TECHNICAL SPECIFICATIONS

Riser Maintenance Repairs
Deep Creek Watershed Dams
Yadkin County Soil and Water Conservation District
Yadkin County, North Carolina

Schnabel Reference 22210042.000
January 6, 2023

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01-06-2023
for general specifications

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1/6/2023
for structural specifications

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RISER MAINTENANCE REPAIRS
DEEP CREEK WATERSHED DAMS
YADKIN COUNTY SOIL AND WATER CONSERVATION DISTRICT
YADKIN COUNTY, NORTH CAROLINA

TECHNICAL SPECIFICATIONS
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SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.1 This Section includes:

A. Contract description.

B. CONTRACTOR's use of site and premises.

C. Work sequence.

1.2 CONTRACT DESCRIPTION

A. Work of the Project includes furnishing all materials, labor, tools, and equipment for the construction work necessary to:

1. Divert the reservoir pools and incoming flows downstream to perform the work.

2. Relocate sediments within the reservoirs to access the risers and perform the work on the risers and existing low-level drain gates at each dam. Sediments shall be relocated a minimum of 100-feet upstream of the riser.

3. Remove, dispose of and replace the existing low-level drain gates, gate stems, guides and operator at each dam.

4. Remove, dispose of and replace, or refurbish the other existing appurtenant structures at each dam as required in the design documents. Appurtenant structures may include ladders, trash racks, and manhole covers.

B. Perform Work of the Contract under stipulated sum contract with the OWNER in accordance with Conditions of Contract.

C. Work of the Contract is identified in the following:

1. Technical Specifications.

2. Construction Drawings (Drawings).

1.3 WORK BY OWNER – Not Used

1.4 OWNER SUPPLIED PRODUCTS – Not Used

1.5 CONTRACTOR'S USE OF SITE

A. Construction Operations: Limited to areas shown on the Drawings or as approved by the OWNER.

B. Time Restrictions for Performing Work: Provided in the General Conditions.

C. Access to the site is depicted on the Drawings. CONTACTOR shall maintain OWNER and adjacent landowner access to the site during construction.

1.6 FUTURE WORK – Not Used

1.7 WORK SEQUENCE

A. Coordinate the construction schedule and operations with ENGINEER and OWNER. The proposed repairs vary at each dam and general construction sequences are provided on the Drawings as a general guidance. The CONTRACTOR is responsible for the actual construction sequence.

END OF SECTION

SECTION 01 22 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes procedures for measurement and payment of items of the Work listed in the Contract Bid Schedule.

1.2 GENERAL REQUIREMENTS

A. Payment for all work done in compliance with the Contract Documents, including all labor, equipment, materials, and performance of operations relative to construction of this project, will be made under the Bid Items listed below.

B. CONTRACTOR shall submit to the ENGINEER a Schedule of Values for bid items to be used in the preparation of the cost-weighted CPM schedule allocated to various portions of the Work. The Schedule of Values shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Each line item in the schedule shall be identified with the number and title of the respective major section of the specifications. Lump sum bid items will be paid based on an estimated percent complete and in accordance with the approved Schedule of Values.

C. Work required by the Contract Documents for which there is not a Bid Item will be considered incidental to the contract and no additional compensation will be allowed. Incidental bid items are listed under the Measurement and Payment paragraphs of the applicable sections.

D. OWNER reserves the right to alter Drawings, modify incidental work as may be necessary, and increase or decrease quantities of work to be performed, including deduction or cancellation of any one or more Bid Items.

E. Changes in the Work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof.

F. When changes result in revised quantities of work to be performed, CONTRACTOR shall accept payment according to contract unit prices appearing in the original Contract.

G. Final measured quantities determined in the field at time of construction shall govern over approximate quantities shown on the Bid Form, unless otherwise noted.

H. CONTRACTOR shall take no advantage of any apparent error or omission in Drawings or Specifications, and ENGINEER shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.

PART 2 BID ITEMS

2.1 MOBILIZATION AND DEMOBILIZATION

A. This item includes establishing site access, preparing laydown and staging areas, and other site modifications to receive construction equipment; installation and removal of any other temporary construction facilities, and all mobilization and demobilization required to complete the work as shown on the Drawings and in accordance with the requirements of Section 01 50 00.

B. Payment will be made as the work proceeds at each site. The unpaid balance will be included in the final contract payment. Payment of the lump sum contract price for mobilization and demobilization will constitute full compensation for completion of the work.

C. Payment will be made at the contract lump sum price for BID ITEM 01 – MOBILIZATION AND DEMOBILIZATION in accordance with the approved Schedule of Values and contract requirements.

2.2 POLLUTION CONTROL

A. This work consists of providing installing measures and performing work to control erosion and minimize the production of sediment and pollutants to water and air during construction operations. This includes keeping public and private roads at construction entrances and exits free from soil and debris.

B. Payment will be made at the contract lump sum price for BID ITEM 02 – POLLUTION CONTROLS in accordance with the approved Schedule of Values and contract requirements.

2.3 CONTROL OF WATER

A. This work consists of control, collection, and routing of the water in the reservoir and incoming flows into the reservoir as needed to perform the work required to perform the work in accordance with Section 01 57 60.

B. Payment will be made at the contract lump sum price for BID ITEM 03 – CONTROL OF WATER in accordance with the approved Schedule of Values and contract requirements.

2.4 SURVEYING

A. This work consists of providing surveying services required to perform the work in accordance with Section 01 57 50.

B. Payment will be made at the contract lump sum price for BID ITEM 04 – SURVEYING in accordance with the approved Schedule of Values and contract requirements.

2.5 SLIDE GATE

A. This item includes providing all labor, materials, equipment, and all other items required for gate removal and installation, removal and disposal of the existing gates, and furnish, install, and test the new wall-mounted cast iron slide gates, grout pads, operating stems, stem guides, operating floor stands, and other appurtenances required as shown on the Drawings and in accordance with the requirements of Section 35 20 16.

B. Payment will be made at the contract lump sum price for BID ITEM 05 – SLIDE GATE in accordance with the approved Schedule of Values and contract requirements.

2.6 METAL FABRICATION AND INSTALLATION

A. This work includes providing all labor, materials, equipment, and all other items required to remove and dispose or refurbish the existing appurtenant structures, repair concrete, and furnish and install new galvanized steel trash racks, ladder, and riser access manhole covers at select locations as shown on the Drawings and in accordance with the requirements of Section 03 60 00, 05 50 50, and 35 20 16.

B. Payment will be made at the contract lump sum price for BID ITEM 06 –TRASH RACKS, LADDERS AND MANHOLE COVERS in accordance with the approved Schedule of Values and contract requirements.

2.7 SEDIMENT RELOCATION

A. This work consists of the excavation and relocation of sediments from the areas around the existing risers at each dam as shown on the Drawings and in accordance with Section 35 20 23.

B. Sediment relocation payment quantities to be based on the in-place volume of material excavated from the reservoirs as measured by CONTRACTOR's surveys in accordance with Section 01 57 50. The CONTRACTOR shall not excavate beyond the limits shown on the Drawings unless otherwise approved by the ENGINEER.

C. Payment will be made at the contract unit price per cubic yard for BID ITEM 07 – SEDIMENT RELOCATION.

2.8 SEEDING AND SITE RESTORATION

A. This item shall consist of site restoration and applying lime and fertilizer, preparing a seedbed, and seeding to establish permanent vegetation on all disturbed areas within the work limits as described and shown on the Drawings, including all material, labor, equipment, tools, and all other items necessary and incidental to the completion of the work. This also includes temporary seeding necessary for all times of year not suitable for establishing permanent vegetation, until permanent vegetation can be established. Site restoration shall be to the pre-project conditions or as approved by the Owner or Engineer in accordance with the requirements of Section 32 92 19.

B. Payment will be made at the contract lump sum price for BID ITEM 08 –SEEDING AND SITE RESTORATION in accordance with the approved Schedule of Values and contract requirements.

PART 3 PRODUCTS - Not Used

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Preconstruction meeting.

C. Progress meetings.

D. Photo Documentation.

E. Applications for payment

F. Change procedures

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of contract documents to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with site utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

C. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

D. After OWNER occupancy of premises, coordinate access to sites for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of OWNER'S activities.

1.3 PRECONSTRUCTION MEETING

A. ENGINEER will schedule meeting after Notice of Award.

B. Attendance Required: OWNER, ENGINEER, and CONTRACTOR.

C. Agenda:

1. Execution of OWNER-CONTRACTOR Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.

4. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule as required by the contract documents.

5. Designation of personnel representing parties in contract.

6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and contract closeout procedures.

7. Scheduling.

D. ENGINEER will record minutes and distribute copies digitally to participants within five days after meeting.

1.4 PROGRESS MEETINGS

A. ENGINEER will schedule and administer meetings throughout progress of the Work. Progress meetings shall be held on a monthly basis (every four weeks), or at specific project milestones as required by ENGINEER.

B. ENGINEER will provide arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

C. Attendance Required: CONTRACTOR (Job superintendent), major subcontractors and suppliers, OWNER, ENGINEER, and others as appropriate based on agenda topics for each meeting.

D. In general, the Agenda for Progress Meetings will include:

1. Review minutes of previous meetings.

2. Review of Work progress.

3. Field observations, problems, and decisions.

4. Identification of problems impeding planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of RFIs (requests for information).

7. Review of off-site fabrication and delivery schedules.

8. Maintenance of progress schedule.

9. Corrective measures to regain projected schedules.

10. Planned progress during succeeding work period.

11. Coordination of projected progress.

12. Effect of proposed changes on progress schedule and coordination.

13. Maintenance of quality and work standards.

14. Safety.

15. Other business relating to Work.

E. ENGINEER will record minutes and distribute copies to participants within five business days after meeting.

1.5 PHOTO DOCUMENTATION

A. Construction photographs shall be digital, and shall include a list indicating the date, name of project, and a brief description of the image(s), including the location and direction the images were taken. Digital copies of all documentations shall be provided to the ENGINEER on an external hard drive.

B. CONSTRUCTION PHOTOGRAPHS

1. The CONTRACTOR shall provide digital construction images showing the progress of the work at each site.

2. The documentation shall be made at least weekly starting immediately after the date of the preconstruction documentation and continuing as long as the work is in progress.

3. Additional photo documentation shall be taken and be of such subjects as may be directed by the ENGINEER.

C. COMPLETION PHOTOGRAPHS

1. The CONTRACTOR shall provide one set of completion photographs, after Substantial Completion has been granted. The CONTRACTOR and ENGINEER are required to be present while photographs are recorded to ensure that existing details are captured.

2. Before Final Completion and acceptance of the project, photographs shall be submitted to the ENGINEER via external hard drive. The CONTRACTOR shall photograph all of the constructed work, the entire area of construction, and all site entries and access roads from multiple perspectives.

1.6 APPLICATIONS FOR PAYMENT

A. Submit to ENGINEER each application on approved form.

B. Content and Format: Utilize list of Payment Items and Schedule of Values for tabulating items in each Application for Payment.

C. Include an updated construction progress schedule.

1.7 CHANGE PROCEDURES

A. The ENGINEER will advise in writing of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time.

B. The ENGINEER may issue a Proposal Request or Notice of Change which includes a detailed description of a proposed change with supplementary or revised Drawings and

specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. CONTRACTOR will prepare and submit an estimate within 7 days.

C. The CONTRACTOR may propose changes by submitting a request for change to the ENGINEER, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by other contractors.

D. Stipulated Sum/Price Change Order: Shall be based on Proposal Request or Notice of Change (as appropriate) and CONTRACTOR'S fixed price quotation, or CONTRACTOR'S request for a Change Order as approved by OWNER.

E. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under a Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

F. Work Change Directive: ENGINEER may issue a Work Change Directive instructing the CONTRACTOR to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute the change.

G. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

H. Execution of Change Orders: ENGINEER will issue Change Orders for signatures of parties as provided in the contract.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Submittals covered by these requirements include test procedures, test results, requests for substitutions, and miscellaneous work-related submittals. The CONTRACTOR shall furnish all drawings, specifications, descriptive data, certificates, tests, methods, and schedules as specifically required in the Contract Documents to demonstrate fully that the materials and equipment to be furnished and the methods of work comply with the provisions and intent of the Contract Documents.

1.2 SUBMITTAL PROCEDURES

A. Transmit one electronic copy in portable document format (pdf) of each submittal, or an approved alternate format, to the ENGINEER with the accepted submittal cover form.

B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

C. Identify Project, CONTRACTOR, subcontractor and supplier; pertinent Drawing and detail number; and Specification section number, appropriate to submittal.

D. Apply CONTRACTOR's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, and coordination of information is in accordance with requirements of the Work and Contract Documents.

E. Schedule submittals to expedite Project. Delivery options for electronic submission of submittals shall be as agreed upon during the pre-construction conference. If required, submit paper copies of submittals to ENGINEER to coordinate submission of related items.

F. For each submittal for review, submittal shall be delivered to the ENGINEER at least 15 days prior to work listed the submittal being initiated unless specifically stated otherwise in the Contract Documents.

G. Identify variations from Contract Documents and product or system limitations, which may be detrimental to successful performance of completed Work.

H. Allow space on submittals for CONTRACTOR and ENGINEER review stamps.

I. When revised for resubmission, identify changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

1.3 SUBMITTAL SCHEDULE

A. CONTRACTOR shall submit to the ENGINEER a Submittal Schedule with a list of the submittals required by the Contract Documents. The Submittal Schedule shall include the following information for each submittal required:
   1. Submittal name
   2. Specification section number and paragraph
   3. Type of submittal (shop drawing, calculation, test results, product data, etc.)
   4. Check box indicating if the submittal requires review by the ENGINEER prior to work being performed or if submitted for information only.

1.4 PROPOSED PRODUCTS LIST

A. Within 10 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

A. Product Data: Submit to ENGINEER for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

C. After review, produce copies and distribute in accordance with Paragraph 1.2.

1.6 TEST REPORTS

A. Submit test reports and information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.7 CERTIFICATES

A. When specified in individual Specification sections, submit certification by manufacturer, installation/application subcontractor, or CONTRACTOR to ENGINEER, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to ENGINEER.

PART 2 PRODUCTS (not used)

PART 3 EXECUTION (not used)

END OF SECTION

SECTION 01 40 00

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 SCOPE

A. This section includes requirements for quality control and inspection of the work by the CONTRACTOR.

1.2 RELATED SECTIONS

A. Section 01 56 50 – Pollution Control

B. Section 07 57 50 - Surveying

C. Section 03 60 00 – Grouting

D. Section 05 50 00 – Metal Fabrication and Installation

E. Section 32 92 19 – Seeding

F. Section 35 20 16 – Slide Gates

1.3 MEASUREMENT AND PAYMENT

A. No measurement and payment will be made for this work. Compensation for quality control will be included in the payment for the items of work that require quality control.

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. The CONTRACTOR is responsible for quality control, to include that of subcontractors and suppliers, and shall establish and maintain an effective quality control system in compliance with the applicable codes and standards listed in these specifications or on the construction drawings, approved shop drawings, and/or the manufacturer's installation requirements. The CONTRACTOR shall comply with handling and installation requirements in the specifications as minimum quality for the work.

B. The CONTRACTOR is responsible for field verifying measurements for components to be replaced.

END OF SECTION

SECTION 01 50 00

MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.1 SCOPE

A. The work shall consist of the mobilization and demobilization of the CONTRACTOR'S forces and equipment necessary for performing the work required under the contract.

B. This work shall not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract.

C. Mobilization will not be considered as work in fulfilling the contract requirement for commencement of work.

1.2 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Mobilization shall include all activities and costs for establishing site access and staging areas, transportation of personnel, equipment, and operating supplies to the sites; temporary utilities, potable water, sewage disposal, and other necessary facilities for the CONTRACTOR'S operations at the sites; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable; obtaining all required permits, licenses, and other regulatory authorizations.

B. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the sites; including the disassembly, removal, and clean-up of facilities assembled on the sites for this contract.

C. This work includes mobilization and demobilization required by the contract at the time of award. If additional mobilization and demobilization activities and costs are required during the performance of the contract as a result of changed, deleted, or added items of work for which the CONTRACTOR is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the item or items of work changed or added.

PART 3 EXECUTION – Not Used

END OF SECTION

SECTION 01 56 50

POLLUTION CONTROL

PART 1 GENERAL

1.1 SCOPE

A. This section includes requirements for sequencing construction and installing measures and/or performing work to control erosion and minimize the production of sediment and pollutants during construction operations. This includes keeping public and private roads at construction entrances and exits free from soil and debris.

1.2 RELATED SECTIONS

A. Section 01 57 60 – Control of Water

B. Section 32 92 19 – Seeding

1.3 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.4 EROSION AND SEDIMENT CONTROL MEASURES AND WORKS

The measures and works shall include, but are not limited to, the following:

A. Seeding: Seeding will be completed as soon as feasible for areas disturbed by the CONTRACTOR'S activities.

B. Mulching: Mulching seeding areas to provide temporary protection of soil surfaces from erosion.

C. Diversions: Diversions if needed to collect rainfall runoff from access routes or divert rainfall runoff from the CONTRACTOR'S staging areas. These works are temporary and shall be removed and the areas restored to their original state when they are no longer needed, unless approved otherwise by the ENGINEER.

D. Silt Fence: Geotextile silt fence to trap sediment from areas of limited runoff, such as the CONTRACTOR'S staging area. Sediment filters shall be properly anchored to prevent erosion under them. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed.

E. Turbidity Curtains: Added at the downstream end of the primary spillway outlets to limit sediment deposits downstream. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed.

PART 2 PRODUCTS

2.1 GENERAL

A. The CONTRACTOR shall be responsible for calculation of the required quantity and volume of each material based on Drawings, consultations with the ENGINEER, estimates of wastage during delivery, stockpiling, haulage and placement, experience with similar materials, and other factors as identified by the CONTRACTOR.

B. The CONTRACTOR shall be responsible for all costs associated with delays or material quantity or volume shortfalls due to miscalculation, or required rework resulting from not meeting material or placement specifications.

2.2 SILT FENCE

A. Silt fence shall meet the requirements of the North Carolina Erosion and Sediment Control Planning and Design Manual.

B. Support fence (when used) shall consist of minimum 14 gage woven wire with a maximum mesh spacing of 6 inches and attached to metal posts.

C. Posts shall be 1.33 lb/linear foot steel and a minimum length of 5 feet.

D. Posts shall be spaced no more than 6 feet on center without support fence and no more than 8 feet on center with support fence.

E. Fabric shall be stapled or wired securely to the support fence.

2.3 AGGREGATES

A. Meet the product requirements specified in the North Carolina Erosion and Sediment Control Planning and Design Manual and the NCDOT Standard Specifications for Roads and Structures.

2.4 TURBIDITY CURTAIN

A. Fabric shall weigh a minimum 22 ounces/square yard of fabric, and have a minimum grab tensile strength of 300 lbs.

B. Seams shall be either vulcanized welded or sewn, and shall develop the full strength of the fabric.

C. A UV inhibitor must be included in the fabric.

D. Flotation devices shall be flexible, buoyant units contained in an individual flotation sleeve or collar attached to the curtain and shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface.

E. Flotation devices shall be a bright yellow or orange in color.

F. Load lines shall be fabricated into the bottom and top of the fabric and shall consist of woven webbing or vinyl-sheathed steel cable.

G. Load lines shall have break strength in excess of 10,000 pounds.

H. The bottom load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position.

I. Additional anchorage shall be provided as necessary.

J. The load lines shall have suitable connecting devices which develop the full breaking strength for connecting to load lines in adjacent sections.

K. Bottom anchors must be sufficient to hold the curtain in the same position relative to the bottom of the lake without interfering with the curtain.

L. The anchor may dig into the bottom or may be weighted and should be attached to a floating anchor buoy via an anchor line. The anchor line would then run from the buoy to the top load line of the curtain.

2.5 SEED, MULCH, AND ACCESSORIES

A. Meet the applicable requirements of Section 32 92 19 – Seeding.

PART 3 EXECUTION

3.1 GENERAL

A. Installation techniques for erosion and sediment control measures shall be in accordance with the information shown on the Drawings, or the North Carolina Erosion and Sediment Control Planning and Design Manual.

3.2 CHEMICAL POLLUTION

A. The CONTRACTOR shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to be used to dispose of chemical pollutants, such as drained lubricating or transmission oils, greases, soaps, etc., produced as a by-product of the construction work. At the completion of the construction work, sumps shall be voided without causing pollution.

B. Sanitary facilities such as chemical toilets, shall not be placed adjacent to the reservoir, live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water sources. At the completion of construction work, facilities shall be disposed of without causing pollution.

3.3 AIR POLLUTION

A. The removal and disposal of materials shall adhere to local and state regulations.

B. Fire prevention measures shall be taken to prevent the start or the spreading of wild fires that result from project work.

C. All public and private haul roads and entrances to the dam site used by the CONTRACTOR during construction of the project shall be sprinkled or otherwise treated to fully suppress dust. All dust control methods shall insure safe operations at all times. If chemical dust suppressants are used, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to the ENGINEER within 3 working days before use.

3.4 MAINTENANCE, REMOVAL, AND RESTORATION

A. The removal and disposal of materials shall adhere to local and state regulations.

B. All pollution control measures and works shall be adequately maintained in a functional condition as long as needed during the construction operation. All temporary measures shall be removed and the site restored to as nearly original conditions as practicable upon completion of the project.

3.5 INSPECTIONS

A. The CONTRACTOR shall inspect disturbed areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and area where vehicles enter or exit the site at least once every three (3) calendar days and within 24 hours of the end of any storm that produces 0.5 inches or more rainfall at the site.

END OF SECTION

SECTION 01 57 50

SURVEYING

PART 1 GENERAL

1.1 SUMMARY

A. This Section addresses the requirements for surveying, including:

1. Temporary Baselines and Controls
2. Construction Surveys

1.2 RELATED SECTIONS

A. Section 01 22 00 – Measurement and Payment

B. Section 01 40 00 – Contractor Quality Control

C. Section 01 70 00 – Execution and Closeout Requirements

1.3 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.4 REFERENCES – Not Used

1.5 SUBMITTALS

A. Meet the applicable requirements of Section 01 33 00 - Submittal Procedures.

B. Prior to commencement of work requiring CONTRACTOR performed surveys, the CONTRACTOR shall submit in writing to the ENGINEER for approval the name, qualifications and experience of the individuals to be assigned to the survey tasks.

C. Survey records shall be available at all times during the progress of the work for examination and use by the ENGINEER and copies shall be made available upon request.

D. Provide complete documentation of computations and supporting data for progress payments.

E. Submit final survey records for as-built conditions in accordance with Section 01 70 00 – Execution and Closeout Requirements.

1.6 QUALITY REQUIREMENTS

A. All work shall follow recognized professional practice and the standards of the industry unless otherwise specified in this specification.

B. The work shall be performed to the accuracy and detail as indicated herein.

C. All computations shall be mathematically correct.

D. Computations shall include information to identify the bid item, date, and who performed, checked and approved the computations.

E. Computations shall be legible, complete and clearly document the source of all information used including assumptions and measurements made.

F. If a computer program is used to perform the computations, the CONTRACTOR shall provide the ENGINEER with the software identification, vender's name, version number, and other pertinent data, prior to beginning survey work.

G. Computer generated computations shall show all input data including values assigned and assumptions made.

H. The elevations of permanent and temporary benchmarks shall be determined and recorded to the nearest 0.01 foot.

I. Vertical control surveys shall be of such precision that the error of vertical closure in feet shall not exceed 0.1 times the square root of the number of miles run from the reference datum.

J. Elevations for earth work shall be determined and recorded to the nearest 0.1 foot.

1.7 QUALIFICATIONS

A. All surveys shall be performed under the responsible control and charge of a Professional Land Surveyor licensed in the State of North Carolina.

1.8 DEFINITIONS – Not Used

PART 2 PRODUCTS

2.1 GENERAL

A. The CONTRACTOR shall be responsible for calculation of the quantity of required equipment, materials and supplies based on the Construction Drawings and other factors as identified by the CONTRACTOR.

B. The CONTRACTOR shall be responsible for all costs associated with delays or material quantity shortfalls due to miscalculations, or required re-work resulting from not meeting material or placement specifications.

2.2 EQUIPMENT AND SUPPLIES

A. CONTRACTOR shall be responsible for all equipment and supplies required for completion of the Work.

B. Ensure that equipment for construction surveys is of a quality and condition to provide the required accuracy.

C. Maintain equipment in good working order and in proper adjustment at all times.

D. Records of calibration tests, accuracy checks and adjustments shall be maintained and be available for inspection by the ENGINEER.

E. Material includes all the necessary field notebooks, stakes, templates, platforms, equipment, spikes, steel pins, tools, and all other items necessary to perform the work specified.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify condition of equipment and supplies.

3.2 PREPARATION

A. Plan installation of temporary control points on site in locations that will not interfere with or be damaged by construction activities.

3.3 PROTECTION

A. Ensure that control points are clearly identified in the field and adequate measures are taken to protect such points during the construction activities.

3.4 FIELD QUALITY CONTROL

A. Meet the applicable requirements of Section 01 40 00 – Contractor Quality Control.

3.5 BENCHMARKS AND PRIMARY CONTROL POINTS

A. Baselines and benchmarks shall be used as the origin of all surveys, layouts, and measurements to establish construction lines and grades. The CONTRACTOR shall take all necessary precautions to prevent the loss or damage of primary control points. Any stakes or control points lost or damaged by construction activity will be reestablished by the CONTRACTOR or at CONTRACTOR's expense.

3.6 TEMPORARY BASELINES AND CONTROL POINTS

A. If possible temporary benchmarks, baselines, etc. shall be tied to primary control points.

3.7 CONSTRUCTION SURVEYS

A. CONTRACTOR performed surveys shall consist of all work necessary for:

1. Establishing lines and grades.
2. Setting stakes as described in 3.8 below.
3. Performing pre-construction and final surveys for final quantities.
4. Performing quantity surveys, measurements, and computations for progress payment.
5. Perform record survey drawings/verification.
6. Other surveys as needed.

B. A pre-sediment excavation/relocation survey after draining of the lake and prior to sediment excavation/relocation shall be performed by a licensed surveyor. This survey will be used as the existing conditions basis for determining sediment excavation/relocation volumes for payment purposes.

C. A survey of the final grading of the sediment excavation area (areas where sediment was removed around the risers) shall be prepared by a licensed surveyor following relocation/removal of the sediment. The existing conditions survey and the final grade survey will be used to compute the quantity of sediment removed.

END OF SECTION

SECTION 01 57 60

CONTROL OF WATER

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the control of surface waters as needed to perform the required construction, including:

1. Preparation and submission of a Water Control Plan.

2. Designing, building, and maintaining all necessary temporary and permanent diversion works required.

3. Furnishing, installing and operating all necessary pumps, piping and other facilities and equipment.

4. Removing all temporary works and equipment after they have served their purposes.

B. Related Sections:

1. Section 01 56 50 – Pollution Control

2. Section 35 20 23 – Sediment Relocation

1.2 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.3 SUBMITTALS

A. Meet the applicable requirements of Section 01 33 00 - Submittal Procedures.

B. Prepare and submit a **Water Control Plan** to the ENGINEER for review:

1. Procedure and schedule to lower and maintain the drained reservoir levels.
2. A narrative describing the approach to diverting water through the construction sites. This includes construction and diversion sequencing, a description of the diversion structures and facilities and associated calculations, coordination with other affected constructions activities, operational considerations, and proposed approach for installation and removal of temporary equipment and facilities.
3. A hydraulic analysis of the CONTRACTOR’s proposed temporary conveyance and diversion systems showing the capacity to handle base and flood flows while minimizing downstream turbidity.

C. Approval by the ENGINEER of CONTRACTOR submittals shall not alleviate the CONTRACTOR’s responsibilities for completing the work as specified.

1.4 WATER CONTROL REQUIREMENTS

A. The Water Control Plan shall consider the following project requirements and constraints:
   1. The lake levels shall be maintained in a dry or relatively dry condition to facilitate the work.
   2. Turbid water will not be allowed to pass downstream.

1.5 QUALITY REQUIREMENTS

A. Surface water, groundwater, runoff and other site conditions will vary at each site.

B. It is solely the CONTRACTOR's responsibility to evaluate the applicability of the available information and to obtain or develop additional information as a basis for development of the Plan.

1.6 QUALIFICATIONS

A. The Water Control Plan shall be completed by personnel with expertise in the appropriate technical disciplines.

B. Calculations and Shop Drawings submitted with the Water Control Plan shall be signed and sealed by a Professional ENGINEER licensed to practice in North Carolina.

PART 2 PRODUCTS

2.1 GENERAL

A. The CONTRACTOR shall be responsible for calculation of the required volume and quantities of each material needed based on Drawings, the approved Water Control Plan and associated Shop Drawings, and other factors as identified by the CONTRACTOR.

B. The CONTRACTOR shall be responsible for all costs associated with delays or material quantity shortfalls due to volume or quantity miscalculations or required rework resulting from not meeting the requirements of this specification and the approved Water Control Plan and Shop Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Meet the applicable requirements of Section 01 40 00 – Contractor Quality Control.

B. Meet the applicable requirements of Section 01 30 00 - Administrative Requirements.

3.2 PREPARATION

A. Complete field activities required in preparation for construction of diversion works.

B. The CONTRACTOR shall plan and sequence work activities taking into consideration the potential for the lake to fill and the spillway to activate (flow).

3.3 PROTECTION

A. Protect lakes and surrounding areas from any and all materials used or disturbed during the water control activities, including soils and sediment, fill, admixtures, oil and grease, loose debris, and chemicals.

B. The CONTRACTOR shall be solely responsible for any and all damage to the Work caused by floods, storms, dewatering device failure and/or floating debris and shall take every precaution to prevent any damage to the Work which may be caused by rain, floods, storms, and/or floating debris.

C. The CONTRACTOR shall be responsible to repair to the satisfaction of the ENGINEER any damages caused to the Work or adjacent property resulting from the CONTRACTOR's failure to provide adequate control of water.

D. In the event of flooding and consequent possibility of diversion structure overtopping or dewatering device failure, the CONTRACTOR shall implement measures to minimize damage to construction work.

E. Should overtopping occur, the CONTRACTOR shall dewater and clean out the affected areas and undertake all repairs to the construction work. This work shall be completed expeditiously after the high-water event has passed.

3.4 FIELD QUALITY CONTROL

A. Meet the requirements of Section 01 40 00 - Quality Requirements.

3.5 DIVERSION

A. The water level in each reservoir should be lowered at a rate of less than 1 foot per day. Care should be taken the lowering the reservoirs to prevent sediments from going into the stream, downstream of each dam.

B. Once each reservoir has been drained, the low-level drain gate shall be exposed and removed. Base flows should then be passed through the riser or over the embankment.

C. Sequencing of the control of water diversion activities and coordination with other construction activities on site shall be the responsibility of the CONTRACTOR and detailed in the Water Control Plan.

3.6 REMOVAL

A. Removal includes stockpiling, spoiling, re-use or disposal of materials used in the Control of Water program. Under no conditions shall the CONTRACTOR be allowed to dispose of any such materials in the lake, or the adjacent areas without prior approval of the ENGINEER.

B. All materials that are stockpiled materials must be removed before completion of the project.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. This Section addresses the following topics:

1. Products.
2. Product delivery requirements.
3. Product storage and handling requirements.
4. Product substitution procedures.

B. Related Sections:

1. None

1.2 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.3 REFERENCES - Not used

1.4 SUBMITTALS

A. Meet the requirements of Section 01 33 00 - Submittal Procedures.

B. Submit all Requests for Product Substitution in writing.

C. Submit a separate request for each proposed substitution.

D. A Request for Product Substitution constitutes a representation that the CONTRACTOR:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for Substitution as for specified product.
3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete at no additional cost to OWNER.
4. Waives claims for additional costs or time extension which may subsequently become apparent.
5. Will reimburse OWNER for review or redesign services associated with re-approval by authorities having jurisdiction.

E. Include the following in each Request for Product Substitution:

1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents.

2. Product identification, including manufacturer's name and address.

3. Manufacturer's literature; including:
   a. Product description.
   b. Reference standards.
   c. Performance and test data.
   d. Operation and maintenance data.

4. Samples, as applicable.

5. Name and address of similar projects on which product has been used and date of each installation.

6. Itemized comparison of the proposed substitution with product specified and significant variations.

7. Data relating to impact on construction schedule occasioned by the proposed substitution.

8. Any effect of substitution on separate contracts.

9. List of changes required in other work or products.

10. Accurate cost data comparing proposed substitution with product specified, including amount of any net change to CONTRACT Sum.

11. Designation of required license fees or royalties.

12. Designation of availability of maintenance services and sources of replacement materials.

13. Technical data as required in individual specifications.

1.5 QUALITY REQUIREMENTS

A. Provide new industrial quality products for the Work, unless used or reuse of existing is specifically authorized in the Contract Documents.

B. Provide standard catalog products of manufacturers regularly engaged in the manufacture of the products unless specifically authorized otherwise.

C. Provide products that comply with specified requirements and that will function properly in their expected environment and under expected service conditions.

D. Provide products complete with accessories, trim, finish, fasteners, and other items shown, indicated, or required for a complete installation for the indicated use and performance.

E. Where two or more units of the same product class are provided, provide products from the same manufacturer that are interchangeable.

F. Use/provide factory assemble equipment when practical.

G. For equipment shipped unassembled, provide assembly plans and written instructions. Match-mark or tag separate parts and assemblies to facilitate field assembly.

H. Install products in accordance with requirements of Contract Documents and approved manufacturer's recommendations.

1.6 QUALIFICATIONS – Not Used

1.7 DEFINITIONS

A. Products: Materials, equipment, machinery, components, fixtures, systems, and other goods incorporated in the Work. Products do not include machinery and equipment used for preparing, fabricating, conveying, erecting, or installing the Work.

B. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.

C. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

D. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: CONTRACTOR may submit request for substitution for any manufacturer not named in accordance with these Specifications.

E. Whenever a product, material or item of equipment is specified or described by using the name of a proprietary product or the name of a particular manufacturer or vendor, followed by the phrase "or equal," the specific item mentioned shall be the basis upon which bids are to be prepared, and shall be understood as establishing the type, function, dimension, appearance, and quality desired.

F. Other manufacturer's or vendor's products not named will be considered as substitutions, provided the required information is submitted in the manner set forth in this Section and provided the substitution meets the requirements set forth in this Section.

1.8 PRODUCT WARRANTIES

A. Warranties specified for products shall be in addition to, and run concurrent with, CONTRACTOR'S general warranty and guarantee and requirements for the required correction period. Disclaimers and limitations in specific product warranties do not limit CONTRACTOR'S general warranty and guarantee.

1. Product manufacturer's warranty is a preprinted written warranty published by product manufacturer and specifically endorsed by product manufacturer to the OWNER.

2. Special warranty is a written warranty required by or incorporated into the Contract Documents, either to extend the time limit provided by the product manufacturer's warranty or to provide increased rights to the OWNER.

B. Requirements for Special Warranties: Provide written special warranty document that includes appropriate terms and identification, ready for execution by product manufacturer and OWNER. Submit draft warranty with submittals required for the product.

1. Manufacturer's Standard Form: Modify to include Project-specific information and properly execute by product manufacturer and other parties as appropriate.

2. Specified Form: When specified forms are included in the Contract Documents, prepare written document, properly executed by product manufacturer and OWNER, using appropriate form.

3. Refer to individual Specifications Sections for content and requirements for submitting special warranties.

C. Submit product manufacturer's warranties and special warranties as submittals in accordance with Schedule of Submittals accepted by OWNER.

PART 2 PRODUCTS

2.1 GENERAL

A. Furnish products of qualified manufacturers suitable for intended use.

B. Furnish products of each type by single manufacturer unless specified otherwise.

2.2 PRODUCT SUBSTITUTION CRITERIA

A. OWNER will consider Requests for Product Substitutions only within 30 days of Notice to Proceed.

B. For each Request for Product Substitution, provide evidence to the OWNER and ENGINEER that all the following conditions exist:

1. The specified product is unavailable for reasons beyond the control of the CONTRACTOR. Such reasons shall consist of strikes, bankruptcy, discontinuance of manufacturer, or acts of God.

2. The CONTRACTOR placed, or attempted to place, orders for the specified products within 15 days after Notice to Proceed.

3. Request for substitution is made in writing to the OWNER within 10 days of the date on which the CONTRACTOR ascertains that they cannot obtain the item specified.

4. Complete data as set forth herein to permit complete analysis of the proposed substitution is submitted with the request.

C. The OWNER'S decision regarding evaluation of substitutions shall be considered final and binding.

D. Requests for time extensions and additional costs based on submission of, acceptance of, or rejection of substitutions will not be allowed.

E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.

PART 3 EXECUTION

3.1 PRODUCT DELIVERY

A. No deliveries will be accepted by the OWNER.

B. CONTRACTOR shall make all arrangements for transportation, delivery and handling of equipment and materials required for prosecution and completion of the Work.

C. Products shall not be fabricated or shipped from the manufacturer's or fabricator's facility or delivered to project site until related Shop Drawings, data sheets, shop or factory test reports and records, have been approved and returned without objection by the OWNER.

D. Shipments of materials shall be delivered to the site only during regular working hours.

E. Products shall not be delivered to the site until required storage facilities have been provided and are ready to receive products for storage.

F. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

3.2 PRODUCT STORAGE AND HANDLING

A. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to the product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

I. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

J. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

3.3 PRODUCT SUBSTITUTION PROCEDURES

A. Submit Request for Product Substitution for consideration.

B. Limit each request to one proposed substitution.

C. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence.

D. Burden of proof is on the CONTRACTOR.

E. ENGINEER will notify CONTRACTOR in writing of decision to accept or reject request.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. This Section expands on the requirements for execution and closeout, and includes the following topics:

1. Project Record Documents.
2. Transfer of Project Records.
3. Operation and Maintenance Manuals.
4. Demonstration and Instruction.
5. Product warranties and product bonds.
6. Spare parts and maintenance products.
7. Final cleaning.

1.2 QUALITY REQUIREMENTS – Not Used

1.3 QUALIFICATIONS – Not Used

1.4 DEFINITIONS

A. **Project Records** is used in this Specification to refer to all of the following:

1. Project Record Documents
2. Project Record Drawings
3. Project Record Specifications
4. Project Record Product Data
5. Project Record Samples
6. Miscellaneous Record Documents

PART 2 PRODUCTS – Not Used

PART 3 EXECUTION

3.1 EXAMINATION – Not Used

3.2 PREPARATION – Not Used

3.3 PROTECTION – Not Used

3.4 FIELD QUALITY CONTROL – Not Used

3.5 PROJECT RECORD DOCUMENTS

A. Maintain in field office in a clean, dry, legible condition at a secure, fire resistant location, a complete set of the following:

1. Contract documents, addenda and modifications
2. Product data
3. Photographs
4. Change orders
5. Test records
6. Survey data
7. Field orders
8. Project Correspondence
9. All other documents pertinent to Contractor's work.

B. Make documents available at all times for inspection by Engineer and Owner during normal working hours.

C. Record Documents shall not be used for any other purpose and shall not be removed from the Contractor's office without Engineer's approval.

D. Keep Record Documents current.

3.6 PROJECT RECORD DRAWINGS

A. Record Drawings may also be referred to as "as-builts" in this and other project documents.

B. Provide a clean, undamaged set of blue or black line white-prints of Drawings and Shop Drawings to be used as Record Drawings.

C. Use colored pencils or felt tipped pens for marking changes, revisions, additions and deletions, to the Record Drawings to show actual installation conditions, as follows:

1. Changes or additions to Work: Red.

2. Deletions: Green.

3. Printed Notation: Blue.

D. Where Shop Drawings more accurately portray Work, record a cross-reference at corresponding location on Drawings.

E. Organize Record Drawings into manageable sets. Bind sets with durable paper cover sheets; print suitable titles, dates, and other identification on cover of each set.

3.7 PROJECT RECORD SPECIFICATIONS

A. Maintain one complete copy of Project Specifications, including addenda as Record Specifications.

B. Include with Record Specifications one copy of other written construction documents, such as Change Orders, RFIs, and modifications issued in printed form during construction.

C. Mark Record Specifications to show substantial variations in actual Work performed in comparison with text of Specifications and modifications.

D. Include manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

E. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

F. Cross-reference to related Record Drawings and Record Product Data.

3.8 PROJECT RECORD PRODUCT DATA:

A. Maintain one copy of each Product Data submittal as Record Product Data.

B. Note related change orders and markup of Record Drawings and Record Specifications.

C. Mark Record Product Data to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to site and from manufacturer's installation instructions and recommendations.

D. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3.9 PROJECT RECORD SAMPLES:

A. Immediately prior to Substantial Completion, meet with Engineer at Project Site to determine which Samples are to be transmitted to Owner for record purposes.

B. Comply with Owner’s instructions regarding delivery to permanent storage area.

3.10 MISCELLANEOUS RECORD DOCUMENTS:

A. Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of Work.

B. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order.

C. Identify miscellaneous records properly and bind or file, ready for continued use and reference.

3.11 TRANSFER OF PROJECT RECORDS

A. Submit Project Records to Engineer for review and comment no later than 30 days after Substantial Completion and prior to Final Acceptance.

B. The Project Records will be reviewed and returned to the Contractor within 30 days of receipt by the Engineer.

C. Make corrections and deliver a final Record Documents submittal not later than 30 days after the Engineer returns the initial submittal and prior to final payment.

D. Each submittal shall be accompanied by a transmittal letter containing:

1. Date
2. Project title and number
3. Contractor’s name and address
4. Title and number of each Record Document
5. Certification that each document as submitted is complete and accurate
6. Signature

3.12 STARTING OF SYSTEMS – Not Used

3.13 OPERATION AND MAINTENANCE MANUALS

A. Submit Operation and Maintenance Manuals bound in 8-1/2 x 11 inch text pages, three D side ring binders with durable [plastic] covers.

B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below in Paragraph E; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Provide required drawings with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages, or insert in pocket pages.

E. Prepare Table of Contents for each volume, with each product or system description identified in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

   a. Significant design criteria.

   b. List of equipment.

   c. Parts list for each component.

   d. Operating instructions.

   e. Maintenance instructions for equipment and systems.

3. Part 3: Project documents and certificates, including the following:

   a. Shop drawings and product data.

   b. Certificates.

   c. Photocopies of warranties.

3.14 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation, control, adjustment, trouble-shooting, servicing, and maintenance of equipment and systems to Owner’s personnel at least two weeks prior to date of final inspection.

B. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

C. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.15 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder(s) with durable plastic cover(s).

F. Submit prior to final Application for Payment.

3.16 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed by Engineer.

C. Obtain receipt prior to final payment.

3.17 FINAL CLEANING

A. Execute final cleaning prior to final project inspection and assessment.

B. Remove waste and surplus materials, rubbish, and construction facilities, including trailers, sheds, workshops, temporary signage, construction lighting, and all temporary utilities from site.

C. Clean site, sweep paved areas, and rake clean landscaped surfaces.

END OF SECTION

SECTION 03 60 00

GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes materials and placement of non-shrink cementitious grout and epoxy grout as designated on Drawings.

B. Use non-shrink cementitious grout for concrete repair and bedding and grouting of equipment base plates.

C. Use epoxy grout for embedding anchors and threaded rods in concrete.

1.2 MEASUREMENT AND PAYMENT

A. No measurement and payment will be made for this work. Compensation for grouting will be included in the payment for the items of work that require grouting.

1.3 REFERENCES

A. American Concrete Institute (ACI)

1. ACI 301 – Specifications for Structural Concrete.
2. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures.

B. ASTM International

1. ASTM C33 – Standard Specification for Concrete Aggregates.
2. ASTM C40 – Test Method for Organic Impurities in Fine Aggregates for Concrete.
3. ASTM C150 – Standard Specification for Portland Cement.
4. ASTM C191 – Test Method for Time of Setting of Hydraulic Cement by Vicat Needle.
5. ASTM C579 – Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings
6. ASTM C827 – Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixture.

C. US Army Corps of Engineers (USACE)

1. CRD-C 621 – Corps of Engineers Specification for Non-Shrink Grout

1.4 SUBMITTALS

A. Meet submittal requirements of Section 01 33 00 - Submittal Procedures.

B. Action Submittals:

1. Concrete Removal Plan:

a. Methods, equipment, and sequence used to cut and remove concrete and prepare the surface for repair.

b. Cleanup operations, equipment, and equipment locations.

c. Plans to prevent damage to remaining concrete.

2. Placement Plan:

a. Describe method(s) to be used to place repair material. Include type and placement of formwork and sequence of installation. Placement plan shall follow the procedure provided in drawings.

C. Product Data: Submit product data on grout to be incorporated into the Work.

D. Manufacturer's Instructions: Submit manufacturer's instructions and recommendations for mixing, handling, surface preparation, placement, curing and appropriate uses for each type of non-shrink and epoxy grouts used in the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Meet applicable requirements of Section 01 60 00 - Product Requirements including transporting, handling, storing, and protecting products.

B. Ensure that pre-packaged materials are stored in an approved location.

C. Deliver grout in manufacturer's unopened containers with proper labels intact.

D. Store grout in a dry shelter, protect from moisture.

E. Store epoxy grout in accordance with manufacturer's recommendations.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not perform grouting if temperatures exceed 95 degrees F.

B. Maintain minimum temperature of 50 degrees F before, during, and after grouting, until grout has set.

PART 2 PRODUCTS

2.1 NON-SHRINK GROUT

A. Non-shrink grout shall be an inorganic, non-gas forming, non-metallic, non-shrink, pre-blended and ready to use cement-based grout requiring only the addition of water at project site.

B. Provide non-shrink grout complying with CRD-C621 from a single manufacturer. Consider:

1. Euclid
2. Five Star Products, Inc.
3. L & M Construction Chemicals, Inc.
4. Meadows
5. Sika
6. Sonneborn or approved equal.

C. Water: Potable; containing no impurities, suspended particles, algae or dissolved natural salts in quantities capable of causing:
   1. Corrosion of steel.
   2. Volume change increasing shrinkage cracking.
   3. Efflorescence.
   4. Excess air entraining.

D. Sand (If required per Manufacturer Specification): ASTM C33 fine aggregate, except 100 percent passing No. 16 sieve.

2.2 EPOXY GROUT

A. Epoxy grout shall be used to embed anchor bolts designed for use with epoxy grouts, dowels, and reinforcing steel required to be set in grout, and other applications as indicated on Drawings.

B. Provide epoxy grout from a single manufacturer. Consider:
   1. Simpson Strong-Tie SET-3G
   2. Hilti RE 500
   3. ITW Ramset/Redhead Epcon C-6
   4. Powers Fasteners Pure150-PRO or approved equal.

2.3 CURING MATERIALS

A. Curing materials shall be as recommended by the manufacturer for pre-packaged grouts.

PART 3 EXECUTION

3.1 EXAMINATION

A. Meet the applicable requirements of Section 01 30 00 - Administrative Requirements.

B. Verify that preparations for installation of grout are complete.

3.2 PREPARATION

A. Remove defective concrete, laitance, dirt, oil, grease and other foreign material from concrete surfaces by cleaning, brushing, hammering, chipping or other similar means until sound, clean concrete surface is achieved.

B. Roughen concrete lightly, but not enough to interfere with placement of grout.

C. Remove foreign materials from metal surfaces in contact with grout.

D. Saturate concrete surfaces with clean water 12 hours prior to grouting. Before placing grout; remove excess or free standing water.

3.3 FORMING

A. Align, level and maintain final positioning of components to be grouted. Forming should allow for a minimum of 1-inch head of grout above bottom of base plates.

B. Provide forms of sufficient strength and securely anchored and shored to withstand pressure of grout and conditions during placement. Fit forms closely together and seal joints.

C. Install formwork with clearances to permit proper placement of grout.

3.4 MIXING

A. Non-Shrink Grout:

1. Mix and prepare non-shrink cementitious grout in accordance with manufacturer's instructions.

2. Non-shrink grouts shall have a minimum compressive strength of 2,400 psi in 48 hours and a minimum 28-day compressive strength of 5,000 psi; shall have no shrinkage (0.0 percent) and a maximum 4.0 percent expansion in the plastic state when tested in accordance with ASTM C827; and shall have no shrinkage (0.0 percent) and a maximum of 0.2 percent expansion in the hardened state when tested in accordance with CRD-C621.

B. Epoxy Grout:

1. Mix and prepare epoxy grout in accordance with manufacturer's instructions.

2. Epoxy grout shall develop a compressive strength of 5,000 psi in 24 hours and 10,000 psi in 7 days when tested in accordance with ASTM C579, Method B.

C. Mix grout components in proximity to work area and transport mixture quickly and in manner not permitting segregation of materials.

3.5 PLACING NON-SHRINK GROUTS

A. Follow established concreting procedures observing precautions for hot and cold weather concreting.

B. Place grout material quickly and continuously using practical method; poured in place or pressure grouted by gravity or plunger. Do not use pneumatic-pressure or dry-packing methods. When practical, place grout from one side flowing to opposite side to avoid air entrapment.

C. Do not vibrate placed grout mixture, or permit placement when area is being vibrated by nearby equipment.

D. Thoroughly compact final installation and eliminate air pockets.

E. Do not remove forms until grout has taken an initial set and will not slump. After removal, cut off excess grout and finish to a smooth surface.

F. Remove shims or leveling devices after curing for 48 hours.

3.6 CURING

A. Immediately after placement, protect grout from premature drying, excessively hot or cold temperatures, and mechanical damage.

B. After grout has attained its initial set, keep damp for minimum of 3 days.

3.7 PROTECTION

A. Ensure that transport, storage, mixing and application of pre-packaged grout does not damage prepared foundations, adjacent concrete or formworks, or allow contamination of adjacent reservoir, creek or wetlands with materials or chemicals.

3.8 FIELD QUALITY CONTROL

A. Meet the applicable requirements of Section 01 40 00 – Contractor Quality Control.

B. Measurement of Ingredients

1. Measurements for grout shall be made accurately by volume using containers.
2. Shovel measurement shall not be allowed.
3. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.

C. Provide free access to Work area and cooperate with OWNER and ENGINEER, as needed.

D. Field Inspection and Testing will be performed by CONTRACTOR'S testing laboratory in accordance with applicable standards.

END OF SECTION

SECTION 05 50 00

METAL FABRICATION AND INSTALLATION

PART 1 GENERAL

1.1 SCOPE

A. This section includes requirements for demolition of existing appurtenant structures, fabricating and installing new appurtenant structures, and cleaning and painting of existing appurtenant structures to remain as shown on the Drawings. The appurtenant structures to be replaced are not consistent across all sites and may include galvanized steel trash racks, ladders, and riser access manhole covers as shown on the Drawings.

1.2 RELATED SECTIONS

A. Section 01 50 00 – Mobilization and Demobilization

B. Section 01 56 50 – Pollution Control

C. Section 01 70 00 – Execution and Closeout Requirements

D. Section 03 60 00 – Grouting

1.3 REFERENCES

A. ASTM International:

1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.

2. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.

3. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

4. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

5. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

6. ASTM A780 - Repair of Damaged Hot-Dip Galvanized Coatings

7. ASTM A992/A992M - Standard Specification for Steel for Structural Shapes for Use in Building Framing

8. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

9. ASTM F594 - Standard Specification for Stainless Steel Nuts

10. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

B. American Welding Society (AWS):

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 – Structural Welding Code – Steel.
3. AWS D1.2 – Structural Welding Code – Aluminum
4. AWS D1.6 – Structural Welding Code – Stainless Steel.

C. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC SP 1 - Solvent Cleaning.
3. SSPC SP 2 - Hand Tool Cleaning
4. SSPC SP 3 - Power Tool Cleaning
5. SSPC SP 6 - Commercial Blast Cleaning.
6. SSPC SP 10 - Near-White Blast Cleaning.

1.4 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.5 SUBMITTALS

A. Shop Drawings:

1. Plans, elevations, sections, and details of metal fabrications and their connections.
2. Anchorage, hardware, locking mechanisms, and accessory items.
3. Show welded connections using standard AWS A2.4 welding symbols.
4. Procedures for shop coating and field repairs to shop coating.

B. Resubmit shop drawings to include as-built changes for installed items in accordance with Section 01 70 00 – Execution and Closeout Requirements.

C. Manufacturer’s data for products used in trash rack fabrication.

D. Manufacturer’s product data for the galvanized steel ladders.

E. Manufacturer’s product data for the riser access manhole frames and covers.

F. Manufacturer’s product data for mounting hardware and other materials used in miscellaneous metal fabrications and installation, as applicable.

G. Procedure for removal of existing appurtenant structures including removal of existing mounting hardware.

H. Approval by the ENGINEER of CONTRACTOR submittals shall not alleviate the CONTRACTOR'S responsibilities for completing the Work as specified.

I. Painting:

1. Shop Drawings: Submit shop drawings indicating layer thickness of coatings for associated metal works at the site, including Manufacturer's product data, pretreatment (if applicable), surface preparation means and methods, application procedures, inspection, and detailing the plan and procedures for containment and other measures to protect the reservoirs.

2. Material Certifications: The paints and paint products in these specifications are mentioned to establish standards of quality. Approved equal products will be considered for application on the project. A request for substitution which decreases the film thickness designated and/or the number of coats to be applied, or which offers a change from the generic type of coating specified will not be considered. Requests for substitutions shall contain the full name of each product, descriptive literature, directions for use and its generic type.

3. Color chips shall be submitted to the OWNER for color selection.

1.6 QUALIFICATIONS

A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce the required product without causing delay in the Work.

B. Quality welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel."

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

PART 2 PRODUCTS

2.1 GENERAL

A. Items specified herein are not intended to be all inclusive. Provide metalwork and castings shown, specified, or which can reasonably be inferred as necessary to complete the project.

2.2 TRASH RACK MATERIALS - STEEL

A. Structural Steel Shapes, Plate, Bars, and Grating (except wide-flange shapes): ASTM A36/A36M.

B. Wide flange shapes: ASTM A992/A992M.

C. Hollow Structural Sections: ASTM A500, Grade B or ASTM A501.

D. Fasteners: Stainless Steel, ASTM F593 and F594.

E. Welding Materials: AWS D1.1; type required for materials being welded.

2.3 LADDER AND MANHOLE FRAMES AND COVERS

A. Galvanized steel ladder members shall meet the requirements of ASTM A36.

B. Stainless steel bolts, anchors, fasteners, and other mounting hardware shall meet the requirements of ASTM F593, Grade 304.

C. All welding shall be in accordance with AWS D1.1.

D. Epoxy Grout for Anchor Bolts: Hilti HIT-RE 500 V3 or approved equal.

2.4 MOUNTING HARDWARE

A. All bolts, anchors, fasteners, and other mounting hardware shall be stainless steel and meet the requirements of ASTM F593, Grade 304. ASTM B98, C651 silicone bronze nuts shall be used for all stainless steel bolts and embedded anchors. Use anti-seize lubricant for all stainless steel fasteners.

B. Anchors shall be Kwik Bolt TZ mechanical expansion anchors or approved equivalent. If stainless steel threaded epoxy anchor bars are used, epoxy shall be Hilti HIT RE 500-V3 or approved equivalent.

2.5 FACTORY APPLIED FINISHES - STEEL

A. Galvanize all ferrous metals for the trash rack and ladder except as noted. Items specified to be galvanized shall be completely fabricated for field assembly before the application of the zinc coatings. Galvanized items shall not be cut, welded, or drilled after the zinc coating is applied.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Galvanizing: ASTM A123/A123M; 1.2 oz/sq. ft. minimum coating thickness or hot-dipped galvanizing, ASTM A153/A153M; galvanize after fabrication.

2.6 FIELD APPLIED FINISHES

A. All products shall be from a single manufacturer. Although the coatings listed in the field coatings include products from a single manufacturer for the purpose of specifying the type of coating system, an alternative single manufacturer may be selected by the CONTRACTOR and approved by the ENGINEER for all products throughout the project. All paint products shall be as manufactured by Carboline, Sherwin-Williams, Tnemec, or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive Work.

B. Obtain field measurements of the manhole opening prior to fabrication of the replacement manhole cover, as necessary.

3.2 DEMOLITION / PREPARATION

A. The CONTRACTOR shall completely remove the old steel trash rack (where specified in the drawings), and ladder including existing anchor bolts, and concrete surfaces shall be cleaned of all projections and debris in order to refurbish or install the new steel trash rack and ladder as shown on the Drawings.

B. Prevent damage to concrete during trash rack and ladder removal. Any damage caused to the existing concrete during trash rack and ladder removal shall be repaired to the satisfaction of the ENGINEER at no additional cost to the OWNER prior to installation of the new gate.

C. Dispose of the existing trash rack, ladder and appurtenances off-site in accordance with applicable local and state regulations.

3.3 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and welded as one trash rack unit.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications.

E. Apply galvanized coating at fabrication shop in accordance with applicable ASTM standards.

3.4 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

3.5 DELIVERY, STORAGE, AND HANDLING

A. Accept metal fabrications on site in labeled shipments. Inspect for damage.

B. Protect metal fabrications from damage and exposure to weather.

C. All paints to be used in the work shall be delivered to the site in their original unbroken containers. All ingredients shall be prepared, packed, labeled, and guaranteed by the manufacturer. Painting materials shall be stored at the site in a place and in the manner consistent with manufacturer recommendations.

3.6 INSTALLATION

A. Provide for delivery, handling and placement loads, and for any bracing to maintain true alignment until completion of installation of permanent attachments.

B. Install the appurtenant structures plumb and level, accurately fitted, free from distortion or defects. Completed installations shall be rigid, and neat in appearance.

C. Install mechanical expansion anchors or epoxy anchors in accordance with the manufacturer's instructions.

D. Obtain prior approval prior to performing any field adjustments or welding. Perform field welding in accordance with the appropriate AWS Standard.

E. Install commercially manufactured products in accordance with manufacturer's recommendations.

3.7 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From Plane: 1/4 inch.

3.8 CLEANING AND FINISHES

A. Where zinc coating has been damaged after installation, substrate surface shall be first cleaned and then repaired with zinc dust-zinc oxide coating in accordance with ASTM A780.

B. Application shall be as recommended by the zinc dust-zinc oxide coating manufacturer.

C. Coating shall consist of multiple coats to dry film thickness of 8 mils.

3.9 FIELD CLEANING AND PAINTING OF EXISTING METALS

A. Storage Conditions:

1. Minimum Ambient Temperature: 45 degrees F (7 degrees C).
2. Maximum Ambient Temperature: 90 degrees F (32 degrees C).

B. Application Conditions:

1. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint manufacturer.
2. Do not apply exterior coatings during rain or snow, when relative humidity is outside humidity ranges, or when moisture content of surfaces exceeds those required by paint manufacturer.

C. No coatings shall be applied in a dust-laden environment. Clean all substrates of substances that could impair bond of paints, including dirt, debris, oil, grease, and incompatible paints and encapsulants.

D. Cleaning:

1. Vacuum surfaces to remove loose particles.
2. Use tack cloth to remove dust and particles just prior to applying next coat.

E. Verify that surfaces are ready to receive Work as recommended by product manufacturer.

F. All surface preparation shall be in accordance with the latest revision of the surface preparation specifications of the Steel Structures Painting Council and NACE.

1. Hand Tool Cleaning (SSPC-SP2): Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by hand chipping, scraping, sanding and wire brushing.
2. Power Tool Cleaning (SSPC-SP3): Removal of loose rust' loose mill scale and other detrimental foreign matter to degree specified by power wire brushing, power impact tools or power sanders.

G. Exposed Steel:

1. Surface Preparation: Power wash using minimum 3,500 psi and rotating tip to remove all loose dirt, dust, mildew, loose coatings, and other foreign matter.

Simple Green Solution or approved equal shall be used with power washing. SSPC-SP2 Hand Tool Cleaning or SSPC-SP3 Power Tool Cleaning to all rusted and bare metal, feather smooth the edges of all tightly adhered material and spot prime.

2. Coating System:

System Manufacturer	First/Prime	Second/Intermediate	Third/Finish
Tnemec	Series 118 Uni-Bond Mastic (at 6.0-8.0 mils DFT)	Series 1095 Endurashield (at 2.5-3.0 mils DFT)	Series 1070 Fluoronar (at 2.5-3.0 mils DFT)

H. Cast Iron:

1. Surface Preparation: Remove all loose dirt, dust, mildew, loose coatings, and other foreign matter following SSPC-SP2 Hand Tool Cleaning.

2. Coating System:

System Manufacturer	First/Prime	Second/Intermediate	Third/Finish
Tnemec	Series 20 Pota-Pox (at 2.0-6.0 mils DFT)	Series 21 Epoxoline (at 4.0-20.0 mils DFT)	Series 1095 Endurashield (at 2.5-5.0 mils DFT)

I. Debris Capture: CONTRACTOR shall install a containment system for the purpose of capturing debris and other items or materials required to perform the work on any locations that are above water. No paint chips, masking materials, tools or other items are permitted to enter the drained reservoir.

J. All paints shall be applied in accordance with the manufacturer's written instructions based on the materials being coated and their exposure conditions. Use applicators and techniques suited for paint and substrate indicated.

K. Do not apply finishes to surfaces that are not dry.

L. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

M. Each application of coating or paint shall be applied evenly, free of brush marks, sags, runs, with no evidence of poor workmanship. Care shall be exercised to avoid lapping on glass or hardware. Coatings and paints shall be sharply cut to lines. Finished surfaces shall be free from defects or blemishes. All coats herein specified are in addition to shop or other coats specified to be applied by other trades.

N. All welds, edges and other irregular surfaces shall receive a brush coat of the specified product prior to application of the first complete coat.

O. All coatings shall be warranted by the CONTRACTOR to be free from defects for a period of three (3) years after final acceptance.

PART 4 SCHEDULES

4.1 METAL FABRICATION AND PAINTING SCHEDULES

A. Fabricate or provide the following items and all other miscellaneous metal components shown on Drawings using materials and methods indicated in this Section:

Item	Material	Finish/Coatings
Trash Rack	Steel	Galvanized
Ladder (New)	Steel	Galvanized
Manhole Cover (New)	Steel	Galvanized

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.1 SCOPE

A. The work shall consist of site restoration and establishing a permanent vegetative cover on all disturbed areas created during access and construction of the work. A temporary vegetative cover shall be established during all times of the year not suitable for permanent seeding.

1.2 RELATED SECTIONS

A. Section 01 56 50 – Pollution Control

1.3 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.4 REFERENCES

A. ASTM International:

1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

B. Other

1. State of North Carolina, Erosion and Sedimentation Control Planning and Design Manual

1.5 SUBMITTALS

A. Submit Product Data for seed mix, fertilizer, mulch, and other products to be used.

B. Submit Manufacturer's Certificate certifying that products meet or exceed specified requirements.

1.6 QUALITY REQUIRMENTS

A. All fertilizers shall be delivered in original, unopened containers bearing manufacturers guaranteed analysis.

B. All seed shall be delivered in original, unopened containers bearing manufacturers analysis of contents. Seed shall be guaranteed 95 percent pure and have a minimum germination rate of 85 percent, within 1 year of test.

PART 2 PRODUCTS

2.1 GENERAL

A. The CONTRACTOR shall be responsible for calculation of the required quantity and volume of each material based on the Drawings, test results, estimates of wastage during delivery, stockpiling, haulage and placement, experience with similar materials, and other factors as identified by the CONTRACTOR.

B. The CONTRACTOR shall be responsible for all costs associated with delays or material quantity or volume shortfalls due to miscalculation or required rework resulting from not meeting material or placement specifications.

2.2 TOPSOIL

A. Topsoil, if needed, shall be a friable loam containing a large amount of humus and shall be original surface soil of good rich, uniform quality, free from any material such as hard clods, stiff clay, hardpan, partially disintegrated stone, pebbles larger than 1/2-inch in diameter, lime, cement, bricks, ashes, cinders, slag, concrete, bitumen or its residue, boards, stocks, chips or other undesirable material harmful or unnecessary to plant growth.

B. Topsoil shall be reasonably free from perennial weeds and shall not contain objectionable plant material, toxic amounts of either acid or alkaline elements, or vegetable debris undesirable or harmful to plant life.

C. Topsoil shall be natural topsoil without admixture of subsoil material, and shall be classifiable as loam, silt loam, clay loam, sandy loam or a combination thereof.

D. The pH of topsoil shall range from 5.5 to 7.0.

E. Topsoil shall contain not less than 5 percent nor more than 20 percent by weight organic matter as determined by loss on ignition of oven-dried samples to 65 degrees C.

2.3 SEEDS

A. Approved seeds for disturbed areas are as follows.

1. KY 31 Tall Fescue or Alto Tall Fescue
2. Kentucky Bluegrass
3. Hard Fescue

B. Approved Kentucky Bluegrass Cultivars: Kenblue, Glade, Adelphi, Baron, Bristol, Challenger, Columbia, Fylking, Merit, Plush, RamI, Rugby, Sydsport, Touchdown, Vantage

C. Approved Hard Fescue Cultivars: Spartan, Scaldis, Aurora, Reliant, Valda, Crystal, Waldina

2.4 SEED MIXTURES

A. Seed Mixtures composed of allowable seeds may be preferred based on soil type and chemistry, type of service expected, life expectancy, maintenance requirements, and location on the site.

B. The CONTRACTOR shall provide the required seed mixes based on such considerations for each area of the site.

2.5 FERTILIZER

A. Commercial Fertilizer shall be a complete plant food containing nitrogen, phosphoric acid, and potash in percentages as recommended by the NC Department of Agriculture based on an analysis of topsoil and soil required herein.

B. Fertilizer shall conform to applicable state fertilizer laws with availability of plant nutrients conforming to the standards of the Association of Official Agricultural Chemists.

C. Fertilizer shall be uniform in composition, dry, and free-flowing.

2.6 MULCH AND MATTING

A. Temporary mulch may be straw, matting, netting, bark, wood chips, or other suitable material as approved by the ENGINEER and shall be reasonably clean and free of noxious weeds and deleterious material.

B. Matting shall be heavy twisted jute mesh. Openings between strands shall be approximately 1” square.

C. For seeded areas, mulch shall be threshed straw of oats, wheat or rye, free from seed of obnoxious weeds, or clean salt hay.

2.7 LIMESTONE / LIME

A. Meets the requirements of ASTM C602 and additional requirements listed as follows.

B. Shall be ground dolomitic limestone not less than 90 percent total of calcium carbonate equivalents, ground so that 25 percent passes #100 mesh sieve and 90 percent passes #20 mesh sieve.

C. Coarser limestone material will be acceptable, provided specified rates of application are increased proportionately on the basis of percent passing the #100 mesh sieve.

D. Shall contain not less than 10 percent magnesium.

2.8 ACCESSORIES

A. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

B. Stakes: Softwood lumber, chisel pointed.

C. String: Inorganic fiber.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify prepared soil base is ready to receive the work of this section.

3.2 PREPARATION

A. Before liming, fertilizing and seeding, the topsoil surface shall be trimmed and worked to true line from unsightly variation, bumps, ridges and depressions and all detrimental material, roots and stones larger than two inches in any dimension shall be removed from the soil.

B. Not earlier than 24 hours before the seed is to be sown, the soil surface to be seeded shall be thoroughly cultivated to a depth of not less than 2 inches with a weighted disc, tiller, pulvimixer or other equipment until the surface is smooth and in a condition acceptable to the ENGINEER.

C. If the prepared surface becomes eroded as a result of rain or for any other reason, or becomes crusted before the seed in sown, the surface shall again be cultivated for seeding.

D. Ground preparation operations shall be performed only when the ground is in a tillable and workable condition, as determined by the ENGINEER.

E. Apply fertilizer prior to seeding as per the requirements listed below.

3.3 PROTECTION

A. Stockpile and store lime, fertilizer, seed, soil conditioners in an area pre-approved by the ENGINEER.

B. Provide protection as needed to maintain these materials dry.

3.4 FIELD QUALITY CONTROL

A. Areas requiring re-work due to failure of the grass to thrive shall be the responsibility of the CONTRACTOR, at the discretion of and at the direction of the ENGINEER.

B. Such re-work shall be completed by the CONTRACTOR as directed by the ENGINEER at no cost to the OWNER.

3.5 LIME AND FERTILIZER APPLICATION

A. Apply lime at application rate recommended by soil analysis.

B. Apply fertilizer at application rate recommended by soil analysis.

C. Apply after smooth raking of topsoil.

D. Do not apply fertilizer at same time or with same machine used to apply seed.

E. Mix fertilizer thoroughly into upper 2 inches of topsoil.

F. Lightly water soil to aid dissipation of fertilizer. Irrigate top level of soil uniformly.

G. During seeding, application of limestone or fertilizer by bulk truck spreader shall not be permitted.

3.6 SEEDING, MULCHING, AND MATTING

A. Seeding and mulching shall be done on all earth areas disturbed by construction or as designated by the ENGINEER.

B. Seeding and mulching shall be carried out immediately behind construction and shall be considered a part of construction. Deviations from this procedure shall be only with the written authorization of the ENGINEER.

C. Apply types and rates as specified in Section 6.11 of the State of North Carolina Erosion and Sediment Control Planning and Design Manual.

D. Apply mulch or matting as required to retain soil and grass.

E. On slopes flatter than 2.5H to 1V, mulch areas by spreading light cover of mulch over seeded area at a rate of not less than 2.0 tons per acre.

F. On slopes steeper than 2.5H to 1V, mulch with matting. Follow manufacturer's recommendations for anchoring of matting to the slope.

3.7 MAINTENANCE

A. Water to prevent grass and soil from drying out.

B. Control growth of weeds. Apply herbicides. Remedy damage resulting from improper use of herbicides.

C. Immediately reseed areas showing bare spots. The CONTRACTOR is responsible for establishing a thick stand of grass and shall reseed and repair washouts, gullies, and eroded areas as necessary until grass is established.

3.8 ACCEPTANCE

A. Vegetative cover shall be determined to be adequate upon approval by the OWNER or ENGINEER.

END OF SECTION

SECTION 35 20 16

SLIDE GATES

PART 1 GENERAL

1.1 SUMMARY

A. This section includes requirements for furnishing, installing, and testing the new wall-mounted cast iron slide gates, grout pads, operating stems, stem guides, operating floor stands, and other appurtenances required. The size, quantity, gate configuration and operating conditions are listed on the gate schedule. Gate and frame design shall conform to AWWA C561 as required. Manufacturer shall be experienced and in regular production of gates and water control equipment.

B. RELATED SECTIONS

1. Section 01 56 50 – Pollution Control
2. Section 01 57 60 – Control of Water
3. Section 01 70 00 – Execution and Closeout Requirements
4. Section 03 60 00 – Grouting
5. Section 05 50 00 – Metal Fabrications and Installation

1.2 REFERENCES

A. ASTM International:

1. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes
2. ASTM A48, Class 30 – Standard Specification for Cast Iron and Grey Cast Iron
3. ASTM B584 - Standard Specification for Cast Bronze

B. American Water Works Association

1. ANSI/AWWA C561 - Fabricated Stainless Steel Slide Gates

1.3 MEASUREMENT AND PAYMENT

A. The basis for measurement and payment is provided in Section 01 22 00 – Measurement and Payment.

1.4 SUBMITTALS

A. Meet the requirements of Section 01 33 00 – Submittal Procedures.

B. Submittals shall include the following minimum information for slide gate described in Gate Schedule:

1. Installation Plan describing methods, materials, and qualifications of personnel for removal of sediment away from the riser as required for removal of the existing slide gate and installation of the new slide gate as shown on the Drawings and specified herein. Include plan for avoiding drilling through existing rebar.
2. Certificate(s) of the new gate's compliance with applicable AWWA standards.
3. Shop drawings for fabricated items shall show dimensions, sizes, finishes, fasteners and welds, and relationship of work to adjoining construction. Reference construction materials by ASTM designations and grades. Include information on painting and coating.
4. For standard manufactured items, submit manufacturer's catalog work sheets showing illustrated cuts of items to be furnished, including scale details, dimensions and materials. Reference construction materials by ASTM designations and grades. Include information on painting and coating.
5. Calculations documenting stem sizing for slide gate.
6. Calculations documenting lift sizing for slide gate.
7. Manufacturer's installation instructions.
8. Estimated weight of slide gate components and assemblies.
9. Placement or installation drawings which indicate locations of all items provided under this section and relationships to adjoining work. Include methods and materials for the grout pad and anchorage of the new slide gate to the riser. Reproduction of contract documents will not be accepted for this purpose. Verify all dimensions to ensure proper fit of all items with existing structures.

C. Informational Submittals:

1. Submit certified test results for all tests required by this Section within 14 days following completion of the respective test.
2. Submit an operation and maintenance manual for sluice gate and lift in accordance with Section 01 70 00 – Execution and Closeout Requirements

D. Approval by the ENGINEER of CONTRACTOR submittals shall not alleviate the Contractor's responsibilities for completing the Work as specified.

1.5 QUALITY REQUIREMENTS

A. Coordinate selection of slide gate, lifts, and accessories with related components of the work to ensure proper operation of all systems and equipment.

B. Provide slide gate, lifts, and related accessories from a single supplier, who shall be responsible for proper selection and sizing of equipment and components in accordance with these specifications.

C. Provide services of a manufacturer's representative to check slide gate installation and perform or supervise testing and adjustment of the equipment.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide slide gate in accordance with Part 4.1 of this Section

B. Slide Gate, guides, operators, hardware and components shall be designed for the operating conditions contained in Part 4.1 of this Section.

C. Slide Gate, guides and anchor systems shall be designed to withstand a seating head for operating conditions contained in Part 4.1 of this Section.

2.2 MANUFACTURERS

A. Slide gate and accessories shall be manufactured by Rodney Hunt Company, Hydro Gate Corporation, Waterman Industries, or approved equal.

2.3 DESIGN CRITERIA – SLIDE GATE

A. Slide gate shall be a wall-mounted, non self-contained, heavy duty cast iron slide gate with flush bottom closure. Slide gate shall be Rodney Hunt Series A-102, or approved equal.

B. Slide gate shall be cast iron, fully bronze mounted with side wedges for seating head conditions and side, top, and bottom wedges for unseating head conditions.

C. Slide gate and accessories shall comply with AWWA C560.

D. Provide slide gate with a rising stem meeting design requirements shown in Part 4.0 - Gate Schedules.

E. All materials and components used in the manufacture and fabrication of slide gate shall be new and suitable for uses intended in this application.

F. All slide gate parts, including lift, shall be designed for the heads shown, with a minimum working stress safety factor not to exceed the lower value of one third the yield strength or one fifth the ultimate strength of the material.

G. Operating load calculations for all installations shall be submitted and shall include the loads imposed on the structure under a 40 pound effort. The normal operating load and the output of the operator at the 40 pound effort shall be noted on the installation drawings.

H. Component Material Specifications:

1. Wedges, thrust nut, gate activator lift nut: Bronze ASTM B584, Alloy C86500 or C86700.

2. Stems, Stem couplings, fasteners, anchors, flush bottom retainer bar: Stainless steel ASTM A276, Type 304.

3. Seating faces, stem guide liners: Bronze ASTM B21, Alloy C46400.

I. Grout pad shall consist of high strength, cementitious, non-shrink grout.

J. Epoxy for anchors shall meet the requirements of Hilti HIT-RE-500 V3 or approved equal.

K. Component Material Specification:

1. Wedges, thrust nut, gate activator lift nut: Bronze ASTM B584, Alloy C86500 or C86700.

2. Stems, Stem couplings, fasteners, flush bottom retainer bar: Stainless steel ASTM A276, Type 304.

3. Seating faces, stem guide liners: ASTM B98, Alloy 651 Silicon Bronze or ASTM B21, Alloy C46400 Naval Bronze.

L. Provide slide gate with guides of such length as to retain and support at least one half the disc in full raised position.

M. Slide gate shall have filled back discs with no more than 0.188" relief.

N. Slide gate shall be provided with square or bull-nosed ribs.

2.4 SLIDE GATE LIFTS

A. Provide slide gate with a manually operated crank floor stand conforming to the requirements of AWWA C540. The crank-operated lifts shall have either single or double gear reduction, depending on lifting capacity required.

B. Floor stands shall operate the slide gate under specified operating head with not greater than a 40-pound pull on the crank or hand wheel. Gears, where required, will be steel with machine-cut teeth designed for smooth operation. Stainless steel pinion shafts on crank operated floor stands, whether single or double ratio, shall be supported on tapered roller bearings or needle bearings. All components will be totally enclosed in a cast iron case and cover. Positive mechanical seals will be provided on the operating nut and pinion shaft to exclude moisture and dirt and prevent leakage of lubricant out of hoist. Provide lubricating fittings for lubrication of all gears and bearings. Removable crank will be designed for rough treatment.

C. Floor stands will include a high strength pedestal designed to position the input, shaft, or hand wheel approximately 36" above the operating floor. An arrow with the word "open" will be permanently attached or cast on the floor stand, indicating the direction of rotation to open the gate.

2.5 FRAME

A. Frame shall be cast iron, one-piece construction with mounting flange and rectangular opening. All contact surfaces of frame will be machined.

2.6 GUIDES

A. Guides shall be cast iron; one-piece designed to withstand the total thrust due to water pressure and wedging action. Guides will be machined on all contact surfaces. Guides will be of such length as to retain and support at least one half the full length of disc in full open position.

2.7 WEDGES

A. Wedges will be solid cast bronze, machined on all contact surfaces. Wedges shall have adjusting screws with lock nuts.

2.8 STEM

A. Stainless steel rising operating stem shall be of a size to safely withstand, without buckling or permanent distortion, the stresses induced by normal operating forces. In addition, the stem shall be designed to transmit in compression at least 2-1/2 times the rated output of the floor stand or bench stand with a 40-pound effort on the crank or hand wheel. Stems of more than one section will be joined by bronze couplings threaded and keyed to the stem. All threaded and keyed couplings of the same size will be interchangeable. Manually operated, rising stem gate shall be provided with an adjustable stop collar on the stem above the floor stand lift nut. Clear stem cover, as described in Article 2.10 of this section, with gradation markings to indicate gate position shall be provided and installed on gate operator.

B. The twist in the stem under full operating load shall be calculated and shall not exceed 0.188 inches measured on the perimeter of the stem. Installations exceeding this value shall be equipped with a torque reaction device (torque plate) located below the threaded section of the stem. Keyways for the torque plate shall not extend into the lifting threads of the stem. The operating load for this installation shall include the additional component of the torque plate in the calculations for the operator sizing and for all pertinent stresses.

2.9 STEM GUIDES

A. Stem guides shall be cast iron, bronze bushed, mounted on cast iron brackets. Stem guides will be adjustable in two directions and will be spaced at sufficient intervals to adequately support the stem. Stem guide spacing will not exceed an L/R ratio (as defined in AWWA C560) of 200, and will not be spaced greater than 10 feet except where required by gate travel. Contractor shall pay special attention to mounting of guides to upstream face of wall.

2.10 STEM COVER (PIPE HOOD)

A. A stem cover shall be supplied for each rising stem gate to cover the spindle threads for protection against damage, dirt, dust, water, etc. The cover shall be made of transparent fracture-resistant polycarbonate material. The cover shall have vent holes to prevent condensation.

2.11 FLUSH BOTTOM CLOSURE

A. The flush bottom closure will have a compressible resilient seal attached to the bottom of the frame or disk (sliding member) with a stainless steel bar and fasteners. The seal will be of a specially extruded shape, and designed to accurately fit to the bottom rib of the disk. The seal will be shaped to produce a wide sealing area on a machined cast iron stop bar that is bolted to the gate frame to form a flush invert. The differential sealing pressure of the resilient seal on the stop bar will be variable by adjustment of the side wedges on the gate.

PART 3 EXECUTION

3.1 EXAMINATION

A. Upon delivery to construction site, all equipment and materials shall be inspected by Contractor and Engineer. Any equipment or materials which are damaged shall be promptly repaired or replaced to the satisfaction of Engineer at no cost to the Owner.

3.2 DEMOLITION / PREPARATION

A. Once control of water measures are in-place as approved by the Engineer and in accordance with specification 01 57 60 – Control of Water and sediment has been relocated from the working area, completely remove the existing slide gate and appurtenances. Cut existing bolts flush with concrete surface.

B. Prevent damage to concrete during gate removal. Any damage caused to the existing concrete during gate removal shall be repaired to the satisfaction of the Engineer at no additional cost to the Owner prior to installation of the new gate.

C. Dispose of the existing slide gate and appurtenances off-site in accordance with applicable local and state regulations.

3.3 PROTECTION

A. All equipment and materials shall be stored by Contractor at the construction site in a suitable location and protected from weather, corrosion, theft, vandalism, or other damage. Equipment and materials shall not be stored directly on any ground surface.

3.4 PAINTING AND COATING

A. Painting and coating for all components shall be recommended by the component manufacturer. All painting and coating shall be shop-applied. Any paint or coatings damaged during shipment or handling shall be repaired by Contractor in accordance with coating manufacturer's recommendations.

3.5 SLIDE GATE FABRICATION AND TESTING

A. Slide gate, lift, and accessories shall be designed, fabricated and shop tested in accordance with all applicable AWWA standards.

B. Slide gate, lift, and accessories shall be tested in the field after installation for approval of Engineer and commissioning.

3.6 INSTALLATION OF EQUIPMENT

A. Gate vendor / supplier shall be at the site for support during installation of the first 2 gates.

B. Gate and accessories shall be installed in accordance with manufacturer's instructions, and in accordance with approved submittals in a manner that will prevent leakage around the seat and binding of the gate during operation.

C. Mount gate frame on minimum one-inch-thick pad of non-shrink grout.

D. Epoxy anchors used for gate installation shall be installed in accordance with the epoxy manufacturer's instructions and approved for use in cracked concrete.

E. Provide manufacturer's recommended lubricants.

F. Before final assembly, thoroughly clean all seating and wedging surfaces of all foreign materials and make final adjustments. With the gate fully closed, clearance between seating faces shall be checked with a 0.004-inch thickness gauge. If this thickness gauge can be inserted between seating faces, wedging devices must be readjusted or gate frame or both re-machined, until insertion is no longer possible. In the event of re-machining, clearances will again be checked, as stated above.

G. After completion, all seating and wedging surfaces shall be thoroughly cleaned of all foreign materials and final adjustments made. Slide gate shall be operated from the fully closed to the fully open position and returned to fully closed position a minimum of two cycles per gate to verify that the assembly is workable.

PART 4 SCHEDULES

4.1 GATE SCHEDULE

A. Dam 6B

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	20" wide by 20" high
3. Quantity Required	One (1)

4.	Gate Invert	Elevation 952.4 feet
5.	18” Diameter Opening Invert	Elevation 952.5 feet
6.	Design Seating Head	28.3 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 981.5 feet)
7.	Operating Head	24.3 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 977.5 feet)
8.	Operator	Manual – Geared Lift Mechanism on Pedestal
9.	Intended Use	Water release and lower reservoir if needed

B. Dam 10

Item		Gate
1.	Type	Heavy Duty Cast Iron Slide Gate
2.	Gate Opening (Nominal)	20” wide by 20” high
3.	Quantity Required	One (1)
4.	Gate Invert	Elevation 994.0 feet
5.	12” Diameter Opening Invert	Elevation 994.1 feet
6.	Design Seating Head	33.7 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 1028.3 feet)
7.	Operating Head	15 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 1009.6 feet)
8.	Operator	Manual – Geared Lift Mechanism on Pedestal
9.	Intended Use	Water release and lower reservoir if needed

C. Dam 12

Item		Gate
1.	Type	Heavy Duty Cast Iron Slide Gate
2.	Gate Opening (Nominal)	20” wide by 20” high
3.	Quantity Required	One (1)
4.	Gate Invert	Elevation 891.9 feet
5.	16” Diameter Opening Invert	Elevation 892.0 feet
6.	Design Seating Head	37.8 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 930.5 feet)

7. Operating Head	14.7 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 907.5 feet)
8. Operator	Manual – Geared Lift Mechanism on Pedestal
9. Intended Use	Water release and lower reservoir if needed

D. Dam 15B

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	28” wide by 28” high
3. Quantity Required	One (1)
4. Gate Invert	Elevation 898.3 feet
5. 24” Diameter Opening Invert	Elevation 898.5 feet
6. Design Seating Head	23 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 922.5 feet)
7. Operating Head	19 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 918.5 feet)
8. Operator	Manual – Geared Lift Mechanism on Pedestal
9. Intended Use	Water release and lower reservoir if needed

E. Dam 19A

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	20” wide by 20” high
3. Quantity Required	One (1)
4. Gate Invert	Elevation 958.4 feet
5. 18” Diameter Opening Invert	Elevation 958.5 feet
6. Design Seating Head	36.8 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 996.0 feet)
7. Operating Head	12.8 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 972.0 feet)
8. Operator	Manual – Geared Lift Mechanism on Pedestal
9. Intended Use	Water release and lower reservoir if needed

F. Dam 21

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	28” wide by 28” high
3. Quantity Required	One (1)
4. Gate Invert	Elevation 819.2 feet
5. 24” Diameter Opening Invert	Elevation 819.4 feet
6. Design Seating Head	37.3 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 857.5 feet)
7. Operating Head	28.2 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 848.4 feet)
8. Operator	Manual – Geared Lift Mechanism on Pedestal
9. Intended Use	Water release and lower reservoir if needed

G. Dam 22A

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	28” wide by 28” high
3. Quantity Required	One (1)
4. Gate Invert	Elevation 820.8 feet
5. 24” Diameter Opening Invert	Elevation 821.0 feet
6. Design Seating Head	28.5 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 850.5 feet)
7. Operating Head	24 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 846.0 feet)
8. Operator	Manual – Geared Lift Mechanism on Pedestal
9. Intended Use	Water release and lower reservoir if needed

H. Dam 23

Item	Gate
1. Type	Heavy Duty Cast Iron Slide Gate
2. Gate Opening (Nominal)	28” wide by 28” high

3.	Quantity Required	One (1)
4.	Gate Invert	Elevation 844.8 feet
5.	24” Diameter Opening Invert	Elevation 845.0 feet
6.	Design Seating Head	23.5 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 869.5 feet)
7.	Operating Head	19.0 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 865.0 feet)
8.	Operator	Manual – Geared Lift Mechanism on Pedestal
9.	Intended Use	Water release and lower reservoir if needed

I. Dam 24

Item		Gate
1.	Type	Heavy Duty Cast Iron Slide Gate
2.	Gate Opening (Nominal)	20” wide by 20” high
3.	Quantity Required	One (1)
4.	Gate Invert	Elevation 857.9 feet
5.	18” Diameter Opening Invert	Elevation 858.0 feet
6.	Design Seating Head	27.8 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 886.5 feet)
7.	Operating Head	23.3 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 882.0 feet)
8.	Operator	Manual – Geared Lift Mechanism on Pedestal
9.	Intended Use	Water release and lower reservoir if needed

J. Dam 30A

Item		Gate
1.	Type	Heavy Duty Cast Iron Slide Gate
2.	Gate Opening (Nominal)	28” wide by 28” high
3.	Quantity Required	One (1)
4.	Gate Invert	Elevation 821.3 feet
5.	24” Diameter Opening Invert	Elevation 821.5 feet

6.	Design Seating Head	32.5 feet (measured from horizontal centerline of gate opening to the top of embankment, Elevation 855.0 feet)
7.	Operating Head	28.0 feet (measured from horizontal centerline of gate opening to the normal operating surface of water at Elevation 850.5 feet)
8.	Operator	Manual – Geared Lift Mechanism on Pedestal
9.	Intended Use	Water release and lower reservoir if needed

END OF SECTION

SECTION 35 20 23

SEDIMENT RELOCATION

PART 1 GENERAL

1.1 SUMMARY

A. Work of the project includes furnishing all materials, labor, tools, and equipment for the mechanical sediment relocation operations within the reservoirs.

B. Related Sections:

1. Section 01 40 00 – Contractor Quality Control
2. Section 01 56 50 – Pollution Control
3. Section 01 57 50 – Surveying
4. Section 01 57 60 – Control of Water

1.2 SUBMITTALS

A. All submittals shall follow the procedures specified in Section 01 33 00 - Submittal Procedures.

B. Submit a **Sediment Relocation Plan** within 10 days of the Notice to Proceed.

C. The Sediment Relocation Plan must be accepted before sediment relocation begins, unless otherwise directed by the ENGINEER.

D. OWNER reserves the right to approve or reject, at its sole discretion, any plan of operation that it deems to be in the OWNER's best interest.

E. The Sediment Relocation Plan shall include:

1. A proposed relocation sequence including proposed equipment, means and methods, locations and types of diversion structures, etc.
2. Survey procedures and planned survey stages.
3. Planned final grades of sediments relocated and sediments surrounding the riser structures

PART 2 MATERIALS (not used)

PART 3 EXECUTION

3.1 PROTECTION OF THE ENVIRONMENT

A. The CONTRACTOR's operations shall in no way contribute to air, water, or land pollution, including surface or groundwater contamination, or any other condition that

would have a detrimental effect on the environment and shall meet all local, state, and federal regulations for handling and disposal of the sediment.

B. The CONTRACTOR shall take reasonable precautions to prevent turbid overflow from being discharged to the downstream watershed.

C. The CONTRACTOR shall minimize air pollution from construction operations. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to the site.

D. The CONTRACTOR shall meet all local and state sedimentation and erosion control requirements.

3.2 EXCAVATION OF SEDIMENT

A. Once control of water measures are in-place as approved by the Engineer and in accordance with specification 01 57 60 – Control of Water, excavate sediment to the extents necessary to perform the work or as determined by the ENGINEER.

B. Excavated side slopes shall not be steeper than 5 horizontal to 1 vertical unless otherwise approved by the ENGINEER.

C. The CONTRACTOR shall place rock riprap as needed to maintain a stable slope of the excavated area after sediment excavation.

D. The CONTRACTOR shall not over-excavate beyond the limits shown on the Drawings unless otherwise approved by the ENGINEER.

E. Initial and final surveys of the excavated areas shall be performed in accordance with Section 01 57 50.

3.3 RELOCATION OF SEDIMENT

A. The CONTRACTOR shall be responsible for relocating the sediment around the riser and away from the work areas. The location to dispose the sediments shall be coordinated with the OWNER and ENGINEER prior to relocating the sediment.

END OF SECTION