

**PROJECT MANUAL**

**FOR**

**LAKE VIRGINIA DAM REPAIR  
LAKE VIRGINIA MANAGEMENT DISTRICT  
SAUK COUNTY, WI**

**JANUARY 2025**

**For Review**

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LAKE VIRGINIA DAM REPAIR  
LAKE VIRGINIA MANAGEMENT DISTRICT  
SAUK COUNTY, WI

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# Specifications

## SECTION 01 01 00

### GENERAL REQUIREMENTS

#### PART 1 GENERAL

##### 1.01 PROJECT DESCRIPTION

- A. In general, the project consists of replacing timber stoplogs and seals in an existing pre-cast concrete riser and sealing riser joints to prevent leakage. Erosion control, earthwork, and site restoration activities are also included.

##### 1.02 WORK BY OTHERS

- A. Owner shall partially draw down the impoundment by removing stoplogs prior to construction. This shall bring the headwater pool to approximately EL 891.0 ft.

##### 1.03 WORK SEQUENCE

- A. The work shall be performed in accordance with general sequence or phasing outlined below. Contractor shall be responsible of the specific sequence of work within this general outline.
  - 1. Construction dewatering.
  - 2. Installation of erosion control measures.
  - 3. Excavation around the existing whistle tube riser.
  - 4. Installation of external wrap-around rubber gaskets to specified riser joints.
  - 5. Replacing timber stop logs and seals.
  - 6. Backfill and site restoration.
- B. The entire work sequence is intended to be completed in a short period of time (no more than one work week) when no significant precipitation and/or runoff is expected. Provide A/E with advance notice of at least 48 hours prior to beginning construction activities.

##### 1.04 PROJECT MEETINGS

- A. A preconstruction conference will be scheduled after award of contract and prior to beginning work. This meeting shall be attended by A/E, Owner, and an authorized representative of Contractor.
- B. Periodic progress meetings will be held at project site at times designated by Owner or A/E. A responsible representative of Contractor who can bind Contractor to decisions shall attend.

##### 1.05 NOTIFICATIONS

- A. Notify Owner and A/E at least five working days prior to planned beginning of work. Then, confirm at least 48 hours prior to beginning work that weather forecasts are suitable for construction to commence.
- B. Notify applicable agencies before closing or restricting public thoroughfares as specified in "Traffic Control" article.

##### 1.06 WORK HOURS

- A. Work shall be conducted between the hours of 7:00 a.m. to 6:00 p.m. on normal work days, unless approved for unusual circumstances.
- B. Give written notice to A/E whenever it is desired to perform work at night, or on a Saturday, Sunday, or holiday, or to vary period of hours during which work is carried on each day. If

approved, such work shall be subject to requirements furnished in writing by A/E, and no extra compensation will be allowed.

#### **1.07 SUBMITTAL PROCEDURES**

- A. See Section 01 33 00.

#### **1.08 PERMITS AND CODES**

- A. Owner will obtain the following permits, licenses, and approvals:
  - 1. Wisconsin Department of Natural Resources Ch. 31 Permit
  - 2. U.S Army Corps of Engineers Authorization
- B. Contractor shall comply with the requirements of the above permits, licenses, and approvals. If a copy of a permit, license, or approval is not available for review prior to the Bid Deadline, and if it contains a requirement not covered by the Contract Documents, such a requirement will be considered extra work if Contractor makes a claim under the terms of the General Conditions. Work shall not begin on items applicable to the above until the required permit, license, or approval is received.
- C. Contractor shall provide all other necessary permits and licenses and pay all fees, taxes, and royalties, unless otherwise indicated.
- D. Comply with local and municipal ordinances and applicable state and national codes.

#### **1.09 PAYMENT FOR WORK REQUIRING TESTING**

- A. Where Contractor is responsible for testing, payment for the item requiring testing, or subsequent work placed on or over the item requiring testing, will not be made until satisfactory test results are submitted to A/E.

#### **1.10 TEMPORARY UTILITIES**

- A. Contractor shall be responsible for providing temporary electric power as required for construction purposes. Provide portable power supply or make arrangements with local utility company.
- B. Contractor shall be responsible for obtaining water for its needs. Pay cost of water used and meter rental, if applicable.
- C. Contractor shall provide temporary outside toilets sufficient for construction workers. Toilets shall be self-contained chemical type and shall comply with applicable Codes. Maintain sanitary facilities in a clean and sanitary condition; supply toilet paper until completion of project.

#### **1.11 PROTECTION**

- A. Furnish and maintain proper barricades, fences, signal lights, warning signs, and personnel as required to properly protect and safeguard the work, persons, animals, and property against injury.

#### **1.12 ENVIRONMENTAL CONTROLS**

- A. Maintain erosion control measures to protect the project site and prevent sediment pollution of adjacent water courses and properties.
  - 1. Install erosion control measures prior to start of construction and maintain them until final completion of work. Unless otherwise instructed, remove temporary erosion control measures prior to final application for payment.

2. Strive to limit stripping of sod and vegetation to a period that will expose bare soil to the least possibility of erosion that construction requirements allow.
  3. Construct and maintain filter fabric barriers, straw bale barriers, or temporary diversions to receive runoff leaving site.
  4. Protect storm drain inlets by using inlet protection of the type shown on Drawings. If not shown, use inlet protection fabric, silt fence barriers, erosion bale barriers, or equivalent.
  5. Remove at the end of each work day soils and sediment reaching public or private streets not part of the construction site.
  6. Unless otherwise shown or specified, erosion control measures shall comply with the WDNR "Stormwater Management Technical Standards" (available on the WDNR web site at [dnr.wi.gov/topic/stormwater/standards/const\\_standards.html](http://dnr.wi.gov/topic/stormwater/standards/const_standards.html)).
- B. Minimize dispersion of dust from construction operations by application of water or other dust control materials. Controls shall confine dust and dirt within the immediate area of project.
- C. Provide noise control measures to limit the amount of noise and prevent nuisance. Properly equip all equipment with mufflers. Limit construction activities generating significant noise to normal working hours.

### 1.13 TRAFFIC CONTROL

- A. Conduct operations to ensure minimum interference with streets, walks, and adjacent facilities not part of construction project.
- B. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. When operations require vehicles or equipment parked along Lake Virginia Road, provide advanced warning signage and flaggers in accordance with the Wisconsin Manual on Uniform Traffic Control Devices and WisDOT requirements.

### 1.14 PRODUCT REQUIREMENTS

- A. General: Provide new products manufactured and conditioned for the particular application as recommended by manufacturer, unless otherwise noted. Transport, handle, store, and protect products as specified and in accordance with manufacturer's recommendations.
- B. Acceptable Manufacturers: Products, materials, and equipment identified by reference to a manufacturer's name, catalog number, or model are identified for the purpose of establishing a standard of type, function, appearance, and quality. Unless otherwise noted, any other product, material, or equipment which will perform adequately the duties imposed by the general design will be considered for substitution in accordance with the provisions below.
- C. Bid Phase Substitutions: Substitutions and "or equal" items proposed prior to the Bid Deadline shall be submitted in accordance with the Instructions to Bidders.
- D. Construction Phase Substitutions: Substitutions and "or equal" items proposed after Contract has been awarded shall be submitted for approval prior to their use. Consideration will be given only to proposed substitutions and "or equal" items where:
1. The products named in the Contract Documents are no longer available or cannot be provided within the Contract Time.
  2. The manufacturers' standard products are no longer in conformance with the specified requirements.
  3. Owner's interests may be adversely affected.
- E. Substitution Procedures: Requests for substitution of alternate products or use of "or equal" items shall be submitted with complete references to manufacturer's product identification

and product data indicating composition, guarantee, availability, applicable standards or agency approvals met or exceeded, restrictions imposed on product, and manufacturer's recommended method of application or installation. A substitution or an "or equal" item will be considered acceptable if the product will perform adequately the duties imposed by the general design and, in opinion of A/E, is of equal substance, quality, appearance, and function, unless the named item is necessary for interchangeability or if the named product has been demonstrated to be most cost-effective.

#### **1.15 SURVEYS, STAKING, LINE AND GRADE**

- A. Owner will provide baseline reference points and benchmarks as indicated on Drawings. Contractor shall provide all other survey staking and layout as required to complete the Work.

#### **1.16 FIELD MEASUREMENTS AND INSPECTION OF SURFACES**

- A. Contractor shall layout its Work based on reference points furnished by Owner and shall be solely responsible for the accuracy of its measurements. Verify grades, lines, levels, locations, and dimensions as shown on Drawings, and inspect surfaces that are to receive work before proceeding with fabricating, assembling, fitting, or erecting. Notify A/E in writing in case of unsuitable conditions, defective substrates, or discrepancies in Contract Documents. Starting of work shall imply acceptance of conditions.
- B. Correct any errors or defects due to faulty measurements, improper layout, or failure to report discrepancies.

#### **1.17 CONSTRUCTION CLEANING**

- A. Keep work area free of accumulations of surplus materials, rubbish, and debris.

#### **1.18 PUNCH LIST**

- A. A "punch list" will be prepared and distributed to Contractor at Substantial Completion. Items on punch list shall be completed within 30 days. Required submittals (see below) shall be completed prior to or when requesting final payment.

#### **1.19 CLOSEOUT SUBMITTALS**

- A. Submit the following items to A/E prior to or with final Application for Payment:
  - 1. Project record drawings marked to show all changes made during construction. Dimension underground and concealed work and utilities from permanent reference points; record vertical distances. Make and record measurements to the nearest 0.5 ft on a clean drawing set.
  - 2. Evidence of continuing insurance coverage complying with insurance requirements (see Conditions of the Contract).
  - 3. Contractor's affidavit, along with final releases and waivers of liens as required by Owner, indicating that all debts and claims against project (less amounts withheld by Owner) have been paid in full or otherwise satisfied.
  - 4. Consent of surety company to final payment.

#### **1.20 DEFINITIONS**

- A. Dimensions on drawings and details are subject to field measurements.
- B. The term "working days" shall exclude weekends (Saturday and Sunday) and holidays.
- C. References to "Division 00" shall mean the Bidding Requirements and Contracting Requirements.
- D. References to "WDNR" shall mean Wisconsin Department of Natural Resources.

- E. References to "WisDOT Std. Spec." shall mean Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, latest edition.
- F. References to "A/E", "Architect", or "Engineer" shall mean Ayres.
- G. References to "Owner" shall mean Lake Virginia Management District.

**PART 2 (NOT USED)**

**PART 3 (NOT USED)**

**END OF SECTION**



## SECTION 01 22 50

### MEASUREMENT AND PAYMENT

#### PART 1 GENERAL

##### 1.01 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. 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.
- B. 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. Changes in the Work shall not be considered as a waiver of any conditions of the Contract nor invalidate any provisions thereof. 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. A supplemental agreement between Contractor and Owner may be requested by either party when cumulative changes involve a net increase or decrease of more than 20 percent in total contract amount.
- C. Final measured quantities determined in field by A/E at time of construction shall govern over approximate quantities shown on the Bid Schedule, unless otherwise noted. Contractor shall take no advantage of any apparent error or omission in Drawings or Specifications, and A/E shall be permitted to make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents.

#### PART 2 (NOT USED)

#### PART 3 EXECUTION

##### 3.01 MOBILIZATION

- A. This work consists of work and operations necessary for movement of personnel, equipment, supplies, and incidentals to project site and for establishment of Contractor's offices and other temporary facilities necessary for work on project; and of all other work and operations which must be performed, or for which costs must be incurred before beginning work on various items on project site; and demobilization at completion of work.
- B. Measurement for payment will be as a complete unit of work acceptably performed.
- C. Payment will be made at the contract lump sum price for MOBILIZATION, payable to Contractor in accordance with the following schedule:
  - 1. When 5 percent or more of original contract amount is earned, 40 percent of amount bid for mobilization will be paid.
  - 2. When 25 percent or more of original contract amount is earned, 80 percent of amount bid for mobilization will be paid.
  - 3. When 90 percent or more of original contract amount is earned, 100 percent of amount bid for mobilization will be paid.

##### 3.02 EROSION CONTROL

- A. This work consists of furnishing, installing, and maintaining erosion and other environmental control measures in accordance with the Drawings and Section 01 01 00.

- B. Measurement for payment will be as a complete unit of work acceptably completed.
- C. Payment will be made at the contract lump sum price for EROSION CONTROL, payable to Contractor in accordance with the following schedule:
  - 1. When erosion control measures are installed, 75 percent of amount bid for erosion control will be paid.
  - 2. When erosion control measures have been removed, 100 percent of amount bid for erosion control will be paid.

### **3.03 CONSTRUCTION DEWATERING**

- A. This work consists of construction dewatering in accordance with the Drawings and Section 01 57 60 as required to complete the work.
- B. Measurement for payment will be as a complete unit of work acceptably performed.
- C. Payment will be made at the contract lump sum price for CONSTRUCTION DEWATERING, payable to Contractor in accordance with the following schedule:
  - 1. When the specified construction pool is attained, 25 percent of amount bid for dewatering will be paid.
  - 2. When all dewatering measures are removed, 100 percent of amount bid for dewatering will be paid.

### **3.04 TIMBER STOP LOGS**

- A. This work consists of furnishing and installing new timber stoplogs and seals in accordance with the Drawings and Section 35 21 82.
- B. Measurement for payment will be as a complete unit of work acceptably performed.
- C. Payment will be made at the contract lump sum price for TIMBER STOP LOGS.

### **3.05 RESEALING SPILLWAY RISER**

- A. This work consists of resealing the pre-cast concrete spillway riser with external wrap-around rubber gaskets in accordance with the Drawings and Section 33 42 15.
- B. Measurement for payment will be the as a complete unit of work acceptably performed.
- C. Payment will be made at the contract unit price per lump sum for RESEALING MANHOLE.

### **3.06 EARTHWORK**

- A. This work consists of excavating and backfilling the embankment around the pre-cast concrete spillway riser to facilitate resealing joints in accordance with the Drawings and Section 31 20 00.
- B. Measurement for payment will be as a complete unit of work acceptably performed.
- C. Payment will be made at the contract lump sum price for EARTHWORK.

### **3.07 SITE RESTORATION**

- A. This work consists of placing topsoil, fertilizing, seeding, and installing erosion mat on the earth embankment in accordance with Section 32 99 10.
- B. Measurement for payment will be as a complete unit of work acceptably performed.

- C. Payment will be made at the contract lump sum price for SITE RESTORATION.

**END OF SECTION**

## SECTION 01 33 00

### SUBMITTAL PROCEDURES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Submit items to A/E for review as required by the various Contract Documents. Refer to individual specification sections, General Conditions, Supplementary Conditions, and sections of Division 01 - General Requirements for submittal requirements.

##### 1.02 GENERAL PROCEDURES

- A. Follow the requirements for each submittal type as specified below.
- B. Submittals shall be identified with project name, numbered consecutively, and bear the stamp of approval of Contractor as evidence of accuracy, compatibility, and conformance with contract requirements. Submittals not so stamped will be returned without being examined.
- C. Give specific written notice of each variation that submittals may have from requirements of the Contract Documents.
- D. Partial submittals will not be considered. Submit each portion of work complete in one submittal.
- E. Products subject to submittal review shall not be used in the work until submittals have been reviewed and bear the stamp and signature of A/E. Submittals will only be reviewed for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Contractor shall be responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and the means and methods of construction, coordinating its work with that of all other trades, and performing all work in a safe and satisfactory manner. Corrections or comments made on submittals shall not relieve Contractor from compliance with requirements of Drawings and Specifications and shall not be considered an order for extra work.
- F. If information on previously reviewed shop drawings is altered, submit changes for review.
- G. Maintain complete copies of all final submittals at the project site.

##### 1.03 PRODUCT DATA

- A. Required product data are designated in the various specification sections. Submit product data for review prior to delivery or installation in one of the following formats:
  - 1. PDF electronic file. An annotated PDF electronic file will be returned to Contractor.
  - 2. A minimum of three paper copies. Two paper copies will be retained and the remainder returned to Contractor.
- B. Product data shall consist of manufacturer's literature, illustrations, and brochures of catalog cuts; instructions for handling, storage, and installation; and specifications and design data. Where manufacturer's standard literature includes multiple products or options, identify the specific products and options as required for this project.

##### 1.04 CERTIFICATES OF COMPLIANCE

- A. Submit certificates of compliance as designated in the various specification sections in one of the following formats:

1. PDF electronic file.
  2. Two paper copies.
- B. Certificates shall be furnished by manufacturer, producer, or supplier of material or product and shall indicate that material or product conforms to or exceeds specified requirements. Include supporting reference data as appropriate. Certificates may be recent or previous test results on material or product, but must be acceptable to A/E.

#### **1.05 PERMITS AND APPROVALS**

- A. Submit permits, code inspections, and agency approval documents as designated in the various specification sections in one of the following formats:
1. PDF electronic file.
  2. One paper copy.

#### **1.06 TEST REPORTS**

- A. Submit test reports as designated in the various technical specifications in one of the following formats:
1. PDF electronic file.
  2. Two paper copies.

#### **1.07 PROJECT RECORD DOCUMENTS**

- A. Keep a current set of paper documents at project site that are marked to show all changes made during construction. Dimension underground and concealed work and utilities from permanent reference points; record vertical distances. Make and record measurements to the nearest 0.1 ft. Submit project record documents upon completion of Work.

**PART 2 (NOT USED)**

**PART 3 (NOT USED)**

**END OF SECTION**

## SECTION 01 57 60

### CONSTRUCTION DEWATERING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Provide construction dewatering as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.
- B. Work under this Section shall consist of removal of surface water and ground water as necessary to perform required work, including:
  - 1. Building and maintaining temporary diversions.
  - 2. Furnishing, installing, and operating pumps, siphons, piping, and other facilities and equipment.
  - 3. Removing temporary works and equipment when no longer required.
- C. Contractor shall be responsible for design of dewatering system as specified below.

##### 1.02 PERMITS

- A. General: Rehabilitation of the dam, including diversions, shall be in accordance with Wisconsin Department of Natural Resources (WDNR) and U.S. Army Corps of Engineers (COE) permits issued for project. The work is subject to inspection, review, and approval by these agencies.
- B. Owner-Furnished Dam Rehabilitation Permit: Owner has obtained permits to rehabilitate dam from WDNR and COE. Refer to Appendix A.
- C. Contractor-Furnished Dewatering Permit: Contractor's method of accommodating seepage may require a high capacity dewatering permit, a pit trench dewatering permit, or similar permit. Contact WDNR for more details. Required dewatering permit(s) shall be obtained at Contractor's cost and no additional schedule allowance will be given to accommodate the permit review period.
- D. Permit Compliance: Should Contractor's actions or construction not be in compliance with applicable permits, Contractor shall remedy situation as directed by Owner, and all costs associated with those actions shall be borne by Contractor.

##### 1.03 SITE CONDITIONS

- A. Planned construction pool and minimum flow requirements are shown on the Drawings.
- B. Contractor will maintain control and operation of dam during construction to maintain the specified construction pool and pass the minimum flow requirement shown on the Drawings.
- C. Contractor shall monitor weather conditions and complete all work expeditiously during a time period where significant precipitation and/or runoff is not expected.

#### PART 2 PRODUCTS

##### 2.01 DESIGN REQUIREMENTS

- A. Contractor shall be responsible for:
  - 1. Protection of work area and safely passing stream flow for duration of construction.

2. Means and methods for dewatering work areas.
  3. All safety precautions and programs related to the work.
- B. Contractor is solely responsible to design and confirm feasibility of proposed dewatering method. Design dewatering system for the conditions indicated.
- C. A/E has not confirmed that all types of systems will suitably dewater site.

## **2.02 MATERIALS**

- A. Contractor shall furnish all materials for and shall construct and maintain, as it deems necessary, all channels, drains, sumps, and protective works for protection of work areas.

## **PART 3 EXECUTION**

### **3.01 DIVERTING SURFACE WATER**

- A. Owner will partially draw down the impoundment prior to construction by removing stoplogs. Contractor will draw down the impoundment further to establish and maintain the construction pool shown on the Drawings. Contractor will complete this additional drawdown by operating the spillway's existing alfalfa valve (preferred, if the valve is operational) or some other means of Contractor's choosing (e.g., pump or siphon). Minimum flows shall be maintained throughout construction.
- B. Construct, maintain, and operate temporary diversion works to divert streamflow and other surface water through or around construction site and away from work while construction is in progress. Unless otherwise specified, diversions must discharge into the same natural drainageway in which its headwaters are located.
- C. Surface water diversion procedures shall not create a condition where erosion or deposition of materials occurs in stream. Riprap or other means of protection shall be provided for erosion protection adjacent to all cofferdams where flows could occur.
- D. Diversion works which are moved out of position by any cause during installation shall be righted or enlarged so as to provide necessary clearance.
- E. As work area is dewatered, diversion works that are not watertight shall be plugged or sealed as much as practical to reduce infiltration of water into work area.

### **3.02 DEWATERING EXCAVATIONS AND WORK AREAS**

- A. Excavations and other parts of construction site shall be dewatered and kept free of standing water or excessively muddy conditions for proper execution of construction work. Furnish, install, operate, and maintain wells, drains, sumps, pumps, and other equipment needed to perform dewatering as specified. Dewatering methods that cause loss of fines from foundation materials will not be permitted.
- B. Maintain pumping operations to keep work area dry until all materials, equipment, and debris have been removed and diversion works is to be removed.

### **3.03 REMOVAL OF TEMPORARY WORKS**

- A. Remove temporary works when no longer required; level and grade earth as required to restore appearance and to prevent obstruction to flow or any other interference with operation of or access to permanent works.
- B. Unless otherwise noted, pipes and casings shall be removed from temporary wells and wells shall be filled to adjacent ground level with gravel or other approved material.

- C. Construction dewatering material shall be removed from site and properly disposed of.
- D. Contractor shall make its own arrangements for a disposal site and shall pay all costs involved.

**3.04 REPAIR OF DAMAGES**

- A. Contractor shall repair, at its expense, any damage to foundations, structures, or other improvements caused by failure of any part of cofferdams or protective works.

**END OF SECTION**



## SECTION 31 05 10

### SITE PREPARATION

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Provide site preparation as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.
- B. Work includes, but is not limited to:
  - 1. Protecting improvements, plants, and utilities.
  - 2. Temporarily removing and replacing improvements.
  - 3. Locating utilities and coordinating with utility companies.
  - 4. Salvaging topsoil.

#### PART 2 (NOT USED)

#### PART 3 EXECUTION

##### 3.01 PROTECTION

- A. Protect improvements on site and on adjoining properties. Provide barricades, coverings, or other types of protection as necessary to prevent damage and to safeguard against injury. Restore to original condition improvements damaged by the work or improvements which required temporary removal during construction.
- B. Protect existing vegetation indicated to remain against unnecessary cutting, breaking, bruising, or smothering by stockpiling excavated materials or parking of vehicles within drip line. Provide temporary fences, tree wells, barricades, or guards; repair or replace trees and vegetation damaged by construction operations.
- C. Maintain survey monuments, reference points, and benchmarks; notify Owner of disturbance to markers.
- D. No extra payment or time will be allowed for protection work that could have been suspected or anticipated by site inspection and interpretation of bidding documents prior to execution of contract.

##### 3.02 LOCATING EXISTING UTILITIES

- A. Location and description of underground utilities and structures shown on drawings are approximate and are based on records available to Owner or surface features indicating their existence. There may be other utilities within project area that are not shown.
- B. Notify all affected utility companies of construction operations at least three working days before beginning work near their facilities. Do not begin excavation work until underground utility locations have been marked.
- C. Use caution when excavating so that exact location of underground utilities, both known and unknown, may be determined. Provide adequate protection and support for utilities during construction operations.
- D. If uncharted or incorrectly charted utilities are encountered during excavation work, or if proposed construction conflicts with existing utilities, give prompt notice and submit proposed

solution to A/E for approval. Cooperate with Owner and public and private utility companies to keep their services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

### **3.03 TOPSOIL STRIPPING**

- A. Topsoil shall include all friable, fertile, loam soil suitable for grass and plants, found at surface, reasonably free of subsoil, clay lumps, stones, objects over 2-in. diameter, weeds, large roots, root clusters, and other objectionable material.
- B. Strip topsoil from project area to whatever depths encountered; prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping topsoil.
- C. Where trees are indicated to remain, terminate stripping a sufficient distance from such trees to prevent damage to root system.
- D. Stockpile topsoil in storage piles in areas where designated. Construct storage piles to freely drain surface water. Cover or sprinkle water on storage piles to prevent windblown dust.

### **3.04 DEBRIS DISPOSAL**

- A. Remove debris and excess materials from site and legally dispose of it; do not burn debris.

**END OF SECTION**

## SECTION 31 20 00

### EARTH MOVING

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Provide earth moving as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

##### 1.02 RELATED SECTIONS

31 05 10 Site Preparation.

##### 1.03 CLASSIFICATION

- A. Excavation of materials encountered under this work will be unclassified without regard to type, difficulty to remove, or suitability for use in construction.

##### 1.04 SUBMITTALS

- A. Test Reports: Submit reports for laboratory and field tests required under "Testing" article.
- B. Make submittals in accordance with Section 01 33 00.

##### 1.05 TESTING

- A. Contractor shall arrange and pay for soil sampling and testing by a qualified testing agency, acceptable to Owner and independent of Contractor.
- B. Test excavated embankment fill materials for gradation in accordance with ASTM C136 for conformance with ASTM D2487 gradation limits. Test materials for liquid limit and plasticity index in accordance with ASTM D4318.
- C. Provide one optimum moisture-maximum density curve for each type of soil encountered in embankment; determine maximum densities in accordance with ASTM D698.
- D. During course of work, testing agency shall inspect and approve subgrades and fill layers before further construction work is performed on each layer. Perform field density tests in accordance with ASTM D6938. Take tests as follows:
  - 1. Riser Backfill: Perform at least one field density test for each vertical foot of backfill.
- E. If in opinion of A/E, based on reports of testing agency and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to Owner.

##### 1.06 PROTECTION

- A. Protect existing improvements, utilities, trees and shrubs, and reference marks in accordance with Section 31 05 10.

## **PART 2 PRODUCTS**

### **2.01 SOIL MATERIALS, GENERAL**

- A. Soil materials shall be free of organic matter, debris, frozen soils, ice, and other objectionable materials. Rock particles larger than maximum size specified shall be removed prior to placement of soil.
- B. Select existing material from required excavations may be used for fill or backfill if it meets the specified product requirements. If necessary, furnish additional approved material from suitable off-site sources.

### **2.02 EMBANKMENT FILL**

- A. Onsite embankment fill excavated to complete work shall be stockpiled, salvaged, and reused for backfill. Testing of salvaged embankment fill per article 1.05 is required.
- B. If additional embankment fill is required for backfill, or if salvaged embankment fill is determined to be unsuitable, notify A/E. Furnishing and placing imported embankment fill, if approved by A/E, will be considered extra work.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Prepare site for work in accordance with Section 31 05 10.
- B. Layout and stake lines and grades as required to complete the work.

### **3.02 EXCAVATION**

- A. Excavate to achieve necessary dimensions, lines, and grades as shown on the Drawings.
- B. Monitor weather forecasts and ensure excavation is backfilled if significant precipitation and/or runoff is expected. An open excavation during sudden pool rise could lead to a breach of the embankment.

### **3.03 UNAUTHORIZED EXCAVATION**

- A. Unauthorized excavation consists of removal of materials beyond indicated elevations or side dimensions without specific direction of A/E. Unauthorized excavation, as well as remedial work, shall be at Contractor's expense. Notify A/E prior to backfilling if unauthorized excavations are made.
- B. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed.

### **3.04 STABILITY OF EXCAVATIONS**

- A. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Slope sides of excavations to angle of repose of material excavated; otherwise, shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfilled excavations, and when sides of excavations are subjected to vibrations from traffic, machinery, or any other source. Comply with applicable codes and ordinances.

### **3.05 SHORING AND BRACING**

- A. Carry down shoring and bracing as required as excavation progresses. Maintain shoring and bracing while excavations are open.
- B. Provide and maintain shoring and bracing, such as sheet piling, uprights, stringers and cross-braces, in good serviceable condition. Use timbers that are sound and free of large or loose knots.

### **3.06 DEWATERING**

- A. Perform earthwork in a manner to prevent surface water and ground water from flowing into excavations. Promptly remove water from excavations using pumps, sumps, and dewatering system components necessary to convey water away from excavations. If underground springs are encountered, notify A/E before proceeding.
- B. Convey water removed from excavations and rain water to collection or run-off areas. Provide and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use foundation or utility trench excavations as temporary drainage ditches.
- C. Provide filter material, trash screens, and other devices around pumps and intakes to avoid pumping or discharging sediment from construction site.

### **3.07 STOCKPILING**

- A. Stockpile excavated materials meeting the requirements for embankment fill where directed until required for the work. Place, grade, and shape stockpiles for proper drainage. Locate stockpiles a sufficient distance from edge of excavations, even though such excavations may be sheeted and braced, to prevent such material from falling or sliding into excavations and to prevent cave-ins.

### **3.08 COLD WEATHER PROTECTION**

- A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 deg F by covering with dry insulating materials of sufficient depth to prevent frost penetration.

### **3.09 SUBGRADE EXAMINATION AND PREPARATION**

- A. Examine subgrade prior to placing fill. Remove organic materials and debris subject to rot or corrosion. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with subgrade.
- B. After subgrade soil is stable, scarify top 6 to 8 in., moisture condition, and compact surface to density specified in Part 4 Schedules.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by A/E, without additional compensation.

### **3.10 ADDITIONAL EXCAVATION (OVER EXCAVATION)**

- A. If unsuitable bearing materials, such as poorly compacted fill, existing foundations, rubble, debris, or organic deposits, are encountered at required subgrade elevations, carry excavations deeper and replace excavated material with properly compacted embankment fill as directed by A/E.
- B. Removal of unsuitable material and its replacement as directed by A/E will be paid for as extra work, unless a pay item is included in the Bid Schedule. Do not proceed with extra or unit price work until authorized.

### **3.11 FILLING AND BACKFILLING, GENERAL**

- A. Do not place fill until required subgrade preparation has been examined and approved by testing agency.
- B. Backfill excavations as promptly as work permits, but not until completion of the following:
  - 1. Acceptance by A/E of construction below finish grade including installation of external wrap-around rubber gaskets.
  - 2. Removal of trash, debris, and other unsuitable materials.
  - 3. Removal of temporary shoring and bracing, and backfilling of voids with compacted embankment fill.
- C. Place embankment fill in approximately horizontal layers; do not exceed the maximum lift thickness specified in Part 4 Schedules before compaction. Spread piles and windrows uniformly.
- D. Adjacent to structure, place fill or backfill to prevent damage and allow structures to assume loads gradually and uniformly, at approximately the same rate on all sides of structure.

### **3.12 SOIL FILL**

- A. Place and compact fill materials in layers to required elevations as follows:
  - 1. All Areas: Use Embankment Fill.
- B. Do not place soil fill on frozen subgrades.

### **3.13 GRADING**

- A. Grade areas within project limits to achieve cross sections, lines, and elevations indicated. Slope grades to direct water away from structures and to prevent ponding. Finish surface to be reasonably smooth and free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.
- B. Finish subgrades to required elevations within the following tolerances:
  - 1. All Areas: Plus or minus 0.5 in.

### **3.14 CONTROL OF MOISTURE CONTENT**

- A. During placement and compaction, maintain moisture content of materials within optimum range.
- B. Apply water to fill materials by sprinkling materials at borrow site or after placement on fill if necessary. Obtain uniform moisture distribution by discing, blading or other approved methods prior to compaction of layer.
- C. If material is too wet when deposited on fill, remove or dry it to specified moisture content prior to compaction.
- D. If top surface of a preceding layer of compacted fill becomes too dry to permit suitable bond, scarify and moisten it by sprinkling to an acceptable moisture content prior to placement of next layer of fill.

### **3.15 COMPACTION**

- A. Compact each layer of soil material to not less than the percentage of maximum density specified in Part 4 Schedules.

- B. Provide compaction equipment required to obtain specified compaction. Compaction by travel of grading equipment is not considered adequate for uniform compaction. Small vibratory compactors are required wherever fill is placed adjacent to structures.

**3.16 MAINTENANCE**

- A. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.
- B. Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add fill or backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

**3.17 DISPOSAL OF EXCESS AND WASTE MATERIALS**

- A. Remove excess excavated material and trash, debris, and other waste materials and legally dispose of them off-site.

**PART 4 SCHEDULES**

**4.01 COMPACTION SCHEDULE**

<u>Material Type</u>	<u>Usage</u>	<u>Lift Thickness <sup>(1)</sup></u>	<u>Compaction <sup>(2)</sup></u>
Embankment Fill	All Areas	8"	95%

(1) Place manually compacted materials in maximum 4 in. layers.

(2) Percent of maximum density determined in accordance with ASTM D698 (Standard Proctor test).

**END OF SECTION**

## SECTION 32 99 10

### TURF REPLACEMENT

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Replace turf and appurtenant improvements disturbed by construction as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.
- B. Restore surfaces as near as practical to condition existing prior to construction and as designated. Clean site and remove equipment, salvaged material, unused materials, cleared brush and trees, and debris resulting from construction. Repair or replace turf, shrubs, trees, and other items within and beyond construction limits damaged or destroyed through carelessness or failure to follow reasonable safeguards.
- C. Unless otherwise indicated, locations and types of Turf Replacement shall be in accordance with Part 4 Schedules.

##### 1.02 RELATED SECTIONS

31 05 10 Site Preparation: For topsoil removal.

#### PART 2 PRODUCTS

##### 2.01 TOPSOIL

- A. Loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing surface soil; 100% passing the 1 in. sieve and at least 90% passing the No. 10 sieve; pH range of 6.0 to 7.0; minimum organic material content of 3 percent; reasonably free of subsoil, clay lumps, brush, and weeds; and free of extraneous matter harmful to plant growth.
- B. Obtain imported topsoil from naturally well-drained local sources; do not obtain from bogs or marshes. Topsoil salvaged from within work area may be reused if it meets the above requirements.

##### 2.02 LIME

- A. Agricultural grade limestone complying with requirements of WisDOT Std. Spec., Section 629.

##### 2.03 FERTILIZER

- A. Solid or liquid form, commercial fertilizer complying with WisDOT Std. Spec., Section 629, for Type A fertilizer.

##### 2.04 GRASS SEED

- A. Seed complying with WisDOT Std. Spec., Section 630, for the seed mixtures indicated in Part 3 Execution for each type of turf replacement.

##### 2.05 EROSION MAT

- A. Erosion mat complying with WisDOT Std. Spec., Section 628, and WisDOT Erosion Control Product Acceptability List (PAL) for class and type of erosion mat indicated on the Drawings. If not indicated provide Class I Urban, Type B erosion mat.



## **PART 3 EXECUTION**

### **3.01 TURF REPLACEMENT, GENERAL**

- A. Comply with construction methods of WisDOT Std. Spec., unless otherwise indicated.
- B. Place topsoil to depth indicated for type of turf replacement.
- C. Apply lime to salvaged topsoil at a uniform rate of 100 lb per 1000 sq ft (based on index zone of 60-69) unless optional Contractor-furnished soil test results permit less. Liming is not required for imported topsoil meeting specified pH range.
- D. Immediately prior to seeding or sodding, apply fertilizer at a rate of 7 lb per 1000 sq ft.

### **3.02 TYPE "B" TURF REPLACEMENT**

- A. Place 6 in. of topsoil, prepare soil, and seed with WisDOT Std. Spec. Mixture No. 40 at the rate of 3 lb per 1000 sq ft. Seed using WisDOT Std. Spec., Section 630, Method A or Method B.

### **3.03 EROSION MAT INSTALLATION**

- A. Provide erosion mats installed and stapled according to manufacturer's recommendations.

### **3.04 MAINTENANCE**

- A. Maintain seeded/sodded areas for 30 days or until satisfactory growth has been achieved, whichever is longer. Maintenance shall include replacement of eroded areas, watering as needed to prevent burn off, and other work as necessary to establish healthy growth. Satisfactory growth for seeded areas shall be considered healthy grass growth with no bare spots larger than 6 in. square and total bare spots not exceeding 2 percent of total seeded area.
- B. After turf replacement work, or portions of turf replacement work, are completed, Contractor and A/E shall review areas that have been restored. If restored areas are acceptable, Contractor's maintenance period shall begin.
- C. If erosion or washouts occur during maintenance period, Contractor shall reshape and reseed or sod. Reshaped areas shall be maintained for an additional 30 days. Contractor shall be responsible for reshaping eroded areas a maximum of two times, after which Owner will assume responsibility.
- D. Areas seeded after September 15 which fail to become established in the fall shall be reseeded and fertilized the following spring before June 1.

## **PART 4 SCHEDULES**

### **4.01 TURF REPLACEMENT SCHEDULE**

Location

All Areas

Turf Replacement

Type B

**END OF SECTION**

## SECTION 33 42 15

### PIPING AND ACCESSORIES

#### PART 1 GENERAL

##### 1.01 SUMMARY

- A. Provide piping and accessories as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

##### 1.02 RELATED SECTIONS

31 20 00 Earth Moving.

##### 1.03 SUBMITTALS

- A. Product Data: Submit product data for external wrap-around rubber gaskets.
- B. Make submittals in accordance with Section 01 33 00.

#### PART 2 PRODUCTS

##### 2.01 EXTERNAL WRAP-AROUND RUBBER GASKETS

- A. Provide external wrap-around rubber gaskets conforming to ASTM C877 (Type III).
- B. Gasket shall have a minimum width of 12 inches. Notify A/E if joint openings exceed 3/4 inches for joints to be treated. If joint openings exceed 3/4 inches, remedial work may be required, which will be considered extra work.
- C. Length of gasket shall be equal to outside circumference of pipe, plus length of gasket required to provide adequate overlap.

#### PART 3 EXECUTION

##### 3.01 INSTALLATION OF EXTERNAL WRAP-AROUND RUBBER GASKETS

- A. Install external wrap-around rubber gaskets at joints as shown on the Drawings.
- B. Prepare joints and install gaskets in strict accordance with manufacturer instructions.
- C. A/E approval of gasket installation is required before backfill can take place.
- D. Take care during backfill operations not to damage gaskets. Replacement of damaged gaskets shall be done at contractor's own expense.

**END OF SECTION**

**SECTION 35 21 82**  
**TIMBER STOP LOGS**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Provide timber stop logs as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

**1.02 QUALITY ASSURANCE**

- A. Timber shall be factory-marked to identify type, grade, inspection agency, producing mill and other qualities as specified.
- B. Obtain measurements and verify dimensions shown and shop drawing details before proceeding with timber work.

**1.03 QUALITY ASSURANCE**

- A. Provide to A/E timber mill certificate(s) for timber to be used for stoplog fabrication. Do not fabricate stoplogs until receiving A/E approval of source timber.
- B. Make submittals in accordance with Section 01 33 00.

**PART 2 PRODUCTS**

**2.01 TIMBER**

- A. Provide kiln-dried, Douglas Fir Select Structural grade timber as shown on the Drawings.
- B. Maintain 19% maximum moisture content for all pieces of construction timber.
- C. Timber shall be untreated.

**2.02 EPDM RUBBER SEALS**

- A. Provide ethylene propylene diene monomer (EPDM) rubber matting and membranes of the thicknesses shown on the Drawings to serve as seals between individual stoplogs and between the stoplogs and adjacent concrete and metal.

**2.03 NEOPRENE BONDING ADHESIVE**

- A. Provide a neoprene bonding adhesive rated for fastening EPDM rubber to concrete and metal.

**2.04 HARDWARE**

- A. General: Unless otherwise indicated, provide stainless steel fasteners and hardware.
- B. Stainless Steel Hardware: Regular hexagon-head annealed stainless steel bolts, ASTM F593, with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1 or Alloy Group 2.

## **PART 3 EXECUTION**

### **3.01 SITE PREPARATION.**

- A. Remove old stoplogs from existing stainless steel frame.
- B. Inspect stainless steel frame and connections for damage and/or looseness. Notify A/E if frame is damaged or if connections to riser wall need to be improved. Replacement of frame components and improving anchorages, if approved by A/E, will be considered extra work.
- C. Thoroughly clean frame components and concrete against which the new stoplogs will bear.

### **3.02 STOPLOG FABRICATION**

- A. Cut stoplog timber to the dimensions shown on the Drawings.
- B. Provide tongue and groove joints between stoplogs as shown. At each joint between stoplogs, provide EPDM membrane as shown for additional sealing capability. EPDM membrane shall be fastened across the entire length of each stoplog tongue using staples. Neoprene bonding adhesive shall not be used to glue EPDM membranes to stoplogs, as this may result in stoplogs inadvertently being glued together.
- C. Bottom stoplog shall be fabricated without a tongue, so that it may rest flush on the concrete riser baffle. Top stoplog shall be fabricated without a groove to provide a flat overflow surface.
- D. Install lifting lugs in each stoplog as shown using stainless steel hardware.

### **3.03 SEAL INSTALLATION**

- A. Fasten EPDM rubber matting as shown to concrete baffle top and the downstream flange of each frame channel. Provide continuous length of EPDM matting for each sealed member, cut to the required size.
- B. Fasten EPDM matting to concrete and stainless steel frame, as shown, using neoprene bonding adhesive. Thoroughly clean all surfaces prior to applying adhesive. Use adhesive according to manufacturer instructions.

### **3.04 STOPLOG INSTALLATION**

- A. Install stoplogs as shown on the Drawings. Adjust height of top stoplog, if needed, to achieve required top elevation within +/- 0.5 inch.
- B. Ensure tight seals between individual stoplogs and between stoplogs and between the stoplogs and adjacent sill and frame seals.
- C. Under full headwater pool, stoplog leakage shall not exceed 0.5 gallons per minute.

**END OF SECTION**