

## **SECTION 18400**

### **RAIL BONDING**

#### **PART 1 - GENERAL**

##### **1.01 DESCRIPTION**

- A. Section includes requirements for rail bonds, fouling bonds, frog bonds, track circuit connections, and all other material required for bonding of track circuit joints, track frog and switch bonding, and track circuit connections.

##### **1.02 SYSTEM DESCRIPTION**

- A. Welded Bonds and track connections shall be in accordance with the requirements of PCJPB Standards.
- B. Rail track joints shall be bonded with welded railhead bonds per PCJPB standards.
- C. Track switch, frog fouling bonds, and track connections shall be stranded bonds.
- D. Crimped sleeves shall not be used for any fouling or frog bonding unless allowed by PCJPB Manager of Signals and Communications through the Engineer.

##### **1.03 QUALITY ASSURANCE**

- A. Install and test the track bonds in accordance with all applicable requirements of CFR 49, Part 236 and the recommendations of the AREMA C&S Manual, Part 8.1.20. When following the recommendations of the AREMA C&S Manual substitute the word "shall" for the word "should" in the applicable Manual Part.

##### **1.04 SUBMITTALS**

- A. Product Data: Manufacturer's catalog cuts, material specifications, installation and maintenance instructions, and other data pertinent to the bonding material, staples, and circuit connections, specified herein and as shown on the Contract Drawings.

#### **PART 2 – PRODUCTS**

##### **2.01 MATERIALS**

- A. Rail Head Bonds: Railhead bonds shall be 3/16-inch in diameter with steel terminals welded to the conductors. They shall have a nominal length of 6 1/2 inches.
- B. Web Bonds: Web Bonds shall be 3/16-inch, 12-inch long welded to the web.
- C. Track Circuit Rail Connectors: Track circuit connectors shall be 3/16-inch stranded bronze conductor, 1-inch tap for welded connection on one end and compression sleeve on the other end for a direct crimp type connection to the

track wire, and shall have a nominal length of 4 inches. Use no crimped connections on fouling wires or frog bonding unless authorized by the PCJPB Manager of Signals and Communications through the Engineer.

- D. Bond Strand: Bond strand for fouling wires shall be 3/16-inch single strand with 1/16-inch black PVC insulation.
- E. Acceptable Manufacturers:
  - 1. Erico International Corporation or Engineer approved equal.

### **PART 3 - EXECUTION**

#### **3.01 INSTALLATION OF WELDED BONDS**

- A. Install welded bonds at all non-insulated rail joints within the limits of this Contract that are not equipped with a bond.
- B. Grind clean with a vitrified grinding wheel the surfaces of the rails where the bond is to be applied. After grinding, clean surface with an approved non-toxic solvent to remove all traces of grease and dirt. After the surface has been ground and cleaned, weld the bond wire to the rail in a manner that will ensure a thorough mechanical and electrical connection.
- C. Before beginning work on these bonds, weld in the field, under conditions similar to those of the regular installation, not less than three complete bond connections, and as many more as the Engineer considers necessary to determine that the welds are being made satisfactorily. Such welds shall be subject to inspection and testing by the Engineer, and acceptance as to the method and quality of workmanship will depend on the results of these inspections and tests.
- D. Ensure that each bond connection is thoroughly welded to the rail. The Engineer reserves the right to require a test of each weld by hammer and striker, or in any other manner, which in the opinion of the Engineer is reasonable.
- E. Remove any welded bond installed by the Contractor that is found to be defective prior to acceptance, and install a new bond.

#### **3.02 INSTALLATION OF TRACK CIRCUIT CONNECTIONS**

- A. The plug end of the track circuit connector shall be as specified herein, at a maximum distance of 3 inches from the end of the insulated joint.
- B. Strip back underground cable a sufficient distance for the exposed conductor to be fully inserted into the compression sleeve. Then compress sleeve with the type of compression tool designed for that purpose.
- C. Track wire installation shall conform to PCJPB Standards.

- D. All track circuit connections shall be installed by the Contractor. Remove any found to be defective prior to acceptance, and install a new track circuit connection.

**3.03 TESTING**

- A. Test all track circuits for continuity of circuit and ensure main line track circuit is de-energized with 0.06-ohm shunt at any point within the track block.

**END OF SECTION**