

**SECTION 02652****CONTINUOUSLY REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT****02652.01 GENERAL****A. Description**

Continuously reinforced Portland cement concrete pavements shall include, but not necessarily be limited to the construction of continuously reinforced Portland cement concrete pavements on a prepared subgrade or base in accordance with the Contract Documents.

**B. Related Work Included Elsewhere**

1. Subgrade preparation; Section 02610.
2. Aggregate base and subbase courses; Section 02621.
3. Stabilized aggregate base course; Section 02622.
4. Plain and reinforced Portland cement concrete pavements; Section 02651.
5. Portland cement concrete; Section 03310.

**C. Quality Assurance**

1. Materials

The Engineer will inspect all materials and equipment to ensure compliance with the Contract Documents.

2. Field Tests

- a. Concrete Tests

The Engineer will conduct normal concrete job control tests, i.e. slump and air content, on the plastic concrete and will prepare test cylinders in accordance with Section 03310.01.

- b. Forms

The Engineer will inspect all forms prior to the placing of concrete in accordance with Section 02651.03.

c. Finished Surface

The finished surface of the slab shall be checked in the longitudinal and transverse directions with a 10 foot straightedge, equipped with a 1/8 inch high block on each end. (For slabs on vertical curves, the longitudinal checking template shall be advanced longitudinally in steps not greater than 5 feet.) If any portion of the slab deviates more than 1/8 inch tolerance previously stipulated, the corrective work shall be done at the Contractor's expense. Any slabs that are found to have less thickness than that shown on the Plans may be rejected. Also see Section 02651.03, Article L.

d. Tolerance of Thickness

After the pavement is placed and before final acceptance, the thickness will be determined by the Engineer by use of cores cut from the pavement in accordance with AASHTO T 24 and measured in accordance with AASHTO T 148.

The County will not be liable for excess thickness. When the thickness of a pavement is deficient by more than 1.00 inch, the full section between limits established by the Engineer shall be removed and replaced by the Contractor at the Contractor's expense. Core drilling and repairing of the replaced pavement shall be at the Contractor's expense.

**D. Submittals**

1. Shop Drawings

- a. Shop drawings for Portland cement concrete shall be submitted as specified in Section 03310.01.
- b. The Contractor shall submit shop drawings in accordance with the "General Provisions" for all chairs or high chair bars he intends to use.

2. Certificate of Compliance

Certified load tickets shall be furnished by the Portland cement concrete producer and delivered to the Engineer. The certified ticket shall state that all materials comply with pertinent specifications and the mix is proportioned in accordance with the specified mix design.

3. Certified Test Results

- a. High Range Water Reducing Admixtures

The manufacturer shall supply the actual laboratory test results conducted in accordance with these specifications. For control purposes, the manufacturer

shall also furnish curves giving the fluid ounces of high range water reducer per 100 pounds of cement as related to water reduction and strength gain for 12 hours when used with a cement factor of a minimum of 700 pounds.

b. Joint Filler

The manufacturer shall submit a complete certified analysis for all hot applied joint fillers.

c. Epoxy Resin Adhesives

The Contractor shall provide a certificate containing the pot life and actual test results showing the material meets the requirements of this specification. Should the manufacturing process or materials change, a new sample and certification are required for approval of the system.

d. Waterstops

The Contractor shall furnish without charge a test sample for each lot or shipment of waterstop. The supplier of the waterstop shall furnish a certified copy of the actual test results showing that the material meets the specification requirements.

e. Bituminous Sealer

The supplier shall furnish a certified copy of the test results showing that the bituminous sealer meets the following requirements:

<u>Test and Method</u>	<u>Specification Limits</u>
Residue by evaporation, nonvolatile matter, ASTM D 2939, % min	70
Inorganic filler on ignition, ASTM D 2939, ash content %	15-45

**02652.02 MATERIALS**

**A. Materials Furnished by the County**

1. The County will not furnish any materials for continuously reinforced Portland cement concrete pavements.
2. The Contractor may obtain water from the County's potable water system in accordance with current County policies and procedures. The Contractor shall contact the Bureau of Utilities, Meter Section, for requirements.

**B. Contractor's Options**

1. The Contractor may make such substitutions as permitted in Section 02651.02.
2. The Contractor may select either deformed steel bar mats, loose deformed steel bars, or welded deformed steel wire fabric for reinforcement.

**C. Detailed Material Requirements**

1. General

Materials shall meet the requirements of Section 02651.02.

2. Reinforcement

All reinforcement shall be fabricated, lapped, and tied as shown on the Plans and shall consist of:

a. Deformed Steel Bar Mats

The longitudinal bars shall be No. 5, Grade 60, and the transverse bars shall be No. 4, Grade 40 or 60;

b. Loose Deformed Steel Bars

The longitudinal bars shall be No. 5, Grade 60, and the transverse bars shall be No. 4, Grade 40 or 60; the longitudinal bars shall have a minimum length of 40 feet.

c. Welded deformed steel wire fabric.

3. Chairs

Chairs or high chair bars shall be designed to support the reinforcement in position without deflection or displacement during the placing and consolidation of the concrete. Chair bases shall have sufficient bearing to prevent overturning or penetration into the subgrade. The design of the chairs shall not impede the placing of the concrete. The Contractor shall obtain the Engineer's approval for the type of chair or high chair bar the Contractor intends to use.

**02652.03 EXECUTION**

**A. General**

The construction shall be in accordance with Section 02651.03 except as modified hereafter.

**B. Placing Reinforcement**

The reinforcement shall be preset on chairs or high chair bars with the transverse members placed down. Placement of the longitudinal bars shall be within the tolerances shown on the Plans when measured from the top of the pavement to the bottom of the bar.

Rust, mud, oil, or other coatings that may reduce bonding shall be removed before placing the concrete. The reinforcement shall be handled with care to keep it flat and free from distortions. Loose steel bars shall be free from kinks or bends that may prevent them from being properly assembled or installed.

Chairs and high chair bars shall not be set so close to the longitudinal bars as to make placing and consolidation of the concrete through the space difficult. Welding of chairs to the transverse bars will be permitted. If the support system does not hold the reinforcement within the specified tolerances, the Contractor will be required to increase the number of chairs or take other steps to assure proper positioning of the steel.

**C. Placing Concrete**

Concrete shall be placed in one lift, and care shall be exercised to consolidate it for the full depth.

The concrete shall be internally vibrated over its full width and depth by a battery of immersion vibrators mounted at intervals, not to exceed 30 inches center to center, across the full width of the slab being placed. The vibrators shall be operated at a frequency and an amplitude sufficient to be perceptible on the surface of the concrete more than 1 foot in any direction and shall be equipped to provide variable controlled frequencies. The battery of vibrators shall advance longitudinally with the paving machinery. The vibrators shall be hinge mounted to facilitate riding up over any obstruction such as transverse joint assemblies, reinforcement, etc. The vibrators shall be set at a depth of 3 1/2 inches from the top surface.

The Engineer may require the surface to be vibrated with a pan-type vibrator or vibrating screed prior to the passage of the finishing screed.

All screeding and vibrating operations shall stop immediately whenever forward motion of the paving machinery is stopped.

**D. Joints**

No transverse expansion or contraction joints will be permitted in continuously reinforced pavement. Transverse construction of bulkhead joints shall be formed only at the end of any working period or when necessary to stop concreting operations for more than 30 minutes. They shall be formed with an approved header board in accordance with the cross section of the pavement, placed at right angles to the centerline and perpendicular to the surface. Additional bars meeting the requirements of Section 02652.02 shall be furnished and installed as shown on the Plans. The pavement shall be finished to the header board without edging. These joints shall be made with extreme care and the bulkhead kept clean. The roadway reinforcement shall

extend continuously through the joint. The reinforcement extending through the joint must be securely supported on chairs or wooden sills to prevent it from deflecting during paving operations and disturbing the fresh concrete. Adequate support is also necessary to prevent the concrete from being damaged when the header board is removed.

A minimum of 12 hours shall elapse before work is resumed. The bulkheads and all debris shall be removed, and the joint shall be cleaned before placing concrete against it.

**E. Terminal Joints**

Terminal joints shall be constructed as shown on the Plans.

**02652.04 METHOD OF MEASUREMENT**

**A. Continuously Reinforced Portland Cement Concrete Pavement**

Measurement of continuously reinforced Portland cement concrete pavement will be made of the area satisfactorily completed of the specified thickness. The width measurement will be the width of the pavement shown on the Plans, and the length will be measured along the centerline of the pavement. From the area so calculated will be deducted the area of all pavement which will be accepted only at a reduced price for scant thickness, which area will be paid for as specified in Section 02652.05.

**B. Terminal Joints**

Measurements of terminal joints will be made of the length of joint measured along the centerline of the joint.

**02652.05 BASIS OF PAYMENT**

**A. General**

1. Payment for continuously reinforced Portland cement concrete pavement and terminal joints will be made at the unit prices bid.

The prices bid shall include furnishing all labor, tools, materials, and incidentals necessary to satisfactorily complete the work shown and specified in strict accordance with the Contract Documents, and accepted by the Engineer.

2. Payment will be made for contingent items when ordered by the Engineer. Payment will be made as specified in Sections 02951, 02952, 02953, 02954, 02955, 02956, and 02957.

**B. Continuously Reinforced Portland Cement Concrete Pavement**

1. Payment for continuously reinforced Portland cement concrete pavements will be made at the price bid per square yard of the specified thickness.
2. Areas that are accepted at a reduced price for scant thickness will be adjusted by the factors shown in the following table. These factors are to be used only where areas of pavement are found to be deficient in thickness by the procedures set forth in Section 02651.01., Article C, Paragraph 2.

<u>Deficiency in inches</u>	<u>Percent of Unit Price</u>	
	<u>Design Thickness</u>	
	<u>8 In and More</u>	<u>Less than 8 In.</u>
0 to 0.15	100	100
0.16 to 0.20	100	80
0.21 to 0.30	80	70
0.31 to 0.40	72	64
0.41 to 0.50	68	58
0.51 to 0.75	57	50
0.76 to 1.00	50	*
Greater than 1.00	*	*

\*See Section 02651.01, Article C, Paragraph 2

The percent payment of the Contract unit price will be full compensation for furnishing and placing all materials and all labor necessary to complete this item.

**C. Terminal Joints**

Payment for terminal joints will be made at the price bid per linear foot complete and in place.