

SECTION 430 ERECTING PRESTRESSED CONCRETE MEMBERS

430-1 DESCRIPTION

Furnish and erect precast-prestressed concrete bridge members other than piling. Furnish, galvanize, place and paint, as applicable, bearing components, anchor bolts, washers, nuts, structural and reinforcing steel, miscellaneous hardware, paint, bearing assemblies and all other materials; handle, transport and store materials; furnish erection drawings; paint; set bearings and anchorage; grout and erect and install the bridge members and all other items necessary to complete the erection in accordance with the contract.

When used in this section, the term “prestressed concrete” refers to precast, pretensioned, prestressed concrete.

430-2 MATERIALS

Refer to Division 10.

Item	Section
Bearing Plate Assemblies	1072-3
Elastomeric Bearings	1079-2
Grout, Type 3	1003
Organic Zinc Repair Paint	1080-9
Plain Steel Bars, Threaded Ends	1074-3
Precast-Prestressed Members	1078
Reinforcing Steel	1070
Structural Steel	1072

430-3 HANDLING AND STORAGE

Take special care in handling, transporting and storing prestressed members. Members damaged while handled or transported will be rejected unless repaired to the satisfaction of the Engineer.

Handle members at the bearings or at pick-up points designated in the plans unless using other methods approved in writing.

Transport prestressed concrete bridge girders in a horizontal upright position. Provide support and bracing for each girder during transportation and storage that matches girder support locations in the final position within the structure.

430-4 METHODS AND EQUIPMENT

Use methods and equipment to install prestressed members that result in satisfactory installation.

430-5 BEARINGS AND ANCHORAGES

Supply elastomeric bearings, when required by the plans, meeting Section 1079.

Set steel sole plates level in exact position with full and even bearing on the bearing pad.

Accurately set anchor bolts in accordance with Subarticle 420-12(A).

When welding the sole plate to the embedded plate in the girder, use temperature indicating wax pens or other suitable means, to ensure that the temperature of the sole plate does not exceed 300°F. Temperatures above this may damage the elastomer.

Before welding, grind the galvanized surface of the portion of the embedded plate and sole plate that require welding. After welding, repair damaged galvanized surfaces in accordance with Article 1076-7.

Internal holding pins are required for all shim plates when the contract plans indicate the structure contains the necessary corrosion protection for a corrosive site.

Laminated (reinforced) bearing pads shall be repaired utilizing external holding pins via vulcanization. Product data for repair material and a detailed application procedure shall be submitted to the Materials and Tests Unit for approval before use and annually thereafter.

430-6 ERECTION AND INSTALLATION

(A) General

Erect prestressed concrete members by methods that satisfy the handling requirements specified in Article 430-3.

Perform field welding in accordance with Article 1072-18 only when required in the plans.

When indicated in the plans, recess the ends of tie rods used in intermediate diaphragms of prestressed concrete girders. Fill these recesses with an approved Type 3 grout to match the neat lines of the girders.

When concrete is cast in contact with prestressed members, thoroughly clean and wet the surface of the prestressed member which contacts the fresh concrete for at least 2 hours just before casting the fresh concrete.

After casting and finishing all concrete, thoroughly clean the prestressed members.

(B) Cored Slabs

When erecting prestressed cored slabs, place the 0.6 inch diameter transverse post tensioning strands and tension to 43,950 lbs. in each span. Grease the transverse strands and place in a non-corrosive 0.6 inch diameter, 1/16 inch minimum wall thickness black polyethylene pipe meeting ASTM D2239. Do not apply grease or extend the pipe in the area of the recesses at the ends of the tensioning strands where grout is applied. Position the jack and tension along the same axis as the strand. Utilize a double acting jack which tensions the strand and properly seats the wedges after achieving tension. Monitor slabs during tensioning operation. If uplift at bearing location occurs at the bearing location, discontinue tensioning and consult the Engineer. After tensioning the 0.6 inch diameter transverse strand in a span and before placing any equipment, material or barrier rail on the span, fill the shear key, dowel holes and recesses at the ends of transverse strands with an approved Type 3 grout.

After tensioning and curing, obtain approval before placing material and equipment on the cored slab spans. Support cranes or other equipment exceeding the legal load limit on mats. Submit for review a detailed drawing for the mats that are intended for use on the cored slabs. Provide a complete description of the equipment that is intended for placement on the mats. Supply and construct mats at no additional cost to the Department.

(C) Box Beams

The post tensioning system shall use 0.6 inch diameter strands. Strands shall be tensioned to 43,950 lb. Strands shall be placed in a non-corrosive 0.6 inch diameter, 1/16 inch minimum wall thickness black polyethylene pipe meeting ASTM D2239.

Grease the strands and place in the polyethylene pipe. Do not apply grease or extend the pipe in the area of the recesses at the ends of the tensioning strands where grout is applied. Tension the strands in the diaphragm nearest mid-span first. Proceed to tension strands in the adjacent diaphragms. Continue the tensioning operation in a symmetric manner along the length of the span. At each diaphragm location, maintain a symmetric tension force

Section 440

between each pair of strands in the diaphragm. Position the jack and tension along the same axis as the strand. Utilize a double acting jack which tensions the strand and properly seats the wedges after achieving the required tension. Monitor beams during tensioning operation. If uplift of the slab occurs at bearing location, discontinue tensioning and consult the Engineer. After all tensioning in a span is completed and before placing any equipment, material or barrier rail on the span, fill the shear key, dowel holes and recesses at the ends of the diaphragm with an approved Type 3 grout.

After tensioning and curing, obtain approval before placing material and equipment on the box beam spans. Support cranes or other equipment exceeding the legal load limit on mats. Submit for review a detailed drawing for the mats that are intended for use on the box beams. Provide a complete description of the equipment that is intended for placement on the mats. Supply and construct mats at no additional cost to the Department.

430-7 PAINTING

Clean, by hand or with power tools, and paint with 2 coats of non-aerosol organic zinc repair paint all ungalvanized steel surfaces, such as tie rod ends, not encased in concrete in accordance with Section 442. Provide a minimum dry thickness of each coat of paint of 1.5 mils.

430-8 MEASUREMENT AND PAYMENT

___" *Prestressed Concrete Girders* will be measured and paid as the number of linear feet of prestressed concrete girders estimated in the plans as being necessary to complete the project.

3'-0" x ___'-___" *Prestressed Concrete Cored Slabs* will be measured and paid as the number of linear feet of prestressed concrete cored slabs estimated in the plans as being necessary to complete the project.

3'-0" x ___'-___" *Prestressed Concrete Box Beams* will be measured and paid as the number of linear feet of prestressed concrete box beams estimated in the plans as being necessary to complete the project.

Concrete Box Beams will be measured and paid as the number of linear feet of concrete box beams estimated in the plans as being necessary to complete the project.

Elastomeric Bearings will be paid at the contract lump sum price.

These prices and payments will be full compensation for all items required to erect prestressed concrete members, including, but not limited to, those items contained in Article 430-1.

Payment will be made under:

Pay Item	Pay Unit
___" Prestressed Concrete Girders	Linear Foot
3'-0" x ___'-___" Prestressed Concrete Cored Slabs	Linear Foot
3'-0" x ___'-___" Prestressed Concrete Box Beams	Linear Foot
Concrete Box Beams	Linear Foot
Elastomeric Bearings	Lump Sum

SECTION 440 STEEL STRUCTURES

440-1 DESCRIPTION

Construct steel structures and steel structure portions of composite structures in conformity with the lines, grades and dimensions shown in the plans and as specified in these specifications.

Furnish, fabricate, galvanize, deliver, place, erect, clean, shop paint and field paint structural metals and all other materials; furnish, erect and remove falsework; set bearings and anchorage; weld and furnish all materials for and assemble all structural joints. Structural metals include