MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**STRUCTURAL STEEL, TEMPORARY SUPPORT, SPECIAL**

BRG:KAH 1 of 2 APPR:JAB:MJF:06-07-24

**a. Description.** This work consists of fabricating, furnishing, erecting, maintaining, and removing the temporary support as shown on the plans, as contained herein, and in accordance with subsection 713.03 of the Standard Specifications for Construction. The work also includes furnishing and installing Polytetrafluoroethylene (PTFE) sliding surface and associated components.

**b. Materials.**

1. Structural Steel. Furnish materials in accordance with subsection 713.02 of the Standard Specifications for Construction and as shown on the plans. Ensure temporary bolts and all associated hardware are in accordance with subsection 906.07 of the Standard Specifications for Construction. Fabricate all steel elements at an *AISC* certified shop with an *AISC-SBR*, *AISC*-*IBR*, or *AISC*-*ABR*, and the SPE. *SSPC QP 3* is an acceptable alternative to *AISC SPE*.

2. Polytetrafluoroethylene (PTFE) Sheet. Furnish unfilled PTFE sheets manufactured from 100 percent pure virgin PTFE resin in accordance with *ASTM D4894* or *ASTM D4895* and in accordance with Table 1. Do not use reclaimed material. Ensure the PTFE is resistant to acids, alkalis, and petroleum products; stable at temperatures from -360 ºF to 500 ºF; nonflammable; and non-absorbing of water.

3. Adhesive. Furnish an epoxy resin adhesive to bond PTFE sheet to steel that is in accordance with *AASHTO M235M/M235*, fluorinated ethylene propylene (FEP) film or equal as approved by the Engineer. Ensure the adhesive is heat-cured, high-temperature epoxy capable of withstanding temperatures from -320 ºF to 500 ºF.

**Table 1: PTFE Mechanical Properties**

|  |  |  |
| --- | --- | --- |
| Mechanical Property | ASTM Method | Limiting Value |
| Tensile Strength | *D2256/D2256M* | Minimum 2.8 ksi |
| Elongation | *D2256/D2256M* | Minimum 200 percent |
| Specific Gravity | *D792* | 2.15 to 2.20 |
| Melting Point | *D4894*, *D4895,* or *D5977* | 622 ºF ±3 ºF |

**c. Construction.** Fabricate in accordance with section 707 of the Standard Specifications for Construction, except as modified herein. Electronically submit a construction sequence to the Engineer for approval at least 21 calendar days prior to installing the temporary support in PDF.

Construct the temporary support as shown on the plans or in accordance with an approved alternate design. If an alternate temporary support is proposed, submit the proposed design and details, sealed by a Professional Engineer licensed in the State of Michigan, to the Engineer for conceptual approval prior to developing the working and fabrication drawings. Design the alternate temporary support in accordance with the 17th edition of *AASHTO Standard Specifications for Highway Bridges with HS25 and Alternate Military loading*. If an alternate design is accepted, submit complete design details and design calculations, sealed by a Professional Engineer licensed in the State of Michigan, for the temporary support in accordance with subsection 104.02 of the Standard Specifications for Construction. Submit shop drawings for the temporary support for the Engineer’s approval prior to the start of fabrication. Do not start fabrication until approval of shop drawing has been received from the Engineer.

Clean all temporary structural steel in accordance with section 716 of the Standard Specifications for Construction. Clean and prime coat structural steel faying surfaces of temporary supports in accordance with section 715 of the Standard Specifications for Construction.

After all permanent repairs are completed remove the temporary support as approved in the construction sequence. Do not remove the temporary support until approved by the Engineer. Bolts and hardware used for the temporary support cannot be re-used at other temporary support locations or for permanent repairs.

Treat surfaces of PTFE that are to be bonded with epoxy, by the sodium naphthalene or sodium ammonia process. Apply the epoxy adhesive in accordance with the manufacturer's recommendations. Ensure the peel strength of the bond is not less than 20 pounds per inch when tested in accordance with *ASTM D429*, *Method B*. Ensure the PTFE is smooth, flat, and free from bubbles or other irregularities after bonding to the lower load plate, as approved by the Engineer.

Remove burrs and raised edges along the perimeter of the PTFE surface.

Protect PTFE from abrasion and paint during cleaning and coating of the lower load plate.

Furnish written certification that the PTFE will possess a coefficient of friction not more than 0.08 at 68 ºF and 500 psi of pressure applied normal to the sheet.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

**Pay Item Pay Unit**

Structural Steel, Temp Support, Spec, Type \_\_ Each

**Structural Steel, Temp Support, Spec, Type \_\_** includes field verification, construction sequence development, working drawings, shop drawings, fabricating, furnishing, erecting, maintaining, and removal including drilling, cleaning, and priming drilled holes in steel members, and cleaning and priming temporary faying surfaces.