Submit manufacturer's instructions and recommendations for assembly and installation.

G. Project Record Drawings: Indicate installed Biofilter Odor Control System on project record drawings. Refer to STS 07 78 39 – Project Record Documents.

H. Operations and Maintenance Data: Plug valves shall comply with general requirements of STS 01 77 23 – Operations and Maintenance Data.

1. Per Specification 01 77 23, the Manufacturer shall provide 5 copies of the operations and maintenance manuals which shall include the assembly and installation instructions. Operation and maintenance instructions which rely on vendor cut sheets and literature which include general configurations, or require operating personnel to selectively read portions of the manual shall not be acceptable. Operation and maintenance instructions must be specific to equipment supplied in accordance with these specifications.

I. Warranty Documents: Submit for all manufactured units and equipment specified in this section.

1.4 QUALITY ASSURANCE

A. Each valve shall be given a test against the seat at the full rated working pressure and a hydrostatic shell test at twice the rated working pressure. Certified copies of individual tests shall be submitted. Certified copies of proof-of-design tests shall be submitted.

B. All the plug valves furnished on the project shall be from the same manufacturer to ensure unit responsibility.

C. The manufacturer's name and pressure ratings of the valve shall be casted on the body of the valve.

D. The manufacturer shall have been manufacturing eccentric plug valves for a period of at least ten years and shall provide a list of installations involving equipment of similar size and application.

1.5 DELIVERY, STORAGE AND HANDLING

A. The CONTRACTOR shall be responsible for the safe storage of the equipment until it is incorporated in the completed project.

1.6 WARRANTY

A. The PRODUCT and work shall be warranted against defects in material and workmanship for a period of two year.

B. The warranty period shall begin after final inspection and acceptance by the project ENGINEER.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work, include, but are not limited to, the following:

1. DEZURIK
2. PRATT

B. Substitutions: If alternative manufacturers other than the pre-approved manufacturer are proposed for any specified equipment in this section, the CONTRACTOR/bidder must supply a submittal, refer to STS 01 33 00, section 6.0 for requirements after the effective date of the agreement.

C. Although the brands listed herein are the preferred brands, it is not the intent of the OWNER for these specifications to be proprietary; equals will be evaluated in accordance with comparable quality, construction, strength, durability, and suitability for the purpose intended and are listed for the purpose of describing the standard of quality performance and characteristics. Manufacturers listed in this specification do not constitute approval. All equipment must have the capabilities and functions as specified herein.

2.2 MATERIALS

A. All plug valves shall be eccentric plug valves unless otherwise specified and conform to the minimum requirements of AWWA C517 in addition to the requirements herein.

B. Eccentric Plug Valves shall be of the tightly closing, resilient faced, non-lubricating variety and shall be of eccentric design such that the valve's pressure member (plug) rises off the boy seat contact area immediately upon shaft rotation during the opening movement.

C. Valves shall be drop-tight at the rated pressure:

1. 175 psi for sizes through 12 inch
2. 150 psi for sizes 14 inch to 36 inch
3. 150 psi for sizes 42 inch to 54 inch

D. The valve shall be satisfactory for applications involving throttling service as well as frequent or infrequent on-off service.

E. The valve closing member should rotate approximately 90 degrees from the full-open to full-closed position and vice-versa.

F. All valves shall be supplied with a valve card per STS 33 05 26.

G. The valve body shall be constructed of cast iron (semi-steel) conforming to ASTM A 126, Class B and AWWA C504.

H. The body ends shall be:

1. Flanged with dimensions, facing, and drilling in full conformance with ANSI B16.1, Class 125. This includes flange thickness.

2. Mechanical Joint to meet the requirements of AWWA C111/ANSI A21.11.
3. Grooved Ends to meet the requirements of AWWA C606.
4. Ball ends per AWWA C100 B.
5. Screwed ends per NPT standard.

I. Eccentric Plug Valves shall have a rectangular shaped port.
   1. Port areas for 3 inch to 24 inch valves shall be a minimum 100% full pipe area.
   2. Port area of 30 inch valves and larger shall be a minimum 100% of full pipe area.

J. Valve seat surface for 4 inch valves and larger shall be welded-in overlay, cylindrically shaped of not less than 90% pure nickel. Seat area shall be raised, with raised area completely covered with weld to ensure proper seat contact. The machined seat area shall be a minimum of 0.125" thick and 0.500" wide. Screwed in seats shall not be acceptable.

K. The resilient plug shall be designated specifically for sewage, sludge or water.

L. Shaft bearings, upper and lower, shall be sleeve type metal bearings, sintered, oil impregnated, and permanently lubricated Type 316 stainless steel. Non-metallic bearings shall not be acceptable.

M. The shaft seals shall be of the multiple V-ring type (Chevron) and shall be adjustable.

N. All packing shall be replaceable without removing the bonnet or actuator and while the valve is in service. Shaft seals shall be made of Buna-N.

O. Valve Operators (Manual):
   1. Buried:
      a. For valves 2 inches and smaller: 2 inch direct opening nut.
      b. For valves 8 inches and larger:
         1) Gear actuator enclosed in a cast iron housing with seals provided on all shafts to prevent entry of dirt or water into the actuator.
         2) Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque and to provide adjustment to compensate for change in pressure differential or flow direction change.
         3) All exposed nuts, bolts and washers shall be stainless steel.
      c. Shall be mechanical joint fitting for 3-inch or larger.
   2. Exposed (unless specified elsewhere in the drawings or specifications):
      a. For valves 6 inches and smaller: wrench operated.
      b. For valves 8 inches and larger: enclosed gear operator with hand wheel.
      c. Within easy access of personnel.
   3. Floor stands:

a. Located directly over valve.

b. Gear reducer in head, enclosed.

c. Hand wheel operator.

4. Counter clockwise turning to open.

5. Easy to read valve position indicator/indication for each valve.

P. Valve Boxes

1. Cast iron, adjustable extension, traffic type.

2. Minimum thickness of metal at any point: 3/16 inch.

3. Removable cast iron cover.

4. Valve box ring shall be designed to accept the valve box cover.

5. Cover marked: “SEWER”

6. Concrete collar per Std. Drawings for valves and as shown in plans.

7. All valve boxes shall be designed for integral installation of the required valve position indicator.

8. Factory painted inside and out with manufacturer’s recommended asphalt paint.

PART 3- EXECUTION

3.1 EXAMINATION

A. Examine all products for compliance with this section.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the valve and pipeline.

3.3 INSTALLATION

A. The CONTRACTOR is responsible for furnishing and installing the PRODUCT including all site preparation, and other items necessary for the proper installation and operation of the PRODUCT per manufacturer's recommendation

B. Install the valve:

1. In horizontal pipelines install valve so plug is horizontal and rotates upward as valve opens.

2. For vertical pipelines, install valve with the end marked “Seat” at top of valve.

C. Tighten the flange bolts or studs in a crisscross pattern.

D. Ensure the valve and flanges are concentric to ensure proper sealing.

END OF SECTION 40 05 62

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 43 47 13
HDPE LINER

PART 1– GENERAL

1.1 SECTION INCLUDES

A. Furnish all labor, materials, equipment, and appurtenances for a flexible membrane lining as shown on the construction drawings. All work shall be done in strict accordance with the drawings and specifications and the membrane lining manufacturer recommendations.

B. Sufficient material shall be furnished to cover the areas as shown on the drawings including seam areas, anchor trenches, penetrations, and accessories as required. The liner installer shall allow for any anticipated or planned shrinkage or wrinkles in the field panels, installing the membrane free of stress or tension.

C. The liner material shall contain reclaimed wastewater for reuse storage.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, specification is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

B. American Society for Testing and Materials (ASTM)

1. D638: Test Method for Tensile Properties of Plastics
2. D792: Specific Gravity (Relative Density) and Density of Plastics by Displacement
3. D1004: Test Method for Initial Tear Resistance of Plastics Film and Sheeting
4. D1238: Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
5. D1505: Test Method for Density of Plastics by the Density-Gradient Technique
6. D1603: Test Method for Carbon Black in Olefin Plastics
7. D3895: Test Method for Oxidative Induction Time of Polyolefins by Thermal Analysis
8. D4218: Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle Furnace Technique
9. D4833: Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

10. D5199: Test Method for Measuring Nominal Thickness of Geotextiles & Geomembranes
11. D5397: Procedure to Perform a Single Point Notched Constant Tensile Load (SP-NCTL) Test
12. D5596: Test Method for Microscopic Evaluation for the Dispersion of Carbon Black in Polyolefin Geosynthetics
13. D5641: Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber
14. D5721: Practice for Air-Oven Aging of Polyolefin Geomembranes
15. D5820: Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembrane
16. D5885: Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry
17. D5994: Test Method for Measuring the Core Thickness of Textured Geomembranes
18. D3692: Standard Test Methods for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo Fusion Method
19. D6497: Standard Guide for Mechanical Attachment of Geomembrane to penetrations or Structures
20. D7240: Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique

C. Geosynthetic Research Institute (GRI) Standards

1. GM 10: Specification for the Stress Crack Resistance of Geomembrane Sheet
2. GM 11: Accelerated Weathering of Geomembranes using a Florescent UVA-Condensation Exposure Device
3. GM 12: Measurement of the Asperity Height of Textured Geomembranes Using a Depth Gage
4. GM 13: Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene Smooth and Textured Geomembranes
5. GM 14: Selecting Variable Intervals for Taking Destructive Geomembrane Samples Using the Method of Attributes
6. GM 17: Test Properties, Test Frequency and Recommended Warranty for Linear Low-Density Polyethylene Smooth and Textured Geomembranes
7. GM 19: Standard Specifications for Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

D. US Environmental Protection Agency Technical Guidance Document “Quality Control Assurance and Quality Control for Waste Containment Facilities”, EPA/600/R-93/182, September 1993, 305 pages.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. HDPE: High Density Polyethylene

B. LLDPE: Linear Low-Density Polyethylene

C. Manufacturing Quality Control (MQC): A planned system of inspections that is used to directly monitor and control the manufacture of a material which is factory originated. MQC is normally performed by the manufacturer of geosynthetic materials and is necessary to ensure minimum (or maximum) specified values in the manufactured product. MQC refers to measures taken by the manufacturer to determine compliance with the requirements for materials and workmanship as stated in certification documents and contract specifications.

D. Manufacturing Quality Assurance (MQA): A planned system of activities that provides assurance that the materials were constructed as specified in the certification documents and contract specifications. MQA includes manufacturing facility inspections, verifications, audits and evaluation of the raw materials (resins and additives) and geosynthetic products to assess the quality of the manufactured materials. MQA refers to measures taken by the MQA organization to determine if the manufacturer is in compliance with the product certification and contract specifications for the project.

E. Formulation, n: The mixture of a unique combination of ingredients identified by type, properties and quantity. For HDPE polyethylene geomembranes, a formulation is defined as the exact percentages and types of resin(s), additives and carbon black.

F. FIS: Field Installation Supervisor or Master Seamer.

1.5 PERFORMANCE REQUIREMENTS

A. The liner material shall contain reclaimed wastewater for reuse storage.

1.6 SUBMITTALS

A. Product Data: Submit product data, including manufacturer’s specifications, installation instructions, and general recommendations for installation. Also include manufacturer’s certification or other data substantiating the products comply with requirements of th Contract Documents. Clearly identify produce to be used.

B. Shop Drawings: Submit clear and concise fabrication and installation drawings indicating model number, size, arrangement and configuration of all products specified. Minimum sheet size is 8.5” x 11”.

C. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that product conforms to performance characteristics and testing requirements specified herein.

D. Example material warranty and liner installation warranty.

E. Submit liner installation data and instructions.

F. Submit Manufacturer "Roll Logs" which document the Rolls manufactured that correspond to Roll labels. These Roll Logs will become part of the final documentation for the project and shall be supplied to the Engineer upon project completion.

G. The Manufacturer shall submit a proposed geomembrane panel layout, liner installer resume(s), and installers QA/QC methods to be approved in writing by the Engineer prior to material shipment. The size and location of panels, and the location of filed seams shall be consistent with the requirements of the project drawings (Appendix 1).

H. The Installer of the lining shall allow for any anticipated or planned shrinkage or wrinkles in the field panels, installing the membrane free of stress or tension, per the project plans, installation and testing procedures as included in these specifications. Submit procedure for determining the amount of liner slack to be used during installation.

I. Upon completion of the installation, the Installer shall submit the following to the Engineer and Owner:

1. Certificate stating the geomembrane has been installed in accordance with the Contract Documents.
2. Final Material and Installation Warranty.
3. Field Drawings (As-builts) shall be generated indicating panel location, width, length, repairs, and/or structures relevant to the scope of the work.

J. Additional Submittals, see appendices:

1. Liner Inspection Report/ Certificate
2. Written acceptance of subgrade surface
3. Prequalification Test Seam Samples
4. Field Seam Non-Destructive Test Result
5. Field Seam Destructive Test Results
6. Daily Field Installation Reports

1.7 QUALITY ASSURANCE

A. Manufacturer shall have manufactured a minimum of 10,000,000 square feet of polyethylene geomembrane during the last year.

B. Contractor shall submit a resume of the installers indicating the following minimum requirements:

1. Installer shall have installed a minimum of 5,000,000 square feet of HDPE geomembrane during the last three (3) years.
2. Installer shall have worked in a similar capacity on at least 10 projects similar in complexity to the project described in the Contract Documents.
3. The installation supervisor shall have worked in a similar capacity on at least 10 projects similar in size and complexity to the project described in the Contract Documents.

4. The installer shall provide a minimum one Master Seamer for work on the project. The Master Seamer must have completed a minimum of 5,000,000 square feet of geomembrane seaming work using the type of seaming apparatus proposed for use on this project.

1.8 DELIVERY, STORAGE AND HANDLING

A. Labeling: Each roll of geomembrane delivered to the site shall be labeled by the Manufacturer. The label will identify:

1. Manufacturer's name
2. Product Identification: An identifier (either alpha or numeric) shall be given to each panel used for installation, which is consistent with the approved layout drawings. The identification number shall be related to a material manufacturer roll number, which identifies the resin type, batch number, date of manufacture, and other relevant material properties
3. Thickness
4. Length
5. Width
6. Roll Number

B. Damage: If any material damage is noted during unloading, the damaged areas are to be marked with a permanent marker, and a notation made as to the roll number, location of damage, and type of damage.

C. Delivery: Rolls of liner will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading. Submit delivery receipts to Engineer after geomembrane rolls or panels have been visually inspected for imperfections/ damage and unloaded at the site.

D. Handling: HDPE rolls are to be unloaded under supervision of the liner installer using straps or other devices that will prevent damage to the liner material.

E. Storage: The Contractor shall store the geomembrane material onsite in a location which will protect the geomembrane from punctures, abrasions, and excessive dirt and moisture. Onsite storage location shall be:

1. Level
2. Smooth
3. Dry
4. Protected from theft and vandalism
5. Adjacent to the area being lined
6. Rolls are to be blocked to prevent movement
7. Rolls shall be stacked a maximum of two (2) rolls in height

1.9 PROJECT CONDITIONS

A. Materials will not be deployed when moisture, high winds, or other adverse weather conditions are expected. This determination will be made by the Owner.

B. Geomembrane shall be deployed at ambient temperatures of 40° F to 104°F. Placement can proceed below 40° F after it has been verified by the Inspector that the material can be seamed according to specifications and is approved by the Engineer.

1.10 WARRANTY

A. The manufacturer shall warrant that the material will be free of defects in materials and workmanship at the time of sale, and against deterioration due to the effects of ozone, ultraviolet, or other normal weathering for a period of no less than 20 years.

B. The installer shall warranty the quality or workmanship for a period of 1 year from installation.

C. The warranties shall warrant the following:

1. The materials supplied are suitable for the conditions at the site
2. The materials meet or exceed the required specifications
3. The materials supplied are free of defects in workmanship per the manufacturer's warranty
4. All defects in material shall be repaired and/ or replaced at no cost to the Owner within the warranty period
5. All defects in seams shall be repaired at no cost to the Owner during the warranty period

PART 2– PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work, include but are not limited to the following:

1. Southwestern Lining, Bernalillo, New Mexico | 505-771-9122
2. GSE Lining Technology, Inc., Houston, Texas | 281-443-8564
3. Colorado Lining International, Parker, Colorado | 303-841-2022
4. Goble Sampson Associates, Mesa, Arizona | 480-220-2327
5. Comanco Lining, Elko, Nevada |775-778-9577
6. Layfield Environmental Systems, Lakeside, California | 800-377-8404
7. CW Neal Corporation

B. Substitutions: If alternative manufacturers other than the pre-approved manufacturers are proposed for any specified equipment/ material in this section, the Contractor shall supply a submittal, refer to STS 01 25 00: Substitution Procedures.

C. Although the brands listed herein are the preferred brands, it is not the intent of the Owner for these specifications to be proprietary; equals will be evaluated in accordance with comparable quality, construction, strength, durability, and suitability for the purpose intended and are listed for the purpose of describing the standard of quality and characteristics.

D. Manufacturers listed in this specification do not constitute approval. All equipment/ material must have the capabilities and functions as specified herein.

2.2 MATERIALS

A. Lining Material: the material supplied under these specifications shall be first quality goods specifically formulated and tested for the containment of treated reuse wastewater.

B. The geomembrane liner material shall be a minimum of 60 mil thick, BLACK, textured, High Density Polyethylene as shown on the Construction Drawing.

C. Resin

1. Resin shall be new, first quality, compounded and manufactured specifically for producing geomembrane.

2. Natural resin (without carbon black) shall meet the following additional minimum requirements:

a. Density, g/cm^3 = 0.932 (HDPE), 0.915 (LLDPE), ASTM D1505

b. Melt Flow Index, g/10 min. = ≤1.0 (HDPE), ≤1.0 (LLDPE), ASTM D 1238

c. OIT, minutes = 100 (HDPE), 100 (LLDPE)

D. Geomembrane Rolls

1. Do not exceed a combined maximum total of 1% by weight of additives other than carbon black.

2. Geomembrane shall be free of holes, pinholes as verified by on-line electrical detection, bubbles, blisters, excessive contamination by foreign matter, and nicks and cuts on roll edges.

3. Geomembrane material is to be supplied in roll form. All liner sheets produced at the factory shall be inspected prior to shipment for compliance with the physical property requirements listed herein and be tested by an acceptable method of inspecting for pinholes. If pinholes are located, identified, and indicated during manufacturing, these pinholes may be corrected during installation.

E. Smooth surfaced geomembrane shall meet the requirements shown in Table 1 included in Appendix 8.

F. Textured surfaced geomembrane shall meet the requirements shown in Table 2 included in Appendix 8.

G. Extrusion Rod or Bead

1. Extrusion material shall be made from same type resin as the geomembrane.
2. Additives shall be thoroughly dispersed.
3. Materials shall be free of contamination by moisture or foreign material.

H. Metal battens, straps, and all associated hardware shall be stainless steel.

PART 3– EXECUTION

3.1 EXAMINATION

A. Verify that the Product dimensions and quantities are correct and that the project conditions are suitable for installation. Do not proceed with installation until condition deficiencies have been corrected.

1. Prior to placement of any liner material, the subgrade is to be inspected and approved by the Owner. Any areas found to be unacceptable are to be corrected. Documentation of this inspection is to be provided to the Engineer.
2. Visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas. This inspection shall be documented in an inspection report to be submitted to the Engineer.

3.2 PREPARATION

A. HDPE materials are to be deployed using methods that will not crimp, bend, or otherwise damage the material.

B. All installation party members shall wear soft-soled shoes or boots while working on the surface of the liner and avoid any activities that could damage the geomembrane.

C. Smoking will not be permitted on or near the geomembrane material.

D. Do not allow any vehicular traffic directly on the geomembrane material.

E. Temporary sandbags are to be used to prevent material uplift and movement from winds during liner installation.

F. Excessive wrinkles are to be removed prior to seaming; however, sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material. The Contractor shall submit to the Engineer his procedure for determining the amount of liner slack to be used.

G. A panel placement log (Appendix 1) shall be filled out once the task is finished and submitted to the Engineer.

3.3 INSTALLATION

A. Installation shall be performed in accordance with the manufacturer's recommendations, including licensing/ certification requirements of the installer.

B. Subgrade Preparation

1. The subgrade shall be prepared immediately prior to placement of the liner. The surface on which the liner is to be placed is to be firm, clean, dry, and smooth. Anchor trench excavation and any structural seal preparation should be completed before the lining installation begins. A final inspection shall be carried out after which a Subgrade Surface Acceptance Form (Appendix 2) shall be signed by all parties concerned.

C. Lining Base Material

1. A base shall be prepared on the bottom and slopes of the area to be lined. This base shall be free of all sharp objects, roots, grass, and vegetation. Unsuitable material found during the pre-installation inspection by the installer shall be removed prior to the installation of the liner. The base material shall be native materials or materials obtained from a borrow source, shall be 3-inches minimum thickness, and compacted in accordance with the Standard Specifications. The material shall have the following gradation:

Table 1: Minimum Gradation Requirements

Sieve Size	Percent Passing by Weight
0.75 inches	100
No. 4	70 – 100
No. 200	10 – 40

2. Foreign materials, protrusions, voids, cracks, and other penetrating or raised sources shall be removed from the sloping areas as well as the base. Loose rocks, and other foreign matter, especially fractured face rocks or any material that poses a possibility to penetrate or teat the liner, will be collected and deposited in the appropriate site out of the area to be lined. The excavated and filled areas shall be trimmed to elevations and contours shown on the drawings and shall be smooth, uniform, and free of all foreign objects and sudden changes in grade.

3. A pre-installation inspection shall be called for and all interested parties, including agencies, shall be present for the inspection. The Contractor shall notify the Engineer a minimum of five (5) working days prior to the coordination of this inspection Any parties not participating in this inspection shall be construed as accepting the site preparation and will acknowledge this defector acceptance in writing at the appropriate time. This inspection shall be summarized in a report to be submitted to the Engineer as part of the final submittal documents at project completion.

D. Anchor Trench Excavation

1. The anchor trench shall be excavated to the line, grade and width shown on the construction drawing prior to the liner system placement. If the anchor trench is located in clay that is susceptible to desiccation, the anchor trench shall be excavated in a manner so as to minimize the desiccation of the anchor trench soils. To avoid sharp bends in the geomembrane, slightly rounded corners shall be provided in the trench where the geomembrane adjoins the trench.
    a. In-situ soil: If the in-situ soil of the anchor trench contains fractured face rocks or other material that poses a possibility to penetrate or tear the liner, over excavate the trench an additional foot and replace with lining base material.
    b. Backfill material over the liner shall be lining base material if in-situ soils contain fractured face rocks or any material that poses a possibility to penetrate or tear the liner.

E. Field Seams shall meet the following requirements:
    1. To the maximum extent possible, orient seams parallel to line of slope, i.e. down the slope, not across the slope.
    2. Minimize the number of field seams in corners, odd-shaped geometric locations and outside corners.
    3. Slope seams (panels) shall extend a minimum of five (5) feet beyond the grade break into the flat area.
    4. Use a sequential seam numbering system compatible with panel numbering system that is agreeable to the Engineer.
    5. Align seam overlaps consistent with the requirements of the welding equipment being used. A six (6) inch overlap is commonly suggested.

F. During Welding (Seaming) Operations
    1. Provide at least one Master Seamer who shall provide direct supervision over other welders as necessary.
    2. Seaming shall not proceed when ambient air temperature or adverse weather conditions jeopardize the integrity of the liner installation. Installer shall demonstrate that acceptable seaming can be performed by completing acceptable trial welds. A complete log of finished seams must be filled out on a daily basis (Appendix 4).

G. Extrusion Welding
    1. Extrusion welding is to be used for detail work, repairs, and in other area where wedge welding cannot be used. Purge welding apparatus of heat-degraded extrusion rods before each weld.

2. Each day, prior to seaming any materials, test seams shall be made, refer to Section 3.4 Field Quality Control of this specification. At least three (3) peel tests are to be conducted on each test seam, using a field tensiometer furnished by the installer. Upon completion of a successful test, the Field Installation Supervisor (FIS) will record the date, time, weather conditions, seamer name, seaming machine number, machine temperature setting, and test results. No seaming is to be done until a successful test seam has been completed and recorded. The seam test results are to be recorded in the project log.
3. Areas to be extrusion welded are to be clean and dry. Surface oxidation is to be removed by grinding not more than one hour prior to the time the extrusion weld is made.
4. Where patches are required, the patches are to be round or oval in shape, and are to overlap the damaged are by a minimum of 4-inches on all sides. Patches are to be heat sealed to the main liner prior to extrusion welding to prevent the edge of the patch from lifting when the extrusion rod is applied.
5. Extrusion welds are to be tested by use of a vacuum box. A soap solution shall be applied to the area to be tested and a vacuum applied to the area. The tested area is then observed for soap bubbles. Any defective areas must be marked, repaired, and retested until passing results are achieved.
6. See Extrusion Weld detail in the Construction Drawings.

H. Fusion Wedge Welding (Hot Wedge Welding/ Double Fusion Weld)

1. Field seams are to be made using the fusion (wedge) method whenever possible.
2. Welding apparatus shall be a self-propelled device equipped with an electronic controller which displays applicable temperatures.
3. Clean seam area of dust, mud, moisture, and debris immediately ahead of hot wedge welder.
4. Protect against moisture build-up between sheets.

I. Liner Installation

1. The lining material shall be maintained by an anchor trench as shown on the Construction Drawings.
2. Construction equipment shall not come into direct contact with the liner material.
3. Sharp bends in the liner shall be avoided by rounding the grading points where the trench and the liner join.
4. Any damage caused to the liner during installation shall be repaired.
5. The liner trench shall not be backfilled with materials containing sharp objects, roots, grass, vegetation, loose rocks, or other foreign material.

J. Ventilation System shall be installed per details and locations shown on the Construction Drawings.

K. Penetration shall be installed per details shown on the Construction Drawings.

1. Lining sheets shall closely fit around all penetrations through the liner. All piping, structures, and irregular projections shall be sealed and flashed with the fabricated boots or other approved sealing methods.

L. Liner Attachment to Concrete

1. Concrete surfaces at attachment areas must be trowel finished or ground smooth.

2. Attach the liner materials to concrete as shown in the Construction Drawings and per manufacturer's recommendations.

3. The liner shall be battened to the concrete during the coolest time of the day (less than 80° F) to allow for thermal contraction of the liner.

3.4 FIELD QUALITY CONTROL

A. Field Testing Seaming

1. All field seams shall be non-destructively tested by the geomembrane installer over the full seam length before the seams are covered. Each seam shall be numbered or otherwise designated. The location, date, test unit, name of tester, and outcome of all non-destructive testing shall be recorded and submitted to the Owner and Engineer.

2. Prequalification Test Seam: Test seams shall be prepared and tested by the geomembrane installer to verify that seaming parameters (speed, temperature, and pressure of welding equipment) are adequate.

a. Test seams shall be made by each welding technician and tested in accordance with ASTM D 4437 at the beginning of each seaming period. Test seaming shall be performed under the same conditions and with the same equipment and operator combination as production seaming. The test seam shall be approximately ten (10) feet (3.3 meters) long for fusion welding and three (3) feet (1 meter) long for extrusion welding with the seam centered lengthwise. At a minimum, test seams shall be made by each technician one time every 4-6 hours; additional tests may be required with changes in environmental conditions.

b. Two (2) 1-inch (25 mm) wide specimens shall be die-cut by the geomembrane installer from each end of the test seam. These specimens shall be tested by the geomembrane installer using a field tensiometer testing both tracks for peel strength and also for shear strength. Each specimen should fail in the parent material and not in the weld, "Film Tear Bond" (FTB Failure). Seam separation equal to or greater than 25% of the track width shall be considered a failing test.

c. The minimum acceptable seam strength values to be obtained for all specimens tested are listed herein. Four (4) specimens shall pass for the test seam to be considered passing.

d. If a test seam fails, an additional test seam shall be immediately conducted. If the additional test seam fails, the seaming apparatus shall be rejected and not used for production seaming until the deficiencies are corrected and a successful test seam can be produced.

e. A sample from each test seam shall be delivered to the Engineer and shall be labeled with the following:

1) Sample date

2) Geomembrane temperature

3) Number of the seaming unit

4) Technician performing the test seam

5) Pass or fail description

B. Trial Welds

1. Perform trial welds on geomembrane samples to verify welding equipment is operating properly.

2. Make trial welds under the same surface and environmental conditions as the production welds, i.e., in contact with subgrade and similar ambient temperature.

3. Minimum of two trial welds per day, per welding apparatus, one made prior to the start of work, and one completed at mid-shift.

4. Cut four (4), one-inch wide by six-inch long test strips from the trial weld.

5. Quantitatively test specimens for peel adhesion, and then for bonded seam strength (shear).

6. Trial weld specimens shall pass when the results shown in Table 2 are achieved in both peel and shear tests.

Table 2: Minimum Weld Values for Geomembrane

Property	Test Method	Liner Thickness, mils (mm)					
		30 (0.75)	40 (1.0)	60 (1.5)	80 (2.0)	100 (2.5)	120 (3.0)
Peel Strength (fusion), ppi (kN/m)	ASTM D 6392	49 (8.6)	65 (12)	98 (17)	130 (23)	162 (29)	196 (35)
Peel Strength (extrusion), ppi (kN/m)	ASTM D 6392	39 (6.9)	52 (9)	78 (14)	104 (18)	130 (23)	157 (28)
Shear Strength (fusion & ext.), ppi (kN/m)	ASTM D 6392	61 (11)	81 (14)	121 (21)	162 (29)	203 (36)	242 (43)

*The above values are considered acceptable for seam tests. All values are expressed in pounds per inch of material width. All testing is done at the speed of two (2) inches per minute.
** Thickness of GSE textured material is determined using GRI GM8 “Measurement of the Core Thickness of Textured Geomembranes”.

9. When peel testing, the break occurs in the liner material itself, not through the peel separation (FTB).

10. The break is ductile.

11. When any of the trial weld samples fail in either peel or shear, repeat the trial weld in its entirety.

12. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully complete trial welds.

13. Pass/Fail Criteria

    a. Seam must exhibit film tear bond (FTB). Trial welds should have no incursions into the weld.

    b. Peel and shear values shall meet or exceed values in Appendix 1, Table 1 for smooth or textured HDPE (@2 in./min.).

    c. Peel and shear values shall meet or exceed values in Appendix 1, Table 2 for smooth or textured LLDPE (@2 in./min.).

    d. Both tracks of fusion welded samples must pass for the trial weld to be considered acceptable. If any of the five (5) coupons fail due to seam incursion (no FTB) or low strength values, the trial weld must be performed again.

    e. All trial data must be recorded in the Trial Weld Log (Appendix 3) with the outside track recorded first followed by the inside track.

C. Field Destructive Seam Testing

1. Each day prior to seaming any materials, destructive seam tests shall be made. Locations of the tests shall be marked upon completion of a successful test; the Field Installation Supervisor will record the date, time, weather conditions, seamer name, seaming machine number, machine temperature setting, machine speed setting, and test results. No seaming is to be done until a successful test seam has been completed and recorded.
2. Frequency of sample removal shall be one (1) sample every 500 feet using a field tensiometer furnished by the installer.
3. Samples shall be labeled in numerical order, i.e., DS-1, DS-2, etc. This should carry through any layer and or multiple ponds. DO NOT start numbering from 1 again.
4. Minimum sample size shall be 12-inches x 12-inches.
5. The field sample shall be cut in to ten (10) coupons. Upon testing, the strength of four (4) out of five (5) specimens should meet or exceed the values indicated, and with the 5^{th} specimen must meet or exceed 80% of the value in Table 2.
6. All weld destructive data must be recorded on the appropriate form (Appendix 5).
7. Seam must exhibit film tear bond (FTB). Welds should have ≤25% incursion into the weld.
8. Peel and shear values shall meet or exceed the values listed in Table 2 for HDPE smooth or textured sheet @ 2 in./min/
9. When logging fusion welded peel values, record the values for the outside track first followed by the inside track. Test results shall be noted as a pass (P) or fail (F).
10. Additional test seams are required if a substantial change in weather conditions occurs or if the seaming machine is turned off for more than ten (10) minutes.
11. The area to be seamed is to be clean and dry. If required, a protective layer is to be placed under the seam to prevent dust or moisture from entering the seam area.
12. At the start of each seam, the machine operator is to mark the date, time, machine number, machine temperature, machine speed, and operator initials on the lining material with a permanent marker. This information is to be recorded in the project log by the FIS.
13. The machine operator is responsible for ensuring that the area to be seamed is clean and dry. If any questionable seam areas are noted, the operator is to mark these areas for later inspection and testing.

14. The machine operator is to read the machine temperature at intervals of approximately 100 feet and mark the temperature on the lining material. This procedure will ensure that seams are made at the proper temperature. If a low temperature reading is noted, the operator is to stop seaming and mark the affected area for testing. The cause of the problem is to be located and corrected before seaming resumes.

15. See Construction Drawings for Double Fusion Weld detail.

D. Non-Destructive Air Pressure Test

1. Wedge welded seams consist of a double seam with an air channel between the seams. Upon completion of a wedge seam, the open ends of the air channel are to be sealed off and a needle inserted into the air channel. The air channel shall be pressurized, allowed to stabilize, and the initial pressure reading shall be recorded.

2. The minimum starting test pressure shall be 30 PSIG. The maximum allowable pressure drop during the five minute test is 2 PSIG.

3. After five (5) minutes, the final pressure reading shall be taken. The date, test start and ending times, and starting and ending pressure readings are to be written on the liner material with a permanent marker. This information is to be recorded in the project log (Appendix 6).

4. If a wedge welded seam area does not pass the air pressure test, the cause of the failure is to be located and repaired, and the seam is to be re-tested. If the cause of the failure cannot be located, the failed seam area must be sealed with an extrusion weld and vacuum tested.

E. Vacuum Testing

1. The equipment shall consist of a vacuum pumping device, a vacuum box, and a foaming agent in solution.

2. Wet section with the foaming agent, place vacuum box over wetted area. Evacuate air from the vacuum box to a pressure suitable to affect the seal between the box and the geomembrane. Observe the seam through the viewing window for the presence of soap bubbles emitting from the seam.

3. If no bubbles are observed, move the box to the next area for testing.

4. If bubbles are observed, mark the area for repair and retest using the Non-Destructive Air Pressure testing method outlined above. All results shall be recorded in the repair log (Appendix 7).

F. Corrective Actions: Replace or repair Work to eliminate defects, deficiencies, and irregularities.

1. Defects and Repairs

a. Any defect in the seam or sheet that is an actual breach (hole) shall be marked with a “P” indicating that a “patch” is required.

b. Any defect that is not a breach shall be circled only indicating that only an extrusion bead is required for repair.

2. Repairs: A portion of the lining that has been identified as defective shall be repaired using one or any combination of the following procedures:

a. Defective seams shall be re-seamed. Extrusion welding shall repair small holes. Patching shall repair tears. When a tear is on a slope, an area of stress, and/or has a sharp end, it must be rounded prior to patching. Patches shall repair contamination by foreign material, blisters, large holes, and undispersed raw materials. Geomembrane surfaces, which are to be patched shall be abraded and cleaned prior to the repair.

b. Patches shall be round or oval in shape, made of the same geomembrane and extend a minimum of six (6) inches beyond the edge of the defect(s). All patches shall have their top edge beveled with an angular grinder prior to placement on the geomembrane.

3.5 MANUFACTURER'S FIELD SERVICES

A. Daily Field Installation Reports

1. At the beginning of each day's work, the liner installer shall provide to the Engineer and Owner a daily report for all work accomplished on the previous day. Reports shall include the following:

a. Total amount and location of geomembrane placed

b. Total length and location of seams completed, name of technicians doing seaming and welding unit numbers

c. Drawings of the previous day's installed geomembrane showing panel numbers, seam numbers, and locations of non-destructive and destructive testing

d. Results of pre-qualification test seams

e. Results of non-destructive testing

f. Results of vacuum testing and repairs

END OF SECTION 43 47 13

PANEL PLACEMENT LOG

PROJECT NAME: _____ **OWNER REP:** _____

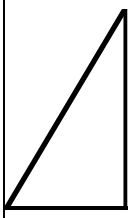
PROJECT # _____

GEN. CONTRACTOR: _____ **MATERIAL TYPE:** _____

LINER CONTRACTOR (FIS) _____

PAGE _____ OF _____ **DEPLOY. DATE:** _____

PANEL #		PANEL #	
ROLL #		ROLL #	



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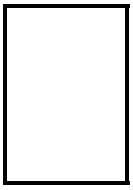
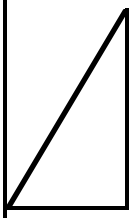
INITIAL WIDTH.		L.F
FINAL LENGTH		L.F
FINAL WIDTH		L.F

NOTES

INITIAL S.F.	
FINAL S.F.	
LINEAL FEET TRENCH	

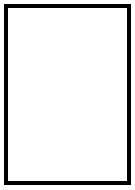




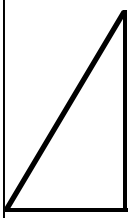
INITIAL LENGTH		L.F
INITIAL WIDTH.		L.F
FINAL LENGTH		L.F
FINAL WIDTH		L.F

NOTES

INITIAL S.F.	
FINAL S.F.	
LINEAL FEET TRENCH	



PANEL #		PANEL #	
ROLL #		ROLL #	



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FINAL LENGTH		L.F
FINAL WIDTH		L.F

NOTES

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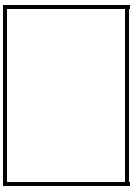
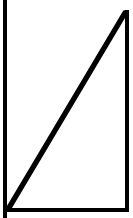
FINAL S.F.	
LINEAL FEET TRENCH	





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NOTES

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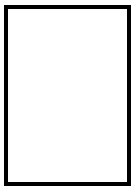
FINAL S.F.	
LINEAL FEET TRENCH	



PANEL PLACEMENT LOG

PROJECT NAME: _____ **PROJECT #** _____

GEN. CONTRACTOR: _____ **OWNERS REP:** _____

SHEET THICKNESS: _____ **LINER CONTRACTOR (FIS):** _____

MATERIAL TYPE: _____ **PAGE** _____ **OF** _____

PANEL NUMBER	ROLL #	DATE USED	WIDTH (ft)	LENGTH (ft)	AREA (sq.ft)

SUBGRADE ACCEPTANCE FORM

PROJECT: _____ **GENERAL CONTRACTOR:** _____

PROJECT # _____ **OWNER:** _____

LOCATION: _____ **LINER CONTRACTOR(FIS):** _____

DATE: _____

AREA ACCEPTED: _____

PANEL(s) _____ **OWNERS REP:** _____

By signing this form, all parties hereby acknowledge that the subgrade has been inspected and deemed acceptable for installing the geomembrane.

Authorized Representatives			**Date**
GENERAL CONTRACTOR:	**NAME,TITLE**	**SIGNATURE**	
LINER CONTRACTOR	**NAME,TITLE**	**SIGNATURE**	
OWNER'S REPRESENTATIVE	**NAME,TITLE**	**SIGNATURE**	
OWNER'S REPRESENTATIVE	**NAME,TITLE**	**SIGNATURE**	
OWNER'S REPRESENTATIVE	**NAME,TITLE**	**SIGNATURE**	

APPENDIX 3: TRIAL WELD LOG

TRIAL WELD LOG

PROJECT NAME: _____ LINER CONTRACTOR (FIS): _____

PROJECT # _____ MATERIAL TYPE: _____

OWNER REP: _____ SHEET THICKNESS: _____

GEN. CONTRACTOR: _____ DEP. DATE: _____ PAGE _____ OF _____

	FUSION (ppi)	EXTRU. (ppi)
MIN PEEL		
MIN SHEAR		

TRIAL #	TIME	TECH ID #	AMBIENT TEMP	WELD TYPE	WEDGE MASS	SPEED PREHEAT	PEEL ppi	PEEL ppi	PEEL ppi	PEEL ppi	PEEL ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi

APPENDIX 4: SEAM LOG

SEAM LOG

PROECT NAME: _____ LINER CONTRACTOR (FIS) _____

PROJECT # _____ MATERIAL TYPE: _____

GEN. CONTRACTOR: _____ SHEET THICKNESS: _____

PAGE _____ OF _____ OWNERS REP: _____

SEAM NUMBER	DATE OF WELD	TIME OF WELD	TYPE OF WELD	LENGTH OF SEAM	MACHINE NUMBER	TECHNICIAN ID NUMBER

APPENDIX 5: DESTRUCTIVE TEST LOG

DESTRUCTIVE TEST LOG

	FUSION (ppi)	EXTR. (ppi)
MIN PEEL		
MIN SHEAR		

PROJECT NAME: _____ LINER CONTRCTOR (FIS): _____

PROJECT # _____ MATERIAL TYPE: _____

GEN. CONTRACTOR: _____ SHEET THICKNESS: _____

PAGE _____ OF _____

OWNERS REP: _____ MANUFACTURER: _____

SAMPLE #	DATE	SEAM #	TECH ID #	MACHINE TYPE & NUMBER	LOCATION	PEEL ppi	PEEL ppi	PEEL ppi	PEEL ppi	PEEL ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi	SHEAR ppi

NON DESTRUCTIVE AIR TEST LOG

PROJECT NAME: _____ **OWNERS REP:** _____

PROJECT NUMBER: _____ **TYPE OF MATERIAL:** _____

GEN. CONTRACTOR: _____ **SHEET THICKENESS:** _____

LINER CONTRACTOR (FIS): _____

PAGE OF _____

SEAM #	TEST DATE	TECH ID #	AIR PRESSURE START (psi)	AIR PRESSURE FINISH (psi)	TEST RESULT (P or F)	LOCATION	COMMENTS

VACUUM TEST REPAIR LOG

OWNERS REP: _____ **PROJECT NAME:** _____

TYPE OF MATERIAL: _____ **PROJECT #** _____

GEN. CONTRACTOR: _____ **LINER CONTR. (FIS)** _____

MANUFACTURER: _____ **PAGE** _____ **OF** _____

REPAIR #	WELD DATE	TECH ID #	LOCATION	TEST DATE	MACHINE NUMBER	PASS	FAIL

Table 1 - High Density Polyethylene (HDPE) Geomembrane - Smooth

Properties	Test Method	Test Value							Testing Frequency
		30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils	
Thickness	D 5199	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Nom.	Per Roll
lowest individual of 10 values		-10%	-10%	-10%	-10%	-10%	-10%	-10%	
Density mg/l (min.)	D 1505 / D 792	0.940g/cc	0.940g/cc	0.940g/cc	0.940g/cc	0.940g/cc	0.940g/cc	0.940g/cc	200,000 lb
Tensile Properties (1) (min. ave.)	D 638 Type IV								20,000 lb
yield strength		63 lb/in.	84 lb/in.	105 lb/in.	126 lb/in.	168 lb/in.	210 lb/in.	252 lb/in.	
break strength		114 lb/in.	152 lb/in.	190 lb/in.	228 lb/in.	304 lb/in.	380 lb/in.	456 lb/in.	
yield elongation		12%	12%	12%	12%	12%	12%	12%	
break elongation		700%	700%	700%	700%	700%	700%	700%	
Tear Resistance (min ave.)	D 1004	21 lb	28 lb	35 lb	42 lb	56 lb	70 lb	84 lb	45,000 lb
Puncture Resistance	D 4833	54 lb	72 lb	90 lb	108 lb	144 lb	180 lb	216 lb	45,000 lb
Stress Crack Resistance (2)	D 5397 (App.)	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	per GRI-GM 10
Carbon Black Content (range)	D 1603 (3)	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	2.0-3.0%	20,000 lb
Carbon Black Dispersion	D 5596	note (4)	note (4)	note (4)	note (4)	note (4)	note (4)	note (4)	45,000 lb
Oxidative Induction Time (OIT) (min. ave.) (5)									200,000 lb
(a) Standard OIT	D 3895	100 min.	100 min.	100 min.	100 min.	100 min.	100 min.	100 min.	
or									
(b) High Pressure OIT	D 5885	400 min.	400 min.	400 min.	400 min.	400 min.	400 min.	400 min.	
Oven Aging at 85˚C (5), (6)	D 5721								
(a) Standard OIT (min. ave.) - % retained after 90 days	D 3895	55%	55%	55%	55%	55%	55%		per each formulation
or									
(b) High Pressure OIT (min. ave.) - % retained after 90 days	D 5885	80%	80%	80%	80%	80%	80%		per each formulation
UV Resistance (7)	GM 11								
(a) Standard OIT (min. ave.)	D 3895	N.R. (8)	N.R. (8)	N.R. (8)	N.R. (8)	N.R. (8)	N.R. (8)		per each formulation
or									
(b) High Pressure OIT (min ave.) % retained after 1600 hrs.(9)	D 5885	50%	50%	50%	50%	50%	50%		per each formulation

(1) Machine direction and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
Yield elongation is calculated using a gage length of 1.3 inches
Break elongation is calculated using a gage length of 2.0 in.
(2) The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value vis MQC testing.
(3) Other methods such as D4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.
(4) Carbon black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 and 2 and 1 in Category 3
(5) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
(6) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.
(7) The condition of the test should be 20 hr. UV cycle at 75˚C followed by 4 hr. condensation at 60˚C.
(8) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
(9) UV resistance is based on percent retained value regardless of the original HP-OIT value.

Table 2 - High Density Polyethylene (HDPE) Geomembrane - Textured									
Properties	Test Method	Test Value							Testing Frequency
		30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils	(minimum)
Thickness (min. ave.)	D 5994	nom. (-.5%)	nom. (-.5%)	nom. (-.5%)	nom. (-.5%)	nom. (-.5%)	nom. (-.5%)	nom. (-.5%)	per roll
lowest individual for 8 out of 10 values		-10%	-10%	-10%	-10%	-10%	-10%	-10%	
lowest individual for any of the 10 values		-15%	-15%	-15%	-15%	-15%	-15%	-15%	
Asperity Height mils (min. ave.) (1)	GM 12	10 mil	10 mil	10 mil	10 mil	10 mil	10 mil	10 mil	every 2nd roll (2)
Density (min. ave.)	D 1505 / D 792	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	0.940 g/cc	200,000 lb
Tensile Properties (min. ave.) (3)	D 638								20,000 lb
yield strength	Type IV	63 lb/in.	84 lb/in.	105 lb/in.	126 lb/in.	168 lb/in.	210 lb/in.	252 lb/in.	
break strength		45 lb/in.	60 lb/in.	75 lb/in.	90 lb/in.	120 lb./in.	150 lb/in.	180 lb/in.	
yield elongation		12%	12%	12%	12%	12%	12%	12%	
break elongation		100%	100%	100%	100%	100%	100%	100%	
Tear Resistance (min. ave.)	D 1004	21 lb	28 lb	35 lb	42 lb	56 lb	70 lb	84 lb	45,000 lb
Puncture Resistance (min ave.)	D 4833	45 lb	60 lb	75 lb	90 lb	120 lb	150 lb	180 lb	45,000 lb
Stress Crack Resistance (4)	D 5397 (App.)	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	200 hr.	per GRI GM 10
Carbon Black Content (range)	D 1603 (5)	2.0%-3.0%	2.0%-3.0%	2.0%-3.0%	2.0%-3.0%	2.0%-3.0%	2.0%-3.0%	2.0%-3.0%	20,000 lb
Carbon Black Dispersion	D 5596	note (6)	note (6)	note (6)	note (6)	note (6)	note (6)	note (6)	45,000 lb
Oxidative Induction Time (OIT) (min. ave.) (7)									200,000 lb
(a) Standard OIT	D 3895	100 min.	100 min.	100 min.	100 min.	100 min.	100 min.	100 min.	
or									
(b) High Pressure OIT	D 5885	400 min.	400 min.	400 min.	400 min.	400 min.	400 min.	400 min.	
Oven Aging at 85˚C (7), (8)	D 5721								
(a) Standard OIT (min. ave.) - % retained after 90 days	D 3895	55%	55%	55%	55%	55%	55%	55%	per each formulation
or									
(b) High Pressure OIT (min. ave.) - % retained after 90 days	D 5885	80%	80%	80%	80%	80%	80%	80%	per each formulation
UV Resistance (9)	GM11								
(a) Standard OIT (min ave.)	D 3895	N.R. (10)	N.R. (10)	N.R. (10)	N.R. (10)	N.R. (10)	N.R. (10)	N.R. (10)	per each formulation
or									
(b) High Pressure OIT (min ave.) -% retained after 1600 hrs. (11)	D 5885	50%	50%	50%	50%	50%	50%	50%	per each formulation

(1) Of 10 readings; 8 out of 10 must be > 7 mils, and lowest individual reading must be > 5 mils

(2) Alternate the measurement side for double sided textured sheet

(3) Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.
Yield elongation is calculated using a gage length of 1.3 inches
Break elongation is calculated using a gage length of 2.0 inches

(4) The SP-NCTL test is not appropriate for testing geomembranes with textured or irregular rough surfaces. Test should be conducted on smooth edges of textured rolls or on smooth sheets made from the same formulation as being used for the textured sheet materials.
The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQC testing.

(5) Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.

(6) Carbon Black dispersion (only near spherical agglomerates) for 10 different views:
9 in Categories 1 or 2 and 1 in Category 3

(7) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.

(8) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.

(9) The condition of test should be 20 hr. UV cycle at 75˚C followed by 4 hr. condensation at 60˚C.

(10) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.

(11) UV resistance is based on percent retained value regardless of the original HP-OIT value.

Smith Engineering Company

SUPPLEMENTAL TECHNICAL SPECIFICATION
SECTION 46 70 80
SLUDGE REMOVAL

PART 1– GENERAL

1.1 SECTION INCLUDES

A. The removal, and surface disposal of sludge from the Existing Lagoons 1 and 2.

1.2 RELATED SECTIONS

A. General and Supplemental General Conditions of the Contract and Division 1.

1.3 REFERENCES

A. Where all or part of a Federal, ASTM, ANSI, AWWA, Maricopa Association of Governments Uniform Standard Specifications for Public Works Construction, specification is incorporated by reference in these specifications, the reference standard shall be the latest edition and revision.

B. Performance of this specification shall conform with recognized and appropriate recommendations and requirements, including the following codes or organizations: U.S. Environmental Protection Agency (40 CFR 503 – Standards for the Use or Disposal of Sewage Sludge), the Occupational Safety and Health Administration (OSHA), Navajo Nation EPA (Navajo Nation Domestic Wastewater Regulations).

C. The sludge removal CONTRACTOR shall also be knowledgeable in current local, federal and state regulations relating to the OWNER'S locality regarding removal, transportation and surface disposal of sludge. Personnel shall be properly trained and certified.

D. Preparing Sewage Sludge for Land Application or Surface Disposal: A Guide for Preparers of Sewage Sludge on the Monitoring, Record Keeping, and Reporting Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503, U.S. EPA, Office of Water, 1993, pp. 1–60.

E. Land Application of Sewage Sludge: A Guide for Land Appliers on the Requirements of the Federal Standards for the Use or Disposal of Sewage Sludge, 40 CFR Part 503, Water Environment Federation, 1995, pp. 1–105.

1.4 DEFINITIONS, ABBREVIATIONS AND ACRONYMS

A. NTUA: Navajo Tribal Utility Authority

B. EPA: United States Environmental Protection Agency

1.5 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with Specification 01 33 00: Submittal Procedures Section

B. Plan of Approach Report Submittal shall include (but are not limited to) the following:

1. Schedule for start and completion of surface disposal
2. Number and type of major equipment to be used
3. Number and type of personnel to be used
4. Sludge Removal and Disposal Logic Sequencing
5. A map detailing which areas of the site will be used throughout the surface disposal period.

C. During Work:

1. Daily log of surface disposal work details to include site location, area, date and amount of sludge applied (mass or volume) provided by CONTRACTOR.
2. Daily log of surface disposal work details to include site location, area, date and amount of sludge applied (mass or volume) provided by CONTRACTOR.

1.6 QUALITY ASSURANCE

A. The CONTRACTOR shall notify the ENGINEER, and the OWNER, one week in advance of any sludge removal activities. A representative of the ENGINER or the OWNER shall be onsite during sludge removal and surface disposal unless the CONTRACTOR is informed otherwise in writing.

1.7 DELIVERY, STORAGE AND HANDLING

A. See the construction drawings for the location of the pre-approved surface disposal site and access roads.

B. If this site is not suitable for whatever reason, the OWNER is responsible for finding and arranging for alternative surface disposal sites totaling in acreage as shown on plan set after the project has been awarded. The CONTRACTOR shall obtain, in writing, (2) copies of documentation from the OWNER indicating the alternative location of a site for sludge disposal.

1.8 PROJECT CONDITIONS

A. Field Measurements and Conditions: In addition to provisions of the Conditions of the Contract, verify dimensions and obtain field measurements prior to producing shop drawings and ordering products. Verify field conditions and condition of substrate and adjoining Work before proceeding with Work specified in this Section.

1.9 SEQUENCING AND SCHEDULING

A. Sequencing and Scheduling. General: Refer to sequence requirements specified in Section 01 11 00 – Summary of work and construction progress schedule requirements specified in Section 01 33 00 – Submittals Procedures.

B. Reference construction drawings for sludge removal sequence.

1.10 WARRANTY

A. The work shall be warranted against defects in material and workmanship for a period of one year. The warranty period shall begin after final inspection and acceptance by the project ENGINEER.

PART 2– PRODUCTS

2.1 MATERIALS

A. The CONTRACTOR shall provide all necessary materials, labor and equipment to remove and transport sludge. The CONTRACTOR shall pay for all utilities used, including electric, gas, telephone and water, as needed.

PART 3– EXECUTION

3.1 EXAMINATION

A. It is the CONTRACTOR'S responsibility to examine the WWTP and all sludge disposal sites prior to bid to determine conditions.

B. Immediately correct all deficiencies and conditions which would cause improper execution of Work specified in this Section and subsequent Work.

C. Proceeding with Work specified in this Section shall be interpreted to mean that all conditions, including site conditions, were determined to be acceptable prior to start of Work.

3.2 WASTEWATER TREATMENT PLANT SITE

A. CONTRACTOR must maintain and restore all non-public roads to match pre-project conditions, including roads used on WWTP property and on sludge disposal site. Road maintenance and restoration shall be done at CONTRACTOR'S expense.

B. CONTRACTOR shall clear and grub sludge disposal site.

C. The CONTRACTOR shall de-water existing lagoon 2.

D. The CONTRACTOR shall remove sludge from Existing Lagoon 2, if present.

1. CONTRACTOR shall install temporary ramp to access sludge disposal site (Existing Lagoon 3) to protect existing liner.

E. The OWNER shall remove sludge from Existing Lagoon 1.

3.3 SLUDGE HANDLING AND STORAGE

A. Transportation of equipment and sludge must comply with all applicable local, state, and federal transportation codes and costs related to sludge transportation are the responsibility of the CONTRACTOR.

B. CONTRACTOR shall have properly licensed drivers and vehicles, and operate vehicles in accordance with applicable local, state and federal codes and laws.

C. The CONTRACTOR shall stockpile sludge in the designated sludge stockpile area.

D. CONTRACTOR shall utilize one of the following designated Pathogen Reduction Alternatives for surface disposal specified in EPA 40 CFR Part 503:

1. Class A solids
2. Class B solids
3. Daily Cover

E. The CONTRACTOR shall test the sludge in accordance with EPA 40 CFR Part 503.

1. The table below displays the ceiling concentrations for contaminants:

Contaminant	Ceiling Concentration (mg/kg)
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7500

F. CONTRACTOR shall utilize one of the following designated Vector Attraction Reduction Options for surface disposal specified in EPA 40 CFR Part 503:

1. Volatile Solid Reduction of 38%
2. Anaerobically digested sludge with less than 38% Volatile Solids Reduction
3. Aerobically digested sludge with less than 38% Volatile Solids Reduction
4. Specific Oxygen Uptake Rate

5. Aerobic Process
6. Alkaline Treatment
7. Drying with raw sludge present
8. Drying without raw sludge present
9. Sewage sludge shall be injected below the surface of the land
10. Sewage sludge applied to the land shall be incorporated into the soil within 6 hours after application to the land

END OF SECTION 46 70 80

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 20, 2023

Cody Sipes

Smith Engineering
2201 San Pedro Drive, NE
Building #4, Suite 200
Albuquerque, NM 87110
TEL: (505) 884-0700
FAX: (505) 884-2376

RE: Coalmine Canyon Lagoon Rehabilitation OrderNo.: 2308F86

Dear Cody Sipes:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/29/2023 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Smith Engineering
Client Sample ID: Sample 1
Project: Coalmine Canyon Lagoon Rehabilitation
Collection Date: 8/28/2023 4:30:00 PM
Lab ID: 2308F86-001 **Matrix:** SOLID
Received Date: 8/29/2023 2:19:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**RBC**
Nitrogen, Nitrate (As N)	ND	1.5		mg/Kg	5	9/5/2023 7:28:56 PM	77303
METHOD 4500-N-ORG C: TKN						Analyst:	**DML**
Nitrogen, Total Kjeldahl	3100	52		mg/Kg	1	9/7/2023 9:58:00 AM	77330
EPA METHOD 6020A: TOTAL METALS						Analyst:	**ELS**
Arsenic	2.3	0.50		mg/Kg	5	9/8/2023 2:25:19 PM	77215
Copper	95	5.0		mg/Kg	50	9/13/2023 2:38:14 PM	77424
Lead	7.0	5.0		mg/Kg	50	9/13/2023 2:38:14 PM	77424
Selenium	1.4	0.50		mg/Kg	5	9/13/2023 1:43:46 PM	77424
EPA METHOD 7471B: MERCURY						Analyst:	**tem**
Mercury	0.55	0.069		mg/Kg	1	9/14/2023 1:18:06 PM	77453
EPA METHOD 6010B: SOIL METALS						Analyst:	**VP**
Cadmium	ND	0.50		mg/Kg	2	9/8/2023 11:35:30 AM	77215
Molybdenum	ND	1.0		mg/Kg	2	9/8/2023 11:35:30 AM	77215
Nickel	5.1	1.0		mg/Kg	2	9/8/2023 11:35:30 AM	77215
Zinc	250	5.0		mg/Kg	2	9/8/2023 11:35:30 AM	77215

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Smith Engineering
Client Sample ID: Sample 2
Project: Coalmine Canyon Lagoon Rehabilitation
Collection Date: 8/28/2023 4:45:00 PM
Lab ID: 2308F86-002 **Matrix:** SOLID
Received Date: 8/29/2023 2:19:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 300.0: ANIONS						Analyst:	**RBC**
Nitrogen, Nitrate (As N)	ND	1.5		mg/Kg	5	9/5/2023 8:18:34 PM	77303
METHOD 4500-N-ORG C: TKN						Analyst:	**DML**
Nitrogen, Total Kjeldahl	3300	220	D	mg/Kg	1	9/7/2023 9:58:00 AM	77330
EPA METHOD 6020A: TOTAL METALS						Analyst:	**ELS**
Arsenic	1.2	0.48		mg/Kg	5	9/8/2023 2:28:50 PM	77215
Copper	7.6	0.49		mg/Kg	5	9/13/2023 1:48:18 PM	77424
Lead	2.6	0.48		mg/Kg	5	9/8/2023 2:28:50 PM	77215
Selenium	0.86	0.49		mg/Kg	5	9/13/2023 1:48:18 PM	77424
EPA METHOD 7471B: MERCURY						Analyst:	**tem**
Mercury	ND	0.078		mg/Kg	1	9/14/2023 1:20:11 PM	77453
EPA METHOD 6010B: SOIL METALS						Analyst:	**VP**
Cadmium	ND	0.48		mg/Kg	2	9/8/2023 11:39:36 AM	77215
Molybdenum	ND	0.97		mg/Kg	2	9/8/2023 11:39:36 AM	77215
Nickel	3.0	0.97		mg/Kg	2	9/8/2023 11:39:36 AM	77215
Zinc	27	4.8		mg/Kg	2	9/8/2023 11:39:36 AM	77215

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix
E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit
P	Sample pH Not In Range
PQL	Practical Quanitative Limit
RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MB-77303**	SampType: **MBLK**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBS**	Batch ID: **77303**	RunNo: **99450**
Prep Date: **9/5/2023**	Analysis Date: **9/5/2023**	SeqNo: **3631569** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	ND	0.30								

Sample ID: **LCS-77303**	SampType: **LCS**	TestCode: **EPA Method 300.0: Anions**
Client ID: **LCSS**	Batch ID: **77303**	RunNo: **99450**
Prep Date: **9/5/2023**	Analysis Date: **9/5/2023**	SeqNo: **3631570** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	7.5	0.30	7.500	0	100	90	110			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MB-77215**	SampType: **MBLK**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **PBS**	Batch ID: **77215**	RunNo: **99399**
Prep Date: **8/30/2023**	Analysis Date: **8/31/2023**	SeqNo: **3627348** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.20								
Lead	ND	0.20								

Sample ID: **MSLCSLL-77215**	SampType: **LCSLL**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **BatchQC**	Batch ID: **77215**	RunNo: **99399**
Prep Date: **8/30/2023**	Analysis Date: **8/31/2023**	SeqNo: **3627349** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.20	0.1000	0	99.6	70	130			

Sample ID: **MSLCS-77215**	SampType: **LCS**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **LCSS**	Batch ID: **77215**	RunNo: **99399**
Prep Date: **8/30/2023**	Analysis Date: **8/31/2023**	SeqNo: **3627350** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	4.8	0.20	5.000	0	95.4	80	120			
Lead	5.6	0.20	5.000	0	111	80	120			

Sample ID: **MSLCSLL-77215**	SampType: **LCSLL**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **BatchQC**	Batch ID: **77215**	RunNo: **99399**
Prep Date: **8/30/2023**	Analysis Date: **8/31/2023**	SeqNo: **3627354** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.20	0.1000	0	117	70	130			

Sample ID: **MB-77424**	SampType: **MBLK**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **PBS**	Batch ID: **77424**	RunNo: **99629**
Prep Date: **9/11/2023**	Analysis Date: **9/12/2023**	SeqNo: **3639343** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.20								

Sample ID: **MSLCS-77424**	SampType: **LCS**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **LCSS**	Batch ID: **77424**	RunNo: **99629**
Prep Date: **9/11/2023**	Analysis Date: **9/12/2023**	SeqNo: **3639350** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	17	0.20	5.000	0	346	80	120			ES

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MSLCSLL-77424**	SampType: **LCSLL**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **BatchQC**	Batch ID: **77424**	RunNo: **99629**
Prep Date: **9/11/2023**	Analysis Date: **9/12/2023**	SeqNo: **3639351** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.20	0.1000	0	124	70	130			

Sample ID: **MB-77424**	SampType: **MBLK**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **PBS**	Batch ID: **77424**	RunNo: **99680**
Prep Date: **9/11/2023**	Analysis Date: **9/13/2023**	SeqNo: **3641721** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	ND	0.20								

Sample ID: **MSLCS-77424**	SampType: **LCS**	TestCode: **EPA Method 6020A: Total Metals**
Client ID: **LCSS**	Batch ID: **77424**	RunNo: **99680**
Prep Date: **9/11/2023**	Analysis Date: **9/13/2023**	SeqNo: **3641723** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Selenium	21	0.20	20.00	0	103	80	120			E

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MB-77453**	SampType: **MBLK**	TestCode: **EPA Method 7471B: Mercury**
Client ID: **PBS**	Batch ID: **77453**	RunNo: **99703**
Prep Date: **9/12/2023**	Analysis Date: **9/14/2023**	SeqNo: **3643159** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.066								

Sample ID: **LCSLL-77453**	SampType: **LCSLL**	TestCode: **EPA Method 7471B: Mercury**
Client ID: **BatchQC**	Batch ID: **77453**	RunNo: **99703**
Prep Date: **9/12/2023**	Analysis Date: **9/14/2023**	SeqNo: **3643160** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.066	0.01332	0	127	70	130			

Sample ID: **LCS-77453**	SampType: **LCS**	TestCode: **EPA Method 7471B: Mercury**
Client ID: **LCSS**	Batch ID: **77453**	RunNo: **99703**
Prep Date: **9/12/2023**	Analysis Date: **9/14/2023**	SeqNo: **3643161** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.31	0.066	0.3333	0	91.5	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MB-77215**	SampType: **MBLK**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **PBS**	Batch ID: **77215**	RunNo: **99548**
Prep Date: **8/30/2023**	Analysis Date: **9/8/2023**	SeqNo: **3635270** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	ND	0.25								
Molybdenum	ND	0.50								
Nickel	ND	0.50								
Zinc	ND	2.5								

Sample ID: **LCSLL-77215**	SampType: **LCSLL**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **BatchQC**	Batch ID: **77215**	RunNo: **99548**
Prep Date: **8/30/2023**	Analysis Date: **9/8/2023**	SeqNo: **3635271** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	ND	0.25	0.1000	0	110	50	150			
Molybdenum	ND	0.50	0.4000	0	108	50	150			
Nickel	ND	0.50	0.2500	0	136	50	150			
Zinc	ND	2.5	0.5000	0	308	50	150			S

Sample ID: **LCS-77215**	SampType: **LCS**	TestCode: **EPA Method 6010B: Soil Metals**
Client ID: **LCSS**	Batch ID: **77215**	RunNo: **99548**
Prep Date: **8/30/2023**	Analysis Date: **9/8/2023**	SeqNo: **3635272** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Cadmium	25	0.25	25.00	0	98.7	80	120			
Molybdenum	26	0.50	25.00	0	106	80	120			
Nickel	24	0.50	25.00	0	98.0	80	120			
Zinc	25	2.5	25.00	0	99.3	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Above Quantitation Range/Estimated Value
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.		

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **2308F86**

20-Sep-23

Client: Smith Engineering

Project: Coalmine Canyon Lagoon Rehabilitation

Sample ID: **MB-77330**	SampType: **MBLK**	TestCode: **Method 4500-N-org C: TKN**
Client ID: **PBS**	Batch ID: **77330**	RunNo: **99519**
Prep Date: **9/6/2023**	Analysis Date: **9/7/2023**	SeqNo: **3633753** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Total Kjeldahl	ND	50								

Sample ID: **LCS-77330**	SampType: **LCS**	TestCode: **Method 4500-N-org C: TKN**
Client ID: **LCSS**	Batch ID: **77330**	RunNo: **99519**
Prep Date: **9/6/2023**	Analysis Date: **9/7/2023**	SeqNo: **3633754** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Nitrogen, Total Kjeldahl	1000	50	1000	0	104	80	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quanitative Limit
S	% Recovery outside of standard limits. If undiluted results may be estimated.
B	Analyte detected in the associated Method Blank
E	Above Quantitation Range/Estimated Value
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Smith Engineering | Work Order Number: 2308F86 | RcptNo: 1

Received By: Juan Rojas 8/29/2023 2:19:00 PM

Completed By: Cheyenne Cason 8/29/2023 3:47:02 PM

Reviewed By: mm 8/29/23

Chain of Custody

1. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2. How was the sample delivered?	Client		

Log In

3. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
4. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☐	No ☑	NA ☐
5. Sample(s) in proper container(s)?	Yes ☑ (Not required)	No ☐	
6. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
7. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
8. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
9. Received at least 1 vial with headspace <1/4" for AQ VOA?	Yes ☐	No ☐	NA ☑
10. Were any sample containers received broken?	Yes ☐	No ☑	
11. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
12. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
13. Is it clear what analyses were requested?	Yes ☑	No ☐	
14. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: mm 8/29/23

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks:

17. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	22.7	Good	Not Present	Yogi		

Chain-of-Custody Record

Client: Smith Engineering Company

Mailing Address: 4-200, 2201 San Pedro Dr. Albuquerque, NM 87110

Phone #: 505-884-0700

email or Fax#: Matthew R@SmithEngineering.pro

QA/QC Package:
☐ Standard ☐ Level 4 (Full Validation)

Accreditation: ☐ Az Compliance
☐ NELAC ☐ Other

☐ EDD (Type)

Turn-Around Time:
☐ Standard ☐ Rush

Project Name: Coalmine Canyon Lagoon Rehabilitation

Project #:

Project Manager: Cody Sipes

Sampler:

On Ice: ☐ Yes ~~☐ No~~

# of Coolers: 1 Yeti

Cooler Temp (including CF): 27.8-0.1=27.7 (°C)

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Name	Container Type and #	Preservative Type	HEAL No. 2308F86	BTEX / MTBE / TMB's (8021)	TPH:8015D(GRO / DRO / MRO)	8081 Pesticides/8082 PCB's	EDB (Method 504.1)	PAHs by 8310 or 8270SIMS	RCRA 8 Metals	Cl, F, Br, NO_3, NO_2, PO_4, SO_4	8260 (VOA)	8270 (Semi-VOA)	Total Coliform (Present/Absent)	(As, Cd, Cu, Pb) metals	(Zn, Hg, Mg, Ni, Se) metals	TKN	NO_3-N		
08/28	4:30	Solid	Sample 1			001											X	X	X	X		
08/28	4:45	Solid	Sample 2			002											X	X	X	X		

Date	Time	Relinquished by:	Received by:	Via:	Date	Time
08/29	2:19	Matthew Raffaele				
					8/29/23	14:19

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.