SP- 231054
(New)

SPECIAL PROVISIONS
FOR
STOPLOG CLOSURE STRUCTURES

Polk County
HDP-1945(411)--71-77

Effective Date
January 22, 2025

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 GENERAL

1.01 Description of Work.

This specification covers the furnishing of all material, equipment, labor and plant, and performing all operations specified herein, including the manufacturing, transporting, and placing stoplog structures.

1.02 References.

The provisions of the following codes, specifications, and standards, latest editions, shall apply:

- ACI 117, “Standard Specifications for Tolerances for Concrete Construction and Materials”.
- ASTM A 320/A 320M, (2017b) “Standard Specification for Alloy-Steel and Stainless-Steel Bolting for Low-Temperature Service”
- ASTM A 325, (2014) “Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength”
- ASTM B 221, (2014) “Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes”
- ASTM B 308/B 308M, (2010) “Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles”
- ASTM D 2240, (2015; E 2017) “Standard Test Method for Rubber Property - Durometer Hardness”
- ASTM D 395, (2016; E 2017) “Standard Test Methods for Rubber Property - Compression Set”
- ASTM D 412, (2016) “Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension”
- ASTM D 413, (1998; R 2017) “Standard Test Methods for Rubber Property - Adhesion to Flexible Substrate”

- ASTM D 471, (2016a) “Standard Test Method for Rubber Property - Effect of Liquid”
- ASTM D 572, (2004; R 2010) “Rubber Deterioration by Heat and Oxygen
- AWS D1.2, (2007) “AWS D1.2 Structural Welding Code – Aluminum”

1.03 Submittals.

Submit the following in accordance with the contract documents:
- Shop Drawings – Fabrication and construction details.
- Product Data – Material mill reports.
- Welding materials and procedures.
- Identification System.
- Test Reports, Inspections and Verifications.

1.04 Qualification of Welders and Welding Operators.

Qualification of welders and welding operators shall conform to the requirements of The American Welding Society (AWS) D1.2 Structural Welding Code - Aluminum.

1.05 Delivery, Storage, and Handling.

Delivery, handling and storage of materials and fabricated items shall conform to the requirements specified herein.

A. Rubber Seals: Store rubber seals in a place which permits free circulation of air, maintains a temperature of 70°F or less, and prevents the rubber from being exposed to the direct rays of the sun. Rubber seals shall be kept free of oils, grease, and other materials which would deteriorate the rubber. Rubber seals shall not be distorted during handling.

B. Identification System: Submit an identification system which shows the disposition of specific lots of approved materials and fabricated items in the work, before completion of the contract.

1.06 Measurement and Payment.

A. Measurement: No field measurement will be made.

B. Payment: Payment will be at the lump sum price for the overall closure structure item.

C. Includes: Includes, but is not limited to, excavation, dewatering, water diversion, foundation preparation, leveling pad, furnishing and placing bedding and backfill material, furnishing and placing structural concrete and reinforcing steel, waterstops, precast units (if used), concrete fillets, stoplog equipment, castings, and grouting. Structural concrete work includes procuring, batching, transporting, forming, placing, vibrating, finishing, and curing concrete. Stoplog equipment work includes procuring, fabricating, transporting, and installation of aluminum stoplogs for closure structure(s). Levee fill to envelope the floodwall component of the closure structure is included under Excavation, Class 10 quantities.

PART 2 PRODUCTS

2.01 Materials.

A. Metals.

1. Structural aluminum, and other metal materials sections and standard articles shall be as shown on the plans and as specified herein cement used throughout the work shall be uniform in color.
2. Structural aluminum shall conform to ASTM B 221, ASTM B 308 Alloy 6061, Temper T6 as indicated on the plans.

B. Rubber Seals.

1. Rubber seals shall be fluorocarbon (Teflon) clad rubber seals of the mold type only, shall be compounded of natural rubber, synthetic polyisoprene, or a blend of both, and shall contain reinforcing carbon black, zinc oxide, accelerators, antioxidants, vulcanizing agents, and plasticizers. Physical characteristics of the seals shall meet the following requirements:

PHYSICAL TEST	TEST VALUE	TEST METHOD SPECIFICATION
Tensile Strength	2500 psi (min.)	ASTM D 412
Elongation at Break	450% (min.)	ASTM D 412
300% Modulus	900 psi (min.)	ASTM D 412
Durometer Hardness (Shore Type A)	60 to 70	ASTM D 2240
*Water Absorption	5% by weight	ASTM D 471
Compression Set	30% (max.)	ASTM D 395
Tensile Strength (after aging 48 hrs)	80% tensile	ASTM D 572

2. The water absorption test shall be performed with distilled water. The washed specimen shall be blotted dry with filter paper or other absorbent material and suspended by means of small glass rods in the oven at a temperature of 70°C ± 2°C for 22 +/- 1/4 hour. The specimen shall be removed, allowed to cool to room temperature in air, and weighed. The weight shall be recorded to the nearest 1 mg as W1 (W1 is defined in ASTM D 471). The immersion temperature shall be 70°C ± 1°C and the duration of immersion shall be 166 hours.
3. Rubber seals shall have a fluorocarbon film vulcanized and bonded to the sealing surface of the bulb. The film shall be 0.030 inch thick Huntington Abrasion Resistant Fluorocarbon Film No. 4508, or equal, and shall have the following physical properties:

Tensile strength	2000 psi
Elongation	250% (min.)

C. The outside surface of the bonded film shall be flush with the surface of the rubber seal and shall be free of adhering or bonded rubber. Strips and corner seals shall be molded in lengths suitable for obtaining the finish lengths shown and with sufficient excess length to provide test specimens for testing the adequacy of the adhesion bond between the film and bulb of the seal. At one end of each strip or corner seal to be tested, the fluorocarbon film shall be masked during bonding to prevent a bond for a length sufficient to hold the film securely during testing.

2.02 Manufactured Units.

A. Bolts, nuts, washers, screws and other manufactured units shall conform to the requirements specified.

B. Bolts. Nuts and Washers.

1. All connections shall conform to the requirements of AWS D1.2. Bolts 1/2 inch and larger shall have hexagon heads. The finished shank of bolts shall be long

enough to provide full bearing. Washers for use with bolts shall conform to the requirements specified in the applicable specification for bolts.

2. Screws shall be of the type indicated.
3. Clips and clip bolts for aluminum panels shall be approved standard manufactured stock items.

2.03 Fabrication.

A. Detail drawings of stoplogs and appurtenant shop fabricated items, including fabrication drawings, shop assembly drawings, delivery drawings, and field installation drawings, shall conform to the requirements specified.

B. Show on the fabrication drawings complete details of materials, tolerances, connections, and proposed welding sequences which clearly differentiate shop welds and field welds.

C. Show on the shop assembly drawings details for connecting the adjoining fabricated components in the shop to assure satisfactory field installation.

D. Show on the delivery drawings descriptions of methods of delivering components to the site, including details for supporting fabricated components during shipping to prevent distortion or other damages.

E. Show on the field installation drawings a detailed description of the field installation procedures. The description shall include the location and method of support of installation and handling equipment; provisions to be taken to protect concrete and other work during installation; method of maintaining components in correct alignment; and methods for installing appurtenant items.

F. Structural fabrication shall conform to the requirements specified.

G. Submit schedules of welding procedures for welding processes for aluminum. Welding shall conform to the requirements specified AWS D1.2.

H. Bolted connections shall conform to the requirements specified.

2.04 Structural Metal Fabrications.

A. Miscellaneous provisions for fabrication shall conform to the requirements specified.

B. Stoplogs and posts shall be fabricated of extruded aluminum conforming to ASTM B 221, ASTM B 308 Alloy 6061, Temper T6 as indicated on the plans.

C. Stoplog guides and post pockets shall be fabricated of structural steel conforming to ASTM A 36, ASTM A 529, ASTM A 572(Grade 42), ASTM A 588 as indicated on the plans.

D. Corner protection angles, frames, base plates, and other embedded metal items required for complete installation shall conform to the details shown.

E. Seal assemblies shall consist of rubber seals, stainless steel retainer and spacer bars, and fasteners. Rubber seals shall be continuous over the full length. Seals shall be accurately fitted and drilled for proper installation. Bolt holes shall be drilled in the rubber seals by using prepared templates or the retainer bars as templates. Splices in seals shall be fully molded, develop a minimum tensile strength of 50% of the unspliced seal, and occur only at locations shown. All vulcanizing of splices shall be done in the shop. The vulcanized splices between molded corners and straight lengths shall be located as

close to the corners as practicable. Splices shall be on a 45 degree bevel related to the "thickness" of the seal. The surfaces of finished splices shall be smooth and free of irregularities. Stainless steel retainer bars shall be field-spliced only where shown and machine-finished after splicing.

2.05 Test, Inspections, and Verifications.

A. Tests, inspections, and verifications for materials shall conform to the requirements specified in AWS D1.2. Submit certified test reports for material tests, with all materials delivered to the site.

B. The fluorocarbon film of rubber seals shall be tested for adhesion bond in accordance with ASTM D 413 using either the machine method or the deadweight method. A 1 inch long piece of seal shall be cut from the end of the seal which has been masked and subjected to tension at an angle approximately 90 degrees to the rubber surface. There shall be no separation between the fluorocarbon film and the rubber when subjected to the following loads:

THICKNESS OF FLUOROCARBON FILM	MACHINE METHOD AT 2 INCHES PER MINUTE	DEADWEIGHT METHOD
0.030 inch	30 pounds per inch	30 pounds per inch
0.060 inch	30 pounds per inch	30 pounds per inch

C. Failure of any specimen to meet the requirements of the test used will be cause for rejection of the piece from which the test specimen was taken.

PART 3 – EXECUTION

3.01 Installation.

A. Installation shall conform to the requirements specified.

B. Embedded Metals.
Corner protection angles, frames, base plates, and other embedded metal items required for complete installation shall be accurately installed to the alignment and grade required to ensure accurate fitting and matching of components. Embedded metals shall be given a primer coat of the required paint on all surfaces prior to installation in concrete forms. Anchors for embedded metals shall be installed as shown. Items requiring two concrete pours for installation shall be attached to the embedded anchors after the initial pour, adjusted to the proper alignment, and concreted in place with the second pour.

C. Seal Assemblies.
Rubber seal assemblies shall be installed after the embedded metal components have been concreted in place and the gate installation, including painting, completed. Rubber seals shall be fastened securely to metal retainers. Before operating the gates, a suitable lubricant shall be applied to the rubber seal rubbing plates to protect the rubber.

3.02 Acceptance Trial Operation.

After completion of installation, the Engineer will examine the stoplog installation for final acceptance. The individual components of the stoplog installation will be examined first to

determine whether or not the workmanship conforms to the specification requirements. The Contractor will be required to place the stoplogs and posts in the guides [and post pockets] a sufficient number of times to demonstrate that the stoplogs fit properly and seat uniformly. Required repairs or replacements to correct defects, shall be made at no cost. The trial operation shall be repeated after defects are corrected.