10-1. CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

GENERAL

Summary
This work includes constructing continuously reinforced concrete pavement. Comply with Section 40, "Concrete Pavement," of the Standard Specifications.

Submittals
If epoxy-coated steel is used in continuously reinforced concrete pavement, submit a copy of the certification for each plant used.

Quality Control and Assurance

General
Perform coefficient of thermal expansion testing under AASHTO T 336 at a frequency of 1 test for each day of paving.
Perform profilograph testing on concrete shoulders. Testing and test results for shoulders must comply with the specifications for concrete pavement smoothness, profilograph test procedure, and corrective action for traffic lanes.

Prepaving Conference
Meet with the Engineer at a prepaving conference at a mutually agreed time and place. The conference facility must be within 3 miles of the job site. Discuss methods of performing the production and paving work.
Prepaving conference attendees must sign an attendance sheet provided by the Engineer. The prepaving conference must be attended by your:

1. Project superintendent
2. Quality control manager
3. Paving construction foreman
4. Subcontractor's workers including:

4.1. Foremen
4.2. Concrete plant manager
4.3. Concrete plant operator
4.4. Personnel performing saw cutting and joint sealing

Do not start paving activities including test strips until the listed personnel have attended a prepaving conference.

Test Strips
The first paving activity must be to construct a test strip:

1. 700 to 1,000 feet long
2. Same width as the planned paving
3. With the same equipment used for the planned paving
The Engineer evaluates the test strip for compliance with the specifications for Engineer's acceptance.

The Engineer selects from 3 to 6 core locations per test strip. Allow the Engineer 3 days to evaluate the test strip for:

1. Smoothness
2. Reinforcement alignment
3. Thickness
4. Final finishing except coefficient of friction is not evaluated

During the 3 day evaluation, the Engineer rejects a test strip if any of the following occurs:

1. Surface varies more than 0.02 feet from a straightedge's lower edge
2. Wheel path's individual high points are greater than 0.025 feet in 25 feet
3. Reinforcement does not comply with specified placement tolerances
4. Pavement thickness deficiency is greater than 0.05 feet
5. Final finishing does not comply with the specifications

Remove the test strip if the Engineer rejects it for noncompliance with the specifications for thickness or reinforcement alignment. Dispose of rejected test strip material under Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

If the Engineer rejects the test strip for noncompliance with smoothness or final finishing specifications, you may grind the test strip into compliance if you intend to leave it as part of the paving.

If the Engineer accepts the test strip, you may start production paving while the Engineer continues to evaluate the test strip for compliance with the other specifications. If the Engineer rejects the test strip for noncompliance with the other specifications, stop production paving until you construct a test strip the Engineer accepts.

For rejected test strips, submit a plan for changed materials, methods, or equipment before constructing additional test strips. Construct additional test strips until the Engineer accepts one. Construct additional test strips for any of the following:

1. You propose different paving equipment including:
   1.1. Batch plant
   1.2. Paver
   1.3. Tining
   1.4. Curing equipment

2. You change concrete mix proportions

The Engineer may allow paving to start without a test strip if you use a batch plant mixer, paving equipment, and personnel that completed a Department continuously reinforced concrete pavement project within the preceding 12 months. Submit supporting documents and previous project information to the Engineer.

**Engineer's Acceptance**

The Engineer accepts concrete pavement based on the Department's testing for the following additional test:
Concrete Pavement Acceptance

<table>
<thead>
<tr>
<th>Test or Determination</th>
<th>Frequency</th>
<th>Test</th>
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</thead>
<tbody>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>1 test per day of paving</td>
<td>AASHTO T 336</td>
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MATERIALS

Concrete
Concrete for terminal joints, support slabs, and pavement anchors must comply with the specifications for concrete for continuously reinforced concrete pavement.

Add enough air-entraining admixture in compliance with Section 90-4, "Admixtures," of the Standard Specifications to attain an air content of 4 ± 1.5 percent in the freshly mixed concrete.

The thermal coefficient of expansion determined under AASHTO T 336 for concrete used in continuously reinforced concrete pavement must not exceed \(6 \times 10^{-6}\) inch/inch/°F.

Bar Reinforcement
Bar reinforcement must be one of the following:

1. Bar reinforcement must comply with ASTM A 706/A 706M. Epoxy-coating must comply with ASTM A 934/A 934M. Epoxy-coating must be purple or gray and handled at the manufacturing plant and job site under ASTM D 3963/D 3963M and Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications.
2. Bar reinforcement must comply with ASTM A 1035/A 1035 M.

Dowel Bars and Dowel Bar Baskets
Dowel bars and dowel bar baskets must be one of the following:

1. Epoxy coating must comply with ASTM A 884/A 884M, Class A, Type 2. Epoxy coating must be purple or gray.
2. Dowel bars must comply with the following:
   2.1. Descaled, pickled, and polished solid stainless steel bars, UNS Designation S31603 or S31803, Grade 60 under ASTM A 276/ A 276M, and ASTM A 955/ A 955M.
   2.2. If placed under the basket placing method, stainless steel baskets must comply with ASTM A 493/ A 493M, UNS S31600 or S31603.

Tie Bars
Tie bars must be one of the following:

1. Epoxy coating must comply with ASTM A 934/A 934M. Epoxy-coating must be purple or gray.
2. Stainless steel bar must be descaled, pickled, and polished solid stainless steel bars UNS Designation S31603 or S31803, Grade 60 under ASTM A 955/A 955M.

Wide Flange Beams
Wide flange beams and studs must be rolled structural steel shapes under ASTM A 36/A 36M or structural steel under ASTM A 572/A 572M.
**Dowel Expansion Caps**
Dowel expansion caps must comply with the following:

1. Made from plastic
2. Sized to provide a slip fit onto the end of dowel bars
3. With a uniform diameter of 1.5 inches
4. Include a device that maintains the end of the cap a minimum 1.5 inches from the end of the dowel bar during concrete placement
5. With a uniform thickness of 63 mils
6. Manufactured in 1 piece
7. Closed on 1 end

**Transverse Bar Assembly**
You may use transverse bar assemblies to support longitudinal reinforcement instead of transverse reinforcement and other support devices. Transverse bar assemblies must comply with the following:

1. Minimum W5 wire size number under ASTM A 82/A 82M for clips
2. Minimum W2 wire size number under ASTM A 82/A 82M for chairs
3. Welded under Section 7.4 of ASTM A 185/A 185M
4. Coated or uncoated in compliance with the following:
   4.1 If coated, coating must comply with ASTM A 884/A 884M, Class A, Type 2 epoxy coating. Epoxy coating must be purple or gray and handled at the manufacturing plant and job site under ASTM D 3963/D 3963M and Section 52-1.02B, "Epoxy-coated Reinforcement," of the Standard Specifications.
   4.2 If uncoated, transverse bar assemblies must comply with ASTM A 1035/A 1035M.

**Tack Coat**
Tack coat must comply with Section 39, "Hot Mix Asphalt," of the Standard Specifications.

**Expansion Joints**

Expanded polystyrene for transverse expansion joints must comply with Section 51-1.12D, "Sheet Packing, Preformed Pads and Board Fillers," of the Standard Specifications.

**Terminal Joints**
For terminal joints (Type D) and (Type E), joint seals must be Type C.

**Wide Flange Beam Terminals**
CONSTRUCTION

Wide Flange Beams

Weld stud ends with an electric arc welder completely fusing the studs to the wide flange beam. At your expense, replace studs dislodged in shipping or that can be dislodged with a hammer.

Anchorage

Class 1 permeable material, filter fabric, and slotted plastic pipe crossdrain for pavement anchors must comply with Section 68-3, "Edge Drains," of the Standard Specifications.

Transition Joints With Asphalt Concrete

If a joint between concrete pavement and asphalt concrete is specified, apply tack coat between the concrete pavement and asphalt concrete.

Longitudinal Contraction Joints

Longitudinal contraction joints must be Type A2.

Transverse Contraction Joints

Transverse contraction joints must be Type A1.
If widening existing concrete pavement, do not construct transverse contraction joints to match the existing pavement's joint spacing or skew unless specified. Transverse joints in pavement on curves must be straight and aligned with the curve's radius point.

Bar Reinforcement in Curves

For transverse bar reinforcement in a curve with a radius under 2,500 feet, place the reinforcement in a single continuous straight line across the lanes and aligned with the radius point. Place tie bars on the same alignment as the transverse bar reinforcement. If the curve does not allow the specified spacing between transverse bar reinforcement and tie bars, space them a distance that is between one half the specified spacing and the specified spacing.

Repair, Removal, and Replacement

If the Engineer orders removal of continuously reinforced concrete pavement, remove it to full depth. Cut transverse saw cuts normal to the lane line. Fill saw cuts extending beyond the removal limits with grout.

Replace unconsolidated concrete.
If you damage existing bar reinforcement during removal, lengthen the removal area to provide the specified splicing length. Below the reinforcement at a partial depth saw cut, leave the face of the concrete pavement inclined no more than 1:12 (horizontal:vertical) into the removal area.

You may make additional saw cuts within the removal area to facilitate concrete removal or to alleviate binding of the saw cut at the removal area's edge.

Prevent base damage and prevent spalling of the concrete remaining in place. Remove and replace base material disturbed during removal. Place a minimum 4-mil thick polyethylene sheet between the base and new continually reinforced concrete pavement. If concrete is used as base, place replacement continually reinforced concrete pavement after the concrete base has gained sufficient strength to prevent displacement.
For transverse joints, connect longitudinal bar reinforcement with lap splices in compliance with Section 52-1.08A, "Lap Splicing Requirements," of the Standard Specifications.

For longitudinal joints, drill and bond tie bars in compliance with Section 40-3.05, "Tie Bar Placement," of the Standard Specifications.

Within 18 hours after inserting tie bars into the chemical adhesive-filled holes, demonstrate the bond strength is \( \frac{3}{4} \) of the tie bar yield strength when tested under ASTM E 488. If the bond strength does not comply, increase the embedment depth and retest. Do not place replacement continuously reinforced concrete pavement until the bond strength complies with the specifications.

Sawcut and seal expansion joints in the repair area. Use preformed sponge rubber expansion joint filler for expansion joints and longitudinal joints. Preformed sponge rubber expansion joint filler must comply with ASTM D 1752.

**MEASUREMENT AND PAYMENT**

Continuously reinforced concrete pavement (Terminal Joint), continuously reinforced concrete pavement (Expansion Joint), and continuously reinforced concrete pavement (Pavement Anchor) of the types designated in the Verified Bid Item List are measured by the linear foot from field measurements.

Continuously reinforced concrete pavement (Wide Flange Beam Terminal) is measured by the linear foot from field measurements perpendicular to the traffic lane.

If the Engineer accepts a test strip and it remains as part of the paving surface, the test strip is measured and paid for as continuously reinforced concrete pavement, seal pavement joint, and seal isolation joint as the case may be.

Full compensation for coring test strips and for back-filling core holes when the test strip remains as part of the continuously reinforced concrete pavement is included in the contract price paid per cubic yard for continuously reinforced concrete pavement and no additional compensation will be allowed therefor.

The contract price paid per linear foot for continuously reinforced concrete pavement (Terminal Joint) of the type designated in the Verified Bid Item List includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the terminal joints including saw cutting, dowel bars, drill and bond dowel bars, support slab, support slab reinforcement, tack coat, and temporary hot mix asphalt, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per linear foot for continuously reinforced concrete pavement (Expansion Joint) of the type designated in the Verified Bid Item List includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in continuously reinforced concrete pavement (Expansion Joint), complete in place, including polystyrene, support slab, support slab reinforcement, dowel bars, drill and bond dowel bars, and bond breaker, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per linear foot for continuously reinforced concrete pavement (Pavement Anchor) includes full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in continuously reinforced concrete pavement (Pavement Anchor), complete in place, including cross drains, anchor reinforcement, filter fabric, and permeable material, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The contract price paid per linear foot for continuously reinforced concrete pavement (Wide Flange Beam Terminal) includes full compensation for furnishing all labor, materials, tools,
equipment, and incidentals, and for doing all the work involved in continuously reinforced concrete pavement (Wide Flange Beam Terminal), complete in place, including polyethylene foam, support slab, and support slab reinforcement, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for providing a facility for and attending the prepaing conference is included in the contract price paid per cubic yard for continuously reinforced concrete pavement and no additional compensation will be allowed therefor.

Full compensation for epoxy coating of steel reinforcement is included in the contract price paid per cubic yard for continuously reinforced concrete pavement and no additional compensation will be allowed therefor.