



**SPECIAL PROVISIONS  
FOR  
STRUCTURAL STEEL**

**Scott County  
IM-NHS-074-1(198)5--03-82**

**Effective Date  
April 25, 2017**

**THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**Gray shading indicates changes from the Standard Specifications. Highlighting indicates changes from the previous version of this special provision.**

**150219b.01 DESCRIPTION.**

This work includes the fabrication and erection of structural steel as shown in the plans.

**150219b.02 MATERIAL.**

Provide materials in accordance with Article 2408.02 of the Standard Specifications, except as modified or appended herein.

**Replace** Article 2408.02, A, 1 of the Standard Specifications with the following:

**1. Rolled Plates, Shapes, and Eyebars.**

- a. Apply Section 4152 of the Standard Specifications, except as modified below.
- b. Use ASTM A 709/A 709M Grade 50W when not designated otherwise.
- c. Provide Charpy V-Notch Impact Testing for Fracture Critical and Non-Fracture Critical Members in accordance with the *AASHTO LRFD Bridge Design Specifications*. Fracture Critical Members are designated in the plans.
- d. Where indicated in the plans, provide steel that meets the Charpy V-Notch Impact Test Minimum Average Energy of 120 foot-pounds at -10°F for Zone 2.

**Add** the following to Article 2408.02, A, 4 of the Standard Specifications:

Threaded Stud: ASTM A 108 with ASTM F 844 washer and ASTM A 563 nut.

**Add** the following to Article 2408.02, A of the Standard Specifications:

**7. Open Steel Grating.**

ANSI/NAAMM HMMA – MBG 531-09. Rectangular bar grating, welded construction, with a serrated surface profile provided for skid resistance added. Provide size and spacing of bearing bars and cross bars as designated on the plans. Grating shall be galvanized in accordance with ASTM A 123 after fabrication.

**8. Inspection Cable at Floorbeams and Cable Handrails at Top of Arch Rib and Interior of Arch Rib.**

- a. Provide wire rope conforming to ASTM A 603, Class C, and with the diameter as indicated on the plans.
- b. Wire rope clips shall be forged and in accordance with Federal Specification FF-C-450, Type I, Class I, galvanized.
- c. Thimbles shall be in accordance with Federal Specification FF-T-276 B, Type III, galvanized.
- d. Where indicated in the plans, provide ASTM F 1145, Type 1, Grade 1, Class B turnbuckles with studded, jawed, or eyed ends.

**9. Access Hatches.**

- a. ASTM A 588. Type 316 Stainless Steel heavy duty hinges with lube bearings and hinge pins conforming to ASTM A 240. Provide a neoprene sheet between the hinge and arch rib conforming to ASTM D 1046. Paint the upper portion of the bolts that are in contact with the hinge.
- b. Type 316 Stainless Steel gas springs capable of lifting a maximum force of 50 pounds per hinge. Provide gas springs of the required size to provide smooth, easy, and controlled hatch operation throughout a 90 degree arc of opening. For the horizontally-mounted access hatches, provide gas springs that assist upward motion and retard downward motion of the cover when closing and can be locked in the open position.
- c. Provide security screws that are keyed-lok type as manufactured by Bryce Fastener or approved equal and that conform to ASTM F 593 (stainless steel). Provide five additional security screws and five compatible bits to the Contracting Authority.
- d. Provide heavy-duty case hardened steel padlocks at all access doors. Key the padlocks alike so that the same key will open all of the padlocks. Provide padlocks with a 5/16 inch minimum diameter shackle, 5-pin tumbler, and a minimum vertical clearance between the shackle and body only as required to permit installation (no excess clearance). Submit manufacturer's information to the Engineer for review and approval.
- e. Glue the rubber seal to the arch rib with an adhesive that is approved by the manufacturer. Install the rubber seal such that the fit is water tight when the security screw is tightened and the hasp is in flush contact with the frame plate.
- f. Lock ring shall be galvanized according to ASTM A 153, Class C.

**10. Ladders.**

ASTM A 588.

**11. Structural Steel.**

ASTM A 709, Gr. 50W steel unless noted otherwise. Painted.

**12. Steel Pipe.**

Provide smooth, rigid, steel pipe conforming to ASTM A 53 Grade B.

**13. Grout Port.**

- a. Provide permanent grout ports and threaded plugs made of ASTM A 240 Type 316 stainless steel, nylon or polyolefin materials. For products made of nylon, the cell class of the nylon according to ASTM D 5989 shall be S-PA0141 (weather resistant), S-PA0231 or S-PA0401 (ultimate strength not less than 10,000 psi with UV stabilizer added). Product made from polyolefin shall contain antioxidant(s) with a minimum Oxidation Induction Time (OIT) according to ASTM D 3895 of not less than 20 minutes. Perform OIT test on samples taken from the finished product. Test the remolded finished polyolefin material for stress crack resistance using ASTM F 2136 at an applied stress of 348 psi resulting in a minimum failure time of 3 hours. Neither metallic nor plastic components, if selected and approved, shall react with the concrete or enhance corrosion of the post-tensioning steel. Use plastic components free of water soluble chlorides.

- b. All grout ports shall be equipped with pressure rated mechanical shut-off valves or plugs. Grout ports shall be rated for a minimum pressure rating of 150 psi. Use grout ports with a minimum inside diameter of 3/4 inch.

#### 15 14. PE Liner.

Use a low density polyethylene (PE) liner fabricated from resins meeting the requirements of ASTM D 4976. Plastic material used shall not react with concrete or enhance corrosion of the S.S. all-thread-bars and shall be free of water soluble chloride.

### 150219b.03 FABRICATION.

- A. Perform fabrication in accordance with Section 2408.02 of the Standard Specifications and AASHTO/AWS D1.5M/D1.5 Bridge Welding Code, except as modified or appended herein.
- B. If the optional complete penetration welded longitudinal splice of the arch rib webs is used, AASHTO/AWS D1.5M/D1.5, Paragraph 3.6.3 is amended such that the surfaces of the butt joint must be finished so as not to reduce the thickness of the base metal or weld metal by more than 0.010 inch nor leave reinforcement that exceeds 0.010 inch.
- C. Develop a Distortion Control Program for this optional splice, in accordance with AASHTO/AWS D1.5M/D1.5, and submit it to the Engineer for review. Variations from flatness of the arch web due to the optional complete penetration welded longitudinal splice must not exceed 0.010 inch.
- D. Place grout ports at locations shown in the plans and shop drawings. Equip all grout ports with positive shut-off devices. Grout ports shall be installed with plugs or valves in the closed position. The use of duct tape is not permitted.
- E. Ensure grout ports connect to the ducts as close to the high/low spot (as applicable) of each duct section to ensure that each section of duct is vented/drained (as applicable) as effectively as possible considering the final installed position of each duct section in the finished structure.
- F. PE Liner shall be constructed from sheet material. Sheet material shall fit tightly within the Pipe duct while remaining smooth and free of kinks after installation. The PE liner shall fit securely such that it will not be dislodged by construction activities. If additional means are required to secure the PE liner during construction, the contractor shall propose a method and submit to the engineer for review and approval. The proposed method shall not interfere with the intent of the liner, which is to debond the upper portion of the post-tensioning bars. Heat form the sheets to a uniform radius if required. Limit the gap between sheet edges to 1/8 inch maximum after final installation. Stagger the gaps in the two layers by a minimum of 3 inches. Each layer shall be comprised of a single piece of sheet material. Drill holes with a diameter 1/2 inch larger than the ID of the grout ports prior to installing the liner in the Pipe. After installation, ensure the grout ports are unobstructed and remain unobstructed throughout construction. Insert PE Liners into Pipe after all welding of the Pipe has been completed.

### 150219b.04 CONSTRUCTION.

- A. Perform construction in accordance with Section 2408 of the Standard Specifications and the Special Provisions for Erection Requirements.
- B. Provide handrails, access hatches, and ladders that meet all applicable federal, state, and local code regulations.
- C. Fasten open steel grating in accordance with the manufacturer's recommendations.

- D. Inspection cable and cable handrails shall be tightened to remove slack. Tolerance shall be 1/2 inch maximum sag at midpoint between supports with no vertical load other than the self-weight of the cable system.
- E. Supply a base plates on Arch Rib Segment R0 that are at least 1/4 inch over the specified thickness indicated in the plans.
- F. Provide temporary support of Arch Rib Segments R0 from initial erection through the completion of post tensioning operations.

**150219b.05 METHOD OF MEASUREMENT.**

The Engineer will compute the quantities of various items of structural steel and incidental parts as follows:

**A. Structural Steel.**

All structural steel and incidental parts will be considered part of this item, except those included with Structural Steel (Grade HPS 70W), Structural Steel, Arch Rib, Structural Steel, Arch Rib (Grade HPS 70W), and those designated otherwise in these Specifications. Measure structural steel in accordance with Article 2408.04, C of the Standard Specifications.

**B. Structural Steel (Grade HPS 70W).**

All structural steel and incidental parts comprised of ASTM A 709, Grade HPS 70W steel, except those included with Structural Steel, Arch Rib (Grade HPS 70W), will be considered part of this item. Measure structural steel in accordance with Article 2408.04, C of the Standard Specifications.

**C. Structural Steel, Arch Rib.**

Structural steel in the arch rib and struts, including all internal stiffeners, internal diaphragms, internal and external access components, pipes (ducts), and attachments, but excluding those included with Structural Steel, Arch Rib (Grade HPS 70W), will be considered part of this item. Measure the structural steel in the arch rib in accordance with Article 2408.04, C of the Standard Specifications.

**D. Structural Steel, Arch Rib (Grade HPS 70W).**

All ASTM A 709, Grade HPS 70W structural steel in the arch rib will be considered part of this item. Measure the structural steel in the arch rib in accordance with Article 2408.04, C of the Standard Specifications.

**150219b.06 BASIS OF PAYMENT.**

**A. Structural Steel.**

Contract unit price per pound. Payment will be made in accordance with Article 2408.05, C, 2 of the Standard Specifications.

**B. Structural Steel (Grade HPS 70W).**

Contract unit price per pound. Payment will be made in accordance with Article 2408.05, C, 2 of the Standard Specifications.

**C. Structural Steel, Arch Rib.**

Contract unit price per pound. Payment will be made in accordance with Article 2408.05, C, 2 of the Standard Specifications.

**D. Structural Steel, Arch Rib (Grade HPS 70W).**

Contract unit price per pound. Payment will be made in accordance with Article 2408.05, C, 2 of the Standard Specifications.