

Item No. 425S
Prestressed Concrete Structures

425S.1 Description

This item shall govern the construction and erection of precast, prestressed concrete members, as indicated on the Drawings, with approved shop and/or working drawings and in conformance with these specifications.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text and accompanying tables, the inch-pound units are given preference followed by SI units shown within parentheses.

425S.2 Submittals

The submittal requirements of this specification item include:

- A. Proposed sequence of erection by structure and span of unit with approximate scheduling.
- B. Shop Drawings for precast, prestressed members. Additional Drawings are required if work will be completed at more than one plant.
- C. Certification that casting beds and facilities are in conformance with this specification.
- D. Proposed curing procedures.

425S.3 General

Prior to the beginning of casting, the Contractor shall provide the Engineer or designated representative ample notice as to the location of the casting site and the date on which the work will begin. The Contractor shall furnish an inspection laboratory at the casing site for use by the City's testing personnel.

The Contractor shall submit to the Engineer or designated representative a proposed sequence of erection by structure and span or unit number with the approximate date that the members are to be erected. Shop Drawings shall be submitted following this proposed sequence.

Shop Drawings for precast prestressed members shall be submitted for approval in accordance with these specifications and shall consist of the following:

Erection Plan - 7 Copies
Index Sheet - 6 Copies
Bearing Sheet - 6 Copies
Fabrication Sheet - 6 Copies

When fabrication is to be conducted at more than one casting plant, two additional sets of Shop Drawings will be required for each additional casting location. Index sheets shall reflect the plant locations where each member is to be fabricated.

After completion of fabrication, a corrected set of final record drawings shall be submitted by the Contractor for inclusion in the final contract plans.

Submission of the above Shop Drawings shall be to the City of Austin, Project Manager of Construction.

A. Casting Schedule shall be prepared on a form approved by the Engineer or designated representative, and submitted to the Engineer or designated representative, prior to stressing.

The design of casting beds and facilities for pretensioned construction indicated in the drawings, shall be designed and sealed by a Licensed Professional Engineer registered in the State of Texas. The Contractor (Fabricator) shall furnish a certificate bearing his signature or that of a responsible Office of the Company, that the bed, facilities and hardware have been constructed in accordance with the above Drawings and specifications. The Contractor (Fabricator) shall specify the maximum loading for which the bed is to be used. Prior to approval for that loading, the facilities shall be proof-loaded to a minimum 10 percent overload for 8 hours. Additional proof loads shall be performed every 12 months at a 10 percent overload for 4 hours, if deemed necessary by the Engineer or designated representative. Minor changes in facilities will not require proofloading but will require submission of the details of changes accompanied with design calculations.

425S.4 Materials

Materials required for use under this item shall conform to the following:

Concrete for Structures	Item No. 403S
Reinforcing Steel (Non Prestressed)	Item No. 406S
Prestressing	TxDOT Item 426
Elastomeric Materials	Item No. 438S

425S.5 Construction Methods

Prestressing shall be in accordance with the most current version of TxDOT Item 426, "Prestressing".

Reinforcing steel shall be fabricated and placed conforming to Item No. 406S, "Reinforcing Steel" and as indicated.

The construction of forms and the placing, curing and finishing of concrete shall be in accordance with the provisions contained herein and requirements of the plans.

(1) Forms

All side and bottom forms for precast prestressed concrete construction shall be constructed of steel unless otherwise noted on the Drawings. End headers and inside forms may be of other materials as approved on the Shop Drawings.

Forms shall be of sufficient thickness with adequate external bracing. Holding devices in forms will not be permitted if such would remain in the finished prestressed member. Joints shall be maintained reasonably mortar tight.

The grade and alignment of forms shall be checked each time they are set and shall be maintained during the casting of concrete.

Metal forms shall be reasonably free from rust, grease or other foreign material. All forms shall be cleaned thoroughly prior to each casting operation.

The soffit for casting members shall be constructed and maintained to provide not more than 1/4 inch (6 mm) variation in any 50 foot (15 m) length of the bed from the theoretical plane of the bottom of the member.

Forms for internal voids in the members shall be anchored securely to prevent movement or misalignment during the placing of concrete. For forming internal voids with a mandrel, special attention shall be given to maintaining the correct position and alignment of the mandrel throughout the casting operation.

The facing of all forms shall be treated with form oil or other bond breaking coating prior to placing of concrete. The oil or other materials used for this purpose shall be of a consistency and composition to facilitate form removal. Materials, which appreciably stain or react with the concrete, will not be permitted.

All forms shall be constructed to facilitate removal without damage to the concrete. At the Contractor's option, forms for piling may be constructed with a 1/8 inch (3 mm) draft to permit ease of removal.

(2) Placing Concrete

All concrete shall be placed during daylight hours unless the fabrication plant or site is provided with an approved lighting system.

The method of concrete placement shall avoid segregation of the aggregate or displacement of the reinforcing steel, prestressing steel or conduit. Concrete shall be deposited as near as possible in its final position in the forms. Depositing large quantities of concrete at one location in the forms and running or working it along the forms will not be permitted.

Special attention shall be directed toward working the coarse aggregate back from the face of the concrete and to forcing the concrete under and around the reinforcing steel, prestressing steel or conduit.

Placement of concrete in large members shall be subject to approval of the Engineer or designated representative. Concrete may be placed in beams and girders in one lift or in multiple continuous horizontal layers. In the latter case the thickness of the first layer shall be slightly above the juncture of the bottom flange and web. Not more

than one hour shall elapse between the placing of the successive layers. Vibration of subsequent layers of concrete shall extend into the previously placed layers. When casting concrete piling or concrete slab units, the concrete shall be placed in one continuous horizontal layer.

Concrete shall not be placed at outdoor casting beds during inclement weather or when weather conditions may result in rainfall or low temperature during the casting operation, which might impair the quality of the finished member. In case rainfall should occur after placing operations are underway, the Contractor shall provide adequate covering to protect exposed concrete. The completion of a member being cast will be permitted, provided adequate provisions are made to prevent damage to the concrete.

(a) Placing Concrete in Cold Weather

When members are produced in a fabricating plant, which has adequate provisions to protect the concrete when placed, and which has approved elevated temperature curing facilities, concrete may be placed under any low temperature conditions provided:

1. The temperature of the concrete is not less than 50°F (10°C) nor more than 85°F (29°C), when placed in the forms.
2. The framework and covering are in place and heat is provided for the concrete and forms within one hour after the concrete is placed. This shall not be constructed to be one hour after the last concrete is placed but that no concrete shall remain unprotected and unheated for longer than one hour.
3. The air surrounding the concrete shall be kept between 50°F (10°C) and 85°F (29°C) for a minimum of three hours prior to beginning the temperature rise which is required for elevated temperature curing. The temperature of the concrete shall not be less than 50°F (10°C) at any time after all materials are added and mixing commences.

For central fabricating plants or job site casting operations which do not provide facilities necessary to accomplish the above provisions, concrete may be placed when the atmospheric temperature is 35°F (2°C) or greater. The temperature of the concrete at the time of placement shall not be less than 50°F (10°C) or more than 85°F (29°C). The concrete shall not be placed in contact with any material having a temperature less than 32°F (0°C) or any material coated with frost.

Aggregates shall be free from ice, frost and frozen lumps. When required, to produce the minimum temperature specified above, the aggregate and/or the water shall be heated uniformly in accordance with the following:

Water shall be heated to a temperature not to exceed 180°F (82°C). The equipment furnished shall be capable of heating the aggregate uniformly to eliminate overheated areas in the stockpile, which might cause flash set of the cement. The temperature of the mixture of the aggregates and water shall be between 50°F (10°C) and 85°F (29°C) before introduction of the cement.

Protection shall be provided to maintain the temperature of the concrete at all surfaces above 50°F (10°C) for the required total curing time as specified in this Item.

Protection shall consist of providing additional covering and, if necessary, supplementing such covering with artificial heating. When weather conditions indicate the possibility of the need for such temperature protection, all necessary heating equipment and covering material shall be on hand ready for use before permission is granted by the Engineer or designated representative to begin placement of concrete.

(b) Placing Concrete in Hot Weather

When concrete is to be placed during hot weather, it shall be placed without the addition of more water to the concrete than required by the design (slump and consistency) and it shall be finished properly without adding water to the surface. Control of the initial set of concrete and lengthening the time for finishing operations, under adverse wind, humidity and hot weather conditions, may be accomplished with the use of an approved retarder conforming to Item No. 403S, "Concrete for Structures".

The maximum time interval between the addition of mixing water and/or cement to the batch and the placing of concrete in the forms shall not exceed the following:

Air or Concrete Temperature (Whichever is Higher)		Maximum Time (Addition of Water or Cement to placing in Forms)
Non-agitated Concrete		
Over 80°F (27°C)		15 Minutes
50°F to 79°F (10°C to 26°C)		30 Minutes
Agitated Concrete		
90°F (32°C) to Above		45 Minutes
75°F to 80°F (24°C to 27°C)		60 Minutes
80°F to 90°F (27°C to 32°C)		
50°F to 74°F (10°C to 23°C)		90 Minutes

The use of an approved retarder in the concrete will permit the extension of each of the above temperature time maximum by 30 minutes, except that for non-agitated concrete, the maximum time shall not exceed 30 minutes.

Under conditions of extreme temperature, wind or humidity, when the specified temperature-time maximums are excessive, the Engineer or designated representative may require the use of an approved retarder or may suspend concrete placing operations, if quality concrete is not being placed.

Minimum required concrete strengths during different phases of construction, shall be shown on approved shop drawings.

For Class H Concrete, the control of the concrete shall be by compressive tests of cylinders. An adequate number of cylinders will be made for each pertinent strength test required. Tests for determining "Release Strength" and/or "Handling Strength" of members, will be the average of the breaking strength of two cylinders.

All test specimens, beams or cylinders representing tests for removal of forms and/or falsework and for "Release Strength" shall be cured under the same conditions, be subjected to the same curing materials and to the same weather conditions as the concrete represented.

"Design Strength" cylinders for acceptance of members shall be cured with the member which the cylinders represent until release of stress or until partial tensioning strength is obtained. These cylinders shall then be cured for the remainder of the test period in accordance with TxDOT Test Method Tex-704-I.

(3) Vibration of Concrete

All concrete shall be compacted and the mortar flushed to the surface of the forms by continuous working with approved high frequency mechanical vibrators, operating at a minimum of 7,000 impulses per minute. Use of external vibrators in conjunction with internal vibrators will be permitted when the forms are of steel.

At least one stand-by vibrator shall be provided for emergency use to avoid delays.

The vibrators shall be inserted systematically into the concrete immediately after deposit, thoroughly consolidating and working the concrete around the reinforcement and into the corners and angles of the forms until it has been reduced to a plastic mass. When the concrete is placed in more than one layer, the vibrator shall be operated so that it will penetrate the previously placed layer of concrete. The vibration shall be of sufficient duration to accomplish thorough compaction and complete embedment of the reinforcing steel and prestressed tendons, but not so excessive as to result in segregation. Vibration shall be supplemented by hand spading, if necessary, to insure the flushing of mortar to the surface of all forms.

(4) Finishing of Concrete

Top surface of prestressed members against which cast-in-place concrete will be placed later shall be screeded or rough floated to bring grout to the surface and cover all aggregate. At the approximate time of initial set the surface shall be roughened by brushing, brooming or other approved methods. Sound concrete shall not be removed or aggregate loosened. Fresh concrete shall be removed from exposed reinforced steel.

The top surfaces of beams, upon which panels are to be placed, shall be finished smooth from the reinforcing bar out to the outside edges. The center portion of these beams shall be roughened.

Top surfaces of members, which will be the riding surface in the finished structure, shall be finished conforming to Item No. 360, "Concrete Pavement". Roadway surfaces, which are to be given an additional wearing course, shall be screeded and given a wood float finish.

Erection holes (lifting eyes, form anchors, etc.) in exterior beams shall be filled with mortar and made flush with the surrounding surface. Holes in interior beams need not be filled unless steel is exposed. Erection of fabrication holes in the bottom of all beams shall be filled with nonstain, nonshrink mortar and made flush with the surrounding surface.

Form marks in excess of that permitted in Item No. 425S, "Prestressed Concrete Beams" and all fins and rough edges along chamfer lines shall be removed in an acceptable manner.

Unless otherwise indicated, strands shall be removed flush with the end of the member or recessed approximately 3/8 inch (9.5 mm). In either case, the ends of the strands and a minimum of 1 inch (25 mm) around each strand shall be cleaned and coated with approximately 10 mils (0.25 mm) of an acceptable commercial grade epoxy or epoxy grout.

After slab placement, the outside and bottom surfaces of exterior beams or members shall be given the grade of surface finish specified for the structure. Other members shall be given the grade or class of finish required by the plans.

(5) Curing of Concrete

Careful attention shall be given to the proper curing of concrete. The Contractor shall inform the Engineer or designated representative regarding the methods and procedures proposed for curing; shall provide the proper equipment and necessary materials; and shall have approval of the Engineer or designated representative of such methods, equipment and materials prior to placing concrete.

Inadequate curing facilities or lack of attention to the proper curing of concrete shall be cause for the Engineer or designated representative to stop all construction until approved curing is provided. Inadequate curing may be cause for rejection of the member.

Side forms may be removed at the discretion of the Contractor at any time after the concrete has reached sufficient strength to prevent physical damage to the member. Weight supporting forms shall remain in place until the concrete has reached the "Handling Strength" shown on the Drawings. Removal of the forms shall be done in such a manner that curing is not interrupted on any member by more than 30 minutes.

Curing shall be commenced prior to the formation of surface shrinkage cracks but in no case delayed longer than one hour after the concrete has been placed in the forms.

An approved water or membrane cure (when permitted) shall be used as an interim measure prior to elevated temperature or other methods of curing.

Concrete shall be cured continuously except as provided for form removal, until the concrete strength as indicated by compressive test of cylinders cured with the members, has reached the "Release Strength" or "Handling Strength" designated on

the plans or shop drawings. Riding surfaces of members shall be cured an additional four curing days. Concrete piling shall be steam or water cured for an additional three curing days. Other members shall be covered to prevent rapid drying for a period of 72 hours after release of stress or after reaching handling strength. All members shall be protected from freezing during the above period.

A period not to exceed four hours will be permitted for removal to a storage area prior to resuming the balance of curing and protection required.

A curing day is defined as a calendar day, when the temperature, taken in the shade away from artificial heat, is above 50°F (10°C) for at least 19 hours, or for colder days if satisfactory provisions are made to maintain the temperature at all surfaces of the concrete above 50°F (10°C) for the entire 24 hours.

All concrete shall be steam or water cured except that membrane curing may be used as interim curing on the top surface of concrete piling. Only Type 1 member curing compound will be permitted for interim curing.

(a) Water Curing

All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet the requirements for concrete mixing water as specified in Item No. 403S, "Concrete for Structures". Sea water will not be permitted. Water, which stains or leaves an unsightly residue, shall not be used.

Water curing will be permitted as follows:

1. Wet Mat Method

For water curing by the wet mat method, cotton mats, polyethylene sheeting or polyethylene burlap blankets may be used.

The mats, sheets or blankets shall not be placed in contact with the prestressed concrete member until such time that damage will not occur to the surfaces.

The mats, sheets or blankets shall be adequately anchored and weighted to provide continuous contact with all concrete surfaces. Any concrete surfaces, which cannot be cured by contact, shall be enclosed by mats, adequately anchored, so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside to keep all of the surfaces of the concrete wet for the required curing time.

2. Water Spray Method

For water curing by the water spray method, overlapping sprays or sprinklers shall be used so that all concrete surfaces are kept wet continuously.

(b) Elevated Temperature Curing

Curing by elevated temperatures will be permitted as follows:

1. Steam Curing

(Steam curing is defined as use of steam above 85°F (29°C) for curing.) When steam curing of concrete is provided, the temperature inside the curing jacket at the

surface of the concrete shall not exceed 165°F (74°C) for more than one hour during the entire steam curing period. Concrete exposed to temperature exceeding 180°F (82°C) will not be acceptable.

Sufficient moisture shall be provided inside the curing jacket so that all surfaces of the concrete are wet.

An unobstructed air space of not less than 6 inches (150 mm) shall be provided between all surfaces of the concrete and the curing jacket. Steam outlets shall be positioned so that live steam is not applied directly on the concrete, reinforcing steel or tendons.

The location of steam lines, location of control points for discharge of steam into the curing jacket and the number and type of openings for steam distribution within the curing jacket shall be arranged so that temperature variation between any points in the enclosure shall not exceed 20°F (-7°C).

Steam curing shall not commence until the concrete has been in place a minimum of three hours.

During the application of steam, the temperature inside the curing jacket shall be raised uniformly at a rate not to exceed 40°F (4°C) per hour.

Temperature decrease at the end of the curing operation shall not exceed the same rate.

When elevated temperature curing is used, members shall remain protected until the differential between the temperature inside the curing jacket and the outside air is not more than 25°F (-4°C).

2. Alternate Methods

Other methods of elevated temperature curing shall be permitted by the Engineer provided temperature maximums, rate of temperature variation, humidity control, etc., are in accordance with the requirements for steam curing. Permission shall be obtained from the Engineer or designated representative, in writing, for use of any alternate method.

425S.6 Handling, Hauling and Erection

The Contractor (Fabricator) shall be responsible for proper handling, monitoring, hauling and erection of all members so that they may be placed in the structure without damage.

Unless approved on erection and/or Shop Drawings, prestressed members shall be maintained in an upright position at all times and shall be picked up and supported near the ends of the member in such a way to prevent torsion. Members may be lifted with the lifting devices on the reviewed Shop Drawings or by other methods approved by the Engineer or designated representative or as indicated on the Drawings.

No member shall be removed from the casting yard until all requirements for tensioning (when pertinent), curing and strength requirements have been attained.

All concrete beams or girders, placed over a traveled roadway or railroad, shall be securely tied and/or braced to prevent over-turning until diaphragms capable of providing lateral stability are permanently in place. When railroads or roadway traffic must be maintained beneath girders or beams already placed, traffic shall be protected against falling objects during the erection of diaphragms and other structural members, during the placing of cast-in-place concrete and during the erection and dismantling of forms thereof. The protection shall consist of safety nets (1 inch (25 mm) mesh maximum) or a flooring with openings not larger than 1 inch (25 mm).

425S.7 Defects and Breakage

Failure of individual wires in a 7 wire strand or wires in a parallel wire tendon is acceptable provided the total area of wire failure is not more than 2 percent of the total cross-sectional area of tendons in any member. Failure of entire strand will be subject to structural review.

Fine hair cracks or checks on the surface of the member which, as determined by the Engineer or designated representative or, do not extend to the plane of the nearest reinforcement will not be cause for rejection unless they are numerous and extensive. Diagonal cracks, which indicate damage from torsion, will be subject to a structural review prior to acceptance. Vertical or horizontal cracks, which are 1/16 inch (1.6 mm) or less in width and which tend to close upon transfer of stress to the concrete, are acceptable. Cracks in excess of this are subject to review prior to acceptance.

Cracks, which extend into the plane of the reinforcing steel and/or prestressed tendons but are acceptable otherwise, shall be repaired by sealing with a latex-base adhesive, grout or with epoxy.

Small damaged or honeycombed areas which are purely surface in nature (not over 1 inch (25 mm) deep) may be repaired. Damage or honeycomb in excess of this will be tentatively rejected, but will be subject to structural review.

425S.8 Tolerances

Reinforcing steel shall not project above the top of the member more than 1/2 inch (12.7 mm) or less than 3/4 inch (19 mm) from plan dimension. In the plan of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than 1/4 inch (6.4 mm) or 1/12 (2.1 mm) of the spacing between bars, whichever is greater. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than 1/4 inch(6.4 mm) .

Allowable tolerance from the dimensions and configuration shown on the approved shop drawings shall be as follows:

	Beams (inches)	Boxes (inches)
Length	+ 3/4 (+19 mm)	+ 1/2 (+12.7 mm)
Width	+ 3/4 - 1/4 (+19 mm- 6.4 mm)	+ 1/4 (+6.4 mm)

Depth	+ 1/2 - 1/4 (+12.7 mm-6.4 mm)	+ 1/4 (+6.4 mm)
Top Slab or Flange	+ 3/4 - 1/4 (+19 mm- 6.4 mm)	+ 1/2 (+12.7 mm)
Thickness Bottom Slab or Flange	+ 1/2 - 1/4 (+12.7 mm-6.4 mm)	+ 1/2 - 1/8 (+12.7 mm-3.2 mm)
Web	+ 3/4 - 1/4 (+19 mm- 6.4 mm)	+ 3/8 (+9.5 mm)
Horizontal Alignment -Upon release of stress	+ 1/8 per 10' of length (+3.2 mm per 3 m) of length	±1/4 (±6.4 mm)
Deviation of Ends from Horizontal	±1/4 (±12.7 mm)	±1/4 (±6.4 mm)
Designated Skew or Bevel Vertical	±1/8 per 1' of depth (±3.2 mm per 300 mm) of depth	±1/4 (±6.4 mm)
Bearing to Vertical Axis	+ 1/8 (+3.2 mm)	
Surfaces Deviation from Plane	+ 1/16 (+1.6 mm)	+ 1/8 (+3.2 mm)
Anchor Hole From End of Member	+ 3/4 - 1/4 (+19 mm- 6.4 mm)	+1/4 (+6.4 mm)
Location Longitudinal Spacing	+ 3/4 (+19 mm)	+1/2 (+12.7 mm)
Transverse Location	+ 1/4 (+6.4 mm)	+1/4 (+6.4 mm)
Diaphragm or Lateral Tie Holes	+1/2 (+12.7 mm)	+1/2 (+12.7 mm)
Longitudinal Position of Void		± 1 (+12.7 mm)
Position of Strands	+1/4 (+6.4 mm)	+1/4 (+6.4 mm)
Position of Hold-Down Points	+ 6 (+150 mm)	+ 6 (+150 mm)
Position of Handling Devices	+ 6 (+150 mm)	+ 6 (+150 mm)

Where sections of forms are to be joined, an offset of 1/16 inch (1.6 mm) for flat surfaces and 1/8 inch (3.2 mm) for corners and bends will be permitted. Offsets between adjacent and header sections shall not exceed 1/4 inch (6.4 mm).

Variations greater than specified above shall be corrected to within these tolerances or be subject to structural review. Horizontal alignment (sweep) beams and girders only, which may increase at a later time over that shown in the table, will be acceptable if the member can be hauled, erected and aligned to within the above tolerance without being damaged.

Tolerances for concrete piling shall not exceed 1/8 inch (3.2 mm) per 10 feet (3 m) for the maximum sweep (curvature along the axis of the pile).

Tolerances for post-tensioned segmental members shall conform to Item No. 403S, "Concrete for Structures".

The head of the pile shall not be out of square by more than 1/8 inch (3.2 mm).

Small, damaged or honeycombed areas which are purely surface in nature (not over 1 inch (25 mm) deep) may be repaired. Damage or honeycomb in excess of this will be tentatively rejected, but will be subject to structural review.

When piling are cast with internal voids, the position of the void shall be within $\pm 1/2$ inch (± 12.7 mm).

Piling cracked in the process of fabrication, handling, hauling or driving will be subject to the following provisions:

Piling which have one or more cracks transverse to the main reinforcement or strand which are 1/16 inch (1.6 mm) or greater in width shall be rejected if the crack(s) occur in a portion which will be below ground or water level after driving. If the crack(s) herein described will be located above ground or water level when driving is completed, the piling may be used provided it is cut back to the crack and rebuilt to grade. No additional payment will be made for this build-up.

Piling which have one or more cracks as described above, that are less than 1/16 inch (1.6 mm) in width may be used if the crack(s) is sealed with a Type VII epoxy, conforming to Item No. 867S, "Epoxy Adhesive".

The cracks shall be grooved a minimum of 1/4 inch (6.4 mm) in width and depth and the epoxy shall be applied in the groove and extend over an area not less than 1 inch (25 mm) on each side of the crack. The area to which the epoxy is to be applied shall be clean and dry. If during driving, cracks develop in the portion, which will be below ground, driving operations shall be stopped and the required epoxy material applied before driving continues.

Piling with one or more cracks parallel or diagonal to the main reinforcing steel or strand which extend to the plane of reinforcement as determined by the Engineer or designated representative, will be cause for rejection. If these piling are found to be acceptable, proper repair shall be made, conforming to the above requirements.

Fine hair cracks or surface checks, which do not extend to the plane of the nearest reinforcing steel, as determined by the Engineer, will not generally require repair and will not be cause for rejection.

425S.9 Measurement

Precast, prestressed concrete beams or girders of the type specified, cast and stressed as required by the Drawings, will be measured by the lineal foot, as established on reviewed shop drawings. Other precast, prestressed concrete members of the size and type specified, cast and stressed as required by the plans will be measured by the linear foot or each as indicated.

Precast, prestressed concrete spans of the size and type specified, cast and stressed as required by the plans will be measured as each prestressed span is complete in place.

Cast-in-place structures (or structures where the Contractor has the option of casting-in-place) will be measured in accordance with the provisions of TxDOT Item 426, "Prestressing".

425S.10 Payment

Precast, prestressed concrete beams or girders will be paid for at the unit price bid per linear foot for "Prestressed Concrete Beams" of the type specified.

The above price shall be full compensation for constructing the members, furnishing and tensioning prestressing steel; conduit, when required; furnishing and placing reinforcing steel, bearing plates and bearing pads; all bars, anchorage plates and appurtenances which become an integral part of the structure; for grouting of holes; for any necessary repair and for any special treatment of end anchorages and shoes as indicated and for furnishing all materials, tools, equipment, labor and incidentals necessary to fabricate, transport and erect the members in the structure as indicated.

Payment will be made under:

Pay Item No. 425S: Prestressed Concrete Beams, Type, Size ____ - Per Lineal Foot.

Pay Item No. 425SA: Prestressed Concrete Beams, Type, Size _____ - Per Each.

End

SPECIFIC CROSS REFERENCE MATERIALS	
Specification Item No. 425S, "Prestressed Concrete Structures"	

City of Austin Standard Specifications

Designation	Description
Item No. 360	Concrete Pavement
Item No. 403S	Concrete for Structures
Item No. 406S	Reinforcing Steel
Item No. 425S	Prestressed Concrete Structures
Item No. 438S	Elastomeric Materials
Item No. 867S	Epoxy Adhesive

Texas Department of Transportation: Manual of Testing Procedures

Designation	Description
Tex-426-A	Estimating Concrete Strength by the Maturity Method
Tex-704.1	Making, Curing and testing Compression Test Specimens for Precast Concrete