ITEM 565.2203--25 - PREFORMED FABRIC BEARINGS

1. DESCRIPTION:

1.01 This work shall consist of furnishing and installing bearing devices in conformance with the contract drawings or as directed by the Engineer.

2. MATERIALS:

2.01 Materials shall meet the requirements of the following Subsections of Section 700 - Materials of the New York State Standard Specifications.

2.02 **Preformed Fabric Bearing Pads** - Preformed fabric bearing pads shall be manufactured from all new materials comprised of multiple layers of prestressed duck impregnated and bound with high quality oil resistant rubber vulcanized and cured under pressure to form a resilient pad of uniform thickness. The duck material shall weigh yard per square meter with warp threads per . The finished product shall have of thickness, and withstand a compressive load perpendicular to the plane of the laminations of Load deflection shall not exceed i and the material shall perform effectively from The test sample for measuring load deflection shall be .

2.03 Galvanizing shall be applied to a minimum thickness of in conformance with or . Metalizing shall be applied in conformance with .

2.04 Unless otherwise specified all materials shall conform with the AASHTO or ASTM specifications prescribed herein and alternate substitutions will not be allowed unless approved on the fabrication drawings.

2.05 **Testing and Certifications**

The Authority requires Certification Of Conformance, for all bearings and bearing components, with the requirements of the contract documents and the approved shop drawings. In addition, the Authority requires testing of the bearings and/or bearing components according to the specifications with the following qualifications:

1. On projects with less than (50) bearings, bearings shall be accepted on certification and visual inspection.

2. The testing frequency shall be one (1) bearing of each type for every fifty (50) new bearings, or portion thereof beyond fifty (50), required on this project.

3. Manufacturer's Certification and Certified Test results shall be sent to the Engineer-In-Charge (E.I.C.) for approval prior to shipping of completed bearings to the project site.

4. **All** costs for shipping to and from testing facilities, certifications, and furnishing bearings for destructive testing shall be paid by the Bearing Manufacturer.

2. MATERIALS: (cont'd)

2.05 **Testing and Certification** (cont'd)

5. The bearings and/or bearing components shall be tested by an independent certified laboratory approved by the Authority. The E.I.C. shall be notified four (4) weeks prior to the anticipated shipping date, so that specific testing requirements can be determined (by the E.I.C.) and arrangements made for such testing by the Authority.

6. Testing to be done shall include the following:

TEST	SAMPES REQUIRED	DETAILS
Rotation	One production bearing per lot	See Note A
Coefficient of Friction	One production bearing per lot	See Notes A & B
Compression Strain	Three production bearings per lot	See Note C
PTFE Physical Properties	One 10" x 15" sheet of PTFE per project	See Note D

NOTES

A. Sample production bearings of such size that cannot be tested at 150% design capacity for rotation and coefficient of friction shall be tested at actual design capacity. Bearings which are tested at actual design capacity will be tested at that capacity because it is not possible, or practical in the Authority's opinion to test them at a higher capacity. Therefore, bearings tested at 150% design capacity which are rejected, shall not be retested below 150% design capacity for the purpose of rendering such bearings acceptable.

B. The coefficient of friction shall be evaluated in a test which simulates the application parameters. The Static Coefficient of Friction shall be determined at breakaway by dividing the horizontal force to start motion by the vertically applied force which shall be equivalent to the application pressure. The Dynamic Coefficient of Friction shall be determined by the same method, but at a speed not exceeding 1 inch per minute in order to approximate actual conditions.

C. Sample production bearings that cannot be tested at 150% design capacity for compressive strain shall be tested at their actual design capacity as in Note A.

D. The sample sheet of PTFE material shall be certified by the manufacturer as having been taken from the same batch of material as was used in the actual production bearings.

7. **All bearings** shall be visually inspected for conformance with the contract documents and the approved shop drawings upon completion in the shop by the bearing manufacturer's quality control representative **and** at the project site upon delivery by the E.I.C.

8. Bearings used for testing will be returned to the fabricator upon completion of testing.

2. MATERIALS: (cont'd)

2.05 **Testing and Certification** (cont'd)

9. **Basis of Acceptance** - Bearings and bearing components will be considered for acceptance in project lot quantities upon satisfactory completion of all certifications and testing, and in addition, individually upon satisfactory completion of the visual inspections.

2.06 **Fabrication Drawings**. The fabricator of bearings furnished under this section shall submit detailed shop drawings, welding procedure specifications and welder qualification test records in accordance with the New York State Standard Specifications and the New York State Steel Construction Manual.

3. CONSTRUCTION DETAILS:

3.01 **Fabrication**

A. **General**. Material furnished under this section shall conform with all applicable provisions of this specification, the New York State Standard Specifications, and the current Edition of AASHTO LRFD Bridge Design Specifications.

All corners and edges of steel plates shall be ground to a 1/16" radius.

Bearing devices shall be fabricated, assembled and certified by one supplier. Anchor bolt assemblies may be fabricated and supplied by an alternate Fabricator. Under certain conditions the Authority may waive the "one supplier" requirement for expansion fabric bearings.

Unless otherwise specified, bearing device components shall be constructed of either structural steel or high strength low alloy structural steel.

Fixed and expansion fabric pad bearings shall be designed and fabricated in accordance with the requirements of Section 14.7.2 of AASHTO LRFD Bridge Design Specifications.

B. **Surface Protection**. All bearing devices shall be galvanized or metalized as shown on the contract plans.

Weldments may be stress relieved during galvanizing, therefore, the Fabricator is responsible for straightening the unit to conform with specified tolerances.

C. **Finish**. The surface finish of bearing device components after fabrication and application of surface protection shall conform with AASHTO LRFD Bridge Construction Specification - Section 18.

D. **Tolerances**. After fabrication and application of surface protection bearing devices or components shall be within the following tolerances:

1. Dimension (length, width, thickness, hole locations and position of welded components), [redacted].

3. CONSTRUCTION DETAILS: (cont'd)

3.01 **Fabrication**: (cont'd)

D. **Tolerances**. (cont'd)

2. Flatness

a. Top sole plate. Bearing surfaces shall be flat with maximum permissible variation of [redacted] from a plane determined by any three corners of the plate.

b. Sliding Surfaces (expansion bearings).

For stainless steel mating with PTFE bonded to Fabric bearing pad material tolerance shall be [redacted] from a plane determined by any three corners of the plate.

E. **Sliding Surfaces** (expansion bearings)

1. The minimum thickness of PTFE material shall be as follows:

[redacted] for PTFE bonded to fabric bearing pad material

PTFE Material shall be bonded to its substrate in accordance with the written instructions of the manufacturer of the adhesive system. Shop drawings shall include details of surface preparation and adhesive application procedure.

2. Stainless steel used as a mating surface with PTFE shall conform with the following:

a. Stainless steel sheets shall be [redacted] minimum thickness for circumferentially welded application.

b. For welded applications, stainless steel sheets shall be circumferentially seal welded to backup (sole) plates in accordance with applicable NYS Steel Construction Manual specifications for Structural Welding. Welding procedures shall be submitted for approval.

c. Prior to attachment of the stainless steel to a backup (sole) plate, the contact surface of the backup plate shall meet the sliding surface tolerance specified in Subsection 3.01 D.2.b. and shall be blast cleaned to an appearance equivalent to Sa 3 defined by [redacted].

F. **Fabric Bearing Pads**

1. Fabric bearing pads shall be constructed of material conforming with Subsection 2.02.

2. Expansion bearings shall have sliding contact surfaces of PTFE and stainless steel. The PTFE shall normally be bonded to the preformed fabric bearing material and the stainless steel shall normally be welded to the structural steel.

3. CONSTRUCTION DETAILS: (cont'd)

3.01 **Fabrication** (cont'd)

F. **Fabric Bearing Pads** (cont'd)

The Design Static Coefficient of Friction between the PTFE and the stainless steel shall not exceed [redacted] compressive loading.

The Design Dynamic Coefficient of friction between the PTFE and the stainless steel shall not exceed [redacted] compressive loading.

3.02 **Marking, Storing & Shipping**

A. **Marking**. Each member shall be identified with an erection mark corresponding with the member identification mark on the approved shop drawings.

Identification marks may be painted on members that will receive field coats of paint. Identification marks on unpainted steel shall be impressed into the member (with a low stress stamp) in a non-stressed or low stressed area of the member. The Fabricator shall identify to the Contractor his procedure for marking material.

B. **Storing**. Material at the Fabricator's plant shall be stored above ground on platforms, skids or other suitable supports. It shall be kept clean, properly drained and protected from unwanted corrosion. Free circulation of air shall be provided around all surfaces.

C. **Shipping**. The Fabricator shall not ship any material, either to the project or to another manufacturer, without the Authority's approval.

3.03 **Field Handling & Storing**

A. The Contractor is responsible for providing equipment that is adequate for safely lifting and placing without damage, all material furnished. Permanent distortion caused by handling or storage will be cause for rejection.

B. The edges of nicks or bumps caused by handling shall be carefully ground to a [redacted] radius.

C. Storage requirements in Subsection 3.02 shall be applicable for all material stored in the field.

3.04 **Installation**

A. Bearings shall be set level and in the exact position specified with full and uniform bearing. Pedestals detailed to be on slope shall be set at the elevation and position specified.

B. Anchor bolts shall be positioned to the alignment and dimensions specified or approved in the shop drawings. When pre-set or cast-in-place anchorages are not specified, the Contractor may drill holes and set the anchor bolts in a non-shrink concrete grout.

3. CONSTRUCTION DETAILS: (cont'd)

3.04 **Installation** (cont'd)

C. Bearings shall initially be positioned to account for a mean temperature of [redacted] and for any bottom chord or flange elongation due to dead load deflection. As erection progresses, fixed bearings may be fully welded and expansion bearings tack welded to their respective members to prevent displacement. When full dead load has been applied to the structural system, any adjustments necessary shall be made to correct bearing position and inclination for a mean temperature of [redacted] (anchor bolts for sliding bearings shall be in the center of their slots).

D. Bearings shall be reset if they are out of position by more than the following tolerance:

Fixed bearings – [redacted] from theoretical centerline of bearing.

Sliding bearings – [redacted] from the corrected position.

E. Parts shall be accurately assembled as shown on the plans. Material shall be carefully handled so that no members or pieces will be bent, broken or damaged. Hammering that will injure or deform members will not be permitted. Bearing surfaces and contact surfaces shall be clean. Members shall be erected to the position specified and externally supported until all connections have been completed.

F. Field welding shall conform to all applicable requirements of the New York State Steel Construction Manual.

4. METHOD OF MEASUREMENT:

4.01 The quantity to be measured for payment will be the number of each unit complete and in place.

4.02 All bearing device materials including bearing pads and anchor bolt assemblies shall be included as part of the measured unit. Anchor bolt assemblies include bolts, threaded rods, nuts, washers and beveled plates required for attachment of bearing devices to the superstructure and substructure.

5. BASIS OF PAYMENT:

5.01 The accepted quantities will be paid for at the contract unit price for the items specified, which price shall be full compensation for detailing, furnishing, handling, transporting and placing the material specified, including surface preparation, protective coating, testing, anchor bolt assemblies, mortar, bearing pads, welding and the furnishing of all labor, tools, equipment and incidentals necessary to complete the work.