5. The concrete design shall meet the following requirements:

ITEM	TEST	VALUE
Air entrainment	ASTM C 260	3 to 6 percent
High range water reducing Admixture	ASTM C 494 Type F or G	
Water cement ratio Gal/.Sack Max.		6.25
Minimum cement content in Sacks (94 lb. sack)		6.0
Coarse aggregate factor		6.5
Slump Maximum, inches		10
Flexural strength @ 7 days, psi		650
Maximum concrete temperature F		100

PART 4 - MEASUREMENT AND PAYMENT

4.01 No additional compensation will be made for the materials, equipment test or methods required by this item, but shall be considered subsidiary to various items included in the contract.

*** * * END OF SECTION * * ***

SECTION ITEM 420

CONCRETE STRUCTURES

420.1. Description. This Item shall govern for the construction of all types of structures involving the use of cast-in-place concrete. All structures shall be constructed in accordance with the details shown on the plans and this Item.

420.2. Materials.

(1) Concrete. All concrete shall conform to the provisions of Item 421, "Portland Cement Concrete".

The class of concrete for each type of structure or unit shall be as shown on the plans, or by pertinent governing specifications.

(2) Reinforcing Steel. All reinforcing steel shall conform to the provisions of Item 440, "Reinforcing Steel".

(3) Expansion Joint Material. The following materials shall conform to the requirements of Item 433, "Joint Sealants and Fillers".

(a) Preformed Fiber Material. Preformed fiber expansion joint material shall conform to the dimensions shown on the plans. Unless otherwise specified, "Preformed Bituminous Fiber Material" shall be used.

(b) Joint Sealing Material. Unless shown otherwise, the sealer shall be a "Low Modulus Silicone Sealant".

(c) Asphalt Board. Asphalt board shall conform to the dimensions shown on the plans.

(d) Rebonded Neoprene Filler. Rebonded neoprene filler shall conform to the dimensions shown on the plans.

(4) Waterstop.

(a) Rubber waterstop or polyvinyl chloride (PVC) waterstop shall be in conformance with Item 435, "Elastomeric Materials".

(b) Other types shall be as shown on the plans.

(5) Curing Materials.

(a) Membrane curing shall conform to Item 526, "Membrane Curing".

(b) Cotton mats shall consist of a filling material of cotton "bat" or "bats" (min. 12 oz. per sq. yd.); covered with un-sized cloth (min. six (6) oz. per sq. yd.); tufted or stitched to maintain stability; shall be free from tears; and shall be in good general condition.

(c) Polyethylene sheeting shall be four (4) mil. minimum thickness and free from visible defects. It shall be clear or opaque white except when the temperature during the curing period does not exceed 60 F or when applicable to control temperature during mass pours.

(d) Burlap-polyethylene mats shall be made from burlap impregnated on one side with a film of opaque white pigmented polyethylene and free from visible defects.

(e) Laminated mats shall have not less than one (1) layer of an impervious material such as polyethylene, vinyl plastic or other acceptable material (either as a solid sheet or impregnated into another fabric) and shall be free of visible defects.

(6) Admixtures. Concrete admixtures shall comply with the requirements of Item 437, "Concrete Admixtures".

(7) Epoxy. Unless otherwise specified, epoxy materials shall conform to Item 575, "Epoxy".

(8) Latex Emulsions. Latex emulsion used for latex based grout/mortar, latex adhesive grout/mortar or other purposes shall conform to Departmental Materials Specification D9-8110.

420.3. General Requirements. Before starting work, the Contractor shall inform the Engineer fully of the construction methods he proposes to use, the adequacy of which shall be subject to the approval of the Engineer.

Concurrence on the part of the Engineer of any proposed construction methods, approval of equipment, or of form and falsework plans does not relieve the Contractor of the responsibility for the safety or correctness of the methods, the adequacy of his equipment or from carrying out the work in full accordance with the contract.

Plans for forms and falsework for piers, superstructure spans over 20 feet long and for all bridge widening details shall be submitted to the Engineer for review. Similar plans shall be submitted for other units of the structure, if requested by the Engineer. The plans shall be prepared on standard 22 inch by 34 inch sheets and shall show all essential details of the proposed forms, falsework and bracing to permit a structural analysis. Four (4) sets of such plans will be required. One (1) set of design calculations shall accompany the submission of such plans. Plans, forms and falsework shall be designed, sealed, and signed by a professional engineer.

Forms or screed supports may be attached to I-beams or girders by welding, subject to the following requirements:

(1) Welds will not be permitted on tension flanges and in those areas shown on the plans or as directed by the Engineer.
(2) Welds shall be made in accordance with Item 448, "Structural Field Welding".

Unless otherwise shown on the plans, the time sequence in which construction operations may be carried on and in which completed structures may be opened to traffic shall be governed by the following:

(1) Superstructure members, forms, falsework, or erection equipment shall not be placed on the substructure before the concrete therein has attained a flexural strength of 425 psi.

(2) Storage of materials on completed portions of a structure will not be permitted until all curing requirements for those particular portions have been met.

(3) A minimum flexural strength of 340 psi will be required for the following:

(a) Forms erected on concrete footings supported by piling or drilled shafts.

(b) Forms on individual drilled shafts.

Such work may begin on spread footings and culvert footings, after the concrete therein has aged at least two (2) curing days. Concrete may be placed as soon as the forms and reinforcing steel are approved.

(4) The support of tie beam and/or cap forms by falsework placed on previously placed tie beams will be permissible provided such beams have attained 425 psi flexural strength, curing requirements are completed, and the member is properly supported to eliminate stresses not provided for in the design.

(5) Bridges and direct traffic culverts shall not be opened to construction traffic or to the traveling public until authorized by the Engineer in accordance with the following:

After the last slab concrete has been in place at least 14 days, authorization may be given for construction traffic on structures not to exceed three-quarter ton vehicles.

After the last slab concrete has been in place at least 21 days, authorization may be given for other construction traffic, or for the traveling public when necessary. Vehicles exceeding the legal load limit will be allowed in accordance with Item 6, "Control of Materials".

(6) Box culverts in fills may be opened to backfilling and compaction equipment when the concrete in the top slab has attained 425 psi flexural strength, and may be opened to other traffic as soon as sufficient backfill and/or embankment has been placed over the top to protect the culverts against damage from heavy construction equipment. The Contractor shall repair, at his expense, any damage inflicted on the culvert by construction traffic.

420.4. Drains. Weep holes and roadway drains shall be installed and constructed as shown on the plans.

420.5. Expansion Joints. Joints and devices to provide for expansion and contraction shall be

constructed in accordance with plan details and the requirements of this Item.

The bearing area under the expansion ends of concrete slabs and slab and girder spans shall be given a steel trowel finish, and finished to the exact grades required.

Bridging of concrete or mortar around expansion joint material in bearings and expansion joints shall be prevented.

All open joints and joints to be filled with expansion joint material shall be constructed using forms adaptable to loosening or early removal. To avoid expansion or contraction damage to the adjacent concrete, these forms shall be loosened as soon as possible after final concrete set to permit free movement of the span without requiring full form removal.

When a "Type A" joint is shown on the plans, preformed fiber joint material shall be used in the vertical joints of the roadway slab, curb, median or sidewalk and the top one (1) inch thereof shall be filled with the joint sealing material shown herein or shown on the plans.

The sealer shall be installed in accordance with Item 438, "Cleaning and/or Sealing Joints and Cracks (Portland Cement Concrete)", and the manufacturer's recommendations.

Where preformed fiber joint material is used, it shall be anchored to the concrete on one (1) side of the joint by light wire or nails.

Finished joints shall conform to the plan details with the concrete sections completely separated by the specified opening or joint material.

Soon after form removal and again where necessary after surface finishing, all concrete shall be removed from within the joint opening to insure full effectiveness of the expansion joint.

420.6. Construction Joints. The joint formed by placing plastic concrete in direct contact with concrete that has attained its initial set shall be deemed a construction joint. The term monolithic placement shall be interpreted to mean that the manner and sequence of concrete placing shall not create a construction joint.

Construction joints shall be of the type and at the locations shown on the plans. Construction joints other than those shown on the plans will not be permitted in bridge slabs. Additional joints in other members will not be permitted without written authorization from the Engineer. When additional joints are authorized, they shall have details equivalent to those shown on the plans for joints in similar locations.

Unless otherwise provided, construction joints shall be square and normal to the forms. Bulkheads shall be provided in the forms for all vertical joints.

Construction joints requiring the use of joint sealing material shall be as shown on the plans. A concrete placement terminating at a horizontal construction joint shall have the top surface roughened thoroughly as soon as practicable after initial set is attained.

The hardened concrete surface shall be thoroughly cleaned of all loose material, laitance, dirt or foreign matter and saturated with water. All freewater shall be removed and the surface shall be in a moist condition when concrete and/or bonding grout is placed against it.

Forms shall be drawn tight against the existing concrete to avoid mortar loss and offsets at joints.

When shown on the plans or in other specifications, the joint surface shall be coated with bonding mortar, grout, or other specified material.

When shown on the plans, Type V epoxy material shall be used for bonding fresh concrete to hardened concrete. The bonding epoxy shall be placed on a clean, dry surface and shall be tacky when the fresh concrete is placed.

420.7. Seal for Foundations. Concrete for foundation seals, unless otherwise specified, shall be in accordance with Item 400, "Excavation and Backfill for Structures".

420.8. Falsework. Falsework shall be designed and constructed to safely carry the maximum anticipated loads, including wind loads, and to provide the necessary rigidity. Details of falsework construction shall be subject to review and approval by the Engineer in accordance with the provisions of Article 420.3.

For evaluating the adequacy of job fabricated falsework, a weight of 150 pounds per cubic foot shall be assumed for concrete, and a live load allowance of 50 pounds per square foot of horizontal surface of the form work shall be included. The maximum stresses shall not exceed 125 percent of the allowable stresses used by the Department for the design of structures.

Commercially produced structural units used in falsework shall not exceed the manufacturer's maximum allowable working load for moment, and shear or end reaction. The maximum allowable working load shall include an allowance of 35 pounds per square foot of horizontal form surface and sufficient details and data shall be submitted to the Engineer for approval.

All timber used in falsework shall be sound, in good condition, and free from defects which would impair its strength.

When wedges are used to adjust falsework to desired elevations, the wedges shall be used in pairs to insure even bearing. The use of wedges to compensate for incorrectly cut bearing surfaces will not be permitted. Wedges shall be hardwood or metal.

Sills or grillages shall be large enough to support the superimposed load without settlement, and unless founded on solid rock, shale or other hard materials, precautions shall be taken to prevent yielding of the supporting material.

Falsework which cannot be founded on a satisfactory spread footing shall be placed on piling or drilled shafts having a bearing capacity sufficient to support the superimposed load without settlement. Falsework piling shall be driven to the required resistance determined by the

applicable formula given in Item 404, "Driving Piling". Drilled shafts for falsework shall be designed to carry the superimposed load using both skin friction and point bearing.

Welding, when used, shall conform to the requirements of Item 448, "Structural Field Welding". Each falsework bent shall be securely braced to provide the stiffness required with the bracing securely fastened to each pile or column it crosses.

The falsework shall be removed when no longer required. Falsework piling shall be pulled or cut off not less than six (6) inches below finished ground level. Falsework, piling or drilled shafts in a stream, lake, or bay shall be completely removed to a point specified by the Engineer to prevent any obstruction to the waterway.

420.9. Forms. All forms shall be constructed in accordance with the following:

(1) General. Except where otherwise specified, forms may be of either timber or metal.

Forms for round columns exposed to view shall be of steel, except that other materials will be allowed with written permission of the Engineer.

Studs, joists, wales or other devices used for form supports shall be of sufficient section and rigidity to withstand undue bulging or settling of the forms. Any device or method used for form support shall be subject to the approval of the Engineer.

Forms shall be designed for the pressure exerted by a liquid weighing 150 pounds per cubic foot. The rate of placing the concrete shall be taken into consideration in determining the depth of the equivalent liquid. Job fabricated forms shall be designed for an additional live load of 50 pounds per square foot of horizontal surface. The maximum unit stresses shall not exceed 125 percent of the allowable stresses used by the Department for the design of structures.

Commercially produced structural units used in form work shall not exceed the manufacturer's maximum allowable working load for moment, shear or end reaction. The maximum working load shall include a live load of 35 pounds per square foot of horizontal form surface and sufficient details and data shall be submitted to the Engineer for review.

Forms shall be practically mortar-tight, rigidly braced and strong enough to prevent bulging between supports and shall be maintained to the proper line and grade during concrete placement. Forms shall be maintained in a manner to prevent warping and shrinkage.

Offsets at form joints shall not exceed 1/16 inch. Form supports for slabs shall not be welded to the top flange of I-beams or girders except in accordance with the provisions of Article 420.3.

Deflections due to cast-in-place slab concrete and railing shown in the dead load deflection diagram shall be taken into account in the setting of slab forms.

All forms and footing areas shall be cleaned of any extraneous matter before placing concrete. Permission to place concrete will not be given until all preparatory work is complete to the

satisfaction of the Engineer.

If, at any stage of placement, the forms show signs of bulging or sagging, the portion of the concrete causing such condition shall be removed immediately, if necessary, and the forms shall be reset and securely braced against further movement.

(2) Timber Forms. Lumber for forms shall be properly seasoned, of good quality, and free from imperfections which would affect its strength or impair the finished surface of the concrete.

Forms or form lumber to be reused shall be maintained clean and in good condition. Any lumber which is split, warped, bulged, marred or has defects that will produce inferior work shall not be used and shall be promptly removed from the work.

Form lining will be required for all formed surfaces, except for the inside of culvert barrels, inlets, manholes and box girders; the bottom of bridge decks between beams or girders; surfaces that are subsequently covered by backfill material or are completely enclosed; and, any surface formed by a single finished board. Lining will not be required when plywood forms are used.

Form lining shall be of an approved type such as masonite or plywood. Thin membrane sheeting such as polyethylene sheets shall not be used for form lining.

Commercial form liners used to imprint a pattern or texture on the surface of the concrete shall be as shown on the plans and/or as approved by the Engineer.

Forms may be constructed of plywood not less than 1/2 inch in thickness. The grain of the face plies on plywood forms shall be placed parallel to the span between the supporting studs or joists.

Plywood used for forming surfaces which remain exposed shall be equal to that specified as B-B Plyform Class I or Class II Exterior of the U.S. Department of Commerce, National Institute of Standards and Technology, U.S. Product Standard, latest edition.

Studs and joists shall be spaced so that the facing form material remains in true alignment under the imposed loads.

Wales shall be spaced close enough to hold forms securely to the designated lines and scabbed at least four (4) feet on each side of joints to provide continuity. A row of wales shall be placed near the bottom of each placement.

Facing material shall be placed with parallel and square joints and securely fastened to supporting studs.

Forms for surfaces receiving only an ordinary finish and exposed to view shall be placed with the form panels symmetrical, i.e., long dimensions set in the same direction. Horizontal joints shall be continuous.

Molding for chamfer strips or other uses shall be made of materials of a grade that will not split

when nailed and which can be maintained to a true line without warping. Wood molding shall be mill cut and dressed on all faces. Unless otherwise provided herein or shown on the plans, forms shall be filleted at all sharp corners and edges with triangular chamfer strips measuring 3/4 inch on the sides.

Except at structures where railing is to be attached, culvert headwall heights shall be adjusted as necessary to provide a maximum projection of three (3) inches above the roadway slope unless otherwise directed by the Engineer. At the entrance of all box culverts, a three (3) inch chamfer shall be provided along the bottom edge of the top slab. Reinforcing steel shall be adjusted as necessary to provide a minimum 1 1/4 inch clear cover. No changes will be made in quantities and no additional compensation will be allowed for this work.

All forms shall be constructed to permit their removal without marring or damaging the concrete. The forms may be given a slight draft to permit ease of removal.

Metal form ties of an approved type or a satisfactory substitute shall be used to hold forms in place and shall be of a type that permits ease of removal of the metal as hereinafter specified.

All metal appliances used inside of forms for alignment purposes shall be removed to a depth of at least 1/2 inch from the concrete surface. The appliances shall be made so the metal may be removed without undue chipping or spalling of the concrete, and when removed, shall leave a smooth opening in the concrete surface. Burning off of rods, bolts or ties will not be permitted.

Any wire ties used shall be cut back at least 1/2 inch from the face of the concrete.

Devices holding metal ties in place shall be capable of developing the strength of the tie and adjustable to allow for proper alignment.

Metal and wooden spreaders which are separate from the forms shall be removed entirely as the concrete is being placed.

Adequate clean-out openings shall be provided for narrow walls and other locations where access to the bottom of the forms is not readily attainable.

The facing of all forms shall be treated with bond breaking coating of such composition that would not discolor or otherwise injuriously affect the concrete surface. Care shall be exercised to prevent coating of the reinforcing steel.

(3) Metal Forms. The foregoing requirements for timber forms regarding design, mortar-tightness, filleted corners, beveled projections, bracing, alignment, removal, reuse and wetting shall also apply to metal forms, except that these will not require lining, unless specifically noted on the plans.

The thickness of form metal shall be as required to maintain the true shape without warping or bulging. All bolt and rivet heads on the facing sides shall be countersunk. Clamps, pins or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or which line up

improperly shall not be used. Metal shall be kept free from rust, grease or other foreign materials.

(4) Form Supports for Overhang Slabs. Form supports which transmit a horizontal force to a steel girder or beam, or to a pre-stressed concrete beam will be permitted, providing a satisfactory structural analysis has been made of the effect on the girder or beam and approval is granted by the Engineer.

When overhang brackets are used on pre-stressed concrete beam spans with slab overhangs not exceeding three (3) feet six (6) inches, bracing requirements shall conform to the details shown on the plans.

For spans in which the overhang exceeds three (3) feet six (6) inches, additional support will be required for the outside beams regardless of the type beam used. Details of the proposed support system shall be submitted by the Contractor for approval.

Holes in steel members for support of overhang brackets may be punched or drilled full size or may be torch cut to 1/4 inch under size and reamed full size. In no case shall the holes be burned full size. The hole shall be left open unless otherwise shown on the plans. The holes shall never be filled by welding.

420.10. Placing Reinforcement. Reinforcement shall be placed as provided in Item 440, "Reinforcing Steel". Reinforcing steel supports shall not be welded to I-beams or girders or to reinforcing steel except where shown on the plans to be permissible.

Post tensioning ducts shall be placed in accordance with the approved pre-stressing details, and in accordance with Item 426, "Pre-stressing". The Contractor shall maintain all ducts free of obstructions until all post tensioning operations are complete.

420.11. Placing Concrete-General. The Contractor shall give the Engineer sufficient advance notice before placing concrete in any unit of the structure to permit the inspection of forms, reinforcing steel placement and other preparations.

The sequence of placing concrete shall be as shown on the plans or as required herein.

Concrete placement will not be permitted when impending weather conditions would impair the quality of the finished work. If conditions of wind, humidity, and temperature are such that concrete cannot be placed without cracking, concrete placement shall be done in the early morning or at night. When concrete mixing, placing, and finishing is done in other than daylight hours, provisions shall be made to adequately light the entire placement site. The Engineer will approve the adequacy of such lighting before operations are begun.

Where work has been started and changes in weather conditions require protective measures, the Contractor shall furnish adequate shelter to protect the concrete against damage from rainfall, or from freezing temperatures as outlined in Article 420.12. If necessary to continue operations during rainfall, the Contractor shall also provide protective coverings for the material stockpiles. Aggregate stockpiles need to be covered only to the extent necessary to control the moisture

conditions in the aggregates.

After concrete has achieved initial set, at least one (1) curing day shall elapse before placing strain on projecting reinforcement in order to prevent damage to the concrete.

(1) Placing Temperature. The temperature of all concrete at the time of placement shall be not less than 50 F.

The temperature of cast-in-place concrete in bridge slabs and top slabs of direct traffic structures shall not exceed 85 F when placed. Concrete diaframs, parapets, concrete portions of railing, curbs, and sidewalks, unless monolithically placed with the slab, will not be subject to the above maximum. Other portions of structures, when shown on the plans, shall require the temperature control specified.

For mass concrete placements, as defined in Subarticle 420.11 (10), the concrete temperature at the time of placement shall not exceed 75 F.

(2) Transporting Time. The maximum time interval between the addition of cement to the batch and the placing of concrete in the forms shall conform to the requirements in Table 1.

Table 1
Temperature-Time Requirements

Concrete Temp (at point of placement)	Max Time (No Retarding Agent) Minutes	Max Time(1) (With Retarding Agent) Minutes
	Non-Agitated Concrete	
Above 80 F		30
80 F and Below	15	45
	30	
	Agitated	
Above 90 F	Concrete	75
Above 75 F thru		90
90 F	45	120
75 F and Below	60	
	90	

(1) Normal dosage of retarder

(3) Transporting Equipment. The method and equipment used to transport concrete to the forms shall be capable of maintaining the rate of placement shown on the plans or required by the Engineer. Concrete may be transported by buckets, chutes, buggies, belt conveyors, pumps or

other methods.

When belt conveyors or pumps are used, sampling for testing should be done at the discharge end. When in the opinion of the Engineer, it is deemed impractical to sample at the discharge end, sampling may be done at the mixer provided that correlation testing is performed and documented to ensure specification requirements are met at the discharge end.

Concrete transported by conveyors shall be protected from sun and wind, if necessary, to prevent loss of slump and workability. Pipes through which concrete is pumped shall be shaded and/or wrapped with wet burlap, if necessary, to prevent loss of slump and workability. Concrete shall not be transported through aluminum pipes, tubes, or other aluminum equipment.

Pump lines shall conform to the following:

For Grade 2 coarse aggregate and smaller, the minimum size pump line shall be five (5) inches ID.

For Grade 1 coarse aggregate, the minimum size pump line shall be eight (8) inches ID.

Chutes, troughs, conveyors or pipes shall be arranged and used so that the concrete ingredients will not be separated. When necessary to prevent segregation, such equipment shall terminate in vertical down-spouts. Open troughs and chutes shall extend, if necessary, down inside the forms or through holes left in the forms.

All transporting equipment shall be kept clean and free from hardened concrete coatings. Water used for cleaning shall be discharged clear of the concrete.

(4) Forms. Openings in forms shall be provided, if needed, for the removal of laitance or foreign matter.

All forms, pre-stressed concrete panels, T-beams, and concrete box beams on which concrete is to be placed shall be wetted thoroughly prior to placing concrete thereon. Any remaining puddles of excess water shall be removed. The top of such members shall be in a moist surface dry condition when concrete is placed on them.

(5) Handling, Placing, and Consolidation. The method of handling, placing, and consolidation of concrete shall minimize segregation of the concrete and displacement of the reinforcement. A uniform dense compact mass shall be produced.

> **(a) Handling and Placing.** Concrete shall not have a free fall of more than five (5) feet, except in the case of thin walls such as in culverts or as specified in other items. Any hardened concrete splatter ahead of the plastic concrete shall be removed.
>
> Each part of the forms shall be filled by depositing concrete as near its final position as possible. Depositing large quantities at one point and running or working the concrete along the forms will not be allowed.

Concrete shall be deposited in the forms in layers of suitable depth but not more than 36 inches in thickness, unless otherwise directed by the Engineer.

Cold joints in a monolithic placement shall be avoided. The sequence of successive layers or adjacent portions of concrete shall be such that they can be vibrated into a homogeneous mass with the previously placed concrete. Not more than one (1) hour shall elapse between adjacent or successive placements of concrete, except as otherwise required by an approved placing procedure when revibration of the concrete is shown on the plans or specifications. This time requirement may be extended by 1/2 hour when the concrete contains not less than a normal dosage of retarding admixture.

An approved retarding agent shall be used to control stress cracks and/or cold joints in placements where differential settlement and/or setting time may induce stress cracking.

(b) Consolidation. All concrete shall be well consolidated and the mortar flushed to the form surfaces with immersion type vibrators. Vibrators which operate by attachment to forms or reinforcement will not be permitted, except on steel forms. At least one (1) stand-by vibrator shall be provided for emergency use in addition to those required for placement.

The concrete shall be vibrated immediately after deposit. A systematic spacing of the points of vibration shall be established to insure complete consolidation and thorough working of the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms. The vibrator may be inserted in a sloping or horizontal position in shallow slabs. The entire depth of each lift shall be vibrated, allowing the vibrator to penetrate several inches into the preceding lift. Concrete along construction joints shall be thoroughly consolidated by operating the vibrator along and close to but not against the joint surface. The vibration shall continue until thorough consolidation and complete embedment of reinforcement and fixtures is produced, but not long enough to cause segregation. Vibration may be supplemented by hand spading or rodding, if necessary, to insure the flushing of mortar to the surface of all forms.

(6) Slabs. Unless otherwise shown on the plans or other specifications, slab concrete shall be mixed in a plant located off the structure. Carting or wheeling concrete batches over completed slabs will not be permitted until the slabs have aged at least four (4) full curing days. For the remainder of the curing period, timber planking will be required for carting of the concrete. Carts shall be equipped with pneumatic tires. Curing operations shall not be interrupted for the purpose of wheeling concrete over finished slabs.

The storing of reinforcing or structural steel on completed roadway slabs generally shall be avoided and, when permitted, shall be limited to quantities and distribution that will not induce excessive stresses.

A longitudinal screed may be placed directly on previously placed concrete slabs for the purpose of checking and grading of an adjacent slab after the previously placed slab has aged not less than 24 hours. Actual screeding may be done after the previously placed slabs have aged at least 48 hours.

(7) Continuous Placements. For continuous placement of the deck on steel units, the initial set of the concrete shall be retarded sufficiently to insure that the concrete remains plastic in not less than three (3) spans immediately preceding the slab being placed. For simple spans, retardation shall be required only if necessary to complete finishing operations or as required by Article 420.13.

(8) Fogging and Interim Curing. From the time of initial strike off of the concrete until finishing is completed and required interim curing is in place, the unformed surfaces of slab concrete in bridge decks and top slabs of direct traffic culverts shall be fogged when necessary to replace water loss due to evaporation.

Fogging equipment shall be capable of applying water in a fine mist, not a spray. The fog shall be produced using equipment which pumps water or water and air under high pressure through a suitable atomizing nozzle. The equipment shall be hand operated and sufficiently portable for use in the direction of any prevailing wind. It shall be adaptable for intermittent use as directed by the Engineer to prevent excessive wetting of the concrete.

Interim curing will be required for slab concrete in bridge decks and top slabs of the direct traffic culverts immediately upon completion of final finish. Type 1-D membrane curing compound (Resin Base Only) will be required. Water curing will be required in accordance with Article 420.20 and shall be commenced as soon as possible without damaging the surface finish.

(9) Installation of Dowels and Anchor Bolts. Dowels and anchor bolts may be cast-in-place or installed by grouting with grout, epoxy or epoxy mortar. Holes for grouting may be formed or drilled.

(a) General. Holes for anchor bolts shall accommodate the bolt embedment required by the plans. Holes for dowels shall be a minimum of 12 inches deep unless otherwise shown on the plans. When grout or epoxy mortar is used, the diameter of the hole shall be not less than twice the dowel or bolt diameter nor more than the diameter plus 1 1/2 inches. When using epoxy, the hole diameter shall be 1/16 inch to 1/4 inch greater than the dowel or bolt diameter.

Holes shall be thoroughly cleaned of all loose material, oil, grease, or other bond breaking substance and blown clean with filtered compressed air. Holes shall be in a surface dry condition when epoxy type material is used. Holes shall be in a surface moist condition when portland cement grout is used. The Contractor shall develop and demonstrate a procedure for cleaning and preparing the holes for installation of the dowels and anchor bolts that is satisfactory to the Engineer. The void between the hole and dowel or bolt shall be completely filled with grouting material.

(b) Cast-in-Place or Grouted Systems. Portland cement grout, epoxy, epoxy mortar, or other prepackaged grouts as approved by the Engineer may be used.

Portland cement grout shall conform to the pertinent provisions of Item 421, "Portland

Cement Concrete". Epoxy (Type V) and Epoxy Mortar (Type VIII) shall conform to Item 575, "Epoxy". Grout, epoxy or epoxy mortar may be used as the binding agent unless otherwise indicated on the plans.

(c) Other Anchor Systems. These systems shall be in accordance with the plans and approved by the Engineer.

(10) Mass Placements. Unless otherwise shown on the plans, for monolithic mass placements having a least dimension greater than five (5) feet, the Contractor shall develop a plan to assure that during the heat dissipation period, the temperature differential between the central core of the placement and the exposed concrete surface does not exceed 35 F.

A detailed plan, along with an analysis of the associated heat generation and dissipation (heat flow analysis) shall be submitted to the Engineer for approval. No concrete shall be placed until this plan is approved.

This plan may include a combination of the following:

1. Selection of concrete ingredients to minimize heat of hydration.
2. Using ice or cooling concrete ingredients.
3. Controlling rate of concrete placement.
4. Using insulation to control heat loss.
5. Using supplemental heat to control heat loss.
6. Use of fly ash.

The Contractor shall furnish and install two (2) sets of strip chart temperature recording devices or approved equivalent at locations designated by the Engineer. These devices shall be accurate to within +/- 2 F within the range of 32 F to 212 F and shall be used to simultaneously measure the temperature of the concrete at the core and the surface.

420.12. Placing Concrete in Cold Weather. The Contractor is responsible for the protection of concrete placed under any and all weather conditions. Permission given by the Engineer for placing during cold weather will not relieve the Contractor of the responsibility for producing concrete equal in quality to that placed under normal conditions. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced.

Concrete may be placed only when the atmospheric temperature is greater than 35 F. Concrete shall not be placed in contact with any material coated with frost or having a temperature less than 32 F.

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

The water temperature shall not exceed 180 F, nor shall the aggregate temperature exceed 150 F. The heating apparatus shall heat the mass of aggregate uniformly. The temperature

of the mixture of aggregates and water shall be between 50 F and 85 F before introduction of the cement.

The Contractor shall provide and install recording thermometer(s) or other suitable temperature measuring device(s) to verify that all concrete is effectively protected as follows:

(a) The temperature of all unformed surfaces of bridge decks and top slabs of direct traffic culverts shall be maintained at 50 F or above for a period of 72 hours from time of placement and above 40 F for an additional 72 hours.

(b) The temperature at the surface of all concrete in bents, piers, culvert walls, retaining walls, parapets, wingwalls, bottom of slabs, and other similar formed concrete shall be maintained at 40 F or above for a period of 72 hours from time of placement.

(c) The temperature of all concrete, including the bottom slabs (footings) of culverts placed on or in the ground, shall be maintained above 32 F for a period of 72 hours from time of placement.

Protection shall consist of providing additional covering, insulated forms or other means, and if necessary, supplementing such covering with artificial heating. Curing as specified under Article 420.20 shall be provided during this period until all requirements for curing have been satisfied.

When impending weather conditions indicate the possibility of the need for such temperature protection, all necessary heating and covering material shall be on hand and ready for use before permission is granted to begin placement.

Sufficient extra test specimens will be made and cured with the placement to ascertain the condition of the concrete as placed prior to form removal and acceptance.

420.13. Placing Concrete in Hot Weather. Unless otherwise directed by the Engineer, when the temperature of the air is above 85 F, an approved retarding agent will be required in all concrete used in superstructures and top slabs of direct traffic culverts.

420.14. Placing Concrete in Water. Concrete shall be deposited in water only when shown on the plans or with the written permission of the Engineer. The forms or cofferdams shall be sufficiently tight to prevent any water current passing through the space in which the concrete is being deposited. Pumping of water will not be permitted during the concrete placing, nor until it has set for at least 36 hours.

The concrete shall be placed with a tremie, or other approved method, and shall not be permitted to fall freely through the water nor shall the concrete be disturbed after being placed. The concrete surface shall be kept approximately level during placement.

The tremie shall consist of a water-tight tube of a diameter which will permit adequate placement of the concrete, but not greater than 14 inches. The tremie shall be constructed so that the bottom

can be sealed and opened after the tremie is in place and fully charged with concrete. The tremie shall be supported so that it can be easily moved horizontally to cover all the work area and vertically to control the concrete flow. The lower end of the tremie shall be submerged in the concrete at all times.

The placing operations shall be continuous until the work is complete.

Unless otherwise specified, all classes of concrete placed under water, except Class E and Class SS, shall be redesigned to contain an additional sack of cement per cubic yard more than the mix design being used. Pilot beam tests may be waived by the Engineer for this redesign.

420.15. Placing Concrete in Superstructure. Unless otherwise shown on the plans, simple span bridge slabs shall be placed without transverse construction joints by using either a mechanical longitudinal screed or a self propelled transverse finishing machine. For small placements or for unusual conditions, the Engineer may waive the mechanical screed requirement and permit the use of manually operated screeding equipment. The screed shall be adequately supported on a header or rail system sufficiently stable to withstand the longitudinal or lateral thrust of the equipment. Unless otherwise shown on the plans, temporary intermediate headers will be permitted for placements exceeding 50 feet in length for the longitudinal screed, provided the rate of placement is rapid enough to prevent a cold joint and that these headers are designed for early removal to permit satisfactory consolidation and finish of the concrete at their locations.

Unless otherwise shown on the plans, slabs on continuous units shall be placed in one continuous operation without transverse construction joints using a mechanical longitudinal screed or a self propelled transverse finishing machine. For unusual conditions, such as widening, variable cross slopes or transitions, the Engineer may waive the mechanical screed requirement and permit the use of manually operated screeding equipment. Rails for transverse finishing machines which are supported from the beams or girders shall be installed so that the supports may be removed without damage to the slab. Bond between removable supports and the concrete shall be prevented in a manner acceptable to the Engineer. Rail support parts which remain embedded in the slab shall not project above the upper mat of reinforcing steel. Rail or screed supports attached to I-beams or girders shall be subject to the requirements of Article 420.3.

Unless otherwise shown on the plans, for transverse screeding, the minimum rate of concrete placement shall be 30 linear feet of bridge deck per hour. The Contractor shall furnish personnel and equipment capable of placing, finishing and curing the slab at an acceptable rate to insure compliance with the specifications.

The profile gradeline may require adjustment, due to variation in beam camber and other factors, to obtain the required cover over the slab reinforcement. Beams shall be set in a sufficient number of spans so that when adjustment is necessary, the profile gradeline can be adjusted over suitable increments and the revised gradeline will produce a smooth riding surface.

One (1) or more passes shall be made with the screed over the bridge deck segment prior to the placement of concrete thereon to insure proper operation and maintenance of grades and clearances.

Slab concrete shall be deposited between the exterior beam and the adjacent beam prior to placing concrete in the overhang portion of the slab.

For transverse screeding, concrete shall be placed in transverse strips. Additionally, on profile grades greater than 1 1/2 percent, placement shall begin at the lowest end.

For longitudinal screeding, concrete shall be placed in longitudinal strips starting at a point in the center of the segment adjacent to one side, except as provided herein, and the strip completed by placing uniformly in both directions toward the ends, except that for spans on a grade of 1 1/2 percent or more placing shall start at the lowest end.

The width of strips shall be such that the concrete therein will remain plastic until the adjacent strip is placed. Where monolithic curb construction is specified, the concrete shall be placed therein in proper sequence to be monolithic with the adjacent longitudinal strips of the slabs.

An approved system of checking shall be used to detect any vertical movement of the forms or falsework. Forms for the bottom surface of concrete slabs, girders and overhangs shall be maintained to the required vertical alignment during concrete placing.

Unless otherwise shown on the plans, girders, slab and curbs of slab and girder spans shall be placed monolithically. Concrete girder stems shall be filled first and the slab concrete placed within the time limits specified in Article 420.11.

Construction joints, when permitted for slab placements on steel and prestressed concrete beams, shall be as shown on the plans. Where plans permit segmental placing without specifying a particular order of placement, any logical placing sequence which will not result in the overstressing of any of the supporting members will be permitted subject to the approval of the Engineer.

Any falsework under steel girder or truss spans shall be released and the spans swung free on their permanent supports before placing any slab concrete thereon.

When the curb forms are filled, the top of curb and sidewalk section shall be brought to the correct camber and alignment and finished as described in Articles 420.18 and 420.23.

420.16. Placing Concrete in Box Culverts. Where the top slab and walls are placed monolithically in culverts more than four (4) feet in clear height, an interval of not less than one (1) nor more than two (2) hours shall elapse before placing the top slab to allow for settlement and shrinkage in the wall concrete.

The footing slab shall be accurately finished at the proper time to provide a smooth uniform surface. Top slabs which carry direct traffic shall be finished as specified in Article 420.19. Top slabs of fill type culverts shall be given a float finish.

420.17. Placing Concrete in Foundation and Substructure. Concrete shall not be placed in footings until the depth and character of the foundation has been inspected by the Engineer and permission has been given to proceed.

Placing of concrete footings upon seal concrete will be permitted after the cofferdams are free from water and the seal concrete cleaned. Any necessary pumping or bailing during the concreting operation shall be done from a suitable sump located outside the forms.

All temporary wales or braces inside cofferdams shall be constructed or adjusted as the work proceeds to prevent unauthorized construction joints.

When footings can be placed in a dry excavation without the use of cofferdams, forms may be omitted, if approved by the Engineer, and the entire excavation filled with concrete to the elevation of the top of footing. In this case, measurement for payment will be based on the footing dimensions shown on the plans.

Concrete in columns shall be placed monolithically between construction joints unless otherwise provided. Columns and caps and/or tie beams supported thereon may be placed in the same operation. To allow for settlement and shrinkage of the column concrete, it shall be placed to the lower level of the cap or tie beam and placement delayed for not less than one (1) hour nor more than two (2) before proceeding.

420.18. Treatment and Finishing of Horizontal Surfaces Except Roadway Slabs. All unformed upper surfaces shall be struck off to grade and finished. The use of mortar topping for surfaces under this classification will not be permitted.

After the concrete has been struck off, the surface shall be floated with a suitable float. Bridge sidewalks shall be given a wood float or broom finish or may be striped with a brush, as specified by the Engineer.

The tops of caps and piers between bearing areas shall be sloped slightly from the center toward the edge, and the tops of abutments and transition bents sloped from the backwall to the edge, as directed by the Engineer, so that the water drains from the surface. The concrete shall be given a smooth trowel finish. When shown on the plans, the top of caps and piers shall be coated with Type X epoxy material except for areas under shoes and bearing pads. Unless otherwise shown on the plans, the color shall be concrete gray. The color of the epoxy may be adjusted to concrete gray by the use of a black universal type tinting paste. Bearing areas for steel units shall be constructed in accordance with Item 441, "Steel Structures".

Bearing seat build-ups or pedestals for concrete units may be cast integrally with the cap or with a construction joint as follows:

The bearing seat build-ups shall be constructed of a latex based mortar or an epoxy mortar, mixed in accordance with the manufacturer's recommendation. Pedestals shall be constructed of Class "C" concrete, reinforced as shown on the plans.

Bearing areas under elastomeric pads or non-reinforced bearing seat build-ups shall be given a textured, wood float finish.

420.19. Finish of Roadway Slabs. In all roadway slab finishing operations, camber for specified vertical curvature and transverse slopes shall be provided.

For concrete slab or concrete slab girder spans cast in place on falsework, an additional amount of camber shall be provided to offset the initial and final deflections of the span. The additional amount of camber shall be determined from the dead load deflection diagram shown on the plans. When dead load deflection is not shown on the plans, the additional amount of camber shall be 1/8 inch per ten foot of span length but not to exceed 1/2 inch. For pan girder spans the additional camber for initial and final deflections shall be approximately 1/2 inch for 30 foot spans and 5/8 inch for 40 foot spans unless otherwise directed by the Engineer.

Roadway slabs supported on pre-stressed concrete, steel beams or girders shall receive no additional camber, except that for slabs without vertical curvature, the longitudinal camber shall be approximately 1/4 inch.

Dead load deflection shall be taken into account in setting the grades of headers and rail systems.

Work bridges or other suitable facilities shall be provided by the Contractor from which to perform all finishing operations and check measurements for slab thickness and reinforcement cover.

As soon as the concrete has been placed and vibrated in a section of sufficient width to permit working, the surface shall be approximately leveled, struck off and screeded, carrying a slight excess of concrete ahead of the screed to insure filling of all low spots. The screed shall be rigid enough to hold true to shape and shall have sufficient adjustments to provide for the required camber or section. A vibrating screed may be used if heavy enough to prevent undue distortion. The screeds, except those of the roller drum type, shall be provided with metal cutting edges.

Longitudinal screeds shall be moved across the concrete with a saw-like motion while their ends rest on headers or templates set true to the roadway grade or on the adjacent finished slab.

The surface of the concrete shall be screeded a sufficient number of times and at such intervals to produce a uniform surface, true to grade and free of voids.

If necessary, the screeded surface shall be worked to a smooth finish with a long handled wood or metal float, or hand floated from bridges over the slab.

When required by the Engineer, the Contractor shall perform sufficient checks with a long handled 10 foot straightedge on the plastic concrete to insure that the final surface will be within the tolerances specified below. The check shall be made with the straightedge parallel to the centerline. Each pass thereof shall lap half of the preceding pass. All high spots shall be removed and all depressions over 1/16 inch in depth shall be filled with fresh concrete and floated. The checking and floating shall be continued until the surface is true to grade and free of depressions, high spots, voids or rough spots.

Rail support holes shall be filled with concrete and finished to match the top of the slab.

Unless otherwise shown on the plans, when no additional wearing course is to be placed, the bridge deck surface shall be given a grooved steel tine finish. The grooves shall be approximately 1/8 to 3/16 inch deep, approximately 1/8 inch wide. The tines shall be randomly spaced approximately 3/4 to one (1) inch apart. The grooves shall run perpendicular to the structure center line when a transverse screed is used and parallel to the structure centerline when a longitudinal screed is used. Areas which receive insufficient texture depth shall receive additional texturing, when directed by the Engineer, by saw grooving in accordance with the procedure given below.

At the option of the Contractor, or when shown on the plans, the surface shall be given its final texture by saw grooving to meet the above requirements. Saw grooving may be done a minimum of four (4) days after the slab concrete has been placed. If saw grooving is done prior to the completion of curing, the curing shall be continued after sawing to provide the minimum curing time required.

When shown on the plans that a concrete overlay is to be placed on the slab (new construction) or on pre-stressed concrete box beams or other precast elements, the slab or the top surface of shear key and diafram concrete shall be given a broom finish. The finish shall have an average texture depth of approximately 0.035 inches with any individual test, not falling below 0.020 inches unless otherwise shown on the plans, when tested in accordance with Test Method Tex-436-A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce the desired texture.

When the plans require that an asphaltic seal, with or without overlay, on the slab (new construction), on pre-stressed concrete box beams or other precast elements, the slab or top surface of shear key and diafram concrete shall be given a lightly textured broom finish having an average texture depth of approximately 0.025 inches when tested in accordance with Test Method Tex-436-A.

Straightedge requirements will be required on slabs (new construction) to be overlaid.

After the concrete slab has attained final set, the Engineer may require that the finished surface be tested with a standard 10 foot straightedge. The straightedge shall be used parallel to the centerline of the structure to bridge any depressions and touch high spots. Ordinates of the irregularities, measured from the face of the straightedge to the surface of the slab, should normally not exceed 1/8 of an inch, making proper allowances for camber, vertical curve and surface texture; however, occasional variations exceeding this will be acceptable if, in the opinion of the Engineer, the variations will not produce unacceptable riding qualities.

When directed by the Engineer, irregularities exceeding the above shall be corrected. Areas which are corrected to produce satisfactory riding qualities shall be provided with an acceptable surface texture in a manner approved by the Engineer.

420.20. Curing Concrete. The Contractor shall inform the Engineer of the methods proposed for curing; shall provide the proper equipment and material in adequate amounts; and shall have the proposed methods, equipment and material approved prior to placing concrete.

Unless otherwise noted herein or shown on the plans, the choice of curing methods shall be at the option of the Contractor, except that the Engineer may require the same curing methods for like portions of a single structure.

Inadequate curing and/or facilities shall be cause for the Engineer to delay all concrete placement on the job until remedial action is taken.

All concrete shall be cured for a period of four (4) curing days except as noted herein.

Table 2
EXCEPTIONS TO 4-DAY CURING

Description	Type of Cement	Required Curing Days
Upper surfaces of bridge slabs, top slab of direct traffic culverts, and concrete overlays	I or III	8
	II or I/II*	10
	All types with fly ash	10
Concrete Piling Build-ups	All	6

*Meets the requirements of both Type I and Type II.

When the air temperature is expected to drop below 40 F, the concrete shall be covered with polyethylene sheeting, burlap-polyethylene blankets, mats or other acceptable materials to provide the protection required by Article 420.12.

A curing day is defined as a calendar day when the temperature, taken in the shade away from artificial heat, is above 50 F for at least 19 hours, or on colder days if satisfactory provisions are made to maintain the temperature of all surfaces of the concrete above 40 F for the entire 24 hours. The required curing period shall begin when all concrete therein has attained its initial set.

The following methods are permitted for curing concrete subject to the requirements of Table 3 and the following additional requirements for each method of curing:

(1) Form Curing. When forms are left in contact with the concrete, other curing methods

will not be required except for exposed surfaces and for cold weather protection.

(2) 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 421, "Portland Cement Concrete". Sea water will not be permitted. Water which stains or leaves an unsightly residue shall not be used.

(a) Wet Mat Curing. This curing method shall consist of keeping the concrete continuously wet by maintaining wet cotton mats in direct contact with the concrete for the required curing time. Damp burlap blankets made from nine (9) ounce stock may be placed on the damp concrete surface for temporary protection prior to the application of cotton mats. The cotton mats may then be placed dry and wetted down immediately after they are placed. The mats shall be weighted down adequately to provide continuous contact with all concrete where possible.

Surfaces which cannot be cured by direct contact shall be covered with mats forming an enclosure well anchored to the forms or ground so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all surfaces of the concrete wet. Wet mat curing will be required for Part A in Table 3 when the anticipated ambient temperature is expected to remain above 40 F for the first 72 hours of the curing period.

Polyethylene sheeting, burlap-polyethylene blankets, laminated mats or insulating curing mats placed in direct contact with the slab will be required when the air temperature is expected to drop below 40 F during the first 72 hours of the curing period. These curing materials shall be weighted down with dry mats to maintain direct contact with the concrete and to provide insulation against cold weather. Supplemental heating or insulation may be required in cold and/or wet weather if the insulating cotton mats become wet or if the concrete drops below the specified curing temperature.

(b) Water Spray. This curing method shall consist of overlapping sprays or sprinklers that keep all unformed surfaces continuously wet.

(c) Ponding. This curing method requires the covering of the surfaces with a minimum of two (2) inches of clean granular material, kept wet at all times, or a minimum of one (1) inch depth of water. Satisfactory provisions shall be made to provide a dam to retain the water or saturated granular material.

(3) Membrane Curing. Unless otherwise provided herein or shown on the plans, either Type 1-D or Type 2 membrane curing compound may be used where membrane curing is permitted except that Type 1-D (Resin Base Only) will be required for bridge slabs and top slabs of direct traffic culverts and all other surfaces which may require a higher grade of surface finish.

Table 3

CURING REQUIREMENTS

STRUCTURE UNIT DESCRIPTION	REQUIRED		PERMITTED	
	Water for Complete Curing	Membrane for Interim Curing	Water for Complete Curing	Membrane for Complete Curing
A. Upper surfaces of Bridge Roadway, Median and Sidewalk slabs, Top Slabs of Direct Traffic Culverts.	X	X (Resin Base)		
B. Top Surface of any Concrete Unit upon which Concrete is to be placed and bonded at a later interval (Stub Walls, Risers, etc.). Other Super structure Concrete (Curbs Wingwalls, Parapet Walls, etc.).	X			
C. All Substructure Concrete, Culverts, Box Sewers, Inlets, Manholes, Retaining Walls, Riprap, Railing			*X	*X
All other concrete	As specified in other items.			

*Polyethylene Sheeting, Burlap-Polyethylene Mats or Laminated Mats in close intimate contact with the concrete surfaces will be considered equivalent to water or membrane curing.

For substructure concrete only one (1) type of curing compound will be permitted on any one (1) structure. Material requirements and construction methods shall be as required by Item 526, "Membrane Curing", except as changed herein.

Membrane curing shall not be applied to dry surfaces, but shall be applied just after free moisture has disappeared. Formed surfaces and surfaces which have been given a first rub shall be dampened and shall be moist at the time of application of the membrane.

When membrane is used for complete curing, the film shall remain unbroken for the minimum curing period specified. Membrane which is damaged shall be corrected immediately by reapplication of membrane. Unless otherwise noted herein or shown on the plans, the choice of membrane type shall be at the option of the Contractor.

420.21. Removal of Forms and Falsework. Except as herein provided, forms for vertical surfaces may be removed when the concrete has aged not less than 12 hours, provided the removal can be done without damage to the concrete.

Forms for inside curb faces may be removed at such time the removal can be done without damage to the curb.

Weight supporting forms and falsework for all bridge components and culvert slabs, except as noted herein, shall remain in place a minimum of four (4) curing days. The forms then may be removed if the concrete has attained a flexural strength of 425 psi, as evidenced by strength tests using test beams made from the same concrete and cured under the same conditions as the portion of the structure involved. Forms for other structural components may be removed as specified by the Engineer.

Inside forms (walls and top slabs) for box culverts and sewers may be removed after concrete has aged not less than one (1) day (24 hrs.) and has acquired a flexural strength of not less than 255 psi, provided an overhead support system, approved by the Engineer, is used to transfer the weight of the top slab to the walls of the box culvert or sewer before the support provided by the forms is removed.

When all test beams made for the purpose of form removal have been broken without attaining the required strength, forms shall remain in place for a total of 14 curing days.

The above provisions relative to form removal shall apply only to forms or parts thereof which are constructed to permit removal without disturbing forms or falsework required to be left in place for a longer period on other portions of the structure.

All forms and falsework shall be removed unless otherwise approved by the Engineer.

420.22. Defective Work. Any defective work shall be repaired as soon as possible.

Any defect which in the opinion of the Engineer cannot be repaired satisfactorily to the extent required by the Engineer shall be removed and replaced at the expense of the Contractor.

420.23. Finishing Exposed Surfaces. A Surface Finish shall be applied to all concrete surfaces and shall be in accordance with Item 427, "Surface Finishes for Concrete".

420.24. Measurement. The quantities of concrete of the various classifications which will constitute the completed and accepted structure or structures in place will be measured by the cubic yard, each, square foot, square yard, or linear foot as shown on the plans. Measurement will be as follows:

(1) General.

(a) All concrete quantities will be based on the dimensions shown on the plans or those established in writing by the Engineer. Diafram concrete, when required, will be included in the slab measurement.

(b) In determining quantities, no deductions will be made for chamfers less than two (2) inches, embedded portions of structural steel or pre-stressed concrete beams, piling, anchor bolts, reinforcing steel, drains, weep holes, junction boxes, electrical or telephone conduit, conduit and/or voids for pre-stressed tendons or for embedded portions of light fixtures.

(c) For pan girder spans, a quantity will be included for the screed setting required to provide proper camber in the roadway surface after form removal.

(d) For slabs on steel and pre-stressed beams, a quantity for the haunch between the slab and beams will be included when required. No measurement will be made during construction for variation in the amount of haunch concrete due to deviation from design camber in the beams.

(e) For slabs on panels, T-beams, or box beams, the combination of span length, theoretical camber in beams, computed deflections, and plan vertical curve will be taken into account in determining the quantity for the slab.

Additional concrete which may be required by an adjustment of the profile grade line during construction, to insure proper slab thickness, will not be measured for payment.

(f) Variation in concrete headwall quantity incurred when an alter- nate bid for pipe is permitted will not be measured for payment.

(g) Quantities revised by a change in design, measured as specified herein, will be increased or decreased, as the case may be, and included for payment.

(2) Plan Quantity. For structure elements designated in Table 4, and when measured by the cubic yard, this is a plans quantity measurement Item and the quantity to be paid for will be that quantity shown in the proposal and on the "Estimate and Quantity" sheet of the contract plans, except as may be modified by Article 9.8. If no adjustment of quantities is required, additional measurements or calculations will not be required.

When the quantity for a complete structure element has been erroneously included or omitted from the plans, the quantity shown on the plans for that element will be added to or deducted from the plan quantity and included for payment. A complete structure element will be the smallest portion of a total structure for which a quantity is included on the plans.

When the plan quantity for a complete structure element is in error by five (5) percent or more, a recalculation will be made and the corrected quantity included for payment.

(3) Measured in Place. For those Items not measured for plan quantity payment, measurement will be made in place.

Table 4
PLAN QUANTITY PAYMENT
(Cubic Yard Measurement Only)

Culverts and Wingwalls	Slabs on Steel Spans
Headwalls for pipe	Slabs on Pre-stressed Spans
Retaining Walls	Pan Girder Spans
Inlets and Manholes	Pile Bent Caps
Slab Spans	Shear Key Concrete
Slab and Girder Spans	Abutments

Note: Other structure elements may be paid for as "plan quantity", including pier and bent concrete, when shown on the plans.

For those portions of structures not listed in Table 4, the concrete quantities, measured as provided in Subarticle 420.24.(1) will be paid for at the unit price bid per "Cubic Yard", per "Each", per "Square Foot", per "Square Yard", or per "Linear Foot", in place, for the various classifications of concrete shown.

420.25. Payment. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the various structure elements specified of the various classes of concrete. This price shall be full compensation for furnishing, hauling and mixing all concrete materials; for furnishing, bending, fabricating, splicing, welding and placing the required reinforcement; for all clips, blocks, metal spacers, ties, wire or other materials used for fastening reinforcement in place; for placing, finishing and curing all concrete; for all grouting and pointing; for furnishing and placing drains; for furnishing and placing metal flashing strips; for furnishing and placing expansion-joint material required by this Item; and for all forms and falsework, labor, tools, equipment and incidentals necessary to complete the work.

Concrete which fails to meet minimum strength requirements may be rejected or a structural review may be made by the Engineer. Such concrete which is proven structurally adequate may be accepted at an adjusted price based on the following formula:

$A = .10Bp + .75(Sa/Ss)^2 Bp$
A = Amount to be paid per unit of measure
Sa = Actual strength from beams or cores.
Ss = Minimum required strength (specified)
Bp = Unit bid price

*** * * END OF SECTION * * ***

SECTION ITEM 421

PORTLAND CEMENT CONCRETE

421.1. Description. This Item shall govern for portland cement concrete to be used in concrete pavement, concrete structures and other concrete construction.

421.2. Materials. The concrete shall be composed of portland cement, (with or without) fly ash, fine and coarse aggregates and water.

(1) Cement. Portland cement shall conform to Item 524, "Hydraulic Cement".

Unless otherwise shown on the plans or in the specifications, the cement shall be either Type I, IP, II or III portland cement except as follows:

a. Type III cement shall not be used when the anticipated air temperature for the succeeding 12 hours will exceed 60 F.

b. Type III cement may be used, regardless of air temperature, in all precast concrete.

All cement used in a monolithic placement shall be of the same type.

Type I/II cement may be considered as either Type I or Type II cement except as otherwise noted.

Type IP cement may be used in lieu of Type I or Type II cement except when otherwise required by the plans or specifications. When Type IP cement is used, additional fly ash will not be permitted.

(2) Fly Ash. Fly ash shall conform to the requirements of Departmental Materials Specification D-9-8900. Copies of Departmental Materials Specifications are available from the Texas Department of Transportation, Division of Materials and Tests, 125 East 11th Street, Austin, Texas 78701-2483.

When fly ash is used, "cement" shall be defined as "cement plus fly ash". "Cement plus fly ash" shall be composed of Type I, II or III portland cement and 20 to 35 percent fly ash by absolute volume, except that for classes of concrete which are specified to have less than five (5) sacks of portland cement per cubic yard, the fly ash replacement of cement shall not exceed 25 percent by absolute volume of the specified cement content. The Contractor has the option of using "cement plus fly ash" as defined herein for all classes of concrete except that Type B fly ash shall not be used when Type II cement is required, and no fly ash is permitted when a white portland cement is required.

(3) Mixing Water. Water for use in concrete and for curing shall be free from oils, acids, organic matter or other deleterious substances and shall not contain more than 1000 parts

per million of chlorides as Cl nor more than 1000 parts per million of sulfates as SO_4.

Water from municipal supplies approved by the State Health Department will not require testing, but water from other sources will be sampled and tested before use in concrete. Tests shall be made in accordance with AASHTO T26. A sample of approximately one (1) gallon shall be submitted to the Texas Department of Transportation, Division of Materials and Tests, 3800 Jackson Ave., Bldg. No. 5, Austin, Texas 78731-6033.

Water used in white portland cement concrete shall be free from iron and other impurities which may cause staining or discoloration.

(4) Coarse Aggregate. Coarse aggregate shall be washed and shall consist of durable particles of gravel, crushed blast furnace slag, crushed stone, or combinations thereof and shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter, or other objectionable material either free or as an adherent coating. When white portland cement is specified, the coarse aggregates used in the concrete shall be light colored. Quality shall be reasonably uniform throughout. Coarse aggregate shall not contain more than 0.25 percent by weight of clay lumps, nor more than one (1.0) percent by weight of shale, nor more than five (5.0) percent by weight of laminated and/or friable particles when tested in accordance with Test Method Tex-413-A. Coarse aggregate from each source shall have a wear of not more than 40 percent when tested in accordance with Test Method Tex-410-A.

Unless otherwise shown on the plans, coarse aggregate from each source will be subjected to five (5) cycles of both the sodium sulfate and the magnesium sulfate soundness test in accordance with Test Method Tex-411-A. When the loss is greater than 12 percent with sodium sulfate and/or 18 percent with magnesium sulfate, further testing will be required prior to acceptance or rejection of the material. A satisfactory record under similar conditions of service and exposure will be considered in the evaluation of material failing to meet these requirements.

When tested in accordance with Test Method Tex-401-A, the coarse aggregate, including combinations of aggregates when used, shall conform to the gradation requirements shown in Table 1, except as provided in Subarticle 427.8.(3) for exposed aggregate finishes.

TABLE 1

COARSE AGGREGATE GRADATION CHART

Aggregate Grade No.	Nominal Size Inches	Percent Retained on Each Sieve								
		2-1/2 in.	2 in.	1-1/2 in.	1 in.	3/4 in.	1/2 in.	3/8 in.	No. 4	No. 8
1	2	0	0-20	15-50		60-80			95-100	
2 (467)*	1-1/2		0	0-5		30-65		70-90	95-100	
3	1-1/2		0	0-5		10-40	40-75		95-100	
4 (57)*	1			0	0-5		40-75		90-100	95-100
5 (67)*	3/4				0	0-10		45-80	90-100	95-100
6 (7)*	1/2					0	0-10	30-60	85-100	95-100
7	3/8						0	5-30	75-100	
8	3/8						0	0-5	35-80	90-100

*Numbers in parenthesis indicate that these gradations conform to corresponding ASTM gradation in ASTM C33.

The loss by decantation in accordance with Test Method Tex-406-A plus the allowable weight of clay lumps, shall not exceed one (1) percent, or the value shown on the plans, whichever is smaller. In the case of aggregates made primarily from the crushing of stone, if the material finer than the 200 sieve is definitely established to be the dust of fracture, essentially free from clay or shale, as established by Part III of Test Method Tex-406-A, the percent may be increased to 1.5.

(5) Fine Aggregate. Fine aggregate shall be washed and consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, with or without a mineral filler. When white portland cement is specified the fine aggregate used in the concrete shall be light colored. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent by weight of clay lumps. When the aggregate is subjected to the color test for organic impurities in accordance with Test Method Tex-408-A, the test result shall not show a color darker than standard.

Unless otherwise shown on the plans, the acid insoluble residue of fine aggregate used in concrete subject to direct traffic shall be not less than 60 percent by weight when tested in accordance with Test Method Tex-612-J.

When tested in accordance with Test Method Tex-401-A, the fine aggregate or combinations of aggregates, including mineral filler, shall conform to the gradation requirements shown in Table 2.

Table 2

FINE AGGREGATE GRADATION CHART

	Percent Retained on Each Sieve							
Aggregate Grade No.	3/8 in.	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
1	0	0 to 5	0 to 20	15 to 50	35 to 75	65 to 90	90 to 100	97 to 100

Where manufactured sand is used in lieu of natural sand, the percent retained on the No. 200 sieve shall be 94 to 100.

Where the sand equivalent value is greater than 85, the retainage on the No. 50 sieve may be 65 to 94 percent.

Fine aggregate will be subjected to the Sand Equivalent Test (Test Method Tex-203-F). The sand equivalent shall not be less than 80 unless otherwise shown on the plans.

For all classes of concrete, except class K, the fineness modulus shall be between 2.30 and 3.10 as determined by Test Method Tex-402-A. The fineness modulus for class K shall be 2.6 to 2.8 unless otherwise shown on the plans.

(6) Mineral Filler. Mineral filler shall consist of stone dust, clean crushed sand, or other approved inert material. When tested in accordance with Test Method Tex-401-A, it shall conform to the following gradation:

Retained on No. 30 Sieve 0 percent

Retained on No. 200 Sieve 0-35 percent

(7) Admixtures. Admixtures and their use shall conform to the requirements of Item 437, "Concrete Admixtures". Calcium chloride will not be permitted.

(8) Mortar and Grout. Unless otherwise specified or approved by the Engineer, mortar and grout shall consist of one (1) part portland cement, two (2) parts finely graded sand and sufficient water to provide the desired consistency. Mortar may contain admixtures.

Post tensioning grout shall be in accordance with Item 426, "Prestressing".

Mortar shall have a consistency such that the mortar can be easily handled and spread by trowel.

Grout shall have a consistency such that the grout will flow into and completely fill all voids.

When required to prevent color difference, white cement shall be added to produce the color required. When shown on the plans or in the specifications, or when required by the Engineer, latex adhesive conforming to the requirements of Departmental Material Specification D-9-8110 shall be added to the mortar.

421.3. Storage of Materials.

(1) Cement, Fly Ash and Mineral Filler. All cement, fly ash and mineral filler shall be stored in well ventilated weatherproof buildings or approved bins, which will protect them from dampness or absorption of moisture. Each shipment of packaged cement shall be kept separated to provide easy access for identification and inspection.

The Engineer may permit small quantities of sacked cement to be stored in the open on a raised platform and under waterproof covering for a maximum of 48 hours.

(2) Aggregates. The method of handling and storing concrete aggregates shall prevent contamination with foreign materials. If the aggregates are stored on the ground, the sites for the stockpiles shall be clear of all vegetation and shall be level. The bottom six (6) inch layer of aggregate shall not be disturbed or used without re-cleaning.

When conditions require the use of two (2) or more sizes of aggregates, the aggregates shall be separated to prevent intermixing. Where space is limited, stockpiles shall be separated by physical barriers. Aggregates from different sources shall be stored in different stockpiles unless the aggregates are pre-blended as approved by the Engineer prior to stockpiling.

Methods of handling aggregates during stockpiling and their subsequent use shall be such that segregation will be minimized. The Engineer may require that stockpiles be remixed when segregation is apparent.

Unless otherwise authorized by the Engineer, all aggregate shall be stockpiled at least 24 hours to reduce the free moisture content. In order to control absorption, stockpiles shall be sprinkled when directed by the Engineer.

To assure uniform concrete, aggregate stockpiles shall be maintained at reasonably uniform moisture content.

(3) Admixtures. Admixtures shall be stored in accordance with Item 437, "Concrete Admixtures".

421.4. Measurement of Materials. Except as noted below, the measurement of materials used in batches of concrete shall be by weight.

Water may be measured by volume or by weight.

Cement and fly ash shall be weighed separately from other materials. Weighing of sacked cement will not be required. When sacked cement is used, the quantity of cement per batch shall be based upon using full bags of cement. Batches involving use of fractional bags will not be permitted except for small hand mixed batches of approximately five (5) cubic feet or less and when an approved method of volumetric measurement is used.

Where two (2) or more sizes or types of aggregates are used, each type and/or size shall be measured separately.

When determining aggregate batch weights, proper allowance shall be made for the water content in the aggregate (free water and/or absorption).

Admixtures shall be measured and dispensed in accordance with Item 437, "Concrete Admixtures".

Measuring materials by volumetric methods may be used where permitted by the specifications. When a mixer using volumetric batching of materials is used, an accurate method of measuring by volume shall be provided. Continuous volumetric mixers shall be calibrated to assure correct measurement of materials.

The amount of each ingredient in the batch shall be measured to within plus or minus one (1) percent of the required amount except that water shall be measured to within plus or minus one (1) gallon and admixture tolerances shall be in accordance with Item 437, "Concrete Admixtures".

421.5. Equipment.

(1) Weighing and Measuring Equipment. Weighing and measuring equipment shall conform to Item 520, "Weighing and Measuring Equipment".

(2) Mixing Equipment.

(a) General. All equipment, tools, and machinery used for hauling materials and performing any part of the work shall be maintained in such condition as to insure completion of the work under way without excessive delays for repairs or replacement.

The mixer shall be of an approved type and size that will produce uniform distribution of the material throughout the mass and shall be capable of producing concrete meeting the requirements of these specifications.

The mixing equipment shall be capable of producing the quantities of concrete necessary to comply with requirements shown on the plans or in these specifications.

For all mixers, an adequate water supply and an accurate method of measuring the water shall be provided.

Delivery of concrete to the worksite and the discharge from the hauling equipment,

agitating, or non-agitating, shall be in accordance with the requirements shown on the plans or in the governing specifications.

Specific requirements for batch plants, mixers and other equipment shall be in accordance with Item 522, "Portland Cement Concrete Plants", Item 360, "Concrete Pavement", or other specifications, except that continuous volumetric mixers shall conform to Subarticle 421.5(2)(b) of this Item.

(b) Continuous Volumetric Mixers. For all miscellaneous concrete placements, a mobile, continuous, volumetric mixer may be used.

When approved in writing by the Engineer or when specified for use in other Items, these mixers may be used for other types of concrete construction, including structural concrete, if the number of mixers furnished will supply the amount of concrete required for the particular operation in question.

These mixers shall be designed to receive all the concrete ingredients, including admixtures, required by the mix design in a continuous uniform rate and mix them to the required consistency before discharging.

(c) Portland Cement Concrete Plants. The use of ready-mixed concrete from a commercial source will be permitted for all structural concrete provided that the plant, truck mixers, and mixing equipment conform to the requirements of Item 522, "Portland Cement Concrete Plants". The use of ready-mix plants and ready-mix concrete for concrete pavement shall be in accordance with Item 360, "Concrete Pavement". The class of plant furnished shall conform to the requirements of Item 522, "Portland Cement Concrete Plants".

421.6. Mixing.

(1) General. Mixed concrete which does not conform to specification requirements shall not be placed. Mixing shall be in accordance with Item 522, "Portland Cement Concrete Plants", except that mixing with continuous volumetric mixers will be in accordance with Subarticle 421.6.(2) and except as set out in Subarticle 421.6.(3).

(2) Continuous Volumetric Mixers. Mixing shall be in accordance with mixer manufacturer's recommendations unless otherwise revised by the Engineer.

(3) Mixing of concrete by hand methods or by the use of a small motor driven mixer will be permitted for small placements of approximately two (2) cubic yards or less when authorized by the Engineer. Hand mixed batches shall not exceed a two (2) sack batch in volume. For such placements the mix may be proportioned by approved volumetric methods.

421.7. Placing, Curing and Finishing. The placing of concrete, including construction of forms and falsework, curing and finishing, shall be in accordance with Item 420, "Concrete Structures", Item 360, "Concrete Pavement", and Item 427, "Surface Finishes for Concrete".

421.8. Classification and Mix Design. The Contractor shall furnish the mix design, using a coarse aggregate factor acceptable to the Engineer, for the class(es) of concrete specified, to conform with the requirements contained herein and in accordance with Construction Bulletin C-11. The Contractor shall perform, at his entire expense, the work required to substantiate the design, except that casting and testing of strength specimens will be done by the Department. Complete concrete design data shall be submitted to the Engineer for approval.

The Contractor shall determine and measure the batch quantity of each ingredient, including all water, not only for batch designs but for all concrete produced for the project. The mixes shall conform to these specifications and other requirements shown on the plans.

For continuous volumetric mixers the materials delivered during a revolution of the driving mechanism, or in a selected time interval, will be considered a batch and the proportion of each ingredient will be calculated in the same manner as for a batch type plant.

The Contractor may accept a design from the Department; however, this acceptance will not relieve the Contractor of the responsibility of providing concrete meeting the requirements of these specifications.

Mix designs from previous or concurrent jobs may be used without trial batches if it is shown that no substantial change in any of the proposed ingredients has been made.

No charge will be made for existing designs furnished by the Engineer. The cost to the Department of preparing a new mix design will be charged to the Contractor and deducted from the payment for the work.

Trial batches shall be made and tested using all the proposed ingredients prior to the placing of concrete, and when the aggregate, and/or type, brand or source of cement, or admixture is changed. When the brand and/or source of cement only is changed, the Engineer may waive trial batch only if a prior record of satisfactory performance of the cement with the other ingredients has been established.

Trial batches generally shall be made in a mixer of adequate capacity to evaluate the design. The trial batches shall be made in a mixer representative of the mixers to be used. Batch size shall not be less than 50 percent of its rated mixing capacity.

Concrete for pneumatically placed concrete shall be in accordance with Item 431, "Pneumatically Placed Concrete".

The coarse aggregate factor shall be selected in accordance with Construction Bulletin C-11 based on grade of the coarse aggregate and the fineness modulus of the sand.

The Contractor shall have the option of using chemical admixtures with all classes of concrete in accordance with Item 437, "Concrete Admixtures", except where the use of specific admixtures is required or prohibited in this or other items.

When a retarding admixture is required for hot weather concreting, the amount to be used will be as required in Item 437, "Concrete Admixtures", subject to change by the Engineer when required. When used for extended retardation, the amount to be used will be established by several trial batches with varying retarder content and simulating the placing conditions to be encountered and tested in accordance with Tex-440-A.

When entrained air is required, the concrete shall be designed to entrain five (5) percent air when Grade 1 or 2 coarse aggregate is used, six (6) percent when Grade 3 or 4 coarse aggregate is used, and seven (7) percent for Grades 5, 6 or 7 unless otherwise specified by the Engineer. Concrete as placed shall contain the proper amount of entrained air as required herein with a tolerance of plus or minus 1-1/2 percentage points. Acceptance of concrete with occasional variations between 1-1/2 and three (3) percentage points over the specified amount will be based on strength tests as required by the Engineer. Such concrete which fails to meet strength requirements may be accepted on the basis of structural reviews subject to the provisions of Article 420.25. When the quantity of entrained air is found to be more than three (3) percentage points over or two (2) percentage points under those values given herein, the concrete will be rejected.

Entrained air will be required for bridge slabs, top slabs of direct traffic culverts, concrete pavement, dense and regular concrete overlays, piers, bents, precast piling (nonprestressed), drilled shafts placed in water, bridge railing, concrete traffic barrier and for other items of work as may be specified, on the plans or in other specifications. Unless otherwise specified, entrained air will not be required when Class "H" concrete is used for precast traffic barrier or precast bridge repair.

Table 3
SLUMP REQUIREMENTS

Concrete Designation	Desired Slump Inches	Max Slump Inches
A. Structural Concrete		
(1) All drilled shafts	6	7
(2) Thin-Walled Section (9" or less)	4	5
(3) Slabs, Concrete Overlay, Caps, Column piers, Wall sections over 9", etc.	3	4
(4) Prestressed Concrete Members		
(5) Concrete traffic Barrier (cast-in-place or precast), Concrete Bridge Railing	4	5
	4	5

(6) Dense concrete overlay	3/4	1
(7) Concrete placed underwater	6	7
(8) Concrete with High Range Water Reducer		8
B. Concrete Pavement	———	
C. Riprap, curb, gutter, slip-formed and extruded concrete	1-1/2	3 max 1 min
	As Approved by the Engineer	

Note: No concrete will be permitted with a slump in excess of the maximums shown.

When high range water reducing admixtures are used, the slump shall not exceed eight (8) inches.

421.9. Quality of Concrete. The concrete shall be uniform, workable and of a consistency acceptable to the Engineer. The cement content, maximum allowable water/cement ratio, the desired and maximum slump, the proper amount of entrained air and the strength requirement for all classes of concrete shall conform to the requirements of these specifications. It shall be the responsibility of the Contractor to provide concrete meeting these requirements.

During the progress of the work, the Engineer will cast test cylinders and/or beams, perform slump and entrained air tests and will make temperature checks, as required, to insure compliance with the specifications.

Unless otherwise shown on the plans the Contractor shall furnish and properly maintain all test molds. The test molds shall meet the requirements of Test Methods Tex-418-A and Tex-448-A and, in the opinion of the Engineer, must be satisfactory for use at the time of use. In addition, the Contractor shall be responsible for furnishing personnel to remove the test specimens from the molds and transport them to the proper curing location at the schedule designated by the Engineer and in accordance with the governing specification. For all concrete items the Contractor shall have a wheelbarrow, or other container acceptable to the Engineer, available to use in the sampling of the concrete. The Contractor is responsible for disposing of used, broken test specimens.

All labor and equipment furnished by the Contractor will be considered subsidiary to the various bid items and will not be paid for directly.

A strength test is defined as the average of the breaking strength of two (2) cylinders or two (2) beams as the case may be. Each specimen will be tested in accordance with Test Methods Tex-418-A or Tex-448-A.

Slump tests will be performed in accordance with Test Method Tex-415-A. Entrained air tests will be performed in accordance with Test Method Tex-416-A.

If the required strength or consistency of the class of concrete being produced cannot be secured with the minimum cement specified or without exceeding the maximum water/cement ratio, the Contractor will be required to furnish different aggregates, use a water reducing agent, an air entraining agent or increase the cement content in order to provide concrete meeting these specifications.

All test specimens, beams or cylinders, representing tests for removal of forms and/or falsework shall be cured using the same methods and under the same conditions as the concrete represented.

"Design Strength" beams and cylinders shall be cast and cured in accordance with Test Method Tex-447-A.

The Contractor shall provide, operate and maintain curing facilities as described in Test Method Tex-447-A, for the purpose of curing test specimens.

When the specified concrete strength is by 28 day compressive strength tests, job control testing will be by seven day compressive strength tests. The minimum strength requirement for seven (7) day tests will be 70 percent of the specified minimum 28 day compressive strength. If the required seven (7) day strength is not obtained with the quantity of cement specified in Table 4, changes in the batch design will be made as specified in this article. For an occasional failure of the seven day compressive test, the concrete may be tested at 28 days for final evaluation.

Strength test requirements for Type II cement will govern when Type I/II cement is used.

Table 4

CLASSES OF CONCRETE

Class of Conc.	Cement per C.Y. Min. (sacks)	Min. Comp. Sgth (f'c) 28 Day psi	Min.Flex. Sgth. 7 day psi	Max. Water Cement Ratio Gal/sk	Coarse Aggr. Grade No.	General Usage (information only)
A	5.0	3000	425 390 (c)	6.5	1-2-3-4-8 (a) (d)	Drilled Shafts; Culverts, except Top Slab of Direct Traffic Culverts; Inlets; Manholes, Headwalls; Appr. Slabs; Curb; Gutter; Curb & Gutter, Conc. Retards; Sidewalks; Driveways; Conc. Pavement; Back-up Walls; Anchors
B	4.0	2000	280	8.0	2-3-4-5-6-7	Riprap, Small Roadside Signs and Anchors
C	6.0	3600	510 470 (c)	6.0	1-2-3-4-5 (d)	Drilled Shafts; Bridge Substructure; Bridge Railing; Culverts, except Top Slab of Direct Traffic Culverts; Wing Walls; Approach Slab; Concrete Traffic Barrier (cast-in-place)

Class of Conc.	Cement per C.Y. Min. (sacks)	Min. Comp. Sgth (f'c) 28 Day psi	Min.Flex. Sgth. 7 day psi	Max. Water Cement Ratio Gal/sk	Coarse Aggr. Grade No.	General Usage (information only)
D	3.0	1500	215	11.0	2-3-4-5-6-7	Riprap
E	6.0	3000	425	6.0	2-3-4-5	Seal Concrete
F	6.0 (8.0 Max)	As specified on plans	.85 f'c / 6	5.5	2-3-4-5	Railroad structures; occasionally for Bridge Piers, Columns or Bents
H	6.0	As specified on plans	N.A.	5.5	3-4-5-6	Prestressed Concrete Beams, Boxes, Piling and Concrete Traffic Barrier (Precast)
S	6.5	4000	570 525(c)	5.0	2-3- 4-5	Bridge Slab; Top Slab of Direct Traffic Culvert; Bridge Substructure
P	5.0	N.A.	555(b)	6.25	2-3	Concrete Pavement
DC	8.75	5500	720	3.6	6	Dense Concrete Overlay
CO	7.0	4600	640	4.5	6	Concrete Overlay
SS	7.0	3600	510	5.5	3-4-5	Slurry Displacement Shafts, Underwater Drilled Shafts
K	Requirements as specified on the plans or in other Items.					

(a) Grade 8 aggregate for use in extruded curbs, unless a larger size is approved by the Engineer.

(b) Minimum running average for concrete pavement (in accordance with construction Bulletin C-II).

(c) When Type II or Type I/II cement is used.

(d) Unless otherwise permitted by the Engineer, Grade I coarse aggregate may be used only in massive foundations with four (4) inch minimum clear spacing between reinforcing steel bars. Grade I aggregate may not be used in drilled shafts.

421.10. Measurement and Payment. The work performed, materials furnished and all labor, tools, equipment and incidentals necessary to complete the work under this Item will not be measured or paid for directly, but will be considered subsidiary to the various bid items of the contract.

*** * * END OF SECTION * * ***

SECTION ITEM 440

REINFORCING STEEL

440.1. Description. This Item shall govern for the furnishing and placing of deformed and smooth reinforcing steel, of the sizes and details shown on the plans and in accordance with this Item.

All Producing Mills of reinforcing steel for the Texas Department of Transportation use shall be preapproved by the Division of Materials and Tests prior to furnishing reinforcing steel. Preapproval will be in accordance with Test Method Tex-741-I. A list of Department approved Producing Mills will be maintained by the Division of Materials and Tests. Reinforcing steel obtained from unapproved sources will not be permitted.

All reinforcing steel to be epoxy coated will be designated on the plans. Epoxy coating of reinforcing steel shall be in accordance with "Epoxy Coating of Reinforcing Steel" of this Item.

All epoxy applicators shall be preapproved by the Division of Materials and Tests prior to furnishing epoxy coated reinforcing steel. Preapproval will be in accordance with Test Method Tex-742-I. A list of Department approved applicators will be maintained by the Division of Materials and Tests.

440.2. Materials. Unless otherwise shown on the plans or specified herein, the reinforcing steel shall be Grade 60 and all bar reinforcement shall be deformed, conforming to one of the following:

(1) ASTM A615, Grades 40 or 60, open hearth, basic oxygen, or electric furnace new billet steel.

(2) ASTM A617, Grades 40 or 60, axle-steel.

(3) ASTM A616, Grade 60, rail steel will be permitted in concrete pavement only. ASTM A616 bars shall be furnished as straight bars only and bending is prohibited. Bend tests will not be required.

(4) ASTM A706, Grade 60, weldable reinforcing steel.

(5) Smooth Bars. Smooth bars for concrete pavement shall have a minimum yield strength of 60 ksi.

All other smooth bars, larger than No. 4, may be steel conforming to the above or may be furnished in any steel that meets the physical requirements of ASTM A36.

(6) Spiral reinforcement shall be either smooth or deformed bars, or wire, of the minimum size or gage shown on the plans, or as specified herein.

Bars for spiral reinforcement shall comply with ASTM A675, Grade 80 (reference to ASTM A29 is voided) A615 or A617, Grade 40, unless otherwise shown on the plans. Smooth wire shall comply with ASTM A82 and deformed wire shall comply with ASTM A496.

In cases where the provisions of this Item are in conflict with the provisions of the ASTM Specification, the provisions of this Item shall govern.

Reinforcing steel to be structurally welded shall comply with ASTM A706 or shall have a carbon equivalency (C.E.) of not more than 0.55 %. A report of chemical analysis, showing the percentages of all elements necessary to establish the carbon equivalency, will be required for all reinforcing steel that is to be structurally welded. The above requirements do not pertain to miscellaneous welds on reinforcing steel as defined in Item 448, "Structural Field Welding."

Carbon equivalency will be calculated using the following formula:

$$C.E. = \%C + \frac{\%Mn}{6} + \frac{\%Cu}{40} + \frac{\%Ni}{20} + \frac{\%Cr}{10} - \frac{\%Mo}{50} - \frac{\%V}{10}$$

The nominal size, area and weight of reinforcing steel bars covered by this specification are as follows:

BAR SIZE NUMBER	NOMINAL DIAMETER IN.	NOMINA AREA SQ. IN.	WEIGHT PER LINEAR FT.
2	0.250	0.05	0.167
3	0.375	0.11	0.376
4	0.500	0.20	0.668
5	0.625	0.31	1.043
6	0.750	0.44	1.502
7	0.875	0.60	2.044
8	1.000	0.79	2.670
9	1.128	1.00	3.400
10	1.270	1.27	4.303
11	1.410	1.56	5.313
14	1.693	2.25	7.65
18	2.257	4.00	13.60

Smooth round bars shall be designated by size number through No. 4. Smooth bars above No. 4 shall be designated by diameter in inches.

(7) Wire for fabric reinforcement shall conform to ASTM A82 or A496. Wire fabric shall conform to ASTM A185 or A497.

When wire is ordered by size numbers, the following relation between size number, diameter in inches and area shall apply unless otherwise specified. Where deformed wire is required, the size number shall be preceded by "D," and for smooth wire the prefix shall be "W."

SIZE NUMBER	NOMINAL DIAMETER IN.	NOMINAL AREA SQ. IN.
30	.0618	0.300
28	0.597	0.280
26	0.575	0.260
24	0.553	0.240
22	0.529	0.220
20	0.505	0.200
18	0.479	0.180
16	0.451	0.160
14	0.422	0.140
12	0.391	0.120
10	0.357	0.100
8	0.319	0.080
7	0.299	0.070
6	0.276	0.060
5.5	0.265	0.055
5	0.252	0.050
4.5	0.239	0.045
4	0.226	0.040
3.5	0.211	0.035
3	0.195	0.030
2.5	0.178	0.025
2	0.160	0.020
1.5	0.138	0.015
1.2	0.124	0.012
1	0.113	0.010
0.5	0.080	0.005

Note: Fractional sizes between the sizes listed above are also available and acceptable for use.

Welded wire fabric will be designated as shown in the following example:

6 x 12 - W16 x W8; indicating six (6) inch longitudinal wire spacing and 12 inch transverse. Wire spacing with smooth number 16 wire longitudinally and smooth number 8 wire transversely.

(8) Epoxy Coating. The epoxy coating material and the material used for the repair of the coating shall comply with the Departmental Materials Specification D-9-8130, "Epoxy Powder Coating For Reinforcing Steel." Copies of the Departmental Materials Specifications are available from the Texas Department of Transportation, Division of Materials and Tests, 125 East 11th Street, Austin, Texas 78701-2483. An eight (8) ounce sample of epoxy powder and manufacturer's certifications will be required for each lot of epoxy powder used to coat materials for Department projects.

440.3. Bending. The reinforcement shall be bent cold, true to the shapes shown on the plans. Fabrication shall preferably be done in the shop. Field fabrication, if permitted, shall be done with equipment approved by the Engineer. Misfabricated, damaged or broken bars shall be rejected and replaced at the Contractor's expense. Damaged or broken bars imbedded in a previous concrete placement may be repaired with the approval of the Engineer.

Unless otherwise shown on the plans, the inside diameter of bar bends, in terms of the nominal bar diameter (d), shall be as follows:

Bends of 90° and greater in stirrups, ties and other secondary bars that enclose another bar in the bend shall be:

#3, #4, #5	4d
#6, #7, #8	6d

All bends in main bars and in secondary bars not covered above shall be:

#3 thru #8	6d
#9, #10, #11	8d
#14, #18	10d

Where bending of Grade 60 bars, sizes No. 14 or No. 18, is required, bend testing shall be performed on representative specimens as described for smaller bars in the applicable ASTM Specification. The required bend shall be 90 degrees around a pin having a diameter of 10 times the nominal diameter of the bar.

440.4. Tolerances. Fabricating tolerances for bars, from plan dimensions, shall not be greater than shown in Figure 1.

440.5. Storing. Steel reinforcement shall be stored above the surface of the ground upon platforms, skids, or other supports and shall be protected from damage and deterioration as approved by the Engineer. When placed in the work, reinforcement shall be free from dirt, paint, grease, oil, or other foreign materials. Reinforcement shall be free from defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum cross-sectional area of a hand wire brushed specimen meets the requirements for the size of steel specified.

440.6. Splices. Splicing of bars, lap spliced or welded, shall be as shown on the plans or specified herein. Additional splices will require written approval of the Engineer.

Splices not provided for on the plans will be permitted in slabs 15 inches or less in thickness, columns, walls and parapets, but will not be included for measurement, subject to the following:

Unless otherwise approved by the Engineer, splices will not be permitted in bars 30 feet or less in plan length. For bars exceeding 30 feet in plan length, the distance center to center of splices shall not be less than 30 feet minus one splice length, with no more than one individual bar length less than 10 feet. Lap splices not shown on the plans, but permitted herein, shall be made in accordance with Table 1. The specified concrete cover and proper spacing shall be maintained at such splices and the lap spliced bars placed in contact and securely tied together.

TABLE 1
Minimum Lap Requirements
for Bar Sizes Through No. 11

	LAP LENTH	
SIZE	**UNCOATED**	**COATED**
No. 3	1'-0"	1'-6"
No. 4	1'-6"	2'-3"
No. 5	1'-10"	2'-9"
No. 6	2'-3"	3'-4"
No. 7	3'-0"	4'-6"
No. 8	3'-9"	5'-7"
No. 9	4'-8"	7'-0"
No. 10	5'-7"	8'-4"
No. 11	6'-7"	9'-10"

Spiral steel shall be lapped a minimum of one turn.

Bar sizes No. 14 and No. 18 may not be lapped.

Welded splices shall conform to the requirements of the plans and Item 448, "Structural Field Welding." End preparation for butt welding reinforcing bars shall be done in the field. Delivered bars shall be of sufficient length to permit weld preparation.

Welded wire fabric shall be spliced using a lap length that will include the overlap of a minimum of two (2) cross wires plus two (2) inches on each sheet or roll. Splices using bars which develop equivalent strength and lapped in accordance with Table 1 will be permitted.

For box culvert extensions with less than one (1) foot of fill, the existing longitudinal bars shall have a lap with the new bars as shown in Table 1. For extensions with more than one (1) foot of fill, a minimum of six (6) inch lap will be required.

440.7. Mechanical Couplers.

(1) General. When shown on the plans, mechanical splices may be made in the reinforcing steel bars using one of the following types:

Sleeve-Filler Type
Sleeve-Threaded Type
Sleeve-Swaged Type
Sleeve-Wedge Type

All couplers furnished by the Contractor shall be produced by a prequalified manufacturer. Prequalification shall be in accordance with Departmental Material Specification D-9-4510. Sleeve-wedge type couplers will not be permitted on coated reinforcing.

(2) Project Samples. For purposes of sampling couplers for use on an individual project, a lot of couplers shall be defined as 500 couplers, or fraction thereof, for each size and type. Prior to use on the project, three (3) test specimens shall be assembled using couplers selected at random from each lot received on the project. All test specimens shall be assembled from materials consigned to the project and shall be assembled in the presence of the Engineer. A test specimen shall consist of a coupler connecting two (2) 21 inch, or longer, bars using the same splice materials, position, equipment and procedures to be used to make splices in the work. The assembled test specimens shall be submitted to the Division of Materials and Tests for testing. Each lot of couplers shall be identified with tags or markings identifying the lot from which the samples were taken.

(3) Testing. Project samples will be tested to 125% of specified yield strength and for total slip requirements. When a test representing a lot of couplers fails to meet the requirements, four (4) additional couplers from that lot will be tested. If all four (4) tests meet the requirements, the lot will be accepted for use in the work. If any of the four (4) tests fail to meet the requirements, that lot of couplers will be rejected and not used in the work.

(4) Construction Methods. All coupling devices shall be installed in accordance with the manufacturer's recommendations. Protection of threaded male or female connections shall be provided and the threaded connections shall be clean when making the connection. Damaged threads shall not be repaired.

(5) Alternate Equivalent Strength. Alternate equivalent strength arrangements to be accomplished by substituting larger bar sizes, or more bars, will be considered if approved by the Engineer, in writing, prior to the fabrication of the systems.

440.8. Placing. Unless otherwise shown on the plans, dimensions shown for reinforcement are to the centers of the bars. Reinforcement shall be placed as near as possible in the position shown on the plans. In the plane of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than 1/12 of the spacing between bars. 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. Cover of concrete to the nearest surface of steel shall meet the above requirements but shall never be less than one (1) inch.

For bridge slabs, the clear cover tolerance for the top mat of reinforcement shall be -0, + 1/2 inch.

The reinforcement shall be accurately located in the forms, and firmly held in place, before and during concrete placement, by means of bar supports, adequate in strength and number in order to prevent displacement and to keep the steel at the proper distance from the forms. Bars shall be supported by standard bar supports with plastic tips, plastic bar supports approved by the Engineer or precast mortar or concrete blocks when supports are in contact with removable or stay-in-place forms. Bright basic bar supports may be used to support reinforcing steel placed in slab overlays on concrete panels or on existing concrete slabs. Bar supports in contact with soil or subgrade shall be as approved by the Engineer.

For bar supports with plastic tips, the plastic protection shall have a minimum thickness of 3/32 of an inch and extend upward on the wire to a point at least 1/2 inch above the formwork.

All accessories such as tie wires, bar chairs, supports or clips used with epoxy coated reinforcement shall be of steel, fully coated with epoxy or plastic. Plastic supports approved by the

Engineer may also be used with epoxy coated reinforcement.

Mortar or concrete blocks shall be cast to uniform dimensions with adequate bearing area. A suitable tie wire shall be provided in each block for anchoring to the steel. The blocks shall be accurately cast to the thickness required in molds approved by the Engineer. The surface placed adjacent to the form shall be a true plane, free of surface imperfections. The blocks shall be cured by covering with wet burlap or mats for a period of 72 hours. Mortar for blocks shall contain approximately one (1) part portland cement to three (3) parts sand. Concrete for blocks shall contain nine (9) sacks of portland cement per cubic yard of concrete.

Individual bar supports shall be placed in rows at four (4) foot maximum spacing in each direction. Continuous type bar supports shall be placed at four (4) feet maximum spacing. Continuous bar supports will be required when permanent metal deck forms are used.

The exposure of the ends of longitudinals, stirrups and spacers used to position the reinforcement in concrete pipe and precast box culverts or sewers shall not be cause for rejection.

Reinforcing steel for bridge slabs, top slabs of direct traffic culverts and the top slabs of pre-stressed box beams shall be tied at all intersections except that where the spacing is less than one (1) foot in each direction, alternate intersections only need to be tied. For reinforcing steel cages for other structural members, the steel shall be tied at a sufficient number of intersections to provide a rigid cage of steel. Mats of wire fabric shall be fastened securely at the ends and edges.

Before concrete placement, all mortar, mud, dirt, etc., shall be cleaned from the reinforcement. Concrete shall not be placed until authorized by the Engineer.

If the reinforcement is not adequately supported or tied to resist settlement, floating upward, overturning of truss bars, or movement in any direction during concrete placement, concrete placement will be halted until corrective measures are taken.

440.9 Epoxy Coating of Reinforcing Steel.

(1) General. When shown on the plans, coating with epoxy of reinforcing bars, plain wire, deformed wire or welded wire fabric to be used as reinforcement for concrete shall conform to the requirements herein.

(2) Surface Preparation. The reinforcing steel shall be free of surface contaminants such as oil, grease or paint when received at the manufacturer's plant and prior to cleaning and coating. The surface of steel to be coated shall be cleaned by abrasive blast cleaning to near white metal in accordance with the requirements of Item 446, "Cleaning, Paint and Painting," Class A Blast Cleaning. All traces of grit and dust from the blast cleaning shall be removed prior to coating. Other methods of cleaning may be submitted to the Engineer for approval.

(3) Application of Coating. The applicator shall notify the Engineer at least 30 days before the date of production. The coating shall be applied as recommended by the manufacturer of the coating material.

The coating shall be applied to the cleaned surface as soon as possible after cleaning and before oxidation of the surface discernible to the unaided eye occurs. The coating shall be a

smooth uniform coat and shall have a thickness of from 7 to 12 mils, after curing. The thickness of the coating shall be measured using magnetic thickness testing gages in accordance with Test Method Tex-728-I.

The coating film shall be fully cured. Sufficient checks shall be made to assure that each coated production lot is supplied in a fully cured condition.

(4) Continuity of Coating. The applicator shall check the coating for continuity after curing. The coating shall be free from holes, voids, cracks, contamination and damaged areas discernible to the unaided eye.

For reinforcing bars a 67 1/2 volt D.C. in-line holiday detector, such as Tinker and Rasor Model M-1 or approved equivalent, shall be used to check the coating for holidays. There shall be no more than two (2) holidays (pinholes not visually discernible) in any linear foot of a coated reinforcing bar.

Holiday checks to determine acceptability of wire or welded wire fabric shall be made at the manufacturer's plant with a 67 1/2 volt D.C. holiday detector. For wire, there shall not be more than an average of two (2) holidays per linear foot of wire. For welded wire fabric, there shall not be more than an average of four (4) holidays per linear foot of wire in welded wire fabric when the wire spacings are four (4) inches or more, or six (6) holidays per linear foot of wire when the spacings are less than four (4) inches. Uncoated areas at cut ends shall not be counted, nor shall sharp edges (weld spurs) at intersections be counted as holidays. When measuring the number of holidays, at least 1/2 inch of wire must be included on each side of the intersections being checked.

(5) Repair of Coating. Material for repair of the coating shall comply with the requirements in "Epoxy Coating" of this Item. Repairs shall be made in accordance with procedures recommended by the manufacturer of the epoxy coating powder. Areas to be patched shall receive at least the same coating thickness as required for the original coating.

All visible damage to the coating shall be repaired.

Sawed and sheared ends, cuts, breaks and/or other damage shall be repaired promptly before additional oxidation occurs. Areas to be repaired shall be clean and free from surface contaminants. Repairs shall be made in the shop or in the field as required.

The acceptable amount of patched area at the applicator shall not exceed 1/4 inch total length in any linear foot.

(6) Sampling and Testing. Sampling and testing of coated reinforcement shall be in accordance with Test Method Tex-739-I.

(7) Identification and Documentation. Identification of all reinforcing shall be maintained throughout the coating and fabrication process and until delivery to the project site.

For all production of coated reinforcing steel to be used on Department projects, the manufacturer shall furnish to the Engineer two (2) copies of a written certification that the coated reinforcing steel meets the requirements of this specification and two (2) copies of the manufacturer's control tests.

(8) Handling. All systems for handling coated reinforcement shall have padded contact areas. Bundling bands shall be padded or suitable banding shall be used to prevent damage to the coating. Bundles of coated reinforcement shall be lifted with a strong back, spreader bar, multiple supports or a platform bridge. The bundled reinforcement shall be transported with care and stored on protective cribbing. The coated reinforcement shall not be dropped or dragged.

(9) Construction Methods. Flame cutting will not be permitted on coated reinforcement. Saw or shear cutting will be permitted with permission of the Engineer. Cut ends shall be coated as specified in "Repair of Coating" of this Item.

Welding or mechanical coupling of coated reinforcing steel will not be permitted except where specifically shown on the plans. The epoxy coating shall be completely removed a minimum of six (6) inches beyond the weld limits prior to welding and two (2) inches beyond the limits of the coupler prior to assembly. After welding or coupling, the steel shall be cleaned of all oil, grease, moisture, dirt, welding contamination (slag and/or acid residue) and rust to a near white finish. The existing epoxy shall be checked for damage. Any damaged or loose epoxy shall be removed back to sound epoxy coating.

After proper cleaning, the splice area shall be coated with epoxy repair material to a thickness of 7 to 12 mils. A second application of repair material shall be applied to the bar and coupler interface to insure complete sealing of the joint.

440.10. Measurement and Payment.

Except as specified below, the work performed, materials furnished, and all labor, tools, equipment and incidentals necessary to complete the work under this Item will not be measured or paid for directly, but will be considered subsidiary to the various bid items of the contract.

The quantities of reinforcing steel shown on the plans are estimates and are for the Contractor's information.

Compensation for adjustment of reinforcing steel quantities will be as follows:

(1) When the reinforcing steel quantity for a complete structure element has been erroneously included in or omitted from the quantities shown on the plans, the quantity for that element will be added or deducted for payment. A complete structure element will be the smallest portion of a total structure for which a corresponding quantity of concrete is included on the plans. Additional payment or reduction in payment for quantities revised in this manner will be made accordingly, in accordance with Article 4.3.

(2) When the plan quantity for reinforcing steel for a complete structure element is in error by five (5) percent or more, a recalculation will be made and payment will be increased or reduced accordingly in accordance with Article 4.3.

(3) When quantities for reinforcing steel are revised by a change in design, the change in quantities will be calculated. Additional payment or reduction in payment for quantities revised in this manner will be made accordingly, in accordance with Article 4.3.

The party to the contract requesting the adjustment shall present to the other one (1) copy of the description and location, together with calculations of the quantity for the structure element involved. When this quantity is certified correct by the Engineer, it will become the basis for additional or reduced payment.

*****END OF SECTION*****

Certification
Regarding Debarment, Suspension and Ineligibility

As is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 76, Government-wide Debarment and Suspension, the applicant certifies, to the best of his or her knowledge and belief, that both it and its principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;

b. Have not within a three-year period preceding this bid proposal and/or application been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction, violation of federal or state antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a government entity with commission of any of the offenses enumerated herein; and

d. Have not within a three-year period preceding this bid proposal and/or application had one or more public transactions terminated for cause or default.

Signature:_____
Print Name:_____
Title:_____
Telephone Number:_____
Date:_____

If the bidder is unable to certify to all of the statements in this Certification, such bidder should attach an explanation to this proposal.

Form **W-9**
(Rev. November 2005)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name, if different from above

Check appropriate box: ☐ Individual/ Sole proprietor ☐ Corporation ☐ Partnership ☐ Other ▶ ..... ☐ Exempt from backup withholding

Address (number, street, and apt. or suite no.) | Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on Line 1 to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number
___ ___ ___ – ___ ___ – ___ ___ ___ ___

or

Employer identification number
___ ___ – ___ ___ ___ ___ ___ ___ ___

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. person (including a U.S. resident alien).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the Certification, but you must provide your correct TIN. (See the instructions on page 4.)

Sign Here Signature of U.S. person ▶ Date ▶

Purpose of Form

A person who is required to file an information return with the IRS, must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

U.S. person. Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee.

In 3 above, if applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

For federal tax purposes, you are considered a person if you are:

- An individual who is a citizen or resident of the United States,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States, or
- Any estate (other than a foreign estate) or trust. See Regulations sections 301.7701-6(a) and 7(a) for additional information.

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,

- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the recipient has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments (after December 31, 2002). This is called "backup withholding." Payments that may be subject to backup withholding include interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,
2. You do not certify your TIN when required (see the Part II instructions on page 4 for details),
3. The IRS tells the requester that you furnished an incorrect TIN,
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules regarding partnerships* on page 1.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). If you are a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Treasury regulations section 301.7701-3, enter the owner's name on the "Name" line. Enter the LLC's name on the "Business name" line. Check the appropriate box for your filing status (sole proprietor, corporation, etc.), then check the box for "Other" and enter "LLC" in the space provided.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Note. You are requested to check the appropriate box for your status (individual/sole proprietor, corporation, etc.).

Exempt From Backup Withholding

If you are exempt, enter your name as described above and check the appropriate box for your status, then check the "Exempt from backup withholding" box in the line following the business name, sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

Exempt payees. Backup withholding is not required on any payments made to the following payees:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The chart below shows types of payments that may be exempt from backup withholding. The chart applies to the exempt recipients listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt recipients except for 9
Broker transactions	Exempt recipients 1 through 13. Also, a person registered under the Investment Advisers Act of 1940 who regularly acts as a broker
Barter exchange transactions and patronage dividends	Exempt recipients 1 through 5
Payments over $600 required to be reported and direct sales over $5,000 [1]	Generally, exempt recipients 1 through 7 [2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation (including gross proceeds paid to an attorney under section 6045(f), even if the attorney is a corporation) and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees; and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-owner LLC that is disregarded as an entity separate from its owner (see *Limited liability company (LLC)* on page 2), enter your SSN (or EIN, if you have one). If the LLC is a corporation, partnership, etc., enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.socialsecurity.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer ID Numbers under Related Topics. You can get Forms W-7 and SS-4 from the IRS by visiting *www.irs.gov* or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Writing "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, and 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). Exempt recipients, see *Exempt From Backup Withholding* on page 2.

Signature requirements. Complete the certification as indicated in 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or single-owner LLC	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Sole proprietorship or single-owner LLC	The owner [3]
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate or LLC electing corporate status on Form 8832	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership or multi-member LLC	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the second name line. You may use either your SSN or EIN (if you have one). If you are a sole proprietor, IRS encourages you to use your SSN.

[4] List first and circle the name of the legal trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules regarding partnerships* on page 1.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA, or Archer MSA or HSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, the District of Columbia, and U.S. possessions to carry out their tax laws. We may also disclose this information to other countries under a tax treaty, to federal and state agencies to enforce federal nontax criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism.

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

HIDALGO COUNTY
PURCHASING DEPARTMENT
Bidder/Vendor Application

Complete in print or type. Please return this application to the Hidalgo County Purchasing Department
thru Facsimile: (956) 318-2629 or (956) 292-7612
in person or regular mail to: 2812 S. Business Hwy. 281 , Edinburg, Texas 78539
or e-mail: purchasing@co.hidalgo.tx.us

Company Name: **Telephone No. ( )**
dba Name:
Legal Name:
Mailing Address : **Fax No. ( )**
Physical Address:
City, State, Zip **Tax I.D. No.**
Remit to Address : **City, State, Zip**
E-Mail Address:
Representative(s) Name(s) & Title(s)
Type of Organization (check one): _____ Individual _____ Partnership _____ Corporation _____Non-Profit _____ LLC _____ Sole Proprietor _____ Other, Specify **State Identification No._____ (Please attached completed W-9 form with this application)** **Federal Identification No. or (if individual) SS No.**
State of Incorporation: _____ Date:_____ Other:
Type of Business (check one): _____ Manufacturer _____ Wholesaler _____ Retailer _____ Broker _____ Distributor _____ Service Organization _____ Other, Specify
Name & Title of Person(s) Authorized to Sign Bids, Proposals, and/or Contracts:
Small and/or Disadvantaged Business Information (check application criteria) **Small Business:** **Disadvantaged Business (At Least 51% Ownership)** ☐ Less than 125,000 annual gross receipt ☐ Black American ☐ Native American ☐ Less than 250,000 annual gross receipt ☐ Hispanic American ☐ Women ☐ Less than 499,000 annual gross receipt ☐ Asian Pacific American ☐ Other ☐ More than 500,000 annual gross receipt **Have you been certified as a HUB or an MBE/WBE source?:** ☐ Yes ☐ No **Indicate Certification No.(s):_____ or are Certificate(s) attached?:** ☐ Yes ☐ No
What type of product(s) is/are solicited by your company?: **Would you like to be provided with specifications for procurements of such products?:** ☐ Yes ☐ No
To Be Completed by the County: Rec'd by (Purchasing):_____ Date Rec'd by (Purchasing): **Date Forwarded Information to Auditor's Office:_____Entry Date: _____ Vendor No.:**

HISTORICALLY UNDERUTILIZED BUSINESS (HUB) DECLARATION

The primary objective of the Hidalgo County HUB Program is to ensure Historically Underutilized Businesses receive a fair and equal opportunity for participation in the County's procurement process. This fact holds true for Services (Professional & Non-Professional), Commodities, and Construction contracts and any subcontracts thereto. The program strongly encourages Prime Contractors to provide subcontracting opportunities to Certified Hub Contractors/Vendors. Our goal for HUB contractor/vendor participation, as well as HUB subcontractor participation is 30%. To be considered as a "Certified HUB Contractor/Vendor" the contractor/vendor must have been certified by, and hold a current and valid certification with any of the three agencies listed below.

Have you been Certified as a HUB or an MBE/WBE source?: ☐Yes ☐ No

If yes, by whom?: ☐ Texas Building & Procurement Commission ☐ Other____________________

Indicate Certification No(s).:______________ or Are Certificate(s) Attached?: ☐ Yes ☐ No

---

LIST OF CERTIFIED HUB SUBCONTRACTORS

(Attach additional pages if necessary)

What percentage of the Bid, RFP,or RFQ is to be subcontracted with Certified HUB sources?: _____%
(List HUB Subcontractor information below).

HUB Subcontractor Name: ________________________ HUB Status:
Certifying Agency (Check all applicable): ☐Texas Building & Procurement Commission ☐ Other
Address: _____________________ City: _________________ State: ________ Zip:
Contact Person: _________________ Title: _________________ Phone No.: (   )
Subcontract Amount: $___________ Description of Work to be Performed:

HUB Subcontractor Name: ________________________ HUB Status:
Certifying Agency (Check all applicable): ☐Texas Building & Procurement Commission ☐ Other
Address: _____________________ City: _________________ State: ________ Zip:
Contact Person: _________________ Title: _________________ Phone No.: (   )
Subcontract Amount: $________ Description of Work to be Performed:

HUB Subcontractor Name: ________________________ HUB Status:
Certifying Agency (Check all applicable): ☐Texas Building & Procurement Commission ☐ Other
Address: _____________________ City: _________________ State: ________ Zip:
Contact Person: _________________ Title: _________________ Phone No.: (   )
Subcontract Amount: $___________ Description of Work to be Performed:

DISCLOSURE OF CONFLICT OF INTEREST

Effective January 1, 2006, Chapter 176 of the Texas Local Government Code requires that any vendor, person, consultant or contractor considering doing business with Hidalgo County ("the County") to disclose in the Conflict of Interest Questionnaire (the "CIQ") attached as Exhibit D, the vendor, person, consultant or contractor's affiliation or business relationship that might cause a conflict of interest with the County. By law, the CIQ must be filed with the Hidalgo County Clerk's Office no later than the seventh business day after the date the person becomes aware of facts that require that statement to be filed. The disclosure requirement applies to a person or business who contracts or seeks to contract with Hidalgo County for the sale or purchase of property, goods or service. Any purchase order or contract resulting from this process shall be considered null and void if the successful bidder fails to comply with Texas Local Government Code Chapter 176. Vendors, consultants, contractors and others who desire to conduct business with Hidalgo County are encouraged to refer to Texas Local Government Code Chapter 176 for the details of this law. An offense under Texas Local Government Code Chapter 176 is a Class C Misdemeanor.

Please Submit completed forms to the Hidalgo County Clerk's Office located at 100 N. Closner, Edinburg, Texas 78539-Hidalgo County Courthouse

COMPLETION AND SUBMISSION OF FORM CIQ IS THE SOLE RESPONSIBILITY OF THE PROSPECTIVE BIDDER.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 1491, 80th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code by a person who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the person meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. *See* Section 176.006, Local Government Code.

A person commits an offense if the person knowingly violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

OFFICE USE ONLY
Date Received

1 **Name of person who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3 **Name of local government officer with whom filer has employment or business relationship.**

_____

Name of Officer

This section (item 3 including subparts A, B, C & D) must be completed for each officer with whom the filer has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the filer of the questionnaire?

☐ Yes ☐ No

B. Is the filer of the questionnaire receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

☐ Yes ☐ No

D. Describe each employment or business relationship with the local government officer named in this section.

4

_____ _____

Signature of person doing business with the governmental entity Date

SALES TAX AND LOCAL SALES TAX
EXEMPTION CERTIFICATE FOR CONTRACTORS

This Contract is to be performed for an exempt organization as defined by Article 20.04 (H) (4) of the Texas Limited Sales, Excise, and Use Tax Act and the undersigned hereby claims an exemption from payment of taxes under Chapter 20, title 122A, revised hereby claims an exemption from payment of taxes under Chapter 20, title 122A, revised civil statues of Texas, and Article 1066 ©, entitle Local Sales and Use Tax, revised civil statues of Texas.

The Contractor performing this Contract may purchase, rent, or lease all materials, supplies, equipment used for consumed in the performance of this Contract by issuing to his retailer an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller's Ruling No 95-9.07. Any such exemption certificate issue by the Contractor in lieu of the tax shall be subject to the provisions of the State Comptroller's Ruling No. 95.0.09 as amended to be effective October 2, 1968.

EXECUTED this the _____ day of _____, 20_____.

_____

Contractor

GOVERNMENT CODE

CHAPTER 2258. PREVAILING WAGE RATES

SUBCHAPTER A. GENERAL PROVISIONS

§Sec. 2258.001. DEFINITIONS. In this chapter:

(1) "Locality in which the work is performed" means:

(A) for a contract for a public work awarded by the state, the political subdivision of the state in which the public work is located:

(i) which may include a county, municipality, county and municipality, or district, except as provided by Subparagraph (ii); and

(ii) which, in a municipality with a population of 500,000 or more, may only include the geographic limits of the municipality; or

(B) for a contract for a public work awarded by a political subdivision of the state, the geographical limits of the political subdivision.

(2) "Public body" means a public body awarding a contract for a public work on behalf of the state or a political subdivision of the state.

(3) "Worker" includes a laborer or mechanic.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995. Amended by Acts 2001, 77th Leg., ch. 1422, Sec. 14.04, eff. Sept. 1, 2001.

§Sec. 2258.002. APPLICABILITY OF CHAPTER TO PUBLIC WORKS. (a) This chapter applies only to the construction of a public work, including a building, highway, road, excavation, and repair work or other project development or improvement, paid for in whole or in part from public funds, without regard to whether the work is done under public supervision or direction.

(b) This chapter does not apply to work done directly by a public utility company under an order of a public authority.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.003. LIABILITY. An officer, agent, or employee of a public body is not liable in a civil action for any act or omission implementing or enforcing this chapter unless the action was made in bad faith.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

SUBCHAPTER B. PAYMENT OF PREVAILING WAGE RATES

§Sec. 2258.021. RIGHT TO BE PAID PREVAILING WAGE RATES. (a) A worker employed on a public work by or on behalf of the state or a political subdivision of the state shall be paid:

(1) not less than the general prevailing rate of per diem wages for work of a similar

character in the locality in which the work is performed; and

(2) not less than the general prevailing rate of per diem wages for legal holiday and overtime work.

(b) Subsection (a) does not apply to maintenance work.

(c) A worker is employed on a public work for the purposes of this section if the worker is employed by a contractor or subcontractor in the execution of a contract for the public work with the state, a political subdivision of the state, or any officer or public body of the state or a political subdivision of the state.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995. Amended by Acts 1997, 75th Leg., ch. 165, Sec. 18.01, eff. Sept. 1, 1997.

§Sec. 2258.022. DETERMINATION OF PREVAILING WAGE RATES.

(a) For a contract for a public work awarded by a political subdivision of the state, the public body shall determine the general prevailing rate of per diem wages in the locality in which the public work is to be performed for each craft or type of worker needed to execute the contract and the prevailing rate for legal holiday and overtime work by:

(1) conducting a survey of the wages received by classes of workers employed on projects of a character similar to the contract work in the political subdivision of the state in which the public work is to be performed; or

(2) using the prevailing wage rate as determined by the United States Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a et seq.), and its subsequent amendments.

(b) This subsection applies only to a public work located in a county bordering the United Mexican States or in a county adjacent to a county bordering the United Mexican States. For a contract for a public work awarded by the state, the public body shall determine the general prevailing rate of per diem wages in the locality in which the public work is to be performed for each craft or type of worker needed to execute the contract and the prevailing rate for legal holiday and overtime work as follows. The public body shall conduct a survey of the wages received by classes of workers employed on projects of a character similar to the contract work both statewide and in the political subdivision of the state in which the public work is to be performed. The public body shall also consider the prevailing wage rate as determined by the United States Department of Labor in accordance with the Davis-Bacon Act (40 U.S.C. Section 276a et seq.), and its subsequent amendments, but only if the survey used to determine that rate was conducted within a three-year period preceding the date the public body calls for bids for the public work. The public body shall determine the general prevailing rate of per diem wages in the locality based on the higher of:

(1) the rate determined from the survey conducted in the political subdivision;

(2) the arithmetic mean between the rate determined from the survey conducted in the political subdivision and the rate determined from the statewide survey; and

(3) if applicable, the arithmetic mean between the rate determined from the survey conducted in the political subdivision and the rate determined by the United States Department of Labor.

(c) The public body shall determine the general prevailing rate of per diem wages as a sum certain, expressed in dollars and cents.

(d) A public body shall specify in the call for bids for the contract and in the contract itself the wage rates determined under this section.

(e) The public body's determination of the general prevailing rate of per diem wages is final.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995. Amended by Acts 1997, 75th Leg., ch. 165, Sec. 18.02, eff. Sept. 1, 1997; Acts 2001, 77th Leg., ch. 1422, Sec. 14.05, eff. Sept. 1, 2001.
Amended by: Acts 2007, 80th Leg., R.S., Ch. 728, Sec. 1, eff. September 1, 2007.

§Sec. 2258.023. PREVAILING WAGE RATES TO BE PAID BY CONTRACTOR AND SUBCONTRACTOR; PENALTY.

(a) The contractor who is awarded a contract by a public body or a subcontractor of the contractor shall pay not less than the rates determined under Section 2258.022 to a worker employed by it in the execution of the contract.

(b) A contractor or subcontractor who violates this section shall pay to the state or a political subdivision of the state on whose behalf the contract is made, $60 for each worker employed for each calendar day or part of the day that the worker is paid less than the wage rates stipulated in the contract. A public body awarding a contract shall specify this penalty in the contract.

(c) A contractor or subcontractor does not violate this section if a public body awarding a contract does not determine the prevailing wage rates and specify the rates in the contract as provided by Section 2258.022.

(d) The public body shall use any money collected under this section to offset the costs incurred in the administration of this chapter.

(e) A municipality is entitled to collect a penalty under this section only if the municipality has a population of more than 10,000.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.024. RECORDS.

(a) A contractor and subcontractor shall keep a record showing:

(1) the name and occupation of each worker employed by the contractor or subcontractor in the construction of the public work; and

(2) the actual per diem wages paid to each worker.

(b) The record shall be open at all reasonable hours to inspection by the officers and agents of the public body.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.025. PAYMENT GREATER THAN PREVAILING RATE NOT PROHIBITED. This chapter does not prohibit the payment to a worker employed on a public work an amount greater than the general prevailing rate of per diem wages.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.026. RELIANCE ON CERTIFICATE OF SUBCONTRACTOR. A contractor is entitled to rely on a certificate by a subcontractor regarding the payment of all sums due those working for the subcontractor until the contrary has been determined.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

SUBCHAPTER C. ENFORCEMENT; CIVIL AND CRIMINAL PENALTIES

§Sec. 2258.051. DUTY OF PUBLIC BODY TO HEAR COMPLAINTS AND WITHHOLD PAYMENT. A public body awarding a contract, and an agent or officer of the public body, shall:

(1) take cognizance of complaints of all violations of this chapter committed in the execution of the contract; and

(2) withhold money forfeited or required to be withheld under this chapter from the payments to the contractor under the contract, except that the public body may not withhold money from other than the final payment without a determination by the public body that there is good cause to believe that the contractor has violated this chapter.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.052. COMPLAINT; INITIAL DETERMINATION.

(a) On receipt of information, including a complaint by a worker, concerning an alleged violation of Section 2258.023 by a contractor or subcontractor, a public body shall make an initial determination as to whether good cause exists to believe that the violation occurred.

(b) A public body must make its determination under Subsection (a) before the 31st day after the date the public body receives the information.

(c) A public body shall notify in writing the contractor or subcontractor and any affected worker of its initial determination.

(d) A public body shall retain any amount due under the contract pending a final determination of the violation.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.053. ARBITRATION REQUIRED FOR UNRESOLVED ISSUE.

(a) An issue relating to an alleged violation of Section 2258.023, including a penalty owed to a public body or an affected worker, shall be submitted to binding arbitration in accordance with the Texas General Arbitration Act (Article 224 et seq., Revised Statutes) if the contractor or subcontractor and any affected worker do not resolve the issue by agreement before the 15th day after the date the public body makes its initial determination under Section 2258.052.

(b) If the persons required to arbitrate under this section do not agree on an arbitrator before the 11th day after the date that arbitration is required under Subsection (a), a district court shall appoint an arbitrator on the petition of any of the persons.

(c) A public body is not a party in the arbitration.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.054. ARBITRATION AWARD; COSTS. (a) If an arbitrator determines that Section 2258.023 has been violated, the arbitrator shall assess and award against the contractor or subcontractor:

(1) penalties as provided by Section 2258.023 and this section; and

(2) all amounts owed to the affected worker.

(b) An arbitrator shall assess and award all reasonable costs, including the arbitrator's fee, against the party who does not prevail. Costs may be assessed against the worker only if the arbitrator finds that the claim is frivolous. If the arbitrator does not find that the claim is frivolous and does not make an award to the worker, costs are shared equally by the parties.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.055. ARBITRATION DECISION AND AWARD FINAL. The decision and award of the arbitrator is final and binding on all parties and may be enforced in any court of competent jurisdiction.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.056. PAYMENT BY PUBLIC BODY TO WORKER; ACTION TO RECOVER PAYMENT.

(a) A public body shall use any amounts retained under this chapter to pay the worker the difference between the amount the worker received in wages for labor on the public work at the rate paid by the contractor or subcontractor and the amount the worker would have received at the general prevailing wage rate as provided in the arbitrator's award.

(b) The public body may adopt rules, orders, or ordinances relating to the manner in which a reimbursement is made.

(c) If the amounts retained by a public body under this chapter are not sufficient for the public body to pay the worker the full amount owed, the worker has a right of action against the contractor or subcontractor and the surety of the contractor or subcontractor to recover the amount owed, reasonable attorney's fees, and court costs.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.057. WITHHOLDING BY CONTRACTOR.

(a) A contractor may withhold from a subcontractor sufficient money to cover an amount withheld from the contractor by a public body because the subcontractor violated this chapter.

(b) If the contractor has made a payment to the subcontractor, the contractor may withhold money from any future payments owed to the subcontractor or sue the subcontractor or the subcontractor's surety for the amount withheld from the contractor by a public body because of the subcontractor's violation.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

§Sec. 2258.058. CRIMINAL OFFENSE.

(a) An officer, agent, or representative of the state or of a political subdivision of the state commits an offense if the person wilfully violates or does not comply with a provision of this chapter.

(b) A contractor or subcontractor of a public work under this chapter, or an agent or representative of the contractor or subcontractor, commits an offense if the person violates Section 2258.024.

(c) An offense under this section is punishable by:

(1) a fine not to exceed $500;

(2) confinement in jail for a term not to exceed six months; or

(3) both a fine and confinement.

Added by Acts 1995, 74th Leg., ch. 76, Sec. 5.49(a), eff. Sept. 1, 1995.

Prevailing Wage Rates
Certification Statement

Date _____

Project Name _____ **CSJ#** _____

Contractor _____ **Application#** _____

I, _____ **do hereby state:**
(Name of Project Director)

1. That a payroll (form WH-347 or similar form) was submitted for contract work Performed for the period covered by the attached application.
2. That a statement of compliance(form WH-347 or similar form) was submitted with the payroll.
3. The certified payroll complies with the classifications and minimum wage rates Stipulated in the contract.
4. That a minimum of one interview was conducted with laborers using Form HUD-11 or similar.

_____
Signature

U.S. Department of Labor
Employment Standards Administration
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions. Form WH-347 Inst.)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐ ADDRESS

OMB No.: 1215-0149
Expires: 03/31/2006

PAYROLL NO. FOR WEEK ENDING PROJECT AND LOCATION PROJECT OR CONTRACT NO.

(1) NAME, ADDRESS, AND SOCIAL SECURITY NUMBER OF EMPLOYEE	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT OR ST	(4) DAY AND DATE HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS FICA	WITHHOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
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We estimate that it will take an average of 56 minutes to complete this collection of information, including time for reviewing instructions searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection of information, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, ESA, U. S. Department of Labor, Room S3502, 200 Constitution Avenue, N. W., Washington, D. C. 20210.

FORM WH-347, Revised Nov. 1998 - FORMERLY SOL 184 - *PURCHASE THIS FORM DIRECTLY FROM THE SUPT. OF DOCUMENTS*

Spec Book Part 2 of 2

Exhibit E-L

Date _____

I _____ _____
(Name of Signatory Party) (Title)

do hereby state

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____ ; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 CFR Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Stat. 108, 72 Stat. 967, 76 Stat. 357, 40 U.S.C. 276c), and described below

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ In addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in Section 4(c) below

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in Section 4(c) below

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE

Form 252 (Rev. 12/82)
Page 1 of 1
(GSD-EPC Word 97)

Contract Time Statement

ESTIMATE NO. 0 CONTRACTOR ______________________

PROJECT NO. ______________ COUNTY ______________ DATE WORK BEGAN ______________

TIME COMPUTED FROM ______________________ DATE WORK COMPLETED ______________

MONTH	DATE OR DAYS	WORKING DAYS CHARGED		DAYS CREDITED AND REASONS THEREFORE
TOTALS		0	0	

NO. OF CONTRACT WORKING DAYS ______________ NO. WORKING DAYS CHARGED TO DATE 0

ASSESSED LIQUIDATED DAMAGES: NO. ______________ PER DAY $ ______________ TOTAL $ 0.00

CERTIFIED AS CORRECT (ONE COPY HAS BEEN GIVEN TO THE ______________________

RESIDENT ENGINEER

INSTRUCTIONS: PROJECT IDENTIFICATION SHOULD COVER CONTRACT. TIME CREDITED AND REASONS THEREFORE MUST CONFORM TO PROVISIONS OF CONTRACT. NO HOLIDAY CREDIT ALLOWED FOR DAYS PRECEDING OR FOLLOWING LEGAL HOLIDAYS. TIME SUSPENDED AND RESUMED MUST BE SUPPORTED BY COPY EACH OF LETTERS TO CONTRACTOR DATED ON OR BEFORE EFFECTIVE DATES. TIME EXTENSION MUST BE INDICATED AND REFERENCED TO RELATED PROVISION OF CONTRACT. SEE BOOKLET OF INSTRUCTIONS, CONSTRUCTION ESTIMATES DATED SEPTEMBER 1, 1956

General Decision Number: TX140008 01/03/2014 TX8

Superseded General Decision Number: TX20130008

State: Texas

Construction Types: Heavy and Highway

Counties: Cameron, Hidalgo and Webb Counties in Texas.

HEAVY & HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/03/2014

* SUTX2011-003 08/02/2011

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER (Paving & Structures)	$ 12.46	
FORM BUILDER/FORM SETTER (Structures)	$ 12.30	
FORM SETTER (Paving & Curb)	$ 12.16	
LABORER		
Asphalt Raker	$ 10.61	
Flagger	$ 9.10	
Laborer, Common	$ 9.86	
Laborer, Utility	$ 11.53	
Pipelayer	$ 11.87	
Work Zone Barricade Servicer	$ 12.88	
POWER EQUIPMENT OPERATOR:		
Asphalt Distributor	$ 13.48	
Asphalt Paving Machine	$ 12.25	
Broom or Sweeper	$ 10.33	
Crane, Lattice Boom 80 Tons or Less	$ 14.39	
Crawler Tractor	$ 16.63	
Excavator, 50,000 lbs or less	$ 12.56	
Excavator, over 50,000 lbs	$ 15.23	
Foundation Drill, Truck Mounted	$ 16.86	
Front End Loader Operator, Over 3 CY	$ 13.69	
Front End Loader, 3 CY or less	$ 13.49	
Loader/Backhoe	$ 12.77	
Mechanic	$ 15.47	
Milling Machine	$ 14.64	
Motor Grader Operator,		

Rough.....$ 14.62
Motor Grader, Fine Grade....$ 16.52
Scraper.....$ 11.07

Servicer.....$ 12.34

Steel Worker (Reinforcing).....$ 14.07

TRUCK DRIVER
Lowboy-Float.....$ 13.63
Single Axle.....$ 10.82
Single or Tandem Axle Dump..$ 14.53
Tandem Axle Tractor with
Semi Trailer.....$ 12.12

WELDER.....$ 14.02

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

CHANGE ORDER NUMBER ONE(1)

Project: _____

DATE OF ISSUANCE: _____ EFFECTIVE DATE: _____

OWNER: _____
OWNER'S CONTRACT NO: _____

CONTRACTOR: _____ ENGINEER: _____

_____ _____

_____ _____

You ar directed to make the following changes in the Contract Documents.

Description:
1.
2.
3.
4.
5.
6.

Reason for Change Order:
1.
2.
3.
4.
5.
6.

Attachments:

CHANGE IN CONTRACT PRICE:		CHANGE IN CONTRACT TIME:
Original Contract Price $ 0.00		Original Contract Time for Substantial Completion: 0 calendar days or dates
Net Changes from previous Change Order $ 0.00		Net Change from previous Change Orders 0 calendar days
Contract Price prior to this Change Order $ 0.00		Contract Time prior to this Change Order Substantial Completion: 0 calendar days or dates
Net Increase(decrease) of this Change Order $ 0.00		Net Increase(decrease) of this Change Order 0 calendar days
Contract Price with all approved Change Orders $ 0.00	Net % increase(decrease)from original contract price. #DIV/0! %	Contract Time with all approved Change Orders Substantial Completion: 0 calendar days or dates

RECOMMENDED:	APPROVED:	ACCEPTED:
By: _____	By: _____	By: _____
Enigineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Date: _____	Date: _____	Date: _____

Exhibit E-B

SAMPLE --APPLICATION FOR PAYMENT NO.

To: _____ (OWNER)
From: _____ (CONTRACTOR)
Contract: _____
Project: _____
Owner's Contract No. _____ Engineer's Project No. _____
For Work accomplished through the date of: _____

1. Original Contract Price:	_____
2. Net change by Change Order and Written Agreements(+or-):	_____
3. Current Contract Price (1 plus 2):	_____
4. Total completed and stored to date:	_____
5. Retainage (per Agreement):	
___10%___ of completed Work: _____	
_____ of stored material _____	
Total Retainage:	_____
6. Total completed and stored to date less retainage (4 minus 5)	_____
7. Less previous Application for Payments:	_____
8. AMOUNT DUE THIS APPLICATION (6 MINUS 7)	_____

Accompanying Documentation:

CONTRACTOR'S Certification:
The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of Work done under the Contract referred to above have been applied on account to discharge CONTRACTOR'S legitimate obligations incurred in connection with Work covered by prior Applications for Payment numbered 1 through __2__ inclusive: (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (3) all Work covered by this Application for Payments is in accordance with the Contract Documents and not defective.

Date _____

_____
CONTRACTOR

State of _____
County of _____
Subscribed and sworn to before me this _____
day of _____.

By: _____

_____
Notary Public
My Commission expires: _____

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Date _____

_____
ENGINEER

By: _____

Exhibit E-C

Estimate Quantity Update Worksheet Date:

Colonia:
Roadway:
Control:
Project No:
County:
Est. No: 1

Contractor:
Contract Price:
Work Done this Mo.:
% Complete: #DIV/0!

Date Began: ?
Contract Time: 120
Time Charged: 90
% Time Used: 75.00%

Work Type: Paving & Drainage
Limits:
From:
To:

ITEM NO.	DESCRIPTION	UNIT	PROJECT QTY	Unit Price	Project Amount	FIRST MONTH MONTHLY QUANTITY	FIRST MONTH QTY to Date	FIRST MONTH Item Cost (Monthly)	SECOND MONTH MONTHLY QUANTITY	SECOND MONTH QTY to Date	SECOND MONTH Item Cost (Monthly)	THIRD MONTH MONTHLY QUANTITY	THIRD MONTH QTY to Date	THIRD MONTH Item Cost (Monthly)
	(901)ADMINISTRATIVE													
	(902) PRELIMINARY ENGINEERING													
	(903) CONSTRUCTION ENGINEERING													
	(904) RIGHT-OF-WAY													
	(905) ROADWAY CONSTRUCTION													
100	PREP ROW	Sta.	1.100	$1,800.00	$1,980.00	1.000	1	$0.00		0	$0.00		0	0.00
110	BACKFILL (TY A)	Sta.	1.000	$600.00	$600.00	0.000		$0.00		0	$0.00		0	0.00
247	FLEX BASE (RDWY DEL)(TY D GR 6 CL 4)	CY	76.000	$28.00	$2,128.00	0.000	0	$0.00		0	$0.00		0	0.00
260	LIME (TY A SLURRY) OR (TY B)	TON	1036.000	$2.00	$2,072.00	0.000	0	$0.00		0	$0.00		0	0.00
260	LIME TREAT SUBGR (DC)(12")	SY	0.000	$6,000.00	$0.00	0.000		$0.00		0	$0.00		0	0.00
262	LIME (TY A SLURRY) OR (TY B)	TON	7.800	$3,000.00	$23,400.00	0.000		$0.00		0	$0.00		0	0.00
262	LME TRT FOR BS CRS (NEW/EXT BS)(DC)(6")	SY	1277.800	$6.00	$7,666.80	0.000	0	$0.00		0	$0.00		0	0.00
310	ASPH MATRL (MC-30)	GAL	246.7	$6.00	$1,480.20		0	$0.00		0	$0.00		0	0.00
500	MOBILIZATION	LS	1.000	$3,000.00	$3,000.00		0	$0.00		0	$0.00		0	0.00
502	BARRICADES, SIGNS, AND TRAF HANDLE	MO	1.000	$1,000.00	$1,000.00			$0.00		0	$0.00		0	0.00
529	CONC CURB AND GUTTER (TY A)(BARRIER)	LF	600.000	$7.50	$4,500.00			$0.00		0	$0.00		0	0.00
644	SMALL RDSD SGN ASSM (TY A)	EA	2.000	$300.00			0	$0.00		0	$0.00		0	0.00
644	SMALL RDSD SGN ASSM (TY F)	EA	2.000	$500.00			0	$0.00		0	$0.00		0	0.00
658	DEL ASM TY A (D-SY)	EA	4.000	$100	$4	0.0	0	$0.00		0	$0.00		0	0.00
666	REFL PAV MRK TY I (Y)(SLD)(4")	LF	400.000		$1	0.00	0	$0.00		0	$0.00		0	0.00
666	REFL PAV MRK TY I (Y)(BRK)(4")	LF	140.000				0	$0.00		0	$0.00		0	0.00
672	RAIS PAV MRKR CL B (REFL)(TY II-A-A)	EA	24.000	$			0	$0.00		0	$0.00		0	0.00
3146	HOT MIX (TY D)	TON	105.5	$34.00	3,587.00	0.000	0	$0.00		0	$0.00		0	0.00
5249	TEMP SEDMT CONT FENCE	LF	70.0	00	10.00	0.000	0	$0.00		0	$0.00		0	0.00
							0			0	$0.00		0	0.00
	(906) DRAINAGE													
464	RC PIPE (CL III)(18")	LF		$25	$10,100.00	0.000	0	$0.00		0	$0.00		0	0.00
464	RC PIPE (CL III)(24")	LF	12	$30.	$3,600.00	0.000	0	$0.00		0	$0.00		0	0.00
465	INLET (COMPL)(TY A)	EA	2.	$2,000	$4,000.00	0.000	0	$0.00		0	$0.00		0	0.00
465	INLET (COMPL)(TY C)	EA	2.000		$3,000.00	0.000	0	$0.00		0	$0.00		0	0.00
465	MANH (COMPL)(TYM)	EA	1.000	.00	$2,000.00	0.000	0	$0.00		0	$0.00		0	0.00
465	INLET EXT.	EA	2.000	00.00	$1,400.00	0.000	0	$0.00		0	$0.00		0	0.00
467	SET (TY II)(18")(RCP)(1:6)	EA	4.000	$550.00	$2,200.00	0.000	0	$0.00		0	$0.00		0	0.00
467	SET (TY II)(24")(RCP)(1:6)	EA	1.000	$650.00	$650.00	0.000	0	$0.00		0	$0.00		0	0.00

Monthly Totals:	$0.00	$0.00	0.00
ADMINISTRATIVE (901)			
PRELIMINARY ENGINEERING (902)			
CONSTRUCTION ENGINEERING (903)			
RIGHT-OF-WAY (904)			
Roadway (905):	$0.00	$0.00	0.00
Drainage (906):	$0.00	$0.00	0.00

Total to Date

Roadway (905):	$0.00
Drainage (906):	$0.00
Total	$0.00

Prepared and Checked By: Signature: _____ Date: _____

Spec Book Part 2 of 2

DRAFT

Printed Name:

SAMPLE

_____________ Contractor Name
_____________ Starting Date
_____________ Project Ending Date
_____________ Retainage Percent

Application No.: _____________
Application Date: _____________
Period To: _____________
Engineer Firm: _____________

Summary													
CSJ#	PROJECT NAME	Original Schedule Value	Revised Schedule Value	Payment Application No 1	Payment Application No 2	Payment Application No 3	[illegible] To	Balance To Finish	Retainage	Net	Payment To Date	Payment Due
		$ -	$ -	$ -	$ -	$ -	[illegible]	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Exhibit E-E

Texas Department of Transportation

Form 252 (Rev. 12/82)
Page 1 of 1
(GSD-EPC Word 97)

Contract Time Statement

ESTIMATE NO. 0 CONTRACTOR _____

PROJECT NO. _____ COUNTY _____ DATE WORK BEGAN _____

TIME COMPUTED FROM _____ DATE WORK COMPLETED _____

MONTH	DATE OR DAYS	WORKING DAYS CHARGED		DAYS CREDITED AND REASONS THEREFORE
TOTALS		0	0	

NO. OF CONTRACT WORKING DAYS _____ NO. WORKING DAYS CHARGED TO DATE 0

ASSESSED LIQUIDATED DAMAGES: NO. _____ PER DAY $ _____ TOTAL $ 0.00

CERTIFIED AS CORRECT (ONE COPY HAS BEEN GIVEN TO THE _____

RESIDENT ENGINEER

INSTRUCTIONS: PROJECT IDENTIFICATION SHOULD COVER CONTRACT. TIME CREDITED AND REASONS THEREFORE MUST CONFORM TO PROVISIONS OF CONTRACT. NO HOLIDAY CREDIT ALLOWED FOR DAYS PRECEDING OR FOLLOWING LEGAL HOLIDAYS. TIME SUSPENDED AND RESUMED MUST BE SUPPORTED BY COPY EACH OF LETTERS TO CONTRACTOR DATED ON OR BEFORE EFFECTIVE DATES. TIME EXTENSION MUST BE INDICATED AND REFERENCED TO RELATED PROVISION OF CONTRACT. SEE BOOKLET OF INSTRUCTIONS, CONSTRUCTION ESTIMATES DATED SEPTEMBER 1, 1956

(Company Letterhead)

(Date)

County of Hidalgo
Attn.: Mr. Raul E. Sesin, P.E.
1304 S. 25th St.
Edinburg, TX 78539

RE: Hidalgo County Precinct No. 2
Gearhart Drive Paving & Drainage Improvements
Contract No.: C-14-032-xx-xxx

Mr. Sesin:

The following is the list of suppliers used in the above mentioned projects as per the County's request:

Hidalgo County Pipe 2605 US Exp. 281 Edinburg, TX 78542 (956)318-2840

If you have any questions, please call me at (956) 607-0741

Best regards,

_____
(name)_____, Manger

PARTIAL/FINAL WAIVER OF LIEN

THE STATE OF TEXAS

COUNTY OF_____

The undersigned contracted with _____
_____to furnish_____
in connection with certain improvements to real property located in_____
County, Texas, and owned by_____
Which improvements are described as follows:

_____
_____
_____

In consideration of Pay Estimate No _____in the amount of_____
_____DOLLAR($_____)and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged and confessed, the undersigned does hereby waive and release any mechanic's lien or materialmen's lien or claims of lien that the undersigned has or hereafter has on the above mentioned real property on account of any labor performed or materials furnished or to be furnished or labor performed and materials furnished by the undersigned pursuant to the above-mentioned contract or any constitutional lien that the undersigned may have.

Undersigned hereby guarantees that all bids for labor performed and/or materials furnished in the erection and construction of such improvements on the Property have been fully paid and satisfied and Undersigned does further guarantee that if for any reason a lien or liens are filed for material or labor against said Property arising out of any bills for material or labor in connection with the erection or construction of said improvements thereon, Undersigned will obtain a settlement of such lien or liens and a proper release thereof shall be obtained.

_____
SUPPLIER

BY:_____
TITLE

SWORN TO AND SUBSCRIBED BEFORE ME, on this the_____day of_____,20__to certify which witness my hand and seal of office.

_____
NOTARY PUBLIC in and for the State of Texas

My Commission Expires: _____

Exhibit E-I

CONTRACTOR'S AFFIDAVIT OF PAYMENTS OF DEBTS AND CLAIMS

PROJECT: **PROJECT NO.**
OWNER:
CONTRACTOR:
ENGINEER:

The Contactor in accordance with the Contract Documents, hereby certifies that, except as listed below, all obligations for all materials and equipment furnished, for all work labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or his property might in any way be held responsible have been paid in full or have otherwisse been satisfied in full.

EXCEPTIONS: (If none, write "NONE". The Contractor shall furnish a bond acceptable to the Owner for each exception.)

CONTRACTOR

By

Title

Subscribed and sworn to before me this day of

Notary Public:

My Commission Expires:

Form K

Exhibit E-K

Prevailing Wage Rates
Certification Statement

Date _____

Project Name _____ **CSJ#** _____

Contractor _____ **Application#** _____

I, _____ **do hereby state:**
(Name of Project Director)

1. That a payroll (form WH-347 or similar form) was submitted for contract work Performed for the period covered by the attached application.
2. That a statement of compliance(form WH-347 or similar form) was submitted with the payroll.
3. The certified payroll complies with the classifications and minimum wage rates Stipulated in the contract.
4. That a minimum of one interview was conducted with laborers using Form HUD-11 or similar.

_____
Signature

CERTIFICATE OF CONSTRUCTION COMPLETION

THIS IS TO CERTIFY THAT ON _____ DAY OF _____A FINAL INSPECTION was made of the project herein described.

CONTRACT

CONTRACT DATE: _____
OWNER: _____
CONSTRUCTION CONTRACTOR: _____
OF THE CITY OF _____ STATE OF _____

PROJECT DESCRIPTION

CONSTRUCTION OF _____

CONTRACT NO: _____
Located in or near the City/Precinct Of _____

THIS IS TO CERTIFY"

1. That the work has been completed in accordance with the plans and specifications and all addenda, change orders, supplemental agreements thereto, and with the following exceptions:

   _____

2. That the sum of _____, deducted from the final payment of the Contractor is a fair and equitable settlement for the foregoing except work.

3. That the contractor has presented a "Certificate of Release" starting under oath, that all claims arising out of the performance of work have been fulfilled, and the Owner is released from all claims arising under or by virtue of said contract.

4. That the CONTRACTOR has presented in behalf of itself and its sureties, satisfactory evidence that it is bound to repair, replace, and make good any faulty workmanship and/or materials discovered in the work within a period of one year from this date, as provided in said contract.

5. Amount of Original Contract _____
   Present Amount of Contract _____
   Total Amount of earned to Date _____
   Less: previous payments _____
   Balance _____
   Authorized deductions _____
   AMOUNTY OF FINAL PAYMENT _____

6. That the final payment in the amount of _____ _____ is now due and payable.

_____
Engineer's Signature

CONCURRED BY:

_____
Contractor's Name

By:_____

Title: _____

CONCURRED BY:

_____
City/Precinct

By:_____

Title: _____

CONTRACTOR'S AFFIDAVIT OF RELEASE OF LIENS

PROJECT: **PROJECT NO.**
OWNER:
CONTRACTOR:
ENGINEER:

The Contractor, in accordance with the Contract Documents, and in consideration for the full and final payment to the Contractor for all services in connection with the project, does hereby waive and release any and all liens, or any and all claims to liens which the Contractor may have on or affecting the project as a result of its contract(s) for the Project or for performing labor and/or furnishing materials in any way connected with the construction of any aspect of the project. The Contractor further certifies and warrants that all subcontractors of labor and/or materials for the Project, except as listed below, have been paid in full for all labor and/or materials supplied to, for through or at the direct or indirect request of the Contractor prior to, through and including the date of this affidavit.

EXCEPTIONS: (If none, write "NONE". The Contractor shall furnish a bond acceptable to the Owner for each exception.)

CONTRACTOR

By

Title

Subscribed and sworn to before me this day of

Notary Public:

My Commission Expires:

Form L

_____ Contractor Name
_____ Starting Date
_____ Project Ending Date
_____ Engineer's / County Project Description

Application No.: _____
Application Date: _____
Period To: _____
Engineer's / County Project No.: _____

No.	Item Code	Description	Unit	Original Rates	Original Schedule Value		Revised Rates	Value		First Month			Second Month			Third Month			Total to Date	Balance To Finish	
					Quan	Dollars		Quan	Dollars	Monthly Quan	QTY to Date	Item Cost (Monthly)	Monthly Quan	QTY to Date	Item Cost (Monthly)	Monthly Quan	QTY to Date	Item Cost (Monthly)		Quan	Dollars
		(905) ROADWAY																			
1	100	Preparation of Right-of-Way	Sta	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
2	152	6" road Grader Work(Dens Cont.) Subgrade	SY	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
3	247	6" FL BS(Compl in Plac)	S.Y.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
4	310	Asph. Matrl. (MC-30)	Gal	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
5	340	Asph. Conc. Ty D	S.Y.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
6	500	Mobilization	L.S.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
7	502	Barricades, Signs and Traffic Handling	Mo	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
8	530	Turnouts	Ea	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
9	5249	Tem Sedmt Cont Fence (Installed)	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
10	5249	Tem Sedmt Cont Fence Handling (Removed)	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-		0	-	-	-	-	-	0.0	0.0
		Total Roadway				-			-			-			-			-	-	0.0	0.0
		(906) DRAINAGE																			
11	530	Drvwys (Asph Conc Pav) (PRB)	S.Y.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
12	247	Drvwys Flexible Base	S.Y.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
13	556	8" Storm Drain	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
14	556	18" RCP Storm Drain	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
15	465	Ty "A" Inlets	Ea.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
16	465	Concrete Manhole	Ea.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
17		15" R.C.P.	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
18		Ty "A" Inlets	Ea.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
19		Manhole	Ea	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
20		6.0" Valley Gutter	L.F.	$ -	0.0	-	$ -	0.0	-	0	0	-	0	0	-	-	-	-	-	0.0	0.0
		Total Drainage				-			-			-			-			-	-		
		TOTAL BASE AMOUNTS:				-			-			-			-			-	-	0.0	0.0

_____ Print Name

_____ Date

_____ Signature

Spec Book Part 2 of 2

Exhibit E-O

CONSTRUCTION IDENTIFICATION SIGN:

Size, 4' – 0" X 8' – 0"
Letters to be brown with beige background

Construction Identification Signs To Be Erected Prior To Beginning of Actual Construction

Wood for Signs Shall Be ¾" Waterproofing Resin Bonded Exterior Grade Plywood (Douglas Fir Plywood Association or Equal)

Payment for Furnishing, Erecting, Maintenance and Removing Construction Identification Signs Will Not Be made Directly. Such Costs Shall be Included in the Overall Bid Submitted.

To Be Erected as Indicated on title Sheet.

Precinct Logo

Your Tax Dollars at Work
Hidalgo County Pct. 2
Hector "Tito" Palacios, Commissioner

Equipment and Maintenance Facility – On-Site Improvements Concrete Work

Hidalgo County Commissioner's Court

Ramon Garcia	County Judge
A.C. Cuellar, Jr.	Commissioner Pct #1
Hector "Tito" Palacios	Commissioner Pct #2
Joe M. Flores	Commissioner Pct #3
Joseph Palacios	Commissioner Pct #4

Project Contractor: _____

Project Engineer: Raul E. Sesin, P.E.

Spec Book Part 2 of 2