

ITB 32801-13977
Water Control Structure Replacement; TWRA
White Lake Refuge, Dyer County

Specifications

This event is to bid for the Water Control Structure Replacement at White Lake. This will be a one-time procurement with a single contract/purchase order awarded.

TWRA, partnering with Ducks Unlimited, proposes to replace the Water Control Structure at White Lake in Dyer County. Work will include:

- Site preparation
- Soil, water, and pollution control
- Removal and replacement of a concrete weir controlling water within the White Lake Refuge

Mandatory Site Visit

The Central Procurement Office will hold a mandatory site visit for this solicitation at the date, time, and location specified below:

Date/Time: August 19, 2026, at 9:00 a.m. Central Time

Location: Dyer County, TN

GPS: 36.1142, -89.5707

Bidders are required to attend and sign in at the mandatory site visit at the project location; failure to do so will render the submitted bid non-responsive.

Work Scope

- **201** – Mobilization
- **202** – Site Preparation
- **203** – Excavation
- **204** – Earthfill/Embankment
- **205** – Water Control
- **206** – Water Control Structure (Removal and Replacement)
- **207** – Aggregate Base Course

- **211 – Pollution Control**

201 – MOBILIZATION

201.1 Scope

The work shall include the supply of all labor, material, and equipment to transport all needed labor, material, and equipment to and from the project site to successfully complete that project as shown on the plans or described by TWRA. When working on a project site consists of construction of a number of pipes, or dam/levees, mobilization shall also include the supply of all labor, material, and equipment needed to transport required labor, material, and equipment between the various pipes or dam/levee sites.

201.2 Method

- The Contractor shall conduct all mobilization and demobilization operations in a timely, orderly manner.
- Unless otherwise approved by TWRA, mobilization operations shall commence no later than **one week** after the pre-construction meeting.
- Demobilization shall commence no later than **one week** after project completion and be finished within **two weeks** of project completion.
- During all operations, the Contractor is responsible for maintaining public and private property in original condition.

202 – SITE PREPARATION

202.1 Scope

This specification shall cover the supply of all labor, materials, and equipment required for clearing, grubbing, and site preparation.

The work shall include:

- Disposal of all trees, roots, brush, stone, rubbish, and all other surface litter in designated areas.
- Coordination of necessary clearing and grubbing operations to allow timely completion of construction staking of a project.
- Disking to remove grass and light brush from fill locations.
- Removal and stockpiling of existing pipes within the work area.

- Final cleanup of the site prior to demobilization, requiring the spreading and shaping of all materials stockpiled or moved to facilitate construction (including but not limited to vegetative material and removal of all erosion control measures).

202.2 Material

Clearing and grubbing material shall include all trees, tree roots, large stones, boulders, grass, and unsuitable material.

202.3 Construction Methods

202.3.1 Clearing & Grubbing

- **Clearing:** Consists of cutting, removing, disposing, and cleaning up all timber, brush, fallen timber, stumps, shrubs, and rubbish. Trees and shrubs designated for preservation shall be marked and protected from scoring, barking, or other injury during construction operations.
- **Grubbing:** Consists of the removal and disposal of all roots, stumps, embedded logs, or objectionable debris to a depth of not less than 12 inches below the original ground surface. Where no trees or brush exist, grubbing shall consist of stripping off any grass or weeds prior to placement of fill material.
- **Disposal:** Trees, logs, stumps, brush, and other debris shall be hauled to designated locations shown on the plans or as directed by TWRA. Areas such as borrow pits and excavations shall be left in a neat and finished appearance, free from debris. All materials disposed of shall be leveled to promote drainage. Areas adjacent to impoundments, approved by TWRA, will be used for disposal of debris. **No clearing debris will be disposed of inside an impoundment.**

202.3.2 Disking

Disking shall be required to remove grass and light woody vegetation from levees, borrow areas, or areas where fill material is to be excavated or embankment material is to be placed. Disking equipment shall be capable of disturbing the soil a minimum of **8 inches deep**, and multiple passes may be required to thoroughly reduce the size of existing vegetation prior to excavation and/or embankment operations. TWRA shall approve all disking operations prior to commencement of excavation and/or embankment work.

202.3.3 Removal of Existing Pipes

All existing pipes and water control structures within the work area not needed to maintain access and/or drainage upon project completion shall be removed and stockpiled at a designated location on site. Care shall be taken not to damage any usable structures during removal. All pipes or structures not designated to be removed shall remain in place and be protected from damage by the Contractor.

202.3.4 Removal of Gravel Surfacing

All gravel surfacing within the work area shall be bladed off the existing road and stockpiled at a designated location on site. After construction activities have commenced, the stockpiled gravel shall be respread on the existing road to the satisfaction of TWRA.

203 – EXCAVATION

203.1 Scope & Requirements

This specification covers the supply of all labor, materials, and equipment required for the excavation, hauling, and spreading of materials from within the construction limits shown on the plans.

Work includes:

- Control of water during excavation.
- Shaping of side slopes to lines and grades shown on drawings.
- Disposal of materials within designated areas.

Note: Unless otherwise specified, all materials to be excavated shall be considered unclassified regardless of their nature or the manner in which they are removed.

203.2 Execution

1. **Preparation:** Prior to any excavation, designated areas shall be cleared and grubbed in accordance with Specification 202 (Site Preparation).
2. **Execution:** Excavation includes removing all materials within limits shown on drawings or staked by TWRA. It shall be performed in as continuous an operation as possible, trimmed and leveled to conform to required lines, grades, and tolerances.

3. **Over-Excavation:** Areas over-excavated shall be replaced with suitable materials compacted to a density at least equal to that of the in-situ material, or to the satisfaction of TWRA.
4. **Material Reuse & Waste:** Suitable excavated soils shall be used for earthfill/embankment areas per Specification 204. All surplus or unsuitable materials designated as waste by TWRA shall be disposed of as directed.
5. **Water Management:** The Contractor is responsible for controlling surface/sub-surface water and drainage during construction. All temporary fills/crossings necessary to promote construction will be installed and removed at the Contractor's expense prior to acceptance. Water control must align with Specification 205 (Water Control).
6. **Safety Standards:** Excavations shall comply with **OSHA Construction Industry Standards (29 CFR Part 1926) Subpart P** (Excavations, Trenching, and Shoring). All excavations shall be maintained in a safe, stable condition throughout construction. Structure and trench excavations shall be completed to specified elevations, lengths, and widths required to safely install, adjust, and remove forms, bracing, or supports.

204 – EARTHFILL / EMBANKMENT

204.1 Scope

The work includes supplying all labor, material, and equipment required to complete the construction of levees and water control structures as shown on plans and staked in the field.

Work includes:

- Backfilling of suitable material around water control structures.
- Leveling and trimming of earthen dikes, embankments, or levees.

204.2 Material Requirements

- **General:** Fill material required for compacted backfill as outlined on construction plans or directed by TWRA shall be suitable on-site or off-site material free of organic matter.
- **Earthen/Clay/Embankment Specifications:** Any necessary off-site fill material shall consist of **USCS Soil Classification CL soils** having:
 - Minimum Plasticity Index (PI): **10**
 - Maximum Plasticity Index (PI): **20**

- Maximum Silt Content: **65%**
- **Submittals:** At least **15 days prior** to delivery of off-site materials, the Contractor shall designate in writing the source of fill material and provide documentation demonstrating compliance with contract requirements.

204.3 Construction Methods

Placement & Subgrade Preparation

- Placement and compaction shall not begin until Specification 202 (Site Preparation) and Specification 203 (Excavation) are completed to TWRA's satisfaction.
- No fill material shall be placed on a frozen subgrade, nor shall snow, ice, or frozen material be incorporated into the fill.
- Foundation subgrades for dikes, embankments, or levees shall be stripped of vegetation, rock, and unsuitable materials.
- Unless otherwise specified, earth foundation surfaces shall be graded to remove irregularities and scarified parallel to the axis of the fill (or loosened) to a minimum depth of **3 inches**. The moisture content shall be controlled, and foundation surface materials shall be compacted and bonded with the first layer of earthfill.
- Earth abutment surfaces shall be free of loose, uncompacted earth in excess of **2 inches** in depth normal to the slope, with adequate moisture to produce a good bond between fill and abutment.

Lift Heights & Compaction

- **Lift Thickness:** Suitable fill material shall be placed in lifts of not more than **6 inches** for heavy compaction equipment and **4 inches** for hand compaction equipment. Each lift must be deposited longitudinally along the embankment.
- **Proximity to Structures:** A handheld vibratory compaction plate **must be used within 2 feet** of culverts and water control structures.
- **Equipment:** Heavy compaction equipment shall consist of motor-driven roller compaction equipment (sheepsfoot roller) or other TWRA-approved methods. Hauling and compaction equipment shall operate over the full width of each layer for uniform compaction.
- **Density Requirements:** Each layer shall be compacted to at least **95% of Standard Proctor Maximum Dry Density (ASTM D-698)** or to TWRA satisfaction.

- **Inspections:** Each lift is subject to inspection by TWRA (or an approved inspector); the Contractor shall not proceed to the next lift until approval is granted.
- **Moisture Control:** Moisture content of fill materials shall be **±3% of optimum**. Wet material (pumping) must be removed and dried prior to compaction. Dry material must be evenly mixed with water. No extra payment will be made for hauling or applying water.

Grading, Tolerances, and Maintenance

- Dikes, embankments, or levees shall be construction-staked to final grade elevations by the Contractor and brought to specified elevations using suitable compacted fill material graded to a tolerance of **0.1 feet**.
- Construction must be as continuous as possible to ensure drainage.
- Should settlement occur during construction, within **30 days** of substantial completion, or prior to acceptance, additional material shall be placed and trimmed to final grade by the Contractor at their own expense.
- Acceptance of finished structures may be made progressively. Once accepted by TWRA, completed levees/embankments shall not be used by the Contractor for haulage or access without prior TWRA consent.
- Haul roads (public or private) are the responsibility of the Contractor and incidental to the work. Borrow areas must be maintained in a graded condition to assure drainage. Upon completion, borrow areas must be left in a condition acceptable to TWRA, and all haul roads, access roads, and temporary crossings must be removed.

205 – WATER CONTROL

205.1 Scope

Work consists of removing surface and groundwater as necessary to perform contract construction.

Scope includes:

1. Constructing, installing, building, and maintaining temporary water containment facilities, channels, and diversions.
2. Furnishing, installing, and operating pumps, piping, and required equipment.
3. Removing temporary works and equipment when no longer needed.

Note: The Contractor is fully responsible for managing and removing cofferdams and water control measures during rainfall events where off-site impacts may occur.

205.2 Diverting Surface Water

- The Contractor shall install, maintain, and operate cofferdams, channels, flumes, sumps, and protective works needed to divert stream flow and surface water.
- Control of surface water shall be continuous during periods where damage could occur. The diversion outlet shall discharge into the same drainageway the water naturally reaches, unless otherwise approved.
- **Submittal:** The Contractor shall submit a written proposed plan for diverting surface water to TWRA before starting construction requiring diversion (unless waived by TWRA).

205.3 Dewatering the Construction Site

- The Contractor is responsible for control of surface/subsurface water and drainage. All temporary fills, crossings, and culverts will be installed and removed at the Contractor's expense.
- **Cofferdams:** Required for all excavations in active watercourse channels and areas of groundwater seepage. Cofferdams must withstand all design forces and provide clearance for cutoff trenches/sump pits.
- **Execution:** Foundations and cutoff trenches shall be kept free of standing water and muddy conditions. Dewatering systems causing loss of soil fines from foundation areas are **prohibited**.
- **Submittal:** The Contractor shall submit a written proposed dewatering plan to TWRA before commencing construction requiring dewatering.

205.4 Erosion & Pollution Control

Water removal (including from borrow areas) shall minimize erosion and sediment transport. Dewatering shall not alter groundwater quality. Operations must comply with Specification 211 (Pollution Control).

205.5 Removal of Temporary Works

- Upon completion, temporary works shall be removed and the area restored to pre-construction conditions, graded for a neat appearance without obstructing natural drainage.

- Care must be taken to minimize the loss of trapped sediment/debris during removal.
- Dewatering pipes and casings must be removed from temporary wells, and wells filled to ground level with clean gravel or TWRA-approved material.

206 – WATER CONTROL STRUCTURES

206.1 Scope

Supply all labor, materials, and equipment required to install water control structures and appurtenances (drainage pipes, concrete riser structures with stoplogs, stoplog lifting hooks, bar grating, and catwalks).

Work includes:

- Fabricating structures
- Cofferdams and dewatering
- Base/bed preparation and supplying bedding material
- Compacting bedding material and backfill
- Installing structures, connecting pipes, hardware, and placing rock bedding

206.2 Materials Specifications

Pipe Culverts

- Contractor supplies all pipe and is responsible for delivery, unloading, and handling.
- Pipe shall be new or **No. 1 Grade used pipe** in good condition (no torch-cut ends, excessive rust, pitting, or deformations).
- Minimum wall thickness: **0.50 inch**.

Precast Concrete Riser

- Dimensions as specified on plans; manufactured using the **wet cast method**, poured as one continuous section with a smooth form finish.
- Minimum concrete compressive strength: **4,000 psi**.
- Chamfer exposed edges: **$\frac{3}{4}$ inch**.
- Minimum concrete cover for reinforcement: **2 inches** (unless drawings show greater).
- Embedded steel stoplog channels: **Hot-dipped galvanized**, cast into concrete as specified.

- Equipped with lifting hooks/inserts of adequate capacity for safe transport and erection.
- **Submittal:** Shop drawings must be submitted and approved by TWRA prior to fabrication.

Aluminum Stoplogs

Fabricated from tongue-and-groove aluminum to the dimensions shown in the plans.

Structural Steel Members

All structural steel members must be domestic steel conforming to:

- **W-Shapes:** ASTM A 992, Grade 50
- **Channels, Angles, & S-Shapes:** ASTM A 36
- **Plates & Bars:** ASTM A 36
- **Cold-Formed Hollow Structural Sections:** ASTM A 500, Grade B (Structural Tubing)
- **Welding Electrodes:** AWS latest standards
- **Structural Piping:** Schedule 40, ASTM A 53, Grade B
- **Catwalk Members:** Hot-dip galvanized with minimum coating weight of **1.8 oz/sq ft.**

Bolts & Hardware

- High-strength bolts, nuts, and washers: **ASTM A 325, Type 1, Heavy-Hex Structural Bolts, Stainless Steel, Grade 316.**
- Snug-tightened in accordance with RCSC *Specification for Structural Joints Using ASTM A 325 Bolts.*

Bar Grating & Gates

- **Bar Grating:** Hot-dip galvanized with minimum coating weight of **1.8 oz/sq ft.**
- **Slide Gate:** Flat-back **Fresno Series 6600 Model 101C** with stainless steel stem (or approved equal).

Cast-In-Place Concrete

- **Cement:** Portland Cement ANSI/ASTM C150 Type 1.
- **Water:** Fresh, clean, potable.

- **Aggregates:** Free from dirt/organic material; max 2% by weight silt/clay. Uniformly graded with max size **¾ inch** and fine sand content between **35%–42%**.
- **Compressive Strength:** 3,000 psi at 28 days; 1-to-4-inch slump.
- **Time Limit:** Placement must occur within **1.5 hours** of mixing.

Sand Diaphragm Gradation Table

Fine aggregate meeting ASTM C-33 requirements:

Sieve Size	% Passing by Weight
3/8"	100
#4	80 – 100
#16	50 – 85
#30	25 – 60
#50	5 – 30
#100	0 – 10

206.3 Handling, Storage, and Construction Methods

Handling & Storage

- Handled and stored in a workmanlike manner. Dents, cracks, or depressions in pipe or risers will not be accepted. Damaged items must be replaced and reinstalled at the Contractor's expense.

Fabrication & Connections

- **High-Strength Bolt Connections:** Installed snug-tight per RCSC specifications.
- **Weld Connections:** Full-penetration welds complying with AWS D1.1/D1.1M. Must also comply with AISC 303 and AISC 360 for bearing, alignment, and paint removal adjacent to welds.

Base Preparation & Pipe Installation

1. Foundation prepared per specifications; precast riser installed on a **minimum 24-inch layer** of Aggregate Base Course.
2. Earthfill placed in **6-inch layers** per Specification 204.
3. Trench excavated along pipe centerline through fill: bottom width **4 feet wider** than pipe diameter.
4. Pipe centered in trench, riser/base constructed, and riser attached to pipe.
5. **Cofferdam & Slurry Placement:**
 - Construct cofferdams across trench at proposed downstream embankment surface and upstream locations (min. **2 feet above** top of conduit).
 - Fill trench between downstream cofferdams with soil/water slurry to **1/3 pipe diameter height**.
 - Anchor conduit (via higher cofferdam elevation, wider width, or equipment loading) to prevent uplift during slurry placement.
 - After slurry placement, complete remaining earthfill per Specification 204.

Riser Connection & Installation

- Lifting slings must conform to **OSHA 29 CFR 1910.184** (spreader bar preferred). Lifting chain length must prevent contact with stoplog channels.
- Compact within **2 feet** of concrete riser using handheld equipment.
- Coat contacting steel pipe surfaces with bituminous mastic paint; fill gap with structural non-shrink grout (min. **4,000 psi** compressive strength).

206.4 Quality Control

- Workmanship/materials subject to systematic TWRA inspection and testing.
- TWRA reserves the right to reject non-conforming materials or work.
- TWRA must be afforded full access to work sites, plants, and borrow pits.

206.5 Method of Measurement

Water control structure installation measured on a unit basis per the Standard Bid Form:

- **54" Smooth Steel Pipe:** Measured per Linear Foot (L.F.) supplied and installed.
- **Precast Concrete Riser:** Measured per Each (EA) structure installed.
- **54" Screw Gate:** Measured per Each (EA) gate installed.
- **Catwalk:** Measured per Each (EA) catwalk supplied and installed.

(Note: No separate measurement made for fabrication, flanges, welding, coatings, or incidental items.)

207 – AGGREGATE BASE COURSE

207.1 Material Specifications

Aggregate Base Course Gradation Table

Materials shall be gravel or crushed stone. Blending separate materials on site is **not permitted** (must use mechanical feeders). Contains no more than 5% shale, slate, or objectionable material.

Sieve Size	Percent Passing
1 ½"	100
1"	95 – 100
1/2"	25 – 60
#4	0 – 10
#8	0 – 5

Sieve Size	Percent Passing
#200	0 – 2.0

Geotextile Fabric Requirements

Class 1 non-woven fabric placed under aggregate base course as indicated on plans:

Property	Test Method	Min. Value
Weight	ASTM D 5261	8 oz/yd ²
Grab Breaking Load	ASTM D 4632	900 N
Sewn Seam Strength	ASTM D 4632	810 N
Tear Strength	ASTM D 4533	350 N
Puncture Strength	ASTM D 6241	1925 N
Apparent Opening Size (AOS)	ASTM D 4751	0.30 mm max
Permittivity	ASTM D 4491	0.1 sec ⁻¹

207.2 Construction Methods

- **Geotextile Placement:** Adequate contact between soil and fabric. Pin in place to prevent sliding/gaps. Overlap seams a minimum of **2 feet** with pins in the center of the overlap. Protect fabric from equipment wheels/tracks.
- **Placement & Compaction:** Place on approved subgrade (not frozen). Spread in lifts of not more than **4 inches**.

- Compact by routing hauling/spreading equipment (min. ground pressure **7 psi**) so every point is traversed by at least **one tread track** (or TWRA-approved method).
- Placement of base course shall not begin until Specification 204 (Earthfill/Embankment) is complete and approved.

211 – POLLUTION CONTROL

211.1 Scope

Install measures to control erosion and minimize sediment/pollutant production to water and air. The Contractor must comply with all conditions in the **404 and 401 permits** for the project.

211.2 Erosion and Sediment Control Measures

- **Staging of Earthwork Activities:** Schedule excavation to minimize unprotected areas for the shortest feasible time.
- **Seeding:** Protect disturbed areas.
- **Rock Check Dams:** Placed in ditches to control discharge from the hydraulic dredge disposal basin.
- **Diversions:** Divert water from work areas and collect runoff for treatment. Temporary; remove upon completion.
- **Stream Crossings:** Culverts or bridges for equipment stream crossings. Temporary; remove upon completion.
- **Sediment Basins:** Settle and filter sediment to protect downstream properties. Temporary; remove upon completion.
- **Sediment Filters:** Straw bale filters or geotextile silt fences to trap sediment. Anchored properly. Temporary; remove upon completion.
- **Turbidity Curtains:** Floating sediment fences in water bodies to prevent sediment flow. Anchored properly. Temporary; remove upon completion.
- **Waterways:** Safe disposal of runoff from fields/diversions. Temporary; remove upon completion.
- **Other:** Additional work specified by TWRA or governing agencies.

211.3 Chemical & Air Pollution Control

- **Chemical Pollution:** Provide watertight tanks/barrels or plastic-lined sumps to dispose of pollutants (oils, greases, soaps, concrete wash water, asphalt). Void sumps at project completion without causing pollution.

- **Sanitary Facilities:** Chemical toilets or septic tanks must be located at a sufficient distance from streams, wells, or springs to prevent contamination.
- **Air & Dust Control:**
 - Burning brush/slash must