

**DEPARTMENT OF TRANSPORTATION**  
DIVISION OF ENGINEERING SERVICES  
OFFICE ENGINEER, MS 43  
1727 30<sup>TH</sup> STREET  
P.O. BOX 168041  
SACRAMENTO, CA 95816-8041  
FAX (916) 227-6214  
TTY 711



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January 14, 2010

03-Pla-65-R4.8 / R8.8  
03-3M2904

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN PLACER COUNTY IN AND NEAR ROSEVILLE AT VARIOUS LOCATIONS FROM ROUTE 65/80 SEPARATION TO PLEASANT GROVE CREEK BRIDGE.

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 Wednesday, January 20, 2010.

This addendum is being issued to revise the Notice to Bidders and Special Provisions, and provide a copy of the Information Handout.

In the "NOTICE TO BIDDERS," the tenth sentence is revised as follows:

"Complete the work within 70 working days."

In the Special Provisions, Section 4, "BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES," is revised as follows:

"Complete the work within 70 working days starting on the 15<sup>th</sup> day after contract approval or on the day you start work at the job site, whichever occurs first."

In the Special Provisions, Section 5-1.08, "SUPPLEMENTAL PROJECT INFORMATION," is revised as attached.

In the Special Provisions, Section 8-2.01, "RAPID STRENGTH CONCRETE FOR STRUCTURES," is added as attached.

In the Special Provisions, Section 10-1.21, "CORE TREATED BRIDGE DECK," is revised as attached.

In the Special Provisions, Section 10-1.24, "BRIDGE DECK RESIN TREATMENT," is revised as attached.

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03-3M2904

To Bid book holders:

Attached is a copy of the Information Handout.

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.

Indicate receipt of this addendum by filling in the number of this addendum in the space provided on the signature page of the Bid book.

Submit bids in the Bid book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.

Inform subcontractors and suppliers as necessary.

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

**[http://www.dot.ca.gov/hq/esc/oe/project\\_ads\\_addenda/03/03-3M2904](http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/03/03-3M2904)**

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,

**ORIGINAL SIGNED BY**

JODY JONES  
District Director

Attachments

**5-1.08 SUPPLEMENTAL PROJECT INFORMATION**

The Department makes the following supplemental project information available:

Included in the Information Handout	STANDARD TEST METHOD FOR PENETRATION OF CRACK FILLING RESIN BY CAPILLARY ACTION
Available as specified in the Standard Specifications	Bridge as-built drawings

## **8-2.01 RAPID STRENGTH CONCRETE FOR STRUCTURES**

### **GENERAL**

#### **Summary**

This section includes specifications for rapid strength concrete (RSC) for structures. You may only use RSC when specified elsewhere in these special provisions.

#### **Definitions**

**Opening age:** The age at which the concrete will achieve the specified strength for opening to public or construction traffic.

#### **Submittals**

##### **Mix Design**

Submit the RSC mix design at least 10 days before use. If a trial slab is required, submit the RSC mix design at least 10 days before constructing the trial slab. Include the following in the submittal:

1. Compressive strength test results for prequalification of RSC at age of break, at 3 days, and at 28 days
2. Opening age
3. Proposed aggregate grading
4. Mix proportions of cementitious material, aggregate, and water
5. Types and amounts of chemical admixtures, if used
6. Range of ambient temperatures over which the mix design will achieve the required minimum compressive strength
7. Source of materials

##### **Volumetric Proportioning**

When using volumetric proportioning, submit the following:

1. Aggregate moisture test results
2. Log of production data

##### **Certificate of Compliance**

Submit a Certificate of Compliance under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications with each delivery of aggregate, cementitious material, and admixtures used for calibration tests. Include certified copies of the weight of each delivery.

The Certificate of Compliance must state that the source of materials used for the calibration tests is from the same source as to be used for the planned work. The Certificate of Compliance must be signed by an authorized representative.

#### **Quality Control and Assurance**

##### **Prequalification of RSC**

Prequalification of a RSC mix design includes determining the opening age and achieving the minimum specified 28-day compressive strength.

Prequalify RSC under the specifications for prequalification of concrete specified by compressive strength in Section 90-9.01, "General," of the Standard Specifications. Determine the opening age as follows:

1. Fabricate at least 5 test cylinders to be used to determine the age of break.
2. Immediately after fabrication of the 5 test cylinders, store the cylinders in a temperature medium of  $70 \pm 3$  °F until the cylinders are tested.
3. Determine the age of break to achieve an average strength of the 5 test cylinders of not less than 1200 psi. Not more than 2 test cylinders shall have a strength of less than 1150 psi.
4. The opening age is the age of break plus 1 hour.

## Weighmaster Certifications

Weighmaster certificates for RSC, regardless of the proportioning method used, must include all information necessary to trace the manufacturer and manufacturer's lot number for the cement being used. When proportioned into fabric containers, the weighmaster certificates for the cement must contain the date of proportioning, location of proportioning, and actual net draft weight of the cement. When proportioned at the job site from a storage silo, the weighmaster certificates must contain the date of proportioning, location of proportioning, and the net draft weight of the cement used in the load.

## MATERIALS

### General

RSC must comply with one of the following:

1. Concrete made with portland cement concrete and a nonchloride Type C chemical admixture. The concrete must comply with Section 90, "Portland Cement Concrete," of the Standard Specifications, except that Type III cement may be used.
2. Concrete made with a proprietary cementitious material. The concrete must comply with Section 90, "Portland Cement Concrete," of the Standard Specifications, except that:
  - 2.1. Cementitious material shall meet the definition of hydraulic cement in ASTM C 219, and the following:

#### Proprietary Cementitious Material

Test Description	Test Method	Requirement
Contraction in Air	California Test 527, w/c ratio = 0.39±0.010	0.053%, max.
Mortar Expansion in Water	ASTM C 1038	0.04%, max.
Soluble Chloride*	California Test 422	0.05%, max.
Soluble Sulfate*	California Test 417	0.30%, max.
Thermal Stability	California Test 553	90%, min.
Compressive Strength @ 3 days	ASTM C 109	2500 psi

\*Test is to be done on a cube specimen fabricated in conformance with the requirements in ASTM C 109, cured at least 14 days, and then pulverized so that 100% passes the No. 50 sieve.

- 2.2. Citric acid or borax may be used if requested in writing by the cement manufacturer and a sample is submitted to the Engineer. Chemical admixtures, if used, shall be included when testing for requirements listed in the table above.

RSC must have a minimum 28-day compressive strength of 3600 psi, except that RSC placed in bridge decks must have a minimum 28-day compressive strength of 4500 psi and must comply with the shrinkage limitations as specified for bridge deck concrete in Section 90-1.01, "Description," of the Standard Specifications.

Supplementary cementitious material is not required.

Penetration requirements of Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications do not apply.

## CONSTRUCTION

### General

RSC may be proportioned and placed by a volumetric mixer.

### Volumetric Proportioning

RSC proportioned by a volumetric mixer must comply with the requirements specified herein.

Proportion liquid admixtures under Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures," of the Standard Specifications, except proportion liquid admixtures with a meter.

Batch-mixer trucks must proportion cement, water, aggregate, and additives by volume. Aggregate feeders must be connected directly to the drive on the cement vane feeder. The cement feed rate must be tied directly to the feed rate for the aggregate and other ingredients. Only change the ratio of cement to aggregate by changing the gate opening for the aggregate feed. The drive shaft of the aggregate feeder must have a revolution counter reading to the nearest full or partial revolution of the aggregate delivery belt.

Proportion aggregate with a belt feeder operated with an adjustable cutoff gate delineated to the nearest quarter increment. The gate opening height must be readily determinable. Proportion cement by any method that complies with the accuracy tolerance specifications. Proportion water with a meter under Section 9-1.01, "Measurement of Quantities," of the Standard Specifications.

Calibrate the cutoff gate for each batch-mixer truck used and for each aggregate source. Calibrate batch-mixer trucks at 3 different aggregate gate settings that are commensurate with production needs. Perform at least 2 calibration runs for each aggregate gate.

Individual aggregate delivery rate check-runs must not deviate more than 1.0 percent from the mathematical average of all runs for the same gate and aggregate type. Each test run must be at least 1,000 pounds.

At the time of batching, dry and drain aggregates to a stable moisture content. Do not proportion aggregates with visible separation of water from the aggregate during proportioning. At the time of batching, the free moisture content of fine aggregate must not exceed 8 percent of its saturated, surface-dry weight.

If the proportioning plant has separate supplies of the same size group of aggregate with different moisture content, specific gravity, or surface characteristics affecting workability, exhaust 1 supply before using another supply.

Cover rotating and reciprocating equipment on batch-mixer trucks with metal guards.

Individual cement delivery rate check-runs must not deviate more than 1.0 percent of the mathematical average of 3 runs of at least 1,000 pounds each.

When the water meter operates between 50 percent and 100 percent of production capacity, the indicated weight of water delivered must not differ from the actual weight delivered by more than 1.5 percent for each of 2 runs of 300 gallons. Calibrate the water meter under California Test 109. The water meter must be equipped with a resettable totalizer and display the operating rate.

Conduct calibration tests for aggregate, cement, and water proportioning devices with a platform scale located at the calibration site. Platform scales for weighing test-run calibration material must have a maximum capacity of 2.75 tons with maximum graduations of 1 pound. Error test the platform scale within 8 hours of calibrating the batch-mixer truck proportioning devices. Perform error-testing with test weights under California Test 109. Furnish a witness scale that is within 2 graduations of the test weight load. The witness scale must be available for use at the production site throughout the production period. Equipment needed for the calibration of proportioning systems must remain available at the production site throughout the production period.

The batch-mixer truck must be equipped so that accuracy checks can be made. Recalibrate proportioning devices every 30 days after production begins or when you change the source or type of any ingredient.

A spot calibration is calibration of the cement proportioning system only. Perform a 2-run spot calibration each time 55 tons of cement passes through the batch-mixer truck. If the spot calibration shows the cement proportioning system does not comply with the specifications, complete a full calibration of the cement proportioning system before you resume production.

Locate cement storage immediately before the cement feeder. Equip the system with a device that automatically shuts down power to the cement feeder and aggregate belt feeder when the cement storage level is less than 20 percent of the total volume.

Determine aggregate moisture under California Test 223 at least every 2 hours during proportioning and mixing operations. Record aggregate moisture determinations and submit them at the end of each production shift.

Equip each aggregate bin with a device that automatically shuts down the power to the cement feeder and the aggregate belt feeder when the aggregate discharge rate is less than 95 percent of the scheduled discharge rate.

Proportioning device indicators must be in working order before beginning proportioning and mixing operations and must be visible when standing near the batch-mixer truck.

Identifying numbers of batch-mixer trucks must be at least 3 inches in height, and be located on the front and rear of the vehicle.

Mix volumetric proportioned RSC in a mechanically operated mixer. You may use auger-type mixers. Operate mixers uniformly at the mixing speed recommended by the manufacturer. Do not use mixers that have an accumulation of hard concrete or mortar.

Do not mix more material than will permit complete mixing. Reduce the volume of material in the mixer if complete mixing is not achieved. Continue mixing until a homogeneous mixture is produced at discharge. Do not add water to the RSC after discharge.

Do not use equipment with components made of aluminum or magnesium alloys that may have contact with plastic concrete during mixing or transporting of RSC.

The Engineer determines uniformity of concrete mixtures by differences in penetration measurements made under California Test 533. Differences in penetration are determined by comparing penetration tests on 2 samples of mixed concrete from the same batch or truck mixer load. The differences must not exceed 5/8 inch. Submit samples of freshly mixed concrete. Sampling facilities must be safe, accessible, clean, and produce a sample that is representative of production. Sampling devices and sampling methods must comply with California Test 125.

Do not use ice to cool RSC directly. If ice is used to cool water used in the mix, it must be melted before entering the mixer.

Proportion and charge cement into a mixer so that there are no losses of cement due to wind or accumulation on equipment, or other conditions that may vary the required quantity of cement.

Each mixer must have metal plates that provide the following information:

1. Designed usage
2. Manufacturer's guaranteed mixed concrete volumetric capacity
3. Rotation speed

The device controlling the proportioning of cement, aggregate, and water must produce production data. The production data must be captured at 15-minute intervals throughout daily production. Each capture of production data represents production activity at that time and is not a summation of data. The amount of material represented by each production capture is the amount produced in the period from 7.5 minutes before to 7.5 minutes after the capture time. Submit the daily production data in electronic or printed media at the end of each production shift. Report the data including data titles in the following order:

1. Weight of cement per revolution count
2. Weight of each aggregate size per revolution count
3. Gate openings for each used aggregate size
4. Weight of water added to the concrete per revolution count
5. Moisture content of each used aggregate size
6. Individual volume of other admixtures per revolution count
7. Time of day
8. Day of week
9. Production start and stop times
10. Batch-mixer truck identification
11. Name of supplier
12. Specific type of concrete being produced
13. Source of the individual aggregate sizes
14. Source, brand, and type of cement
15. Source, brand and type of individual admixtures
16. Name and signature of operator

You may input production data by hand into a pre-printed form or it may be captured and printed by the proportioning device. Present electronic media containing recorded production data in a tab delimited format on a CD or DVD. Each capture of production data must be followed by a line-feed carriage-return with sufficient fields for the specified data.

### **Curing Concrete**

For RSC made with a proprietary cement, the curing method must be as recommended by the manufacturer of the cement and as approved by the Engineer.

For RSC made using portland cement concrete, you must:

1. Cure the concrete using the curing compound method under Section 90-7.03, "Curing Structures," of the Standard Specifications. Fogging of the surface with water after the curing compound has been applied will not be required.
2. Repair immediately any damage to the film of the curing compound with additional compound. Do not repair damage to the curing compound after the concrete is opened to public traffic.

- Cover the surface with an insulating layer or blanket when the ambient temperature is below 65 °F during the curing period. The insulation layer or blanket shall have an R-value rating given in the table below. A heating tent may be used in lieu of or in combination with the insulating layer or blanket:

**R-Value Ratings**

Temperature Range During Curing Period	R-value, minimum
55 °F to 65 °F	1
45 °F to 55 °F	2
39 °F to 45 °F	3

If compressive strength tests are performed in the field showing that the concrete has achieved 1200 psi, you may open the lane to traffic at the age of break. Perform the compressive strength tests under the provisions for sampling and testing cylinders in Section 90-9.01, "General," of the Standard Specifications. The decision to use this option must be made in writing to the Engineer before beginning construction.

## **10-1.21 CORE TREATED BRIDGE DECK**

### **GENERAL**

#### **Summary**

This work includes taking deck core samples from methacrylate or epoxy-treated bridge decks and filling the holes with rapid setting concrete.

### **MATERIALS**

Rapid setting concrete must comply with "Rapid Setting Concrete Patches" of these special provisions.

Water for coring activities must contain no more than 1,000 PPM of chlorides as Cl and no more than 1,300 PPM of sulfates as SO<sub>4</sub>.

### **CONSTRUCTION**

Take 2 core samples 2 inches in diameter and 5 inches deep from each bridge deck span. Clean cored holes and fill with rapid setting concrete. Label core samples with the project contract number, bridge number, and span location. Submit core samples to the Engineer.

Core holes no sooner than 24 hours after placing methacrylate or epoxy resin. Core samples must be taken over an existing crack in the deck at a location determined by the Engineer. At most 8 core samples will be taken at each bridge.

Concrete adjacent to the holes must not be damaged during coring. Cored holes must be clean and dry before patching. Removing 1/8 inch of concrete during hole cleaning is not required.

### **MEASUREMENT AND PAYMENT**

Core treated bridge deck will be measured and paid for by the unit for each core sample.

The contract unit price paid for core treated bridge deck shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in coring the holes, including repairing damaged reinforcement and patching holes with rapid setting concrete, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

## 10-1.24 BRIDGE DECK RESIN TREATMENT

### GENERAL

#### Summary

This work includes furnishing, testing, and the application of methacrylate, or epoxy resin, and sand on bridge decks as shown on the plans and as specified in these special provisions.

#### Submittals

Before starting deck treatment, the Contractor shall submit plans in conformance with Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and these special provisions for the following:

#### Placement plan for the construction operation

The plan shall identify materials, equipment, and methods to be used.

The placement plan for construction shall include the following:

- A. Schedule of deck treatment for each bridge. The schedule shall be consistent with "Maintaining Traffic" of these special provisions and shall include time for the Engineer to perform California Test 342.
- B. Methods and materials to be used, including the following:
  1. Description of equipment for applying the resin
  2. Description of equipment for applying the sand
  3. Gel time range and final cure time for the resin
  4. List of on-site staff and description of on-site equipment to be on standby for abrasive blasting

Before treating bridge decks, the deck surface shall be cleaned, unsound concrete removed, and voids patched as shown on the plans and as specified in "Clean Bridge Deck" and "Remove Unsound Concrete" "Core Treated Bridge Deck", and "Rapid Setting Concrete (Patch)" of these special provisions.

### MATERIALS

Before using deck treatment resin, a Material Safety Data Sheet shall be submitted for each shipment of resin.

Deck treatment resin shall be either methacrylate with low odor and have a high molecular weight or low viscosity epoxy based resin. Deck treatment will meet the volatile organic content requirements in the Air Pollution Control District in which the project is located. Initiated resin shall conform to the following:

Methacrylate Resin Properties:

PROPERTY	REQUIREMENT	TEST METHOD
Average Resin Rise	35 mm minimum, at 25°C	California Test 555
* Specific Gravity	0.90 minimum, at 25°C	ASTM D 1475
* Flash Point	180°F, minimum	ASTM D 3278
Tack-free Time	400 minutes, maximum, at 25°C	Specimens prepared per California Test 551
Tensile Strength	2000 psi, minimum 1% minimum elongation at break	ASTM D 638, cross head speed 0.45 in/minute. Cure 24 hours at 25°C
PCC Saturated Surface-Dry Bond Strength	3.5 MPa, minimum at 24 hours and 21 ± 1°C	California Test 551
* Test shall be performed before adding initiator.		

Epoxy Resin Properties:

PROPERTY	REQUIREMENT	TEST METHOD
Average Resin Rise	35 mm minimum, at 25°C	California Test 555
Specific Gravity	0.90 minimum, at 25°C	ASTM D 1475
Tack-free Time	400 minutes, maximum, at 25°C	Specimens prepared per California Test 551
Tensile Strength	2000 psi, minimum 1% minimum elongation at break	ASTM D 638, cross head speed 0.45 in/minute. Cure 24 hours at 25°C
Bond Strength to Concrete	500 psi, minimum at 24 hours at 25°C	ASTM C 1583

**TESTING**

The Contractor shall allow 20 days for sampling and testing by the Engineer of the methacrylate resin before proposed use. If bulk resin is to be used, the Contractor shall notify the Engineer in writing at least 15 days before the delivery of the bulk resin to the job site. Bulk resin is any resin stored in containers in excess of 55 gallons.

Before starting production treatment, the Contractor shall treat a test area of approximately 500 square feet that is within the project limits and at a location approved by the Engineer. When available the test area shall be outside of the traveled way. Weather and pavement conditions during the test treatment shall be similar to those expected on the deck. Equipment used for testing shall be similar to those used for deck treating operations.

The acceptance criteria for a treated test area are as follows:

- A. The treated deck surface is tack free (non-oily).
- B. The sand cover adheres and resists brushing by hand.
- C. Excess sand has been removed.
- D. The coefficient of friction is at least 0.35 when tested in conformance with California Test 342.

Deck treatment on the test area shall demonstrate that the methods and materials meet the acceptance criteria and that the production work will be completed within the specified time for maintaining traffic.

If a test area fails to meet the acceptance criteria, as determined by the Engineer, the test will be rejected, and the treatment shall be removed and replaced until the test area complies with the acceptance criteria.

**CONSTRUCTION**

Equipment shall be fitted with suitable traps, filters, drip pans, or other devices as necessary to prevent oil or other deleterious material from being deposited on the deck.

When resin is applied by machine each component must be combined in volumetric streams, mixed in static in-line mixers and applied without atomization.

At the Contractor's option, manual application may be used. For manual application, the resin prepared for deck application must not exceed 5 gallons.

The Contractor shall apply deck treatment resin only to the specified area. Barriers, railing, joints, and drainage facilities shall be adequately protected to prevent contamination by the treatment material. Contaminated items shall be repaired at the Contractor's expense.

The relative humidity shall be less than 90 percent at the time of treatment. The prepared area shall be dry and the surface temperature shall be at least 50°F and not more than 100°F when the resin is applied. The rate of application of promoted/initiated resin shall be approximately 90 square feet per gallon; the exact rate shall be determined by the Engineer.

The deck surfaces to be treated shall be completely covered with resin so the resin penetrates and fills all cracks. The resin shall be applied within 5 minutes after complete mixing. A significant increase in viscosity shall be cause for rejection. Excess material shall be redistributed by squeegees and brooms within 10 minutes after application. For textured deck surfaces, including grooved surfaces, excess material shall be removed from the texture indentations.

After the resin has been applied, at least 20 minutes shall elapse before applying sand. The sand shall be commercial quality dry blast sand. At least 95 percent of the sand shall pass the No. 8 sieve and at least 95 percent shall be retained on the No. 20 sieve. The sand shall be applied at a rate of approximately 2 pounds per square yard or until refusal as determined by the Engineer.

Traffic will not be allowed on the treated area until the Engineer has determined that the following conditions have been met:

- A. The treated deck surface is tack free (non-oily).
- B. The sand cover adheres and resists brushing by hand.
- C. Excess sand has been removed.
- D. The coefficient of friction is at least 0.35 when tested in conformance with California Test 342.

If a treated area does not meet the listed conditions and the allowable lane closure time is about to expire, the treatment will be rejected. The Contractor shall immediately remove the rejected deck treatment by the blast method shown in the placement plan. The Contractor shall submit a plan and revised schedule for replacement of rejected deck treatment materials.

After the entire deck surface for a given bridge or a group of bridges has been completed, the Engineer will perform California Test 342. The Engineer will provide at least a 15-day notice for the Contractor to provide traffic control for each bridge location. The coefficient of friction of the treated deck shall be at least 0.35 when tested in conformance with California Test 342. If the coefficient of friction is less than 0.35, the deck treatment will be rejected. The Contractor shall submit a plan and revised schedule for modification or replacement of rejected deck treatment materials.

### **MEASUREMENT AND PAYMENT**

Bridge deck resin treatment will be measured by the square foot based on the dimensions shown on the plans and will be paid for as treat bridge deck. Furnish bridge deck treatment material will be measured by the gallon of mixed deck treatment resin actually placed and will be paid for as furnish bridge deck treatment material. No payment will be made for materials wasted or not incorporated in the work.

The contract price paid per square foot for treat bridge deck shall include full compensation for furnishing all labor, materials (including sand, but excluding treatment material), tools, equipment, and incidentals, and for doing all the work involved in test areas, applying treatment material, removing excess sand, for furnishing standby blast crew, and for removing and replacing rejected materials 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 gallon for furnish bridge deck treatment material shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary to furnish the bridge deck treatment material to the site of the work, ready for application, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for providing traffic control for the Engineer to perform inspections and testing shall be considered as included in the contract prices paid for the items of work involving bridge deck resin treatment and no additional compensation will be allowed therefor.