

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

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October 3, 2014

07-LA-210-R16.1/R25.8

07-2881U4

Project ID 0714000085

ACNHPI-210-1(823)E

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN LOS ANGELES COUNTY IN LA CANADA FLINTRIDGE, GLENDALE AND PASADENA FROM DUNSMORE AVENUE UNDERCROSSING TO NORTH LOS ROBLES AVENUE OVERCROSSING.

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on Thursday, October 16, 2014.

This addendum is being issued to revise the project plans, the *Notice to Bidders and Special Provisions*, and the *Bid* book

Project plan sheets 2, 17, 48, 87, 102, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 500, 603, 604, 605, 606, 607, 608, 609, 610, 611, 614, 615, 616, 638, 639, 640, 647, 678, 679, 681, 682, 691, and 692 are replaced and attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 9-1.16C is replaced as attached.

In the Special Provisions, Section 15-2.03D, "Salvage Precast Concrete Pavement" is added as attached.

In the Special Provisions, Section 26, "AGGREGATE BASES," the last paragraph is deleted.

In the Special Provisions, Section 28-6, "ROLLER COMPACTED CONCRETE BASE," is replaced as attached.

In the Special Provisions, Section 39-1.02D(1), "General," the second paragraph is replaced as follows:

"For HMA-SP (Type A), the grade of binder must be PG 64-10."

In the Special Provisions, Section 39-1.02D(1), "General," the third paragraph is replaced as follows:

"For RHMA -SP-G, the grade of asphalt binder must be PG 64-16."

In the Special Provisions, Section 40-5, "JOINED PLAIN CONCRETE PAVEMENT WITH RAPID STRENGTH CONCRETE," is added as attached.

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In the Special Provisions, Section 40-6, "JOINTED PLAIN CONCRETE PAVEMENT WITH ROLLER COMPACTED CONCRETE," is added as attached.

In the Special Provisions, Section 40-8, "PRECAST JOINTED CONCRETE PAVEMENT," is replaced as attached.

In the Special Provisions, Section 40-10, "SHOULDER CONCRETE PAVEMENT," is added as attached.

In the Special Provisions, Section 83-2.02G, "RUSTIC ROCK BARRIER PATTERN," is added as attached

In the Special Provisions, Section 86-2.05A is replaced as follows:

"Replace "section 86-2.05A" with:

Conduit installed underground for lighting systems, ramp metering systems, automatic vehicle classification system, inductive loop detector systems, and for microwave vehicle detections systems must be Type 1. Conduit installed underground for other systems must be Type 1 or Type 3."

In the Special Provisions, Section 86-2.05B is replaced as follows:

Replace "section 86-2.05B" with:

The conduit in a foundation and between a foundation and the nearest pull box must be Type 1 for lighting systems, ramp metering systems, automatic vehicle classification system, inductive loop detector systems, and for microwave vehicle detections systems, except conduit will be Type 3 for Southern California Edison line side conduit. Conduit for Tunnel lighting shall be Type 1 or Type 3 as noted on the plans.

In the Special Provisions, Section 86-2.06E is replaced as attached.

In the *Bid* book, in the "Bid Item List," Items 45, 46, 48, 54, 79, 105, 106, 107, 110, 112, 113, 114, 120, 121, 123, 124, 126, 181, 183, 193, and 214 are replaced.

In the *Bid* book, in the "Bid Item List," Items 229 and 230 are added.

In the *Bid book*, in the "Bid Item List," Item 228 is deleted.

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To *Bid* book holders:

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the *Notice to Bidders* section of the *Notice to Bidders and Special Provisions*.

Submit the *Bid* book as described in the *Electronic Bidding Guide* at the Bidders' Exchange website.

http://www.dot.ca.gov/hq/esc/oe/electronic_bidding/electronic_bidding.html

Inform subcontractors and suppliers as necessary.

This addendum, EBS addendum file and attachments are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/07/07-2881U4

If you are not a *Bid* book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

Handwritten signature of Carrie Bowen in cursive, followed by the word "for" in a smaller, less legible script.

CARRIE BOWEN
District Director

Attachments

Add to section 9-1.16C:

The following items are eligible for progress payment even if they are not incorporated into the work:

1. Drill and bond (dowel bar)
2. Joint seal (MR 1")
3. Joint seal (MR 1 1/2")
4. Pipe (Irrigation Systems)
5. Valves
6. Joint seal (MR 2")
7. Type B joint seal
8. Bar reinforcing steel
9. Reinforced concrete pipe
10. Slotted corrugated steel pipe
11. Perforated plastic pipe underdrain
12. Non-perforated plastic pipe underdrain
13. Rock slope protection fabric (class 8)
14. Miscellaneous iron and steel
15. Chain link fence and gate
16. Midwest guardrail system
17. Double Midwest guardrail system
18. Transition railing (Type WB-31)
19. Crash cushion (Type SCI SMART 100GM)
20. Pavement marker
21. Luminaires
22. Metal sign structures (including contractor-furnished sign panels)
23. Lighting fixtures and standards

Add to Section 15-2.03D:

15-2.03D Salvage Precast Concrete Pavement

15-2.03D(1) General

Remove only the precast concrete pavement to be replaced during the same lane closure.

Remove the full panel between the longitudinal and transverse joints. If panels are wider than 12' or longer than 15', the Engineer determines the exact limits of the precast concrete pavement to be removed.

Bar reinforcement or other steel may be encountered in precast concrete pavement to be removed.

Do not impact the pavement. Use removal methods that do not damage the pavement to be salvaged or the remaining pavement and base. If you damage the pavement to remain in place, repair the pavement under section 41-4. Damaged precast concrete pavement is rejected.

Do not dispose of precast concrete pavement.

15-2.03D(2) Saw Cuts

Saw cut must be the full depth of the pavement.

Saw cut using a diamond blade and make cuts vertical to the pavement surface. Saw cut along all existing joints of the precast concrete pavement, and adjacent to hot mix asphalt pavement.

Saw cut (1) no more than 2 days before removing pavement and (2) such that traffic will not dislodge any panel or segment. Saw cut perpendicular to the traveled way except when you remove pavement during the same lane closure as the saw cutting.

Do not make additional saw cuts within the sawed outline of the panel.

15-2.03D(3) Salvage

Clean the exposed faces of the panel by:

1. Blowing the exposed area with compressed air free of moisture and oil to remove debris. Air compressors must deliver air at a minimum of 120 cfm and develop 90 psi of nozzle pressure.
2. Remove loose grout attached to the bottom of the panel. Do not damage the panel.

After cleaning the panel, paint the cut ends of bar reinforcement and other exposed steel with zinc rich primer.

15-2.03D(4) Payment

Salvaged precast concrete pavement is paid based on the authorized saw cut area.

15-2.03D(5) Department Salvage Location

A minimum of 2 business days before hauling salvaged material to the Department salvage storage location, notify:

1. The Engineer
2. District Regional Recycle Coordinator at telephone number (626) 794-6465 or (818) 422-6459

For precast concrete pavement, the Department salvage storage location is:

Altadena Maintenance Field Office

2122 N. Windsor Ave., Altadena, CA 91001

Replace section 28-6 in the RSS for section 28 with:

28-6 ROLLER COMPACTED CONCRETE BASE

28-6.01 GENERAL

28-6.01A Summary

Section 28-6 Roller Compacted Concrete Base includes specifications for placing and curing RCC base.

28-6.01B Definitions

high density paver: a paver equipped with a high density screed capable of placing the RCC material to a minimum of 88 percent relative density based on wet density.

28-6.01C Submittals

28-6.01C(1) General

Reserved

28-6.01C(2) Mix Design

At least 10 days before starting field qualification, submit the proposed RCC base mix proportions, the corresponding mix identifications, and laboratory test reports including the compressive strength for each trial mixture at 10, 21, 28, and 42 days. If the mix proportions qualify for 56 days to attain the strength under 90-1.01D(5)a, submit the strength test results for 56 days.

28-6.01C(3) Quality Control Plan

Submit a RCC base QC plan. Allow 30 days for the Department's review. You or the Engineer may request a QC plan meeting.

The QC plan must comply with section 40-1.01D(4) except do not include bar reinforcement, dowel bars, tie bars, joint seals, and corrective action to be taken if penetration or air content measurements are outside action or suspension limits.

28-6.01C(4) Field Qualification

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Volume produced in cubic yards
4. Type and source of ingredients used
5. Age and strength at time of testing

Field qualification test reports must be certified with a signature by the official in responsible charge of the laboratory performing the tests.

28-6.01D Quality Control and Assurance

28-6.01D(1) General

For QC testing use personnel qualified under the Department's Independent Assurance Program who are employed by an authorized laboratory.

Stop RCC base activities and immediately notify the Engineer whenever:

1. Any quality control or acceptance test result does not comply with the specifications
2. Visual inspection shows noncompliant RCC base

If RCC base activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant RCC base
3. Obtain authorization

28-6.01D(2) Mix Design

Class A RCC base must contain at least 340 pounds of cementitious material per cubic yard.

Class B RCC base must contain at least 255 pounds of cementitious material per cubic yard.

Your laboratory must determine the cementitious materials content to ensure compliance with the specifications.

For Class A RCC base, the compressive strength of cylinders made under ASTM C 1435 and tested under California Test 521 used to determine the mixture proportions must be at least 2,800 psi at 28 days age and at least 3,600 psi at 42 days age. If the mix proportions qualify the mix to allow 56 days to attain the compressive strength under 90-1.01D(5)a, the compressive strength must be at least 2,400 psi at 28 days and 3,600 psi at 56 days.

For Class B RCC base, the compressive strength of cylinders made under ASTM C 1435 and tested under California Test 521 used to determine the mixture proportions must be at least 1,500 psi at 28 days age and at least 2,100 psi at 42 days age. If the mix proportions qualify the mix to allow 56 days to attain the compressive strength under 90-1.01D(5)a, the compressive strength must be at least 1,250 psi at 28 days and 2,100 psi at 56 days.

If changing an aggregate supply source or the mix proportions, produce a trial batch and field-qualify the new RCC base. The Engineer does not adjust contract time for performing sampling, testing, and qualifying new mix proportions or changing an aggregate supply source.

28-6.01D(3) Field Qualification

Proposed proportions must be field qualified before you place the RCC base represented by those proportions. Use an American Concrete Institute (ACI) certified "Concrete Laboratory Technician, Grade I" to perform field qualification tests and calculations.

Notify the Engineer at least 5 days before field qualification. Perform field qualification within the job site or a location authorized by the Engineer.

For field qualification fabric five test cylinders for each test age. Comply with the following:

1. Test cylinders at 10, 21, 28 days and the maximum age allowed.
2. For Class A RCC base each specimen must either:
 - 2.1 Achieve 2400 psi at 28 days or less
 - 2.2 Achieve 3600 psi at the maximum age allowed or less.
3. For Class B RCC base each specimen must either:
 - 3.1 Achieve 1250 psi at 28 days or less
 - 3.2 Achieve 2100 psi at the maximum age allowed or less.

28-6.01D(4) Quality Control Testing

Perform sampling under California Test 125.

Perform quality control sampling, testing, and inspection throughout RCC base production and placement. Notify the Engineer at least 2 business days before any sampling and testing. Notify the Engineer of testing results within 15 minutes of testing completion. Record inspection, sampling, and testing on the forms accepted with the QC plan and submit them within 48 hours of completion of each day of production. Perform testing and sampling for the quality characteristics shown in the following table:

Quality Control Testing			
Test	Frequency	Test method	Requirement
Cleanness value	2 per day	CT 227	Section 90-1
Sand equivalent	2 per day	CT 217	
Aggregate gradation	2 per day	CT 202	
Relative compaction (% min)	4 per day	CT 231	98

CONTRACT NO. 07-2881U4
REPLACED PER ADDENDUM NO. 3 DATED OCTOBER 3, 2014

28-6.01D(5) Acceptance Criteria

RCC base is accepted based on the Department's testing for the quality characteristics shown in the following table:

Quality characteristic	Requirement		Test
Compressive strength at 28 days (psi, min) ^{a, b}	Class A	Class B	ASTM C 1435; CT 521
	2,800	1,500	
Compressive strength at max age allowed (psi, min) ^{a, b}	3,600	2,100	
Air content ^{c, d}	Section 90-1		CT 504
Relative Compaction (% min) ^a	98		CT 231

^a A single test represents no more than 1,000 cu yd

^b The Engineer calculates compressive strength by averaging the individual test results of 2 cylinders. The difference in the individual test results of two cylinders the same age must not exceed 10 percent of the average.

^c If air entrainment is specified or optionally used, air content tests must be performed.

^d A single test represents no more than one day's paving.

Other base quality characteristics are considered in determining final acceptance. Acceptance of strength, thickness, placement, smoothness, and air content, does not constitute final base acceptance.

28-6.02 MATERIALS

RCC base must comply with section 90-8.

Choose a maximum aggregate size that is less than one third of the lift thickness you are placing.

Aggregate for Class A RCC base may contain crushed portland cement concrete.

Aggregate for Class B RCC base may contain crushed portland cement concrete and crushed asphalt concrete coarse aggregate. The maximum amount of crushed asphalt concrete coarse aggregate is 25 percent of the mass of the total aggregate.

Crushed asphalt concrete coarse aggregate must be:

1. 100 percent passing the 5/8 inch sieve and no more than 20 percent passing the No. 4 sieve
2. No more than 10 percent of the particles may be an agglomeration of smaller mineral particles.

28-6.03 CONSTRUCTION

28-6.03A General

Reserved

28-6.03B Subgrade

Immediately before placing RCC base, the subgrade must:

1. Comply with the specified compaction and elevation tolerance for the material involved
2. Be free from loose or extraneous material
3. Be uniformly moist

Areas of subgrade lower than the grade established by the Engineer must be filled with RCC base. RCC base used to fill low areas of subgrade is not included in the quantity of RCC base for payment.

28-6.03C Construction Joints

Construct transverse construction joints by placing and compacting the concrete beyond the joint location a sufficient distance so the base is full thickness at the construction joint location. Saw cut the RCC base at the construction joint location full depth and remove excess concrete.

Construct longitudinal construction joints by sawing the older concrete full depth and removing the edge. If the older concrete is existing or new LCB, JPCP or CRCP cut as close to the edge as possible to create a vertical edge. If the older concrete is RCC, cut 1.2 times the concrete thickness from the edge.

28-6.03D Placing RCC Base

Place RCC base using equipment specifically designed or adapted for placing RCC. Compact RCC base with steel tired rollers, rubber tired rollers or a combination of both. The minimum compacted thickness of a lift is 0.33 ft. The maximum thickness of a lift is 0.50 ft unless a high density paving machine is used and then the maximum is 0.77 ft compacted thickness.

When RCC base is placed in multiple lifts, place the subsequent lift on compacted RCC base that was placed less than 45 minutes before. Keep the surfaces of the prior lift damp until it is covered.

Place RCC base adjacent to previously placed RCC base within 60 minutes of mixing the previously placed concrete or construct a construction joint. Keep the previously placed RCC base surface damp until it is covered or cured.

Unless shown or specified, construct RCC base in minimum widths of 12 feet separated by construction joints. For RCC base constructed monolithically in widths greater than 60 times the thickness, construct longitudinal contraction joints no less than 12 feet apart and no more than 60 times the RCC base thickness apart.

Longitudinal contraction joints must be constructed with a power driven saw with a diamond blade.

For RCC base to be paved with concrete pavement, construct longitudinal construction and contraction joints in RCC base to provide at least 1 foot horizontal clearance from planned longitudinal construction and contraction joints in the concrete pavement.

Do not mix or place RCC base when the atmospheric temperature is below 35 degrees F.

28-6.03E Finishing

Finishing must produce a smooth and true-to-grade finish.

For RCC base to be paved with concrete pavement produce a finish free from cracks or fissures. If allowed, you may apply cement slurry to fill cracks and fissures and remove all slurry from the surface. If you use base bond breaker no. 3, 4 or 5 filling cracks and fissures less than 1/4 inch wide is optional.

Complete finishing activities during daylight unless lighting is authorized.

For RCC base to be paved with HMA, the finished surface must not vary more than 0.05 foot from the grade established by the Engineer.

For RCC base to be paved with concrete pavement, the finished surface must not be above the grade, or more than 0.05 foot below the grade established by the Engineer.

28-6.03F Curing

Cure the RCC base exposed surfaces under section 90-1.03B< Curing Concrete > using the curing compound method or waterproof membrane method. If using the curing compound method use curing compound 1, 2 or 3. If the base is to be paved with HMA do not use curing compound 3. If RCC base will be covered with pavement less than 2 hours after placement, curing of covered surface is not required and use base bond breaker no. 3, 4, or 5. Dampen the concrete surface before applying base bond breaker no. 3 or 4. Apply between 2 and 7 gallons of water per 100 square feet onto base bond breaker no.5 after placing it.

Apply curing compound with mechanical sprayers in two applications. Complete the first application at a nominal rate of 150 sq ft/gal. Complete the second application at a nominal rate of 300 sq ft/gal with the nozzles offset 50 percent of the nozzle spacing from the first application, except if curing compound 3 is used the second application must be at a rate of 150 sq ft/gal. Reapply curing compound to saw cuts and disturbed areas.

If the RCC base will be used for traffic before paving, allow 3 days of curing before allowing traffic on RCC base.

28-6.03G Surfaces Not Within Tolerance

Where RCC base will be paved with concrete pavement, grind the surface with either a diamond or carborundum blade to within tolerance. After grinding RCC base to be paved with concrete pavement and after all free water has left the surface, clean foreign material and grinding residue from the surface. Apply curing compound to the ground area at a rate of approximately 150 ft sq/gal.

Where the surface of RCC base is lower than 0.05 foot from the grade established by the Engineer, fill low areas according to the pavement material as follows:

1. For HMA pavement, fill low areas with HMA that complies with the specifications for the lowest layer of pavement. Do not fill low areas concurrently with the paving operation.
2. For concrete pavement, fill low areas with pavement concrete concurrent with the paving operation.

28-6.04 PAYMENT

The volume for the payment of roller compacted concrete base is calculated based on the dimensions shown.

Replace "Reserved" in section 40-5 of the RSS for section 40 with:

40-5 JOINTED PLAIN CONCRETE PAVEMENT WITH RAPID STRENGTH CONCRETE

40-5.01 GENERAL

40-5.01A Summary

Section 40-5 includes specifications for constructing JPCP with RSC (JPCP—RSC).

JPCP—RSC must comply with the specifications for JPCP in section 40-4.

40-5.01B Definitions

early age: Any age less than 10 times the time of final setting.

opening age: Age when the minimum modulus of rupture specified for opening to traffic and equipment is attained.

time of final setting: Elapsed time required to develop concrete penetration resistance that is at least 4,000 psi under ASTM C403/C403M.

40-5.01C Submittals

40-5.01C(1) General

At least 15 days before delivery to the job site, submit manufacturer's recommendations, MSDS and instructions for storage and installation of joint filler material.

Submit QC test results within 48 hours of paving shift completion except submit modulus of rupture results within:

1. 15 minutes of opening age test completion
2. 24 hours of a 3, 7, or 10-day test completion

40-5.01C(2) Quality Control Plan

At least 20 days before placing trial slabs, submit a QC plan.

40-5.01C(3) Rapid Strength Concrete

At least 45 days before the intended use, submit a sample of cement from each proposed lot and samples of proposed admixtures in the quantities ordered by the Engineer.

During JPCP—RSC operations, submit uniformity reports for hydraulic cement at least once every 30 days to the Engineer and METS, attention Cement Laboratory. Uniformity reports must comply with ASTM C 917 except testing age and water content may be modified to suit the particular material.

40-5.01C(4) Mix Design

Section 40-1.01C(4) does not apply.

At least 10 days before constructing trial slabs, submit mix designs

40-5.01D Quality Control and Assurance

40-5.01D(1) General

Section 40-1.01D(1) does not apply.

Core pavement as described for thickness, bar placement, and air content.

Allow at least 25 days for the Department to schedule testing for coefficient of friction. Notify the Engineer when the pavement is scheduled to be opened to traffic

The Department tests for coefficient of friction within 7 days of receiving notification that the pavement is ready for testing.

40-5.01D(2) Prepaving Conference

Section 40-1.01D(3) does not apply.

Provide the conference facility.

Prepaving conference attendees must sign an attendance sheet provided by the Engineer. The prepaving conference must be attended by your:

1. Project superintendent
2. Project manager
3. QC manager
4. Workers and your subcontractor's workers, including:
 - 4.1. Foremen
 - 4.2. Concrete plant manager
 - 4.3. Concrete plant operator
 - 4.4. Concrete plant inspectors
 - 4.5. Personnel performing saw cutting and joint sealing
 - 4.6. Paving machine operators
 - 4.7. Inspectors
 - 4.8. Samplers
 - 4.9. Testers

Do not start paving activities, trial slabs, or test strips until the listed personnel have attended the preconstruction conference.

The purpose of the prepaving conference is to familiarize personnel with the project's specifications. Discuss the QC plan and processes for constructing each item of work including:

1. Production
2. Transportation
3. Trial slabs
4. Pavement structure removal
5. Placement
6. Contingency plan
7. Sampling
8. Testing
9. Acceptance

40-5.01D(3) Quality Control Plan

Section 40-1.01D(4) does not apply.

Establish, implement, and maintain a QC plan for pavement. The QC plan must describe the organization and procedures used to:

1. Control the production process
2. Determine if a change to the production process is needed
3. Implement a change

The QC plan must include:

1. Names and qualifications of the QC manager and assistant QC managers.
2. Action and suspension limits and details of corrective action to be taken if any process is out of those limits. Suspension limits must not exceed specified acceptance criteria.
3. Contingency plan for correcting problems in production, transportation, and placement.
4. Provisions for determining if JPCP—RSC placement must be suspended.
5. Outline of the procedure for the production, transportation, and placement of JPCP—RSC.
6. Outline of the procedure for sampling and testing to be performed during and after JPCP—RSC construction.
7. Production target values for material properties that impact concrete quality or strength including cleanness value and sand equivalent.
8. Forms to report concrete inspection, sampling, and testing results.
9. Location of your quality control testing laboratory and testing equipment to be used during and after paving operations.
10. List of the testing equipment to be used including the date of last calibration.
11. Names and certifications of quality control personnel including those performing sampling and testing.
12. Outline of the procedure for placing and testing trial slabs, including:
 - 12.1. Locations and times
 - 12.2. Production procedures
 - 12.3. Placement and finishing methods
 - 12.4. Sampling methods, sample curing, and sample transportation
 - 12.5. Testing and reposting test results reporting
13. Procedure for identifying transverse contraction joint locations relative to the dowel bars longitudinal center.
14. Procedure for consolidating concrete around the dowel bars.

The QC plan must address the elements affecting concrete pavement quality including:

1. Mix proportions
2. Aggregate gradation
3. Materials quality
4. Stockpile management
5. Line and grade control
6. Proportioning
7. Mixing and transportation
8. Placing and consolidation
9. Contraction and construction joints
10. Dowel bar placement, alignment, and anchorage
11. Tie bar placement and alignment
12. Modulus of rupture strength
13. Finishing and curing
14. Protecting pavement before opening to traffic
15. Surface smoothness

40-5.01D(4) Quality Control Manager

Designate a QC manager and assistant QC managers to administer the QC plan. The QC manager must be certified as an American Concrete Institute (ACI) Concrete Field Testing Technician-Grade I and Concrete Laboratory Testing Technician-Grade II. The assistant QC managers must have the same certification except Concrete Laboratory Testing Technician-Grade I instead of Grade II is acceptable.

The QC manager must review and sign the sampling, inspection, and test reports before submitting them. The QC manager or his assistant must be present for:

1. Each stage of mix design
2. Trial slab construction
3. Test strip construction
4. Production and construction of JPCP—RSC
5. Meetings with the Engineer relating to production, placement, or testing

The QC manager must not be a member of this project's production or paving crews, an inspector, or a tester. The QC manager must have no duties during the production and placement of JPCP—RSC except those specified for QC.

40-5.01D(5) Mix Design for RSC

40-5.01D(5)(a) General

Section 40-1.01D(5) does not apply.

40-5.01D(5)(b) Mix Design

The maximum ambient temperature range for a mix design is 18 degrees F. Submit more than 1 mix design based on ambient temperature variations anticipated during JPCP—RSC placement. Each mix design must include:

1. Mix design identification number
2. Aggregate source
3. Opening age
4. Aggregate gradation
5. Types of cement and chemical admixtures
6. Mix proportions
7. Maximum time allowed between batching and placing
8. Range of effective ambient temperatures
9. Time of final setting
10. Modulus of rupture development data from laboratory-prepared samples including tests at the following ages:
 - 10.1. 80 percent of opening age
 - 10.2. Opening age
 - 10.3. 120 percent of opening age
 - 10.4. 1-day when the opening age is less than or equal to 1 day
 - 10.5. 3-day when the opening age is less than or equal to 3 days
 - 10.6. 7-day when the opening age is less than 7 days
 - 10.7. 10-day
 - 10.8. 28-day
11. Shrinkage test result
12. Any special instructions or conditions such as water temperature requirements

Before placing JPCP—RSC, your mix design must be field qualified. Testing must be performed by a technician certified as an ACI "Concrete Laboratory Technician, Grade I" or Grade II Test for modulus of rupture under California Test 524 at the following ages:

1. Opening age
2. 3-day when the opening age is less than or equal to 3 days
3. 10-day when the opening age is more than 3 days

If a mix design is rejected, submit a new mix design and obtain field qualification.

40-5.01D(5)(c) Shrinkage

The first paragraph of section 90-1.01D(3) does not apply:

Test the concrete under AASHTO T 160 modified as follows:

1. Prepare specimens that have a 4 by 4 inch cross section.
2. Remove each specimen from the mold at the earlier of either:
 - 2.1. 1-hour before opening age
 - 2.2. 23 ± 1 hours after mixing the concrete
3. Place the specimen in lime water at 73 ± 3 degrees F until the initial reading at opening age or 7-day age whichever earlier.
4. Take a comparator reading and record it as the initial reading.
5. Store the specimens in a humidity-controlled room maintained at 73 ± 3 degrees F and 50 ± 4 percent relative humidity for the remainder of the test.
- 6.. Take subsequent readings at 1, 3, 7, 14, 21, and 28 days drying.

40-5.01D(6) Trial Slabs

Before constructing test strips, construct 1 trial slab for each mix design and obtain authorization. Trial slabs must:

1. Be 10 by 20 feet
2. Have a thickness of 10 inches or the largest thickness shown, whichever is greater
3. Constructed using the same equipment and methods proposed for paving and under similar atmospheric and temperature conditions expected during paving
4. Demonstrate that JPCP—RSC will be cured, sawed, and comply with the requirement for opening to traffic within the specified lane closures

Place trial slabs near the job site at a mutually-agreed location that is not on the roadway nor within the project limits.

During trial slab construction, sample and split the aggregate for grading, cleanness value, and sand equivalent testing.

Within 20 minutes after RSC delivery for trial slabs, fabricate test beams under California Test 524. Use test beams to determine opening age and 10-day modulus of rupture values.

Cure beams fabricated for early age testing such that the monitored temperatures in the beams and the slab are always within 5 degrees F. Monitor and record the internal temperatures of trial slabs and early age beams at intervals of at least 5 minutes. Install thermocouples or thermistors connected to strip-chart recorders or digital data loggers to monitor the temperatures. Temperature recording devices must be accurate to within ± 2 degrees F. Measure internal temperatures at 1 inch from the top, 1 inch from the bottom, and no closer than 3 inches from any edge until early age testing is completed.

Cure beams fabricated for 10-day testing under California Test 524 except place them into sand at a time that is (1) from 5 to 10 times the final set time or (2) 24 hours, whichever is earlier.

After authorization remove and dispose of trial slabs and testing materials.

40-5.01D(7) Quality Control Testing

40-5.01D(7)(a) General

Section 40-1.01D(6)(b) does not apply.

Provide continuous process control and quality control sampling and testing throughout RSC production and placement. Notify the Engineer at least 2 business days notice before any sampling and testing.

Establish a testing facility at the job site or at an authorized location.

Sample under California Test 125.

During JPCP—RSC placement, sample and fabricate beams for modulus of rupture testing within the first 30 cu yd, at least once every 130 cu yd, and within the final truckload. Submit split samples and assist the Department in fabricating test beams for the Department's testing unless the Engineer informs you otherwise. Determine the modulus of rupture at opening age under California Test 524, except beam specimens may be fabricated using an internal vibrator under ASTM C 31. Cure beams under the same conditions as the pavement and until 1 hour before testing. Test 3 beam-specimens in the presence of the Engineer and average the results. A single test represents no more than that day's production or 130 cu yd, whichever is less.

Determine the modulus of rupture at other ages using beams cured and tested under California Test 524 except place them in sand from 5 to 10 times the time of final setting under ASTM C403/C403M or 24 hours, whichever is earlier.

40-5.01D(7)(b) Rapid Strength Concrete

40-5.01D(7)(b)(i) General

Your quality control must include testing materials and RSC for the properties at the frequencies shown in the following table:

RSC Minimum Quality Control		
Property	Test method	Minimum testing frequency ^a
Cleanness value	California Test 227	650 cu yd or 1 per shift
Sand equivalent	California Test 217	650 cu yd or 1 per shift
Aggregate gradation	California Test 202	650 cu yd or 1 per shift
Air content	California Test 504	130 cu yd or 2 per shift
Yield	California Test 518	2 per shift
Slump or penetration	ASTM C143 or California Test 533	1 per 2 hours of paving
Unit weight	California Test 518	650 cu yd or 2 per shift
Aggregate moisture meter calibration ^b	California Test 223 or California Test 226	1 per shift
Modulus of rupture	California Test 524	Comply with section 40-5.01D(7)(a)

^aTest at the most frequent interval.

^bCheck calibration of the plant moisture meter by comparing moisture meter readings with California Test 223 or California Test 226 test results.

Maintain control charts to identify potential problems and assignable causes. Post a copy of each control chart at a location determined by the Engineer.

Individual measurement control charts must use the target values in the mix proportions as indicators of central tendency.

Develop linear control charts for:

1. Cleanness value
2. Sand equivalent
3. Fine and coarse aggregate gradation
4. Air content
5. Slump or penetration

Control charts must include:

1. Contract number
2. Mix proportions
3. Test number
4. Each test parameter
5. Action and suspension limits
6. Specification limits
7. Quality control test results

For fine and coarse aggregate gradation control charts, record the running average of the previous 4 consecutive gradation tests for each sieve and superimpose the specification limits.

For air content control charts, the action limit is ± 1.0 percent of the specified value. If no value is specified, the action limit is ± 1.0 percent of the value used for your approved mix design.

As a minimum, a process is out of control if any of the following occurs:

1. For fine and coarse aggregate gradation, 2 consecutive running averages of 4 tests are outside the specification limits
2. For individual penetration or air content measurements:
 - 2.1. One point falls outside the suspension limit line
 - 2.2. Two points in a row fall outside the action limit line

Stop production and take corrective action for out of control processes or the Engineer rejects subsequent material.

Before each day's concrete pavement placement and at intervals not to exceed 4 hours of production, use a tachometer to test and record vibration frequency for concrete consolidation vibrators.

If requested, submit split samples and assist the Department in fabricating test beams for the Department's testing.

40-5.01D(7)(b)(ii) Modulus of Rupture

Fabricate and test for modulus of rupture in the Engineer's presence.

Fabricate beams for modulus of rupture testing under California Test 524 except beams may be fabricated using an internal vibrator under ASTM C 31.

Test beams under California Test 524 except place them in sand from (1) 5 to 10 times the final set time or (2) 24 hours, whichever is earlier. For each sample, calculate the test result as the average from testing 3 beams.

Your quality control testing must include modulus of rupture testing for each day's paving. Test within the first 30 cu yd, at least once per every 130 cu yd. and the final truck load.

A single test result represents no more than 1 paving shift or 130 cu yd, whichever is less. If you wish to increase the testing frequency, you must notify the Engineer at least 2 days before paving. No payment is made for your additional testing.

40-5.01D(8) Acceptance Criteria

40-5.01D(8)(a) General

The requirement for testing the modulus of rupture at 28 days in section 40-1.01D7(a)(i) does not apply.

40-5.01D(8)(b) Modulus of Rupture

Section 40-1.01D(7)(b)(ii) does not apply.

JPCP—RSC is accepted based on your testing for modulus of rupture at opening age and the Department's testing for modulus of rupture at 10 days. For each sample, the Department calculates the test result as the average from testing 3 beams. The test result represents 1 paving shift or 130 cu yd, whichever is less.

If the opening age is equal to or less than 3 days, JPCP—RSC must have a modulus of rupture at opening age that is at least 400 psi and a modulus of rupture at 10 days that is at least 650 psi.

If the opening age is between 3 and 9 days, JPCP—RSC must have a modulus of rupture at opening age that is at least 550 psi and a modulus of rupture at 10 days that is at least 650 psi.

If the opening age is equal to or less than 3 days, the modulus of rupture at opening age is at least 400 psi, and the modulus of rupture at 10 days is at least 570 psi but less than 650 psi, you may request authorization to leave the JPCP—RSC in place and accept the specified deduction.

If the opening age is between 3 and 9 days, if the modulus of rupture at opening age is at least 550 psi, and the modulus of rupture at 10 days is at least 570 psi but less than 650 psi, you may request authorization to leave the JPCP—RSC in place and accept the specified deduction.

40-5.02 MATERIALS

40-5.02A General

Section 40-1.02B does not apply.

RSC must comply with 90-3 except volumetric proportioning is not allowed and the 2nd paragraph of section 90-1.02I(2)(a) does not apply.

40-5.02B Aggregate

Aggregate must comply with section 90-1.02C except the specifications for reduction in operating range and contract compliance for cleanness value and sand equivalent specified in section 90-1.02C(2) and section 90-1.02C(3) do not apply.

For coarse aggregate in high desert and high mountain climate regions, the loss must not exceed 25 percent when tested under California Test 211 with 500 revolutions.

For combined aggregate gradings, the difference between the percent passing the 3/8-inch sieve and the percent passing the no. 8 sieve must not be less than 16 percent of the total aggregate.

Aggregate must be either:

1. Innocuous
2. Such that the RSC has an expansion ratio of less than 0.10 percent under ASTM C 1567 with the proposed proportion and mix design. Include test data with the mix design submittal. Test data must be dated within 3 years of the contract award date. The test data must be for the same mix design and based on aggregate from the same proposed source and proportion.

40-5.02C Proportioning

For batches with a volume of 1 cu yd or more, proportioning methods must comply with one of the following:

1. Batch at a central batch plant and charge into a mixer truck for transportation to the job site. Proportion under section 90-1.02(F).
2. Except for cement, batch at a central batch plant. Charge into a mixer truck, transport to a cement silo and weigh system, use the silo and system to proportion cement, and charge cement into the mixer truck.
3. Except for cement, batch at a central batch plant. Charge into a mixer truck, transport to a location where pre-weighed containerized cement is added to the mixer truck. The cement pre-weighing operation must utilize a platform scale. The platform scale must have a maximum capacity of 2.75 tons with a maximum graduation size of 1 pound. Pre-weigh cement into a fabric container. The minimum amount of cement to be proportioned into any single container must be 1/2 of the total amount required for the load of RSC being produced. Before reuse, clean fabric containers used for transportation or proportioning of cement.

40-5.03 CONSTRUCTION

40-5.03A General

If the cement in JPCP—RSC is other than portland cement, section 40-1.03K does not apply, and the pavement must be cured per the cement Manufacturer's written recommendations.

Do not place JPCP—RSC if the opening age is less than or equal to 3 days and the temperature is forecasted to be less than 40 degrees within 72 hours of final finishing. Use the forecast from the National Weather Service.

40-5.03B Test Strips

The 8th paragraph of section 40-1.03C does not apply.

Test strips must be 400–1000 feet long.

40-5.03C Joints

Section 40-1.03D(2) does not apply.

Before placing JPCP—RSC against existing concrete, place 1/4-inch thick commercial quality polyethylene flexible foam expansion joint filler across the original transverse and longitudinal joint faces. Place the top of the joint filler flush with the top of the pavement and extend it down to the bottom of excavation. Secure joint filler to the joint face of the existing pavement and prevent it from moving during the placement of JPCP—RSC.

Where the existing transverse joint spacing in an adjacent lane exceeds 15 feet, construct an additional transverse contraction joint midway between the existing joints. If transverse joints do not align in a curve, drill a full depth 2-inch diameter hole under ASTM C 42/C 42M where the joint meets the adjacent slab. Fill the hole with joint filler material. Do not allow the filling material to penetrate into unsealed joints.

In addition to the specifications in section 40-1.03D(4), after removing new pavement, clean the faces of joints and remove loose material and contaminants from underlying base. Coat the base surface with curing compound under section 28-2.03F.

40-5.03D Placing Concrete

The 3rd paragraph of section 40-1.03H(1) does not apply.

Place consecutive concrete loads without interruption. Do not allow cold joints where a visible lineation forms after concrete is placed, sets, and hardens before additional concrete placed.

After mixing and placing JPCP—RSC, do not add water to the surface to facilitate final finishing. You may request authorization to use a surface finishing additive; include the manufacture's recommendations with you request.

40-5.03E Protecting Concrete Pavement

If the opening age is equal to or less than 3 days, section 40-1.03L does not apply. Protect pavement under section 90-1.03C . Protect JPCP—RSC from activities that cause damage, reduce texture, and reduce the coefficient of friction. Do not allow soil, gravel, petroleum products, concrete, or asphalt mixes on the JPCP—RSC surface.

40-5.03F Early Use of Concrete Pavement

Section 40-1.03M does not apply.

40-5.04 PAYMENT

If the jointed plain concrete pavement (RSC) has an opening age equal to or less than 3 days, a modulus of rupture at opening age that is at least 400 psi, and a modulus of rupture at 10 days that is greater than or equal to 570 psi but less than 650 psi, the Department deducts 10 percent of the payment for jointed plain concrete pavement (RSC).

If the jointed plain concrete pavement (RSC) has an opening age between 3 and 9 days, a modulus of rupture at opening age that is at least 550 psi, and a modulus of rupture at 10 days that is greater than or equal to 570 psi but less than 650 psi, the Department deducts 10 percent of the payment for jointed plain concrete pavement (RSC).

Replace section 40-6 in the RSS for section 40 with:

40-6 JOINTED PLAIN CONCRETE PAVEMENT WITH ROLLER COMPACTED CONCRETE

40-6.01 GENERAL

40-6.01 Summary

Section 40-6 includes specifications for constructing JPCP with roller compacted concrete (JPCP—RCC).

JPCP—RCC must comply with the specifications for JPCP in section 40-4 except the specifications for modulus of rupture do not apply. JPCP—RCC is constructed without tie bars and without dowel bars.

40-6.01B Definitions

high density paver: a paver equipped with a high density screed capable of placing the RCC material to a minimum of 88 percent relative density based on wet density.

40-6.01C Submittals

At least 30 days before starting field qualification, submit the proposed concrete mix proportions, the corresponding mix identifications, and laboratory test reports including the compressive strength for each trial mixture at 3, 7, 28, and 42 days. If the mix proportions qualify for 56 days to attain the strength under 90-1.01D(5)a, submit the strength test results for 56 days.

40-6.01D Quality Control and Assurance

40-6.01D(1) General

Section 40-4.01D(2) does not apply

40-6.01D(2) Quality Control Plan

A process is out of control if the average of 4 consecutive in-place density tests is below 98 percent or 1 test is below 96 percent

The QC plan must address achieving density.

40-6.01D(3) Quality Control Testing

Your quality control testing must include in-place density testing under ASTM C 1040. Test at random locations and at a frequency of at least 2 tests per 1500 cu yd of JPCP—RSC. Complete each density test within 30 minutes of compacting the test location.

40-6.01D(4) Mix Design

Section 40-1.01D(5) does not apply.

Determine mix proportions based on compressive strengths of more than 4000 psi at 28 days age and 5000 psi at 42 days age. If the mix proportions qualify the mix to allow 56 days to attain the strength under 90-1.01D(5)a, determine mix proportions based on strengths of more than 3500 psi at 28 days and 5000 psi at 56 days.

If changing an aggregate supply source or the mix proportions, produce a trial batch and field-qualify the new mix design. The Engineer does not adjust contract time for performing sampling, testing, and qualifying new mix proportions or changing an aggregate supply source.

40-6.01D(5) Acceptance Criteria

40-6.01D(5)(a) General

Sections 40-1.01D(7)(a)(i) and 40-1.01D(7)(a)(iii) do not apply.

The Department's acceptance testing includes testing the properties at the frequency shown in the following table:

Property	Test method	Frequency ^a
28-day compressive strength	ASTM C 1435	1,000 cu yd
Sample	CT 521	1,000 cu yd
Test		
In-place density	ASTM C 1040	1,500 cu yd
Thickness	California Test 531	1,200 sq yd
Coefficient of friction	California Test 342	1 day's paving

^a A single test represents no more than the quantity specified

40-6.01D(5)(b) Field Qualification

For field qualification, fabricate and test 5 cylinders for each test age; the strength of each cylinder must be at least:

1. 3,500 psi at 28 days or less
2. 5,000 psi by the maximum days allowed

40-6.01D(5)(c) Compressive Strength

JPCP—RCC must have a minimum strength of either 4000 psi at 28 days or 5000 psi at the maximum age allowed.

40-6.02 MATERIALS

40-6.02A General

Section 90-1.02A does not apply.

40-6.02B Concrete

JPCP—RCC must comply with section 90-8.

40-6.02C Cementitious Material

JPCP—RCC must contain at least 450 pounds of cementitious material per cubic yard.

40-6.02D Aggregate

Section 40-1.02B(3) does not apply.

For the surface lift use the 1/2-inch or the 3/4-inch maximum size grading. For other than the surface lift choose a maximum size that is less than 1/3 of the lift thickness

40-6.03 CONSTRUCTION

40-6.03A General

Section 40-1.03C does not apply.

40-6.03B Joints

40-6.03B(1) General

Construct longitudinal joints as either construction joints or isolation joints.

40-6.03B(2) Construction Joints

Construct transverse construction joints by placing and compacting the concrete beyond the joint at a sufficient distance such that the pavement is full thickness at the construction joint. Saw cut the JPCP—RCC at the construction joint full depth and remove excess concrete.

Construct longitudinal construction joints by sawing the older pavement full depth and removing the edge of pavement. If the older pavement is existing or new JPCP or CRCP cut as close to the edge as possible to create a vertical edge. If the older pavement is RCC cut 1.2 times the pavement thickness from the edge.

40-6.03B(3) Contraction Joints

Where shoulders are adjacent to JPCP, match the joint spacing of the adjacent pavement. Where shoulders are adjacent to CRCP or HMA, cut joints spaced at 1.4 times the paving width or less.

Where a slab length of less than 0.7 times the monolithic width would be formed, adjust the transverse contraction joint spacing such that slab length is more than 0.7 times the paving width and less than both 45 times the paving thickness and 1.4 times the paving width. Construct transverse contraction joints at an angle to the centerline of the pavement that is equal to 2 feet per 12-foot width.

40-6.03C Placing Concrete

40-6.03C(1) General

Section 40-1.03H does not apply.

Place RCC using equipment specifically designed or adapted for placing RCC. Produce a uniform surface without tearing, shoving, gouging or signs of segregation. Compact RCC with steel tired rollers, rubber tired rollers or a combination of both. The minimum compacted thickness of a lift is 0.33 feet. The maximum thickness of a lift is 0.50 feet unless a high density paving machine is used and then the maximum is 0.77 feet compacted thickness.

Compact RCC to 98 percent relative compaction, minimum based on wet density.

When JPCP—RCC is placed in multiple lifts, place the subsequent lift on compacted RCC that was placed less than 45 minutes before. Keep the surfaces of the prior lift damp until it is covered.

Place RCC adjacent to previously placed RCC within 60 minutes of mixing the previously placed concrete or construct a construction joint. Keep the previously placed RCC surface damp until it is covered or cured.

40-6.03C(2) Surface Treatment of Adjacent Existing Concrete Pavement

Where JPCP—RCC is placed adjacent to existing concrete pavement:

1. Grind adjacent pavement before placing the JPCP—RCC
2. If equipment will operate on existing pavement, use paving equipment with padded crawler tracks or rubber-tired wheels with enough offset to prevent damage
3. Match pavement grade with the elevation of existing concrete pavement after grinding.

40-6.03D Preliminary Finishing

Section 40-1.03J does not apply

Preliminary finishing must produce a smooth and true-to-grade finish. After preliminary finishing, mark each day's concrete pavement with a stamp. The stamp must be authorized before paving starts. The stamp must be approximately 1 by 2 feet in size. The stamp must form a uniform mark that remains from 1/8 to 1/4 inch deep after final finishing. Locate the mark 20 ± 5 feet from the transverse construction joint formed at each day's start of paving and 1 ± 0.25 foot from the concrete pavement's outside edge. The stamp mark must show the month, day, and year of placement and the station of the transverse construction joint. Orient the stamp mark so it can be read from the concrete pavement's outside edge.

Use rubber tired rollers or rubber coated steel drum rollers to produce a finish free from cracks or fissures. If authorized, you may fill cracks and fissures with cement slurry. After filling cracks and fissures, remove slurry from the surface.

Complete finishing activities during daylight unless lighting is authorized.

40-6.03E Curing

Section 40-1.03K does not apply

Cure the concrete pavement's exposed area under section 90-1.03B Curing Concrete using the curing compound method or waterproof membrane method. If using the curing compound method use curing compound 1 or 2.

Apply curing compound with mechanical sprayers in two applications. Complete the 1st application at a nominal rate of 150 sq ft/gal. Complete the 2nd application at a nominal rate of 300 sq ft/gal with the nozzles offset at 50 percent of the nozzle spacing from the 1st application. Reapply curing compound to saw cuts and disturbed areas.

40-6.03F Final Finishing

Final finishing is performed after curing and the concrete is strong enough to finish without spalling or dislodging aggregate particles. Apply one of the following final finishes:

1. Grind the entire width of the JPCP RCC
2. Groove the entire width of the JPCP RCC
3. No additional finishing

On a continuous length of JPCP RCC is less than 2000 feet apply one final finish to the entire surface. On lengths that are greater than 2000 feet long, you may use two or more final finish surfaces provided that no length of any one finish is less than 3000 feet or one half the continuous length of JPCP RCC, whichever is shorter.

When the smoothness requirements of 40-1.01D are not met, grind the pavement under section 42 to comply with 40-1.01D(7)(b)(vii)

When the smoothness requirements of 40-1.01D are met and the coefficient of friction is less than 0.30 when tested under California Test 342, groove or grind the pavement under section 42 to achieve a coefficient of friction of at least 0.30.

When the smoothness requirements of 40-1.01D are met and the coefficient of friction is at least 0.30 when tested under California Test 342, no additional finishing is required and you may grind or groove the pavement under section 42.

Open the pavement to public traffic only after final finishing is complete and after 3 days.

40-6.04 PAYMENT

Not used

**Replace section 40-8 of the RSS for section 40 with:
PRECAST JOINTED CONCRETE PAVEMENT**

40-8.01 GENERAL

40-8.01A Summary

Section 40-8 includes specifications for furnishing and installing precast jointed concrete pavement (PJCP). Furnishing includes pretensioning PJCP before shipping to the jobsite. Installing includes grading PJCP in place, furnishing and installing dowel bars at joints between PJCP and the existing pavement, and sealing non-compliant joints.

Before submitting shop drawings, field verify the geometry described.

For horizontal curves and transition to horizontal curves, PJCP must match the superelevation and superelevation transition of the roadway.

Install dowel bars at joints between PJCP and the existing concrete in compliance with the requirement in either section 41-8 or "Dowel Bar Slots" of these special provisions.

40-8.01B Definitions

system: consists of features that are part of design, construction, and performance of the precast pavement product. These features are included, but are not limited to size and thickness of panels and slabs, joints, elements cast in the panels, load transfer method, techniques for providing grade control for the panels, etc.

40-8.01C Submittals

40-8.01C(1) General

Section 40-1.01C does not apply.

Section 50-1.01C(3) does not apply.

In addition to the requirements in section 90-4, submit PJCP shop drawings to the Engineer and to Office of Concrete Pavement and Pavement Foundation, MS # 5, 5900 Folsom Boulevard, Sacramento, CA 95819. Submit 4 sets to the Engineer and 1 set to the Office of Concrete Pavement and Pavement Foundation. Allow 15 business days for review.

Shop drawings must include:

1. Details for furnishing PJCP panels including:
 - 1.1. Panel layout and coordinating panel identification system
 - 1.2. Your survey notes for field verification of the existing profile and grade information described
 - 1.3. Your adjusted panel dimensions including calculations for:
 - 1.3.1. Pavement profile with any superelevation or transition
 - 1.3.2. Horizontal curve locations
 - 1.3.3. Allowable fabrication tolerances
 - 1.3.4. Allowable installation tolerances
 - 1.4. Method for casting connection elements within the specified alignment for final placement
 - 1.5. Underslab grout vents locations on the details shown for panels.
 - 1.6. Finishing methods and procedures
 - 1.7. Methods and procedures for handling and transport
2. Details, methods and procedures for installing PJCP panels including:
 - 2.1. Methods and procedures for handling panels
 - 2.2. Methods and procedures for supporting and adjusting grade of the PJCP during installation
 - 2.3. Methods and procedures for installing joint filler, joints, and joint seals
 - 2.4. Details and methods for connecting to the existing pavement
3. Detail method for repairing damaged during removal from the forms or transport and installation

4. Prepared and stamped by a California Licensed Professional Civil Engineer folded panels
 - 4.2. Use cast-in-place concrete pavement (if allowed by engineer)
5. Drop-in panels must be reinforced or pre-tensioned and at least 8 feet long.
6. Panels must be set to grade using one of the following methods, or any other method that provides acceptable results:
 - 6.1. Shimming
 - 6.2. Treated bedding layer (must be used when there is no risk of erosion)
 - 6.3. Leveling bolts
 - 6.4. Grading brackets
 - 6.5. Grading beams
7. When truck lanes are not cast together (monolithic), the panel edge must be supported or the longitudinal joint must have a system to prevent relative vertical displacement of panels. This could be, but is not limited to:
 - 7.1. Additional reinforcement at the longitudinal edges
 - 7.2. Key and keyway
 - 7.3. Dual keyway with shear key
 - 7.4. Tie bar retrofit
8. Bond breaker must comply with section 36-2.if applicable.
9. You could use synthetic fibers in concrete mix, provided that fibers do not adversely impact panel surface final finishing and grindings.

For alternate system approval, the process consists of two parts. In Part 1, the system designer shall prepare and submit specification, fabrication drawings, and installation procedures. Part 2 of the approval process will consist of construction and evaluation of a trial installation. Final approval and use as an approved system will be given once the specification, fabrication drawings and installation procedures have been completed, the trial panels have been installed in accordance with the approved process and the Department has determined the trial installation is successful.

If you choose to use patented components in the PJCP, you must pay any applicable royalties.

Any new idea or process proposed for use as part of the alternative design which is approved and allowed on the job will become property of the Department and no patent could be filed for that idea or process.

40-8.01D Quality Control and Assurance

40-8.01D(1) General

Section 40-1.01D does not apply.

Test the coefficient of thermal expansion for each mix design.

Provide a QC manager.

Arrange for a prepaving conference facility and hold the conference after submitting the shop drawings, and 10 business days before beginning installation activities including test strip. Discuss methods of performing the installation work.

At the minimum, the meeting must be attended by your:

1. Project superintendent
2. QC manager
3. Installation construction foreman
4. Subcontractor's workers including:
 - 4.1. Fabricator's project manager
 - 4.2. Personnel responsible for saw cutting, underslab grouting and joint sealing

40-8.01D(2) Quality Control Testing

Construct pavement test strips and obtain authorization of your test strips before starting other paving work. Test strips must comply with the authorized shop drawings and be:

1. At least 300 feet long
2. Same width as shown on the authorized shop drawings
3. Same cross-section dimensions as for the highest rate of superelevation as shown on the authorized shop drawings

Notify the Engineer at least 25 working days before you start test strip installation.

Allow 3 business days for test strip review.

Test strip is rejected if:

1. Panels do not comply with alignment criteria
2. Before grouting, there are voids more than 1/4 inch between base and bottom of panel
3. Joint width exceeds its acceptable tolerance
4. Surface varies more than 0.02 foot from a 12-foot straightedge's lower edge
5. Wheel path's individual high points are greater than 0.025 foot in 25 feet
6. Final finishing does not comply with the specifications except coefficient of friction
7. Excess grout flows from under the panel into joints, dowel slots or onto the pavement.

If the test strip complies with the acceptance criteria except for the coefficient of friction, you may grind the test strip under section 42. If the test strip complies with the acceptance criteria after grinding, you may request to leave the test strip in place.

If the test strip does not comply with the panel alignment criteria, submit revised shop drawings that include your proposed changes to correct the alignment. After the revised submittals are authorized, install a new test strip. Repeat this process until the test strip complies with the acceptance criteria.

Remove and dispose of rejected test strips.

Construct additional test strips if you change:

1. Methods and equipment including:
 - 1.1. Fabrication plants
 - 1.2. Panel lifting, shipment, and delivery methods
 - 1.3. Grouting equipment
 - 1.4. Connections to the existing pavement
2. Base layer preparation method
3. Grout mix for under the slab
4. Panel leveling methods

If you have successfully installed PJCP on a previous Department project and used the same fabrication plant, installation equipment and procedures, and personnel, you may request authorization to start precasting without a test strip. Your request must include supporting documentation from the previous Department project.

40-8.01D(3) Pavement Acceptance

40-8.01D(3)(a) General

Construct PJCP panels to the dimensions shown on the authorized shop drawings. PJCP panels are rejected if the fabricated dimensions are not within the tolerances shown in the following table:

PJCP Panel Fabrication	
Dimension	Tolerances
Length (longer dimension)	+/- 1/4 inch
Width (shorter dimension)	+/- 1/8 inch
Nominal thickness	+/- 1/16 inch
Edge alignment straightness measured from a horizontal plane	+/- 1/8 inch
Skew at the ends	+/- 1/8 inch
Batter	+/- 1/16 inch
Position of pre-tensioning strands	+/- 1/8 inch, vertical ^a
	+/- 1/8 inch, horizontal
Diagonal difference of the corner to corner measurement	+/- 1/8 inch
Position of lifting anchors	+/- 3 inches

^aMeasured from the bottom of the panel

The profile and grade of the finished PJCP must match the existing pavement including any superelevation and superelevation transition. PJCP panels are rejected if the installed alignments are not within the tolerances shown in the following table:

PJCP Panel Installation	
Alignment	Tolerances
Vertical at transverse joints	+/- 1/4 inch
Vertical at longitudinal joints	+/- 1/4 inch
Horizontal at transverse joints	+/- 1/8 inch
Horizontal at longitudinal joints	+/- 1/4 inch

40-8.02 MATERIALS

40-8.02A General

Proportion grout for under slab grouting under ASTM C938 or use prepackaged grout complying with ASTM C1107. Fine aggregate, if used, must meet grading 2 in ASTM C637. Proportion the ingredients of the grout to meet the following properties:

Quality Characteristic	Test method	Requirement
Strength at 1 hr: @73°F @45°F	ASTM C942	2500 PSI Min 2000 PSI Min
Strength at 7 days @73°F @45°F	ASTM C942	7600 PSI Min 6000 PSI Min
Expansion	ASTM C940	0 to 3%
Bleeding at 30 min	ASTM C940	0.1% Max
Eflux Time	ASTM C939	15 to 30 seconds
Grout Bond Strength, bond to dry PCC	CT 551	150 PSI Min in 24 hr
Note: For tests at 45°F condition materials to 45°F for 24 hr before fabrication and store specimens at 45°F until testing		

Polyester concrete must comply with section 41-1.

Tack coat must comply with section 39.

For panels with traffic loop detectors, use glass fiber reinforced polymer (GFRP) in compliance with section 40-1.02C of these special provisions

40-8.02B Prestressing

Prestressing must comply with section 50-1.02.

Transverse pretensioning strand must be either 0.5 or 0.6 inch diameter and comply with ASTM Designation: A 416, Grade 270 (low relaxation).

40-8.02C Expansion Cap

Expansion cap must comply with section 41-8.

40-8.02D Joint Filler

Joint filler material must comply with ASTM D1742 or ASTM D7174, and must be compatible with polyester concrete.

40-8.03 CONSTRUCTION

40-8.03A General

Prestressing must comply with section 50-1.03. The specification for a "member" applies to a PJCP panel.

Where existing pavement is replaced with PJCP, replace only the portion of pavement where the work will be completed during the same lane closure. If installation of the PJCP is not completed during the same lane closure, comply with the specifications for temporary roadway pavement structure in section 41-9.

40-8.03B Furnishing PJCP

If the roadway alignment is on a curve with a radius less than 2, 500 feet, place the reinforcement along a single plane. If the curve does not allow the spacing shown between transverse bar reinforcement and prestress, space them a distance that is between one half the specified spacing and the specified spacing. Before casting, grease the section of dowels extending into the expansion sleeve.

Lifting devices must be recessed at least 1/2 inch below the panel surface and a distance of at least 0.2L from any panel edge.

After casting and before curing, comply with section 40-1.03M.

Section 40-1.03N does not apply. Cure PJCP under section 90-4.

Section 40-1.03O does not apply.

PJCP must have a minimum compressive strength of 4,000 psi prior to the time of releasing the pretensioning strands or moving PJCP panels. Before shipping, PJCP must have a minimum compressive strength of 6,000 psi and must have cured for at least 14 days.

40-8.03C Installing PJCP

40-8.03C(1) General

The existing concrete pavement at transverse or longitudinal joints may be saw cut to a maximum of 3 inches from the joint in order to provide a straight edge for a uniform conform.

Grade the new base or existing base and remove loose and unstable material. If leveling course is used, limit the maximum thickness of the layer to 2".

Before installing PJCP, clean and dry the surface of the base and place the bond breaker on it. The bond breaker must be free of wrinkles and overlapped at least 6 inches in the same direction as the panel installation.

Before installing PJCP panels, attach joint filler across the full length and depth of the transverse and longitudinal joint faces, except at joint keys and keyways. Place the top of the joint filler flush with the top edge of the panel and extend it to the bottom edge of the panel. Secure joint filler to the panel face and prevent it from moving, curling, tearing and other damage. Repair or replace damaged joint filler.

At dowel slots, joint filler installation must comply with caulking and foam inserts requirement.

When truck lanes are not cast together (monolithic), the panel edge must be supported or the longitudinal joint must have a system to prevent relative vertical displacement of panels. Use additional reinforcement at the longitudinal edges, key and keyway, dual keyway with shear key, or tie bar retrofit.

40-8.03C(2) Backfilling

Fill dowel bar slots in the PJCP and existing concrete pavement as soon as possible after panel placement and prior to opening to traffic. Fill dowel bar slots with polyester concrete in accordance with section 41-8, or "Dowel Bar Slots" in these special provisions.

Backfill voids or recessions in the panels related to lifting anchors with polyester concrete.

40-8.03C(3) Grouting

Before grouting, fill dowel bar slots and shear keys with polyester concrete. Consolidate the polyester concrete in place and finish the surface to match the pavement surface. If cracks appear, replace the concrete.

If dowel bar slots and shear keys are unable to be filled prior to opening to traffic, install temporary covers to withstand traffic loading. Fasten the temporary covers to the panels so they are not disturbed or dislodged by traffic and are flush with the surface of the pavement. Do not leave temporary covers at any given location for more than 48 hours. Do not use other filler materials before final filling. Clean slots before filling.

Inject grout under section 41-2.01C and 41-2.03, except do not drill holes, or inject water into holes. Complete underslab grouting prior to opening to traffic.

Backfill any gaps that remain between PJCP and existing AC to remain in place with underslab grout.

40-8.03D Panel Repair

Repair panels damaged during removal from forms and handling in compliance with section 41-4, except polyester concrete must be used. Repairs are required when any surface of the panel is damaged and will affect ride quality, assembly of the panels, or long-term performance of the pavement. Treat the cracks that do not extend to the full depth of a panel with a high molecular weight methacrylate resin in compliance with section 41--3" Crack Treatment".

Seal joints that have a width greater than ¼ inch and less than ¾ inch with preformed compression seals in compliance with section 41-5. For joint widths between ¾" and 1 ½", use the details shown on the plans. Remove and replace the panels when joint width is more than 1 ½".

40-8.04 PAYMENT

Precast jointed concrete pavement is measured based on the dimensions shown.

If the Engineer accepts a test strip for use as roadway, the test strip is paid for as precast jointed concrete pavement.

**Replace section 40-10 in the RSS for section 40 with:
40-10 SHOULDER CONCRETE PAVEMENT**

40-10.01 GENERAL

Section 40-10 includes specifications for constructing concrete shoulders.

Construct concrete shoulder as either:

1. CRCP under section 40-2
2. JPCP under section 40-4
3. JPCP—RCC under section 40-6
4. PJCP under section 40-8

Only use CRCP to construct concrete shoulder if adjacent pavement is CRCP.

Dowel bars and tie bars do not apply to shoulders constructed using JPCP.

40-10.02 MATERIALS

Reserved

40-10.03 CONSTRUCTION

Construct CRCP shoulder with tie bars between shoulder and pavement.

40-10.04 PAYMENT

Reserved

Replace section 83-2.02G with:

83-2.02G Rustic Rock Barrier Pattern

Apply the rustic rock barrier pattern shown to the Type 60 series concrete barriers.

Only apply a soft brush finish to the top and lip of the concrete barrier.

Before constructing the concrete barriers with the rustic rock barrier pattern, construct a 10-foot-long test section of the Type 60G concrete barrier, including the pattern. The Engineer may request additional test sections until the pattern shown is attained. Additional test sections are change order work. The test section must be authorized before constructing the concrete barriers.

The authorized test section will be the standard of comparison in determining acceptability of the concrete barrier with the rustic rock barrier pattern.

Dispose of the test section after the completion and acceptance of the concrete barriers with the rustic rock barrier pattern.

Replace "section 86-2.06E" with:

86-2.06E Tamper Resistant Cover for Pull Box

86-2.06E(1) General

86-2.06E(1)(a) Summary

Section 86-2.06E includes specification for installing tamper resistant (TR) cover on traffic pull box.

86-2.06E(1)(b) Definitions

Fastening hardware: Bolts with necessary nuts and washers, fasteners, hex or lock nuts, or other metal components to lock the TR cover.

86-2.06E(1)(c) Submittals

Submit a list of materials, contract number, manufacturer's name, and manufacturer's instructions for installation before shipping TR cover and accessories to the job site.

Submit warranty documentation before installation.

86-2.06E(1)(d) Quality Control and Assurance

Miscellaneous iron and steel materials under section 75-1.02.

Galvanized metal parts under section 75-1.05.

Pull box steel cover must comply with ASTM C857 for HS20 loading.

86-2.06E(1)(d)(i) Warranty

Furnish a 2 year replacement warranty from the manufacturer for the TR cover and accessories against any defects or structural failures. The effective date of the warranty is the date of contract acceptance. Replacement parts must arrive within 5 business days after receipt of the failed parts. The Department does not pay for replacement parts. Deliver replacement parts to the following Department's Maintenance Electrical Shop.

Burbank Electrical Maintenance Yard
602 S Flower Street
Burbank, CA 91502

86-2.06E(2) Materials

Provide pull box cover and accessories. TR cover marking must comply with 86-2.06A(1).

Non-welded stainless steel fastening hardware must be passivated stainless steel type 304, 304L, 305, 316, 316L, or UNS Designation S30430. Welded stainless steel fastening hardware must be passivated stainless steel type 304L or 316L with 308L filler metal for 304L and 316L filler metal for 316L.

Provide:

1. A factory welded, non-skid steel embossed cover with an all around steel security skirt sized to fit inside the pull box
2. L shape steel anchor rod not less than 1 inch diameter by 4 feet long for the No. 5 pull box and not less than 1 inch diameter by 5 feet long for No. 6 pull box
3. Stainless steel top cap, steel hex nuts and lock nuts
4. Epoxy.

TR cover and accessories must be manufactured by one of the following companies or equal:

1. Factory Direct Fastening, Inc., 5655 Cahuenga Blvd, North Hollywood, CA 91601. Telephone (800) 942-4844.
2. ERC, Inc., 2970 E Maria, Rancho Dominguez, CA 90221. Telephone (310) 941-9390.
3. Pendarvis Manufacturing, 1808 American St, Anaheim, CA 92801. Telephone (714) 992-0950.

TR cover manufactured by FDF is patented and royalty payments may apply.

Provide epoxy to fill the lock nut socket space. Epoxy must conform to Loc-tite no. E-120HP or Scotch-weld no. DP460 or Devcon Plus 25 no.14278 or equal.

CONTRACT NO. 07-2881U4
REPLACED PER ADDENDUM NO. 3 DATED OCTOBER 3, 2014

86-2.06E(3) Construction

Ground and bond TR cover.

Top of TR cover must be flush with finished grade for pull boxes installed in paved areas.

Install TR cover as follows:

1. Dig 8 inch diameter by 5 feet deep hole and install L shape steel anchor rod, set center of the pull box to coincide with the anchor rod. Include a provision for drain hole for the pull box.
2. Install pull box over the steel anchor rod and conduits.
3. Stabilize and align the anchor rod. Ensure the anchor rod is vertical and concentric with the pull box.
4. Pour concrete around anchor rod only for pull box to be installed in paved area. Do not cover conduits and conductors with concrete.
5. Pour concrete around anchor rod and outside pull box to a width of 6 inch around the pull box and under it for pull box to be installed in non-paved area. Do not cover conduits and conductors with concrete.
6. Secure TR cover to the anchor rod with penta head nut.
7. Add epoxy to fill the lock nut socket space.
8. Fix top cap.
9. For new pull boxes adjacent to lighting standards, the fuse inside the pull box must be rated at 10 A. For existing pull boxes, replace the existing 5 A fuse with a 10 A. Install a 3 A fuse in the circuit in the lighting standard handhole.

For existing pull boxes in paved areas, remove existing pull box cover. Install TR cover and accessories under manufacturer's instructions.

86-2.06E(4) Payment

Not Used.

BID ITEM LIST**07-2881U4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	150757	REMOVE SIGN STRUCTURE (EA)	EA	46		
42	150771	REMOVE ASPHALT CONCRETE DIKE	LF	149,000		
43	150812	REMOVE PIPE (LF)	LF	3,500		
44	150820	REMOVE INLET	EA	73		
45	150853	REMOVE CONCRETE PAVEMENT (SQYD)	SQYD	283,000		
46	150860	REMOVE BASE AND SURFACING	CY	960		
47	150870	REMOVE CONCRETE DECK SURFACE	SQFT	1,810		
48	027672	SALVAGE PRECAST CONCRETE SLABS	SQFT	12,300		
49	151251	SALVAGE IRRIGATION FACILITY	LS	LUMP SUM	LUMP SUM	
50	152390	RELOCATE ROADSIDE SIGN	EA	1		
51	152430	ADJUST INLET	EA	2		
52	152454	ADJUST PULL BOX	EA	40		
53	152604	MODIFY INLET	EA	14		
54	153103	COLD PLANE ASPHALT CONCRETE PAVEMENT	SQYD	69,300		
55	153221	REMOVE CONCRETE BARRIER	LF	32,100		
56	153225	PREPARE CONCRETE BRIDGE DECK SURFACE	SQFT	13,770		
57	153226	REFINISH BRIDGE DECK	SQFT	7,610		
58	153227	FURNISH POLYESTER CONCRETE OVERLAY	CF	1,550		
59 (F)	153228	PLACE POLYESTER CONCRETE OVERLAY	SQFT	13,770		
60	155003	CAP INLET	EA	1		

BID ITEM LIST**07-2881U4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61	156585	REMOVE CRASH CUSHION	EA	4		
62	157561	BRIDGE REMOVAL (PORTION), LOCATION A	LS	LUMP SUM	LUMP SUM	
63	157562	BRIDGE REMOVAL (PORTION), LOCATION B	LS	LUMP SUM	LUMP SUM	
64	157563	BRIDGE REMOVAL (PORTION), LOCATION C	LS	LUMP SUM	LUMP SUM	
65	157564	BRIDGE REMOVAL (PORTION), LOCATION D	LS	LUMP SUM	LUMP SUM	
66	157565	BRIDGE REMOVAL (PORTION), LOCATION E	LS	LUMP SUM	LUMP SUM	
67	157566	BRIDGE REMOVAL (PORTION), LOCATION F	LS	LUMP SUM	LUMP SUM	
68	157567	BRIDGE REMOVAL (PORTION), LOCATION G	LS	LUMP SUM	LUMP SUM	
69	157568	BRIDGE REMOVAL (PORTION), LOCATION H	LS	LUMP SUM	LUMP SUM	
70	157569	BRIDGE REMOVAL (PORTION), LOCATION I	LS	LUMP SUM	LUMP SUM	
71	157570	BRIDGE REMOVAL (PORTION), LOCATION J	LS	LUMP SUM	LUMP SUM	
72	157571	BRIDGE REMOVAL (PORTION), LOCATION K	LS	LUMP SUM	LUMP SUM	
73	157572	BRIDGE REMOVAL (PORTION), LOCATION L	LS	LUMP SUM	LUMP SUM	
74	157573	BRIDGE REMOVAL (PORTION), LOCATION M	LS	LUMP SUM	LUMP SUM	
75	044684	BRIDGE REMOVAL (PORTION), LOCATION N	LS	LUMP SUM	LUMP SUM	
76	044685	BRIDGE REMOVAL (PORTION), LOCATION O	LS	LUMP SUM	LUMP SUM	
77	044686	BRIDGE REMOVAL (PORTION), LOCATION P	LS	LUMP SUM	LUMP SUM	
78	160102	CLEARING AND GRUBBING (LS)	LS	LUMP SUM	LUMP SUM	
79	190101	ROADWAY EXCAVATION	CY	277,000		
80	190105	ROADWAY EXCAVATION (TYPE Z-2) (AERIALY DEPOSITED LEAD)	CY	1,230		

BID ITEM LIST

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Item No.	Item Code	Item Description	Unit of Meas	Estimated Quantity	Unit Price	Item Total
101 (F)	208597	1 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	250		
10 (F)2	208598	2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	1,020		
103 (F)	208599	2 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	870		
104	208683	BALL VALVE	EA	4		
105	260303	CLASS 3 AGGREGATE BASE (CY)	CY	76,600		
106	027673	AGGREGATE BASE CEMENT SLURRY	CY	18,000		
107	027674	ALTERNATE TREATED BASE	CY	50,000		
108	280015	LEAN CONCRETE BASE RAPID SETTING	CY	4		
109	280200	REPLACE BASE	CY	360		
110	360200	BASE BOND BREAKER	SQY D	490,000		
111	027675	HIGH FRICTION SURFACE TREATMENT	SQY D	18,200		
112	390095	REPLACE ASPHALT CONCRETE SURFACING	CY	7,980		
113	390300	HOT MIX ASPHALT, SUPERPAVE (TYPE A)	TON	4,170		
114	390301	RUBBERIZED HOT MIX ASPHALT, SUPERPAVE (GAP GRADED)	TON	7,720		
115	394073	PLACE HOT MIX ASPHALT DIKE (TYPE A)	LF	127,000		
116	394074	PLACE HOT MIX ASPHALT DIKE (TYPE C)	LF	2,450		
117	394075	PLACE HOT MIX ASPHALT DIKE (TYPE D)	LF	760		
118	394077	PLACE HOT MIX ASPHALT DIKE (TYPE F)	LF	580		
119	400050	CONTINUOUSLY REINFORCED CONCRETE PAVEMENT	CY	150		
120	027676	CONTINUOUSLY REINFORCED CONCRETE PAVEMENT - RAPID STRENGTH CONCRETE	CY	520		

BID ITEM LIST

07-2881U4

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
121	401050	JOINTED PLAIN CONCRETE PAVEMENT	CY	95,200		
122	401055	JOINTED PLAIN CONCRETE PAVEMENT (RSC)	CY	180		
123	027677	PRECAST JOINTED CONCRETE PAVEMENT (PJCP)	CY	34,200		
124	027678	SHOULDER CONCRETE PAVEMENT	CY	2,250		
125	027679	INDIVIDUAL PRECAST SLAB REPLACEMENT (IPSR)	CY	520		
126	420201	GRIND EXISTING CONCRETE PAVEMENT	SQYD	421,000		
127	498052	60" CAST-IN-DRILLED-HOLE CONCRETE PILE (SIGN FOUNDATION)	LF	1,090		
128 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	193		
129 (F)	510060	STRUCTURAL CONCRETE, RETAINING WALL	CY	420		
130	510081	AGGREGATE BASE (APPROACH SLAB)	CY	743		
131	510087	STRUCTURAL CONCRETE, APPROACH SLAB (TYPE R)	CY	7,445		
132 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	294		
133	510800	PAVING NOTCH EXTENSION	CF	4,225		
134	511106	DRILL AND BOND DOWEL	LF	545		
135	511118	CLEAN EXPANSION JOINT	LF	760		
136	519081	JOINT SEAL (MR 1/2")	LF	3,327		
137	519088	JOINT SEAL (MR 1")	LF	2,300		
138	519091	JOINT SEAL (MR 1 1/2")	LF	1,385		
139	519100	JOINT SEAL (MR 2")	LF	629		
140 (F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	25,500		

BID ITEM LIST

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
181	820107	DELINEATOR (CLASS 1)	EA	270		
182	027681	INSTALL MEDIAN MILEAGE PANEL	EA	64		
183	832015	MIDWEST GUARDRAIL SYSTEM (7' WOOD POST)	LF	8,310		
184	832070	VEGETATION CONTROL (MINOR CONCRETE)	SQYD	5,230		
185	044688	CONCRETE BARRIER (TRANSITION)	LF	133		
186	839221	DOUBLE MIDWEST GUARDRAIL SYSTEM (WOOD POST)	LF	310		
187 (F)	839521	CABLE RAILING	LF	512		
188	839543	TRANSITION RAILING (TYPE WB-31)	EA	36		
189	839576	END CAP (TYPE A)	EA	5		
190	839581	END ANCHOR ASSEMBLY (TYPE SFT)	EA	32		
191	839584	ALTERNATIVE IN-LINE TERMINAL SYSTEM	EA	33		
192	839585	ALTERNATIVE FLARED TERMINAL SYSTEM	EA	24		
193	027682	CRASH CUSHION (TYPE SCI SMART 100 GM)	EA	6		
194 (F)	044689	RUSTIC ROCK BARRIER PATTERN	LF	75,726		
195 (F)	044690	CONCRETE BARRIER (TYPE 60A MODIFIED)	LF	4,339		
196 (F)	044691	CONCRETE BARRIER (TYPE 60A MODIFIED 1)	LF	656		
197	027683	CONCRETE ANCHOR BLOCK	CY	19		
198	027684	CONCRETE BARRIER (TYPE 60F MODIFIED)	LF	40		
199	839700	CONCRETE BARRIER (TYPE 60F)	LF	2,940		
200	839701	CONCRETE BARRIER (TYPE 60)	LF	13,700		

BID ITEM LIST

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Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
201	839703	CONCRETE BARRIER (TYPE 60C)	LF	310		
202	839704	CONCRETE BARRIER (TYPE 60D)	LF	520		
203	027685	CONCRETE BARRIER (TYPE 60W)	LF	970		
204	027686	CONCRETE BARRIER (TYPE 60W MODIFIED)	LF	19,300		
205 (F)	027687	CONCRETE BARRIER (TYPE 736B MODIFIED)	LF	19,615		
206	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	307,000		
207	840506	8" THERMOPLASTIC TRAFFIC STRIPE	LF	38,100		
208	840508	8" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 12-3)	LF	25,800		
209	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	6,090		
210	840525	4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 36-12)	LF	358,000		
211	840526	4" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 17-7)	LF	9,590		
212	840550	8" THERMOPLASTIC TRAFFIC STRIPE (BROKEN 36-12)	LF	1,950		
213	BLANK					
214	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	1,110,000		
215	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	29,900		
216	850111	PAVEMENT MARKER (RETROREFLECTIVE)	EA	21,700		
217	860090	MAINTAINING EXISTING TRAFFIC MANAGEMENT SYSTEM ELEMENTS DURING CONSTRUCTION	LS	LUMP SUM	LUMP SUM	
218	860400	LIGHTING (TEMPORARY)	LS	LUMP SUM	LUMP SUM	
219	027688	TEMPORARY MICROWAVE VEHICLE DETECTION SYSTEM (MVDS)	LS	LUMP SUM	LUMP SUM	
220	860807	INDUCTIVE LOOP DETECTOR	LS	LUMP SUM	LUMP SUM	

BID ITEM LIST**07-2881U4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
221	861088	MODIFY RAMP METERING SYSTEM	LS	LUMP SUM	LUMP SUM	
222	027689	MODIFY AUTOMATIC VEHICLE CLASSIFICATION STATION	LS	LUMP SUM	LUMP SUM	
223	861504	MODIFY LIGHTING AND SIGN ILLUMINATION	LS	LUMP SUM	LUMP SUM	
224	044692	TUNNELS AND CONTROL BUILDING	LS	LUMP SUM	LUMP SUM	
225	BLANK					
226	204008	PLANT (GROUP H)	EA	36,300		
227	397005	TACK COAT	TON	55		
228	BLANK					
229	414242	ISOLATION JOINT SEAL (PREFORMED COMPRESSION)	LF	160,000		
230	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID:**\$**
