

DEPARTMENT OF TRANSPORTATION

ES-OE MS #43
1727 30TH Street, 2ND Floor
Sacramento, CA 95816



April 27, 2001

06-Fre-99-32.5/50.9
06-393304
ACNH-P099(415)E

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in FRESNO COUNTY IN FRESNO FROM VENTURA STREET OVERCROSSING TO FRESNO/MADERA COUNTY LINE.

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 May 23, 2001, instead of the original date of May 1, 2001.

This addendum is being issued to set a new bid opening date as shown herein and revise the Project Plans, the Notice to Contractors and Special Provisions, the Proposal and Contract, and the Federal Minimum Wages with Modification Number 4 dated 4-27-01. A copy of the modified wage rates are available for the contractor's use on the Internet Site:

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

On Project Plan Sheet 5, in the "Ramp and Frontage Road Data Table," in the Ramp Location "R-31 Clinton Ave/Old 99 NB On," the quantities 180/240 are added to the "Shld Reconst" column.

Project Plan Sheets 131 and 132 are revised. Half-sized copies of the revised sheets are attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 10-1.02, "MATERIAL CONTAINING AERIALY DEPOSITED LEAD," the subsection, "Soil Handling," is deleted.

In the Special Provisions, Section 10-1.31, "REPLACE CONCRETE PAVEMENT," the first paragraph is revised as follows:

"Replace concrete pavement shall consist of removing existing portland cement concrete pavement and replacing the removed pavement with new portland cement concrete pavement in all areas of the project except Lane No. 2 in both the northbound and southbound directions between Kilometer Post 32.4 and Kilometer Post 43.8 as shown on the plans and in conformance with these special provisions."

In the Special Provisions, Section 10-1.31, "REPLACE CONCRETE PAVEMENT," the following paragraph is added after the first paragraph:

"Attention is directed to "Replace Concrete Pavement (Type 2)" elsewhere in these special provisions regarding replacing concrete pavement in Lane No. 2."

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In the Special Provisions, Section 10-1.31, "REPLACE CONCRETE PAVEMENT," the subsection, "Portland Cement Concrete Replacement Pavement," the first sentence of the second paragraph is revised as follows:

"Concrete pavement shall attain a flexural strength (modulus of rupture) of not less than 2.8 MPa prior to the time the lane is to be opened to public traffic, as designated in "Maintaining Traffic" of these special provisions, and shall attain a flexural strength of not less than 4.2 MPa within 7 days after placement."

In the Special Provisions, Section 10-1.31A, "REPLACE CONCRETE PAVEMENT (TYPE 2)," is added as attached.

In the Proposal and Contract, the Engineer's Estimate Items 33 and 50 are revised and Item 90 is added as attached.

To Proposal and Contract book holders:

Replace pages 4, 5 and 7 of the Engineer's Estimate in the Proposal with the attached revised pages 4, 5 and 7 of the Engineer's Estimate. The revised Engineer's Estimate is to be used in the bid.

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

Submit bids in the Proposal and Contract 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 office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it.

If you are not a Proposal and Contract 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

REBECCA D. HARNAGEL, Chief
Plans, Specifications & Estimates Branch
Office of Office Engineer

Attachments

10-1.31A REPLACE CONCRETE PAVEMENT (Type 2)

This work shall consist of removing existing portland cement concrete pavement in lane number 2, in both the northbound and southbound direction, between Kilometer Post 32.4 and Kilometer Post 43.8 and replacing the removed pavement with new concrete pavement as shown on the plans and in conformance with these special provisions.

At the option of the Contractor, the replacement concrete shall be either portland cement concrete or fast-setting hydraulic cement concrete (FSHCC).

If the replacement concrete selected is portland cement concrete, all of the work involved shall conform to the provisions in "Replace Concrete Pavement" elsewhere in these special provisions.

If the replacement concrete selected is FSHCC, the work shall conform to the provisions in the subsections "General," "Removing Existing Pavement," and "Temporary Roadway Structural Section" in said section "Replace Concrete Pavement" and to the provisions in this section. Wherever the subsections in "Replace Concrete Pavement" refer to portland cement concrete it shall be understood to mean FSHCC for the purpose of this section.

Materials resulting from construction of trial slabs and test specimens shall become the property of the Contractor and shall be removed and disposed of outside the highway right of way as provided in Section 7-1.13 of the Standard Specifications.

Fast Setting Hydraulic Cement Concrete

General — Fast-setting hydraulic cement concrete (FSHCC) shall be a concrete made with hydraulic cement and develops service strength quickly and within the allotted lane closure time. Pavement made with FSHCC shall conform to the provisions in Section 40, "Portland Cement Concrete Pavement," of the Standard Specifications and these special provisions. The requirements in Section 40-1.015, "Cement Content;" Section 40-1.05, "Proportioning;" and Section 90-1.01, "Description;" of the Standard Specifications shall not apply.

The combined aggregate grading used in concrete for replacement pavement shall be either the 37.5-mm maximum or the 25-mm maximum grading.

The FSHCC pavement shall develop a flexural strength (modulus of rupture) of 2.8 MPa or greater before opening to public or contractor traffic and also shall develop a modulus of rupture of not less than 4.2 MPa 7 days after placement. The modulus of rupture shall be considered to be the average of test results of 3 beam specimens determined by California Test 523. Beam specimens may be fabricated using an internal vibrator in conformance with ASTM Designation: C31. No single test shall represent more than the production for one day.

Modulus of rupture at early ages may be determined by estimation based on a correlation determined during trial slab placement or using beams cured under the same atmospheric and temperature conditions ($\pm 3^{\circ}\text{C}$) as the pavement. Modulus of rupture at other ages shall be determined by using beams cured and tested in accordance with California Test Method 523 except they shall be placed into the sand at between five and 10 times the time to final set or 24 hours whichever is earlier. "Early age" is defined as any time less than 10 times the time to final set as determined by ASTM Designation: C 403 and reported in the mix design submittal.

The modulus of rupture, as determined above, will be the basis for accepting or rejecting the FSHCC pavement for modulus of rupture requirements.

The cement for FSHCC pavement shall be hydraulic cement as defined in ASTM Designation: C219 and conform to the following requirements:

Property	Test Method	Requirement
Contraction in Air	California Test 527 w/c Ratio = 0.39 \pm 0.010	0.053% (max)
Mortar Expansion in Water	ASTM: C1038	0.04% (max)
Soluble Chloride	California Test 422	0.05% (max)*
Soluble Sulfates	California Test 417	0.30% (max)*
Thermal Stability	California Test 553	60% (min)
Compressive Strength @ 3 days	ASTM C109	17 MPa

* The test is to be done on a C 109 cube specimen cured at least 14 days and then pulverized to 100% passing the 300 μm sieve.

At least 45 days prior to intended use, the Contractor shall furnish a sample of the fast-setting hydraulic cement from each lot proposed for use and all admixtures proposed for use in the quantities ordered by the Engineer.

A Type C accelerating chemical admixture approved by the Engineer and conforming to the requirements in Section 90-4, "Admixtures," of the Standard Specifications may be used. In addition to the admixtures listed on the Department's current list of approved brands of admixtures, citric acid or borax may be used if requested in writing by the fast-setting hydraulic cement manufacturer and a sample is submitted to the Engineer. All chemical admixtures, if used, shall be included in all the testing for the requirements listed in the table above.

At least 10 days prior to use, the Contractor shall submit in writing to the Engineer a proposed mix design that shall include:

- (1) The "opening age," the age at which the concrete will achieve the specified strength for opening to public or contractor's traffic;
 - (2) The proposed aggregate gradings;
 - (3) The mix proportions of hydraulic cement and aggregate;
 - (4) The type and amount of chemical admixture;
 - (5) The maximum time allowed between batching and placing roadway pavement;
 - (6) The range of temperature over which this mix design is effective (10°C maximum);
 - (7) The final set time of the concrete; and
- Any special conditions (including water temperature) or instructions.

The Contractor shall submit more than one mix design to include the temperature range when the anticipated atmospheric temperature during placement of the FSHCC pavement exceeds 10°C. In addition, the Contractor shall furnish samples of the hydraulic cement, aggregates and chemical admixture proposed for use in FSHCC pavement in the quantity ordered by the Engineer. The Contractor shall develop and furnish flexural strength gain curves for each proposed mix design. The strength gain curves for up to 7 days must be provided to the engineer prior to beginning paving with any given mix design. The minimum testing ages for strength gain curves shall be: one hour before opening age, opening age, one hour after opening age, 24 hours, 7 days and 28 days. Strength gain curves may be developed from laboratory prepared samples.

The penetration requirement in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications shall not apply.

Fast-Setting Hydraulic Cement Concrete Proportioning — All weighing, measuring or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," of the Standard Specifications and these specifications.

The eleventh paragraph of Section 9-1.01, "Measurement of Quantities," of the Standard Specifications shall not apply to FSHCC. When an automatic weighing system is used it shall comply with the requirements for automatic proportioning devices in these specifications. These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, hydraulic cement, or mineral admixture for one designated batch or draft is a single operation of a switch or starter.

Aggregates shall be handled and stored in accordance with the requirements of Section 90-5.01, "Storage of Aggregates" of the Standard Specifications. Liquid admixtures shall be proportioned as required in Section 90-4.10, "Proportioning and Dispensing Liquid Admixtures," of the Standard Specifications. Mineral admixtures shall be protected from exposure to moisture until used. Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.

Proportioning devices shall be tested in accordance with California Test 109 at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy. All proportioning devices shall be tested in advance of fast-setting hydraulic cement concrete production and re-tested upon moving to a new location.

Weighing equipment shall be insulated against vibration or movement of other operating equipment. When the plant is in operation, the mass of each draft of material shall not vary from the designated mass by more than the tolerances specified herein.

Aggregate shall be weighed cumulatively and equipment for the weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch mass of the aggregate. Equipment for the separate weighing of the hydraulic cement or mineral admixture shall have a zero tolerance of ± 0.5 percent of their designated individual batch drafts. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated mass or volume.

The mass indicated for any individual batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate shall be within 1.0 percent of the designated total batch mass of the aggregate.
- B. Hydraulic cement shall be within 0.5 percent of its designated batch mass. Mineral admixture shall be within 1.0 percent of its designated batch mass.
- C. Water shall be within 1.5 percent of its designated mass or volume.

Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing hydraulic cement, mineral admixture, and aggregates shall not exceed that of commercially available scales having single graduations indicating a mass not exceeding the maximum permissible mass variation above, except that no scale shall be required having a capacity of less than 500 kg, with 0.5 kg graduations

Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with hydraulic cement, mineral admixture and water as provided in these specifications. Dry ingredients shall be proportioned by mass. Liquid ingredients shall be proportioned by mass or volume.

At the time of batching, all aggregates shall have been dried or drained sufficiently to result in stable moisture content such that no visible separation of water from aggregate will take place during the proportioning process. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry mass.

Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

The hydraulic cement shall be kept separate from the aggregates until it is released for discharge into the mixer. The hydraulic cement shall be free of lumps and clods when discharged into the mixer. Fabric containers used for transportation or proportioning of the hydraulic cement shall be clean and free of residue before reuse.

The weigh systems for the proportioning of the aggregate, the hydraulic cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and an indicator to constitute an individual and independent material-weighing device.

For all batches with a volume of one cubic meter or more, the batching equipment shall conform to one of the following combinations:

- A. Single box, scale, and indicator for all aggregates, located at a batch plant. The batch plant may be remote from the hydraulic cement proportioning location.

- B. Platform scale for the weighing of hydraulic cement in a fabric container at a separate location which may be remote from the batch plant or the pour site. The fabric container shall have a capacity of at least 1200 kg. The minimum amount of hydraulic cement to be proportioned shall be one half of the total amount required for the load of fast-setting hydraulic cement concrete being produced.

- A silo and weigh system located at the pour site for the proportioning of hydraulic cement. This system shall proportion the hydraulic cement into a weigh hopper or directly into the truck mixer.

In order to check the accuracy of batch masses, the gross mass and tare mass of truck mixers shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by mass of the fine aggregate.

No additional mixing water shall be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer. If the Engineer authorizes additional water to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed after the water is added and before discharge is commenced. Water added to the truck mixer at the job site shall be measured through a meter that conforms to the requirements of Section 9-1.01, "Measurement of Quantities" of the Standard Specifications.

Aggregate discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of discharge from the several bins, and from the weigh hopper, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh hopper cannot be discharged until the required quantity from each of the several bins has been deposited in the weigh hopper.

Should the Contractor elect to proportion all ingredients for fast-setting hydraulic cement concrete at a central batch plant the proportioning shall meet the requirements of Section 90-5, "Proportioning" of the Standard Specifications.

Weight Certificates — Each load of FSHCC delivered at the job site shall be accompanied by a weight certificate showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water added to the load, the reading of the revolution counter at the time the truck mixer is charged with the hydraulic cement. This weight certificate shall also show the actual scale masses (kilograms) for the ingredients batched. Theoretical or target batch masses shall not be used as a substitute for actual scale masses.

Weight certificates shall be provided in printed form, or if approved by the Engineer, the data may be submitted in electronic media. Electronic media shall be presented in a tab-delimited format on 90-mm diskette with a capacity of at least 1.4 megabytes. Captured data for the ingredients represented by each batch shall be followed by a line-feed carriage-return. There shall be sufficient fields to satisfy the amount of data required by these specifications.

The Contractor may furnish a weight certificate that is accompanied by a separate certificate which lists the actual batch masses or measurements for a load of FSHCC provided that both certificates are: 1) imprinted with the same non-repeating load number that is unique to the contract and; 2) delivered to the pour site with the load.

Weight certificates for fast-setting hydraulic cement concrete, regardless of the proportioning method used, shall include all information necessary to trace the manufacturer, and manufacturer's lot number for the hydraulic cement being used. When proportioned into fabric containers the weight certificates for the hydraulic cement shall contain the date of proportioning, the location of proportioning and the actual net draft mass of the hydraulic cement. When proportioned at the pour site from a storage silo the weight certificates shall contain the date of proportioning, the location of proportioning and the net draft mass of the hydraulic cement used in the load.

All weight certificates furnished by the Contractor shall conform to the requirements of Section 9 - 1.01, "Measurement of Quantities," of the Standard Specifications.

Spreading, Compacting and Shaping — Fast-setting hydraulic cement concrete shall be spread, shaped and consolidated so that the completed pavement conforms to the thickness and cross section requirements of the plans and specifications. Sides of pavement may be constructed on a batter not to exceed 6.0 vertical to 1.0 horizontal, provided the top of the pavement is maintained at the specified width.

FSHCC to be constructed contiguous with an existing parallel concrete pavement not constructed as part of the contract shall be spread, compacted, and shaped so that completed pavement will conform to the thickness and cross section requirements of the plans and specifications and to the following:

The elevation of the pavement surface shall be such that water will not pond on either side of the longitudinal contact joint with existing pavement.

The new pavement surface at the longitudinal contact joint shall conform to the elevation of the existing concrete pavement. Any difference in elevation between the new pavement and the existing pavement shall be eliminated by finishing the new pavement within 300 mm of the existing pavement by hand methods.

Tests to determine the coefficient of friction of the final textured surface will be made only if the Engineer determines by visual inspection that the final texturing may not have produced a surface having the specified coefficient of friction. Any tests to determine the coefficient of friction will be made after the pavement is opened to public traffic, but not later than 5 days after concrete placement. Pavement areas having a coefficient of friction as determined by California Test 342 of less than 0.30 shall be grooved in accordance with the provisions of Section 42-1.02 "Construction" of the Standard Specifications.

Transverse straightedge and longitudinal straightedge, will not apply to the pavement surface within 300-mm of the existing concrete pavement except as required in this paragraph. Longitudinal straightedge requirements of Section 40-1.10, "Final Finishing," of Standard Specifications shall be applied at transverse contact joints with existing concrete pavement and the straightedge is to be placed with the midpoint coincident with the joints. Pavement not meeting this straightedge requirement shall be corrected within 48 hours by grinding or other methods, as approved by the Engineer.

The surface of the replacement concrete pavement which is not to be covered with asphalt concrete will be profiled and the Profile Index requirements shall apply. The surface of the concrete pavement at these locations shall conform to the provisions in Section 40-1.10, "Final Finishing," of the Standard Specifications. The surface of the replacement concrete pavement which is to be covered with asphalt concrete will not be profiled and the Profile Index requirements shall not apply.

FSHCC for the full paving width shall be effectively consolidated with surface vibrators, internal vibrators, or by some other method of consolidation that produces equivalent results without segregation. Consolidation of the FSHCC shall be by means of high-frequency internal vibrators after it is deposited on the subgrade. Vibrating shall be done with care and in such manner to assure adequate consolidation adjacent to forms and uniformly across the full paving width. Use of vibrators for shifting of the mass of FSHCC will not be permitted. When vibrators are used to consolidate fast-setting hydraulic concrete, the rate of vibration shall be not less than 3500 cycles per minute for surface vibrators and shall be not less than 5000 cycles per minute for internal vibrators. Amplitude of vibration shall be sufficient to be perceptible on the surface of FSHCC more than 0.3 m from the vibrating element. The Contractor shall furnish a tachometer or other suitable device for measuring and indicating frequency of vibration.

Vibrators shall not rest on new pavement. Power to vibrators shall be connected so that vibration ceases when forward or backward motion of the machine is stopped.

FSHCC shall be spread and shaped by any suitable powered finishing machines, supplemented by handwork as necessary. Methods of spreading, shaping and compacting that result in segregation, voids or rock pockets shall be discontinued, and the Contractor shall adopt methods which will produce dense homogeneous pavement conforming to required cross section.

Joints — Prior to placing concrete against existing concrete, a 6-mm thick commercial quality polyethylene flexible foam expansion joint filler shall be placed across the original transverse joint faces and extend the full depth of the excavation with the top of the joint filler flush with the top of pavement. The joint filler shall be secured to the face of the existing pavement joint face by any method that will hold the joint filler in place during placement of concrete.

For replacement concrete pavement which is to be covered with asphalt concrete, longitudinal and transverse weakened plane joints shall be constructed to create segments of the nominal size specified in "Crack Existing Concrete Pavement" elsewhere in these special provisions. Weakened plane joints shall be hardboard inserts or shall be sawed and the depth of the weakened joints shall be three-fourths the thickness of the new concrete pavement.

For replacement concrete pavement which is not to be covered with asphalt concrete, transverse weakened plane joints shall be constructed to match the spacing and skew of the weakened plane joints in the existing pavement. The provisions in the second and third paragraphs in Section 40-1.08B, "Weakened Plane Joints," of the Standard Specifications and the provisions in the third paragraph in Section 40-1.08B(1), "Sawing Method," shall not apply. Sawing of weakened plane joints shall be completed within 2 hours of completion of final finishing. The minimum depth of the cut for the weakened plane joint shall be 75 mm.

The provisions in Section 40-1.08B(3), "Repair of Spalls, Ravelling and Tearing," of the Standard Specifications shall not apply to replacement concrete which is to be covered with asphalt concrete.

Curing Method — The method of cure for replacement pavement shall be as recommended by the manufacturer of the hydraulic cement and approved by the Engineer.

Bond Breaker — A bond breaker shall be placed between the replacement pavement and the existing cement treated base; or newly placed base replacement layer and the replacement pavement. Bond breaker shall be one of the following:

- (1) Curing Paper conforming to ASTM C171, White.
- (2) Polyethylene Film conforming to ASTM C171, except that the thickness shall be 0.15 mm (min.), White Opaque.
- (3) Paving asphalt, Grade AR-4000, conforming to Section 92 of the Standard Specifications.
- (4) Pigmented Curing Compound conforming to the requirements in ASTM C309, Type 2, Class A and shall contain 22 percent minimum nonvolatile vehicles consisting of at least 50 percent paraffin wax.
Asphaltic Emulsion conforming to Section 94 of the Standard Specifications.

When curing paper or polyethylene film is used, the bond breakers shall be placed in a wrinkle-free manner. Adjacent sheets shall be overlapped a minimum of 150 mm.

When curing compound or paving asphalt is used as the bond breakers, all foreign material and loose material remaining from slab removal shall be removed prior to application.

When paving asphalt is used as the bond breaker, no water shall be added before application to the surface of the base. The paving asphalt shall be applied in one even application at a rate of 0.10 to 0.45 L/m² over the entire base surface area.

When asphaltic emulsion is used as the bond breaker, no water shall be added before application to the surface of the base. The paving asphalt shall be applied in one even application at a rate of 0.20 to 0.50 L/m² over the entire base surface area.

When curing compound is used as the bond breaker, curing compound shall be applied in two separate applications. Each application of curing compound shall be applied at the approximate rate of 0.3 to 0.5 L/m². Application of curing compound shall cover the entire surface evenly.

Contractor Process Control

General — The Contractor shall establish, provide and maintain a quality control system that will provide assurance to the Engineer that all materials and completed construction conform to the contract requirements specified herein. The Contractor shall also be responsible for the quality of all component materials contained within replacement pavement, complete in place, including those procured from subcontractors or vendors.

At least 14 days prior to the placement of the trial slab the Contractor shall submit to the Engineer for approval a complete and written Quality Control Plan that shall be used to ensure the quality of the product and the work. At the request of the Engineer or Contractor, the Contractor and the Quality Control Managers shall meet with the Engineer to discuss the Quality Control Plan.

If in the judgment of the Engineer the Contractor has not implemented or is not complying with the approved Quality Control Plan, production and placement shall be suspended. Production and placement shall resume with the Engineer's approval.

Quality Control Plan

The Contractor shall provide a Quality Control Plan that describes the procedures which the Contractor will use to control the production process, to determine when changes to the production process are needed, and the procedures proposed to be used to implement the required changes for replacement pavement. The Quality Control Plan shall also include an outline for the placement and testing of the trial slab.

Replacement pavement production and placement shall not begin until the Quality Control Plan has been approved by the Engineer. Approval of the Quality Control Plan will be based on the inclusion of all required information. Approval of the Quality Control Plan does not imply any warranty by the Engineer that adherence to the plan will result in production of replacement pavement that complies with these specifications. It shall remain the responsibility of the Contractor to demonstrate such compliance.

The Quality Control Plan shall include the names and qualifications of 2 Quality Control Managers. The Quality Control Managers shall be responsible for the administration of the Quality Control Plan. The Quality Control Managers shall have a current ACI certification for inspection and testing of concrete. All sampling, inspection and test reports shall be reviewed and signed by the Quality Control Manager responsible for the production period involved prior to submittal to the Engineer. At least one of the Quality Control Managers shall be present for all stages of design, trial slab construction, during production and construction of replacement pavement and for all meetings between the Contractor and Engineer relating to production, placement or testing of replacement pavement. The Quality Control Manager shall not be a member of the production or paving crew, an inspector or tester on this project during production and placement of replacement pavement. The Quality Control Manager shall have no duties other than those referenced in these special provisions during the production and placement.

The Quality Control Plan shall include an outline of the production, transportation and placement of the replacement pavement. The Quality Control Plan shall include a contingency plan for correcting situations when there is a problem in production, transportation or placement. The Contractor shall have the equipment and personnel present to meet the requirements of the contingency plan. The Quality Control Plan shall contain provisions for determining when placement of replacement pavement will be suspended and temporary roadway will be substituted.

The Quality Control Plan shall include an outline of the sampling, testing and quality control personnel to be used during and after construction of the replacement pavement. At the time of submission of the Quality Control Plan, quality control samplers and testers must be Caltrans qualified through the Independent Assurance Program for the samples and tests for which they will be responsible.

Before production and placement begins, the Contractor, Quality Control Managers, and Engineer shall have a meeting with all production, transportation, placement, inspection, sampling and testing personnel to familiarize them with the requirements of this project. Requirements include the production, transportation and placement processes for replacement pavement; the contingency plan; and sampling and testing. The Contractor will provide the facility for this meeting. The meeting date and location shall be approved by the Engineer. Attendance at this meeting is mandatory for at least the project manager, the quality control managers, the production plant manager, the plant inspector, all concrete delivery truck drivers, the paving superintendent, the paving foreman, the paving machine operator and all inspectors, samplers and testers. All meeting attendees will sign in at the meeting. Production and placement shall not begin nor proceed unless those key personnel have attended the mandatory meeting.

Quality Control Inspection, Sampling and Testing

The Contractor shall perform quality control inspection, sampling and testing to ensure that replacement pavement production and placement conforms to the requirements specified herein.

The Contractor shall provide the required sampling, testing and inspection during all phases of the replacement pavement production and placement. The Contractor shall provide notice so that the Engineer can witness all sampling and testing. The Engineer shall be given unrestricted access to the Contractor's quality control inspectors, samplers, testers and laboratories. During the production and placement period, the Contractor shall provide results of all testing to the Engineer within 15 minutes of completion of testing. The Contractor shall record all inspection, sampling and testing on forms approved by the Engineer. The Contractor shall provide written results of all inspection and testing to the Engineer within 48 hours of completion of each shift of paving and within 24 hours for all 7-day strength tests.

The Contractor shall provide a testing laboratory with adequate equipment and personnel for the performance of the quality control tests. This laboratory shall be located at a location approved by the Engineer and such that the prompt testing requirements can be met. All sampling and testing equipment shall be maintained in proper working condition. All sampling shall be performed to the standards of California Test 125. The Quality Control Plan shall include a list of the equipment to be used, the method of testing flexural strength, the names and certifications of the sampling and testing personnel and the location of the laboratory and testing equipment during and after the paving operation.

Testing laboratories and equipment and sampling and testing personnel shall conform to the requirements of the Department's Independent Assurance Program.

Trial Slab and Process Control Testing

Prior to construction of FSHCC pavement, the Contractor shall construct one or more trial slabs under conditions similar to those which will exist during pavement replacement, for each mix design, to show that the personnel and equipment and the mixing, placing, curing, and sawing techniques will produce a concrete pavement conforming to these special provisions in the anticipated time period under similar atmospheric and temperature conditions as pavement construction. During production and placement, the Contractor shall conform to the requirements of these special provisions and to the procedure outlined in the Quality Control Plan to ensure that mixing, transporting, placing, finishing, curing and sawing techniques and that the personnel and equipment to be used will produce replacement pavement conforming to these special provisions.

Trial Slab

The trial slab shall be constructed using the approved mix design, admixtures and conditions for batching. During construction of the trial slab, the Contractor shall demonstrate placement at the minimum and maximum times allowed from batching to placement. The Contractor shall not proceed to placing FSHCC pavement within the roadway until a trial slab has been constructed that meets the requirements of these special provisions.

The trial slab of replacement pavement shall have dimensions of not less than 3.6 m by 12.5 m and shall be 230 mm in thickness. The trial slab shall not be placed on the roadway or within the project limits. The trial slab shall be placed in a location agreed to by the Engineer.

During trial slab construction, the Contractor shall sample the aggregates for gradings, cleanness value, and sand equivalent. The Contractor will split these samples with the Engineer. Both sets of test results of these samples shall conform to the provisions in Section 90-2.02, "Aggregates," of the Standard Specifications. If the test results do not conform to the requirements, the trial slab will be rejected.

During trial slab construction, beams shall be fabricated within 20 minutes of delivery of concrete. Beams shall be used to determine the early age and 7-day modulus of rupture. Beams fabricated for the early age test shall be cured under the same temperature conditions ($\pm 3^{\circ}\text{C}$) as the trial slab. The temperature of the slab and beams shall be monitored and recorded at time intervals of 5 min or less 25 mm from the top and 25 mm from the bottom until the early age testing is completed. Beams fabricated for the 7-day test shall be cured in accordance with California Test 523 except they shall be placed into the sand at between five and 10 times the time to final set or 24 hours whichever is earlier. Testing will be performed by the Contractor and witnessed by the Engineer. At the Engineer's request, the Contractor shall produce samples for the Engineer to test. The strengths determined from these beams shall be the basis for determining FSHCC pavement production and placement may proceed. Beams failing the early age or 7-day modulus of rupture requirements shall be cause for the Engineer to reject the trial slab and require construction of a new trial slab.

The Contractor will outline the location and time; procedure for production, placement and finishing of the fast-setting hydraulic cement concrete pavement; sampling, sample curing and sample transportation; testing and reporting of test results for the trial slab in the Quality Control Plan.

Process Control and Quality Control Testing

The Contractor shall provide continuous process control and quality control sampling and testing throughout production and placement of replacement pavement.

During production of fast-setting hydraulic cement concrete for use on the roadway, the Contractor shall sample and test aggregates at least once in every 500 cubic meters of replacement pavement produced but not less than one sample per placement shift. The aggregate shall be tested for gradings, cleanness, and sand equivalent.

During placement of replacement pavement, the Contractor shall fabricate specimens and test for modulus of rupture in the first 25 cubic meters, in the final truckload and at least once in every 100 cubic meters (or part thereof) in between.

During placement of replacement pavement on the roadway, the Contractor shall sample and test yield, penetration, air content and unit weight at least once in every 500 cubic meters of replacement pavement produced but not less than 2 samples per placement shift.

At the Engineer's request, the Contractor shall provide split samples and fabricate beams for the engineer to test. The cost of sampling, fabricating and transporting extra samples shall be paid as extra work as specified in Section 4-1.03D, "Extra Work," of the Standard Specifications. When, in the opinion of the Engineer, the replacement pavement fails to conform to the mix design requirements or the requirements of these special provisions the Contractor shall provide sample fabrication and testing at the direction of the Engineer. If the material fails to meet requirements of these special provisions, the cost of sampling and testing shall be at the Contractor's expense. If the material meets the requirements of these special provisions, the cost of sampling and testing shall be paid as extra work as specified in Section 4-1.03D of the Standard Specifications.

When beams are used for determining the early age modulus of rupture, they shall be cured under the same conditions as the pavement until one hour before testing before transporting, and stripping molds. Beams fabricated for the 7-day test shall be cured in accordance with California Test 523 and as modified in these special provisions. Modulus of rupture shall be the basis for determining whether replacement pavement production and placement may proceed and will be used for accepting or rejecting the replacement pavement.

At the Engineer's direction, the Contractor shall suspend producing and placing fast-setting concrete pavement if it is determined that further production, placement or attempts at placement will interfere with the time the lane is to be opened to public traffic as designated in "Maintaining Traffic" of these special provisions.

The Contractor shall remove and replace all temporary roadway with replacement pavement, at the Contractor's expense, at a future time agreed to by the Engineer.

Materials resulting from the construction of the trial slab, test specimens, and all rejected replacement pavement shall become the property of the Contractor and shall be removed and disposed outside the highway right of way as provided in Section 7-1.13, "Disposal of Material Outside the Highway Right of Way," of the Standard Specifications.

Pavement Delineation Repair

Wherever pavement delineation is removed or damaged due to work involved in Replace Concrete Pavement (Fast-Setting Hydraulic Cement Concrete), the Contractor shall replace or repair the delineation to its original condition. Pavement delineation repairs shall be made in conformance with the provisions in Section 84, "Traffic Stripes and Pavement Markings" and Section 85, "Pavement Markers," of the Standard Specifications and these special provisions.

Acceptance

All portland cement concrete replacement pavement will be accepted or rejected as provided in "Replace Concrete Pavement" elsewhere in these special provisions.

All FSHCC replacement pavement produced and placed during construction of the roadway will be accepted or rejected as follows:

Replacement concrete pavement that has modulus of rupture of 2.8 MPa or greater before the lane is opened to the traffic and a 7 day modulus of rupture of 4.2 MPa or greater shall be accepted and shall be paid at the contract price paid per cubic meter of replace concrete pavement.

Replacement concrete pavement that has a modulus of rupture less than 2.1 MPa when the lane is opened to traffic shall be rejected. Rejected replacement pavement shall be removed and replaced at the contractor's expense.

Payment shall be made according to following table for other combinations of modulus of rupture achieved upon opening to traffic and at 7 days.

Percentage Pay Table

		7-Day Modulus of Rupture (MPa)			
		Greater than or equal to 4.20	3.81 - 4.19	3.41 - 3.80	Less than 3.40
Modulus of Rupture (MPa) at opening to traffic	Greater than or equal to 2.80	100%	95%	90%	80%
	2.41 - 2.79	95%	95%	90%	80%
	2.10 - 2.40	80%	80%	80%	50%
	Less than 2.10	0	0	0	0

MEASUREMENT AND PAYMENT

Regardless of the type of concrete furnished, replace concrete pavement (Type 2) will be measured and paid for in the same manner specified for concrete pavement in Section 40-1.13, "Measurement," Section 40-1.14, "Payment," of the Standard Specifications, except that the provisions in Section 40-1.135, "Pavement Thickness," of the Standard Specifications shall not apply.

The contract price paid per cubic meter for replace concrete pavement (Type 2) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Full compensation for removing and disposing of existing concrete pavement; furnishing and disposing of standby materials for construction of a temporary structural section; and constructing, maintaining, removing, and disposing of temporary structural sections shall be considered as included in the contract price paid per cubic meter for replace concrete pavement (Type 2) and no separate payment will be made therefor.

Full compensation for furnishing the asphalt concrete and for constructing, maintaining, removing, and disposing of temporary asphalt concrete tapers, shall be considered as included in the contract price paid per cubic meter for replace concrete pavement (Type 2) and no separate payment will be made therefor.

If the replacement concrete furnished is portland cement concrete, full compensation for construction and removal of trial slabs and for fabrication and disposal of test beams shall be considered as included in the contract price paid per cubic meter for replace concrete pavement and no separate payment will be made therefor.

If the replacement concrete selected is FSHCC, full compensation for furnishing and placing bond breaker, and for performing contractor process control, shall be considered as included in the contract price paid per cubic meter for replace concrete pavement (Type 2), and no separate payment will be made therefor.

The contract price paid per cubic meter for replace concrete pavement (Type 2) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved, complete in place, including contractor process control and removal of existing pavement, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

ENGINEER'S ESTIMATE
06-393304

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	151272	SALVAGE METAL BEAM GUARD RAILING	M	170		
22 (S)	151625	RECONSTRUCT METAL BEAM GUARD RAILING (WOOD POST)	M	760		
23	152320	RESET ROADSIDE SIGN	EA	5		
24	152390	RELOCATE ROADSIDE SIGN	EA	14		
25	152422	ADJUST MONUMENT COVER	EA	21		
26	152430	ADJUST INLET	EA	62		
27	020867	CURED-IN-PLACE PIPE	M	440		
28	152555	ADJUST SLOTTED DRAIN TO GRADE	M	59		
29 (S)	153153	COLD PLANE ASPHALT CONCRETE PAVEMENT (45 MM MAXIMUM)	M2	30 100		
30 (S)	153154	COLD PLANE ASPHALT CONCRETE PAVEMENT (60 MM MAXIMUM)	M2	20 900		
31	156590	REMOVE CRASH CUSHION (SAND FILLED)	EA	8		
32	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
33	190101	ROADWAY EXCAVATION	M3	21 500		
34	190185	SHOULDER BACKING	STA	210		
35 (S)	200001	HIGHWAY PLANTING	LS	LUMP SUM	LUMP SUM	
36 (S)	204099	PLANT ESTABLISHMENT WORK	LS	LUMP SUM	LUMP SUM	
37 (S)	208000	IRRIGATION SYSTEM	LS	LUMP SUM	LUMP SUM	
38 (S)	208909	EXTEND 200 MM CONDUIT	EA	1.4		
39 (S)	260201	CLASS 2 AGGREGATE BASE	M3	6420		
40	390152	ASPHALT CONCRETE	TONN	153 000		

ENGINEER'S ESTIMATE**06-393304**

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	391031	PAVING ASPHALT (BINDER-PAVEMENT REINFORCING FABRIC)	TONN	360		
42	393001	PAVEMENT REINFORCING FABRIC	M2	291 000		
43	394002	PLACE ASPHALT CONCRETE (MISCELLANEOUS AREA)	M2	2010		
44	394040	PLACE ASPHALT CONCRETE DIKE (TYPE A)	M	10 100		
45	394044	PLACE ASPHALT CONCRETE DIKE (TYPE C)	M	6080		
46	394048	PLACE ASPHALT CONCRETE DIKE (TYPE E)	M	7200		
47	394049	PLACE ASPHALT CONCRETE DIKE (TYPE F)	M	350		
48	397001	ASPHALTIC EMULSION (PAINT BINDER)	TONN	370		
49	401066	CONCRETE PAVEMENT (RAMP TERMINI)	M3	460		
50	401100	REPLACE CONCRETE PAVEMENT	M3	10 100		
51	401102	CONCRETE PAVEMENT (WEIGH-IN-MOTION)	M3	290		
52	415101	CRACK EXISTING CONCRETE PAVEMENT	M2	161 000		
53	020868	SAWCUT CONCRETE PANEL (245 MM)	M	3500		
54 (S)	020871	GRIND EXISTING ASPHALT CONCRETE PAVEMENT	M2	210		
55 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	M3	36		
56 (S)	020872	STAIN CONCRETE SURFACE	M2	4900		
57	650465	300 MM REINFORCED CONCRETE PIPE (CLASS IV)	M	51		
58	650466	375 MM REINFORCED CONCRETE PIPE (CLASS IV)	M	1.3		
59	650470	450 MM REINFORCED CONCRETE PIPE (CLASS IV)	M	31		
60	681136	50 MM PLASTIC PIPE (EDGE DRAIN OUTLET)	M	10		

ENGINEER'S ESTIMATE

06-393304

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
81 (S)	860791	COMMUNICATION CONDUIT	LS	LUMP SUM	LUMP SUM	
82 (S)	860811	DETECTOR LOOP	LS	LUMP SUM	LUMP SUM	
83 (S)	860931	TRAFFIC MONITORING STATION (LOCATION 1)	LS	LUMP SUM	LUMP SUM	
84 (S)	860932	TRAFFIC MONITORING STATION (LOCATION 2)	LS	LUMP SUM	LUMP SUM	
85 (S)	860933	TRAFFIC MONITORING STATION (LOCATION 3)	LS	LUMP SUM	LUMP SUM	
86 (S)	860934	TRAFFIC MONITORING STATION (LOCATION 4)	LS	LUMP SUM	LUMP SUM	
87 (S)	861203	HIGH SPEED WEIGH-IN-MOTION SYSTEM	LS	LUMP SUM	LUMP SUM	
88 (S)	861502	MODIFY SIGNAL	LS	LUMP SUM	LUMP SUM	
89 (S)	861503	MODIFY LIGHTING	LS	LUMP SUM	LUMP SUM	
90	021400	REPLACE CONCRETE PAVEMENT (TYPE 2)	M3	5300		

TOTAL BID: _____