

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

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Be energy efficient!*

September 10, 2013

12-Ora-55-2.0/11.8

12-OL74U4

Project ID 1213000066

NH-HSNH-P055(054)E

Addendum No. 4

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN ORANGE COUNTY IN COSTA MESA AND SANTA ANA FROM 19TH STREET TO 17TH STREET.

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, September 19, 2013.

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

Project plan sheet 2 is replaced and attached for substitution for the like-numbered sheet.

In the Special Provisions, Section 12-4.05B, "Chart Nos. SB-02, SB-03, NB-01, NB-02, NB-03, SB-11 and SB-12," are replaced as attached.

In the Special Provisions, Section 15-2.02B(3)(a), "General," the second paragraph is deleted.

In the Special Provisions, DIVISION IV "SUBBASES AND BASES," Section 28-4, is added as attached.

In the Special Provisions, Section 39-1.02C, the third paragraph is replaced as follows:

"Asphalt binder mixed with asphalt modifier and CRM for asphalt rubber binder must be PG 64-16."

In the Special Provisions, Section 39-1.18, is added as attached.

In the Special Provisions, Section 39-1.19, "HOT MIX ASPHALT AGGREGATE LIME TREATMENT—SLURRY METHOD," is replaced as attached.

In the Special Provisions, Section 39-1.20, is added as attached.

Addendum No. 4  
Page 2  
September 10, 2013

12-Ora-55-2.0/11.8  
12-0L74U4  
Project ID 1213000066  
NH-HSNH-P055(054)E

In the *Bid* book, in the "Bid Item List," Item 75 is replaced as attached.

To *Bid* book holders:

In the *Bid* book, page 6 of the "Bid Item List" is replaced as attached. The attached Bid Item List is to be used in the bid.

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/12/12-0L74U4](http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/12/12-0L74U4)**

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,



REBECCA D. HARNAGEL  
Chief, Office of Plans, Specifications & Estimates  
Office Engineer  
Division of Engineering Services

Attachments

Replace "Reserved" in section 12-4.05B with:

Chart no. SB-02 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/SB										PM:Var											
Closure limits: SB Route 55 main-line from Edinger Ave. to 405 Interchange in Santa Ana																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		1	1	1	1	3	4	N	N	N	N	N	N	N	N	N	N	N	N	N	S	S	4	3	2	
Fridays		1	1	1	1	3	4	N	N	N	N	N	N	N	N	N	N	N	N	N	S	S	4	3	2	
Saturdays		1	1	1	1	1	2	3	4	S	S	S	S	S	S	S	S	S	S	S	S	S	4	3	2	
Sundays		1	1	1	1	1	2	3	4	S	S	S	S	S	S	S	S	S	S	S	S	S	4	3	2	
Legend:																										
1		Provide at least 1 through freeway lane open in direction of travel																								
2		Provide at least 2 adjacent through freeway lanes open in direction of travel																								
3		Provide at least 3 adjacent through freeway lanes open in direction of travel																								
4		Provide at least 4 adjacent through freeway lanes open in direction of travel																								
S		Shoulder closure allowed (right / left)																								
N		No work allowed																								
REMARKS:																										

Replace "Reserved" in section 12-4.05B with:

Chart no. SB-03 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/SB										PM:Var											
Closure limits: SB Route 55 main-line from 405 Interchange to 19th Street in Costa Mesa.																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		1	1	1	1	3	S	N	N	N	N	N	N	N	N	N	N	N	N	N	S	S	S	3	2	
Fridays		1	1	1	1	3	S	N	N	N	N	N	N	N	N	N	N	N	N	S	S	S	3	2		
Saturdays		1	1	1	1	1	2	3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	3	2		
Sundays		1	1	1	1	1	2	3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	3	2		
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S		Shoulder closure allowed (right / left)																								
N		No work allowed																								
REMARKS:																										

Replace "Reserved" in section 12-4.05B with:

Chart no. NB-01 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/NB										PM:Var											
Closure limits: NB Route 55 main-line from 19 <sup>th</sup> St. in Costa Mesa to I-405. interchange																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		1	1	1	1	3	S	N	N	N	N	N	N	N	N	N	N	N	N	N	S	S	S	3	2	
Fridays		1	1	1	1	3	S	N	N	N	N	N	N	N	N	N	N	N	N	N	S	S	S	3	2	
Saturdays		1	1	1	1	1	2	3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	3	2	
Sundays		1	1	1	1	1	2	3	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	3	2	
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S		Shoulder closure allowed (right / left)																								
N		No work allowed																								
REMARKS:																										

Replace "Reserved" in section 12-4.05B with:

Chart no. NB-02 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/NB										PM:Var											
Closure limits: NB Route 55 main-line from I-405 Interchange to Edinger Ave. in Santa Ana																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		2	1	1	1	3	4	S	N	N	N	N	N	N	N	N	N	N	N	N	S	S	4	3	2	
Fridays		2	1	1	1	3	4	S	N	N	N	N	N	N	N	N	N	N	N	N	S	S	4	3	2	
Saturdays		2	1	1	1	1	2	3	4	S	S	S	S	S	S	S	S	S	S	S	S	S	4	3	2	
Sundays		2	1	1	1	1	2	3	4	S	S	S	S	S	S	S	S	S	S	S	S	S	4	3	2	
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N		No work allowed																								
REMARKS:																										

Replace "Reserved" in section 12-4.05B with:

Chart no. NB-03 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/NB										PM:Var											
Closure limits: SB Route 55 main-line from north of 17 <sup>th</sup> Street to Edinger Ave. in Santa Ana																										
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays		2	1	1	1	3	S	S	N	N	N	N	N	N	N	N	N	N	N	N	S	S	3	3	2	
Fridays		2	1	1	1	3	S	S	N	N	N	N	N	N	N	N	N	N	N	N	S	S	3	3	2	
Saturdays		2	1	1	1	1	2	3	3	S	S	S	S	S	S	S	S	S	S	S	S	S	3	3	2	
Sundays		2	1	1	1	1	2	3	3	S	S	S	S	S	S	S	S	S	S	S	S	S	3	3	2	
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3		Provide at least 3 adjacent through freeway lanes open in direction of travel																								
S		Shoulder closure allowed (right / left)																								
N		No work allowed																								
REMARKS:																										

Replace "Reserved" in section 12-4.05B with:

Chart no. SB-11 Freeway/Expressway Lane Requirements																										
County: Orange					Route/Direction:55/SB										PM:Var											
Closure limits: SB Route 55 main-line from north of 17 <sup>th</sup> St. to South of 4th St. in Santa Ana																										
From hour to hour      24 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24																										
Mondays through Thursdays																										
Fridays																								3	2	
Saturdays					1	C	C	C	C	2	3	4												3	2	
Sundays					1	C	C	C	C	2	3	4														
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4 Provide at least 4 adjacent through freeway lanes open in direction of travel																										
C Full freeway closure allowed in one direction only																										
REMARKS:																										
This chart is for one event and only for installation of overhead sign operational closures																										

Replace "Reserved" in section 12-4.05B with:

Chart no. SB-12 Freeway/Expressway Lane Requirements																											
County: Orange							Route/Direction:55/SB							PM:Var													
Closure limits: SB Route 55 main-line @ 19 <sup>th</sup> St in Costa Mesa																											
From hour to hour		24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
Mondays through Thursdays																											
Fridays																										3	2
Saturdays		1	C	C	C	C	2	3																		3	2
Sundays		1	C	C	C	C	2	3																			
Legend:																											
1		Provide at least 1 through freeway lane open in direction of travel																									
2		Provide at least 2 adjacent through freeway lanes open in direction of travel																									
3		Provide at least 3 adjacent through freeway lanes open in direction of travel																									
C		Full freeway closure allowed in one direction only																									
REMARKS:																											
This chart is for one event and only for installation of overhead sign operational closures																											

Replace "Reserved" in section 28-4 of the RSS for section 28 with:

**28-4.01 GENERAL**

**28-4.01A Summary**

Section 28-4 includes specifications for constructing lean concrete base rapid setting (LCBRS).

**28-4.01B Definitions**

**final set time:** Elapsed time after initial contact of cement and water required for the mortar sieved from the concrete to develop a penetration resistance of 4,000 psi under ASTM C 403.

**opening age:** Age when the LCBRS achieves the specified strength for opening to traffic including construction traffic.

**28-4.01C Submittals**

**28-4.01C(1) General**

At least 25 days before field qualification, submit the name of your proposed testing laboratory.

Submit quality control test results within 24 hours of test completion.

**28-4.01C(2) Mix Design**

Determine the mix proportions for LCBRS and submit mix designs.

At least 10 days before placing LCBRS, submit a mix design for LCBRS and include:

1. Opening age
2. Proposed aggregate gradation
3. Mix design, including
  - 3.1. Proportions
  - 3.2. Types and amounts of chemical admixtures
4. Maximum time allowed between batching and placing
5. Range of ambient temperatures over which the mix design is applicable
6. Final-set-time
7. Aggregate qualification test results if required

Submit 1 mix design for each ambient temperature variation anticipated during LCBRS placement. Each mix design must have a maximum ambient temperature range of 18 degrees F.

Submit compressive strength development data for each mix design. You may use strength development data from laboratory-prepared samples. The testing ages for strength development data must include 1 hour before opening age, opening age, 1 hour after opening age, 24 hours, and 7 days.

**28-4.01C(3) Field Qualification**

Submit field qualification data and test reports including:

1. Mixing date
2. Mixing equipment and procedures used
3. Batch volume in cubic yards, minimum 5 cu yd
4. Type and source of ingredients used
5. Age and strength at time of cylinder testing

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

## **28-4.01D Quality Control and Assurance**

### **28-4.01D(1) General**

Stop LCBRS activities and immediately notify the Engineer if:

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

If LCBRS activities are stopped, before resuming activities:

1. Inform the Engineer of the adjustments you will make
2. Remedy or replace the noncompliant LCBRS until it complies with specifications
3. Field qualify the LCBRS demonstrating ability to comply with the specifications
4. Obtain authorization

For compressive strength testing, prepare 6 cylinders under California Test 540. Test specimens must be 6 by 12 inches. As an alternative to rodding, a vibrator may be used under California Test 524. Test cylinders under California Test 521 and perform 3 tests with each test consisting of 2 cylinders. The test result is the average from the 2 cylinders.

### **28-4.01D(2) Field Qualification**

Proposed mix proportions must be field qualified before you place LCBRS. The technician performing the field test must hold current American Concrete Institute (ACI) certification as a Concrete Field Testing Technician-Grade I.

Field qualification must comply with the following:

1. Test for compressive strength at opening age and 7 days of age
2. At opening age, the compressive strength for each test must be at least 180 psi and the average strength for the 3 tests must be at least 200 psi
3. At 7 days age, the compressive strength for each test must be at least 600 psi and the average strength for the 3 tests must be at least 725 psi

### **28-4.01D(3) Quality Control Testing**

Perform sampling under California Test 125.

Testing laboratories and testing equipment must comply with the Department's Independent Assurance Program.

Perform quality control sampling, testing, and inspection throughout LCBRS production and placement. For LCBRS, your quality control testing and results must comply with the following table:

**Quality Control Requirements**

Quality characteristic	Test method	Minimum testing frequency	Requirement
Sand equivalent (min)	ASTM D 2419	1 per 500 cu yd, minimum 1 per day of production	71 <sup>a</sup>
Aggregate gradation	ASTM C 136		Comply with section 28-2.02C
Air content (max, percent) <sup>b</sup>	ASTM C 231	1 per 4 hours of placement work, plus one in the last hour of placement work	4
Penetration <sup>c</sup> (inches)	ASTM C 360		0–2-1/2 nominal 3 maximum
Slump <sup>c</sup> (inches)	ASTM C 143		0–5 nominal 6 maximum
Compressive strength (min, psi at 7 days)	California Test 521		725
Compressive strength (min, psi at opening age)	California Test 521		200

<sup>a</sup> If aggregate is qualified under section 28-4.02D, subparagraph 2, the minimum is 18.

<sup>b</sup> If no single test in the first 5 air content tests exceeds 1-1/2 percent, no further air content tests are required.

<sup>c</sup> Test either penetration or slump

**28-4.01D(4) Acceptance Criteria**

LCBRS acceptance is based on compliance with the requirement for the quality characteristic shown in the following table:

**LCBRS Acceptance Criteria Testing**

Quality characteristic	Test method	Requirement
Compressive strength (min, psi at 7 days)	California Test 521 <sup>a</sup>	725

<sup>a</sup>Cylinders made under California Test 540

**28-4.02 MATERIALS**

**28-4.02A General**

Not Used

**28-4.02B Cement**

Cement must comply with the requirements for RSC.

**28-4.02C Chemical Admixtures**

Chemical admixtures must comply with chemical admixtures for concrete except you may use Type E chemical admixture. You may submit a request to use citric acid or borax. Your request must include a request from the cement manufacturer and a test sample.

#### **28-4.02D Aggregates**

Aggregate must comply with either of the following:

1. Section 90-1.02C except aggregate grading must comply with the aggregate grading table in section 28-2.02C
2. Section 28-2.02C and the following:
  - 2.1. Qualify the aggregate for each proposed aggregate source and gradation
  - 2.2. Qualification tests include (1) sand equivalent and (2) average 7-day compressive strength under ASTM C 39 on 3 specimens manufactured under ASTM C 192. The cement content for this test must be 300 lb/cu yd, and the 7-day compressive strength must be at least 610 psi. Cement must be Type II portland cement under section 90-1.02B(2) without SCM.

#### **28-4.03 CONSTRUCTION**

##### **28-4.03A General**

Construct LCBRS under section 28-2.03 except (1) section 28-2.03A does not apply and (2) the 4th through 6th paragraphs of section 28-2.03D do not apply.

Do not open the LCBRS to traffic before opening age.

Subsequent paving operations may begin only after final set time of LCBRS and it must have a compressive strength of at least 450 psi under California Test 521 before:

1. Placing HMA
2. Placing base
3. Operating equipment on the LCBRS

##### **28-4.03B Proportioning, Mixing, and Transporting**

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

1. Batch the ingredients at a central batch plant and charge them into a mixer truck for transportation to the pour site.
2. Batch the ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a cement silo and weigh system, which must proportion cement for charging into the mixer truck.
3. Batch ingredients except the cement at a central batch plant and charge them into a mixer truck for transportation to a location where preweighed containerized cement is added to the mixer truck. The cement preweighing 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 lb. Preweigh 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 LCBRS being produced.
4. Proportion cement, water, and aggregate volumetrically under ASTM C 685 or section 90-3.02B.

##### **28-4.03C Spreading, Compacting and Shaping**

You may use metal or wood side forms. Wood side forms must be at least 1-1/2 inches thick.

After you deposit the LCBRS on the subgrade, consolidate it with high-frequency internal vibrators. Consolidate adjacent to forms and across the full pavement width. Place LCBRS as nearly as possible to its final position.

Spread and shape LCBRS with powered finishing machines supplemented by hand finishing.

After you place LCBRS, do not add water to the surface to facilitate finishing. Use surface finishing additives as recommended by the manufacturer of the cement after their use is authorized.

**28-4.04 PAYMENT**

Lean concrete base rapid setting is measured from the dimensions shown.

If volumetric proportioning is used and calibration is performed more than 100 miles from the project limits, the Department deducts \$1,000 for each calibration session.

Replace "Reserved" in section 39-1.18 with:

**39-1.18A General**

**39-1.18A(1) Summary**

Treat HMA aggregate with lime using the dry lime method either with marination or without.

Treat aggregate for **RHMA-G** with dry lime.

**39-1.18A(2) Submittals**

Determine the exact lime proportions for fine and coarse virgin aggregate and submit them as part of the proposed JMF.

If marination is required, submit the averaged aggregate quality test results within 24 hours of sampling.

Submit a treatment data log from the dry lime and aggregate proportioning device in the following order:

1. Treatment date
2. Time of day the data is captured
3. Aggregate size being treated
4. HMA type and mix aggregate size
5. Wet aggregate flow rate collected directly from the aggregate weigh belt
6. Aggregate moisture content, expressed as a percent of the dry aggregate weight
7. Flow rate of dry aggregate calculated from the flow rate of wet aggregate
8. Dry lime flow rate
9. Lime ratio from the accepted JMF for each aggregate size being treated
10. Lime ratio from the accepted JMF for the combined aggregate
11. Actual lime ratio calculated from the aggregate weigh belt output, the aggregate moisture input, and the dry lime meter output, expressed as a percent of the dry aggregate weight
12. Calculated difference between the authorized lime ratio and the actual lime ratio

Each day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

**39-1.18A(3) Quality Control and Assurance**

If marination is required, the QC plan must include aggregate quality control sampling and testing during lime treatment. Sample and test in compliance with minimum frequencies shown in the following table:

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent	California Test 217	Once per 1,000 tons of aggregate treated with lime
Percent of crushed particles	California Test 205	As necessary and as designated in the QC plan
Los Angeles Rattler	California Test 211	
Fine aggregate angularity	California Test 234	
Flat and elongated particles	California Test 235	

Note: During lime treatment, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Run tests for aggregate quality in triplicate and report test results as the average of 3 tests.

For any of the following, the Engineer orders proportioning operations stopped if you:

1. Do not submit the treatment data log
2. Do not submit the aggregate quality control data for marinated aggregate
3. Submit incomplete, untimely, or incorrectly formatted data
4. Do not take corrective actions
5. Take late or unsuccessful corrective actions
6. Do not stop treatment when proportioning tolerances are exceeded
7. Use malfunctioning or failed proportioning devices

If you stop treatment, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

**39-1.18B Materials**

High-calcium hydrated lime and water must comply with section 24-2.02.

Before virgin aggregate is treated, it must comply with the aggregate quality specifications. Do not test treated aggregate for quality control except for gradation. The Department does not test treated aggregate for acceptance except for gradation.

The Engineer determines the combined aggregate gradation during HMA production after you have treated the aggregate.

Treated aggregate must not have lime balls or clods.

**39-1.18C Construction**

**39-1.18C(1) General**

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Do not treat RAP.

Marinate aggregate if the plasticity index determined under California Test 204 is from 4 to 10.

If marination is required:

1. Treat and marinate coarse and fine aggregates separately.
2. Treat the aggregate and stockpile for marination only once.
3. Treat the aggregate separate from HMA production.

The lime ratio is the pounds of dry hydrated lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

Aggregate gradations must have the lime ratio ranges shown in the following table:

Aggregate gradation	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions.

Proportion dry lime by weight with a continuous operation.

The device controlling dry lime and aggregate proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by a data set is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the controller.

If 3 consecutive sets of recorded treatment data indicate deviation more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the day's treated aggregate in HMA.

If you stop treatment for noncompliance, you must implement corrective action and successfully treat aggregate for a 20-minute period. Notify the Engineer before beginning the 20-minute treatment period.

If you use a batch-type proportioning operation for HMA production, control proportioning in compliance with the specifications for continuous mixing plants. Use a separate dry lime aggregate treatment operation from HMA batching operations including:

1. Pugmill mixer
2. Controller
3. Weigh belt for the lime
4. Weigh belt for the aggregate

If using a continuous mixing operation for HMA without lime marinated aggregates, use a controller that measures the blended aggregate weight after any additional water is added to the mixture. The controller must determine the quantity of lime added to the aggregate from the aggregate weigh belt input in connection with the manually input total aggregate moisture, the manually input target lime content, and the lime proportioning system output. Use a continuous aggregate weigh belt and pugmill mixer for the lime treatment operation in addition to the weigh belt for the aggregate proportioning to asphalt binder in the HMA plant. If you use a water meter for moisture control for lime treatment, the meter must comply with California Test 109.

At the time of mixing dry lime with aggregate, the aggregate moisture content must ensure complete lime coating. The aggregate moisture content must not cause aggregate to be lost between the point of weighing the combined aggregate continuous stream and the dryer. Add water for mixing and coating aggregate to the aggregate before dry lime addition. Immediately before mixing lime with aggregate, water must not visibly separate from aggregate.

The HMA plant must be equipped with a bag-house dust system. Material collected in the dust system must be returned to the mix.

#### **39-1.18C(2) Mixing Dry Lime and Aggregate**

Mix aggregate, water, and dry lime with a continuous pugmill mixer with twin shafts. Immediately before mixing lime with aggregate, water must not visibly separate from the aggregate. Store dry lime in a uniform and free-flowing condition. Introduce dry lime to the pugmill in a continuous operation. The introduction must occur after the aggregate cold feed and before the point of proportioning across a weigh belt and the aggregate dryer. Prevent loss of dry lime.

If marination is required, marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated more than 60 days.

The pugmill must be equipped with paddles arranged to provide sufficient mixing action and mixture movement. The pugmill must produce a homogeneous mixture of uniformly coated aggregates at mixer discharge.

If the aggregate treatment operation is stopped longer than 1 hour, clean the equipment of partially treated aggregate and lime.

Aggregate must be completely treated before introduction into the mixing drum.

#### **39-1.18D Payment**

Not Used

Replace "Reserved" in section 39-1.19 with:

**39-1.19A General**

**39-1.19A(1) Summary**

Treat HMA aggregate with lime using the slurry method and place it in stockpiles to marinate.

Treat aggregate for **RHMA-G** with lime slurry.

**39-1.19A(2) Submittals**

Determine the exact lime proportions for fine and coarse virgin aggregate and submit them as part of the proposed JMF.

Submit the averaged aggregate quality test results to the Engineer within 24 hours of sampling.

Submit a treatment data log from the slurry proportioning device in the following order:

1. Treatment date
2. Time of day the data is captured
3. Aggregate size being treated
4. Wet aggregate flow rate collected directly from the aggregate weigh belt
5. Moisture content of the aggregate just before treatment, expressed as a percent of the dry aggregate weight
6. Dry aggregate flow rate calculated from the wet aggregate flow rate
7. Lime slurry flow rate measured by the slurry meter
8. Dry lime flow rate calculated from the slurry meter output
9. Authorized lime ratio for each aggregate size being treated
10. Actual lime ratio calculated from the aggregate weigh belt and the slurry meter output, expressed as a percent of the dry aggregate weight
11. Calculated difference between the authorized lime ratio and the actual lime ratio
12. Dry lime and water proportions at the slurry treatment time

Every day during lime treatment, submit the treatment data log on electronic media in tab delimited format on a removable CD-ROM storage disk. Each continuous treatment data set must be a separate record using a line feed carriage return to present the specified data on 1 line. The reported data must include data titles at least once per report.

**39-1.19A(3) Quality Control and Assurance**

The QC plan must include aggregate quality control sampling and testing during aggregate lime treatment. Sample and test in compliance with frequencies in the following table:

Quality characteristic	Test method	Minimum sampling and testing frequency
Sand equivalent	California Test 217	Once per 1,000 tons of aggregate treated with lime
Percent of crushed particles	California Test 205	As necessary and as designated in the QC plan
Los Angeles Rattler	California Test 211	
Fine aggregate angularity	California Test 234	
Flat and elongated particles	California Test 235	

Note: During lime treatment, sample coarse and fine aggregate from individual stockpiles. Combine aggregate in the JMF proportions. Run tests for aggregate quality in triplicate and report test results as the average of 3 tests.

For any of the following, the Engineer orders proportioning operations stopped if you:

1. Do not submit the treatment data log
2. Do not submit the aggregate quality control data
3. Submit incomplete, untimely, or incorrectly formatted data
4. Do not take corrective actions
5. Take late or unsuccessful corrective actions
6. Do not stop treatment when proportioning tolerances are exceeded
7. Use malfunctioning or failed proportioning devices

If you stop treatment, notify the Engineer of any corrective actions taken and conduct a successful 20-minute test run before resuming treatment.

For the aggregate to be treated, determine the moisture content at least once during each 2 hours of treatment. Calculate moisture content under California Test 226 or 370 and report it as a percent of dry aggregate weight. Use the moisture content calculations as a set point for the proportioning process controller.

**39-1.19B Materials**

High-calcium hydrated lime and water must comply with section 24-2.02.

Before virgin aggregate is treated, it must comply with the aggregate quality specifications. Do not test treated aggregate for quality control except for gradation. The Engineer does not test treated aggregate for acceptance except for gradation.

The Engineer determines the combined aggregate gradation during HMA production after you have treated the aggregate. If RAP is used, the Engineer determines combined aggregate gradations containing RAP under Laboratory Procedure LP-9.

Treated aggregate must not have lime balls or clods.

**39-1.19C Construction**

**39-1.19C(1) General**

Notify the Engineer at least 24 hours before the start of aggregate treatment.

Treat aggregate separate from HMA production.

Do not treat RAP.

Add lime to the aggregate as slurry consisting of mixed dry lime and water at a ratio of 1 part lime to from 2 to 3 parts water by weight. The slurry must completely coat the aggregate.

Lime treat and marinate coarse and fine aggregates separately.

Immediately before mixing lime slurry with the aggregate, water must not visibly separate from the aggregate.

Treat the aggregate and stockpile for marination only once.

The lime ratio is the pounds of dry hydrated lime per 100 lb of dry virgin aggregate expressed as a percentage. Water content of slurry or untreated aggregate must not affect the lime ratio.

The following aggregate gradations must have the lime ratio ranges shown in the following table:

Aggregate gradation	Lime ratio percent
Coarse	0.4–1.0
Fine	1.5–2.0
Combined virgin aggregate	0.8–1.5

The lime ratio for fine and coarse aggregate must be within  $\pm 0.2$  percent of the lime ratio in the accepted JMF. The lime ratio must be within  $\pm 0.2$  percent of the authorized lime ratio when you combine the individual aggregate sizes in the JMF proportions. The lime ratio must be determined before the addition of RAP.

If 3 consecutive sets of recorded treatment data indicate deviation more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment.

If a set of recorded treatment data indicates a deviation of more than 0.4 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the material represented by that set of data in HMA.

If 20 percent or more of the total daily treatment indicates deviation of more than 0.2 percent above or below the lime ratio in the accepted JMF, stop treatment and do not use the day's total treatment in HMA.

If you stop treatment for noncompliance, you must implement corrective action and successfully treat aggregate for a 20-minute period. Notify the Engineer before beginning the 20-minute treatment period.

**39-1.19C(2) Lime Slurry Proportioning**

Proportion lime and water with a continuous or batch operation.

The device controlling slurry proportioning must produce a treatment data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily treatment. The data must be a treatment activity register and not a summation. The material represented by the data set is the quantity produced 5 minutes before and 5 minutes after the capture time. For the Contract's duration, collected data must be stored by the controller.

**39-1.19C(3) Proportioning and Mixing Lime Slurry Treated Aggregate**

Treat HMA aggregate by proportioning lime slurry and aggregate by weight in a continuous operation.

Marinate treated aggregate in stockpiles from 24 hours to 60 days before using in HMA. Do not use aggregate marinated longer than 60 days.

**39-1.19D Payment**

Not Used

Replace "Reserved" in section 39-1.20 with:

**39-1.20A General**

**39-1.20A(1) Summary**

Treat asphalt binder with liquid antistrip (LAS) treatment to bond the asphalt binder to aggregate in HMA.

**39-1.20A(2) Submittals**

For LAS, submit with the proposed JMF submittal:

1. MSDS
2. One 1-pint sample
3. Infrared analysis including copy of absorption spectra

Submit a certified copy of test results and an MSDS for each LAS lot.

Submit a certificate of compliance for each LAS shipment. With each certificate of compliance, submit:

1. Your signature and printed name
2. Shipment number
3. Material type
4. Material specific gravity
5. Refinery
6. Consignee
7. Destination
8. Quantity
9. Contact or purchase order number
10. Shipment date

Submit proportions for LAS as part of the JMF submittal. If you change the brand or type of LAS, submit a new JMF.

For each job site delivery of LAS, submit one 1/2-pint sample to METS. Submit shipping documents to the Engineer. Label each LAS sampling container with:

1. LAS type
2. Application rate
3. Sample date
4. Contract number

At the end of each day's production shift, submit production data in electronic and printed media. Present data on electronic media in tab delimited format. Use line feed carriage return with 1 separate record per line for each production data set. Allow sufficient fields for the specified data. Include data titles at least once per report. For each mixing operation type, submit in order:

1. Batch mixing:
  - 1.1. Production date
  - 1.2. Time of batch completion
  - 1.3. Mix size and type
  - 1.4. Each ingredient's weight
  - 1.5. Asphalt binder content as a percentage of the dry aggregate weight
  - 1.6. LAS content as a percentage of the asphalt binder weight

2. Continuous mixing:
  - 2.1. Production date
  - 2.2. Data capture time
  - 2.3. Mix size and type
  - 2.4. Flow rate of wet aggregate collected directly from the aggregate weigh belt
  - 2.5. Aggregate moisture content as percentage of the dry aggregate weight
  - 2.6. Flow rate of asphalt binder collected from the asphalt binder meter
  - 2.7. Flow rate of LAS collected from the LAS meter
  - 2.8. Asphalt binder content as percentage of total weight of mix calculated from:
    - 2.8.1. Aggregate weigh belt output
    - 2.8.2. Aggregate moisture input
    - 2.8.3. Asphalt binder meter output
  - 2.9. LAS content as percentage of the asphalt binder weight calculated from:
    - 2.9.1. Asphalt binder meter output
    - 2.9.2. LAS meter output

### **39-1.20A(3) Quality Control and Assurance**

For continuous mixing and batch mixing operations, sample asphalt binder before adding LAS. For continuous mixing operations, sample combined asphalt binder and LAS after the static mixer.

The Engineer orders proportioning operations stopped for any of the following if you:

1. Do not submit data
2. Submit incomplete, untimely, or incorrectly formatted data
3. Do not take corrective actions
4. Take late or unsuccessful corrective actions
5. Do not stop production when proportioning tolerances are exceeded
6. Use malfunctioning or failed proportioning devices

If you stop production, notify the Engineer of any corrective actions taken before resuming.

### **39-1.20B Materials**

LAS-treated asphalt binder must comply with the specifications for asphalt binder in section 39-1.02C. Do not use LAS as a substitute for asphalt binder.

LAS total amine value must be 325 minimum when tested under ASTM D 2074.

Use only 1 LAS type or brand at a time. Do not mix LAS types or brands.

Store and mix LAS under the manufacturer's instruction.

**39-1.20C Construction**

LAS must be from 0.5 to 1.0 percent by weight of asphalt binder.

If 3 consecutive sets of recorded production data show actual delivered LAS weight is more than  $\pm 1$  percent of the authorized mix design LAS weight, stop production and take corrective action.

If a set of recorded production data shows actual delivered LAS weight is more than  $\pm 2$  percent of the authorized mix design LAS weight, stop production. If the LAS weight exceeds 1.2 percent of the asphalt binder weight, do not use the HMA represented by that data.

The continuous mixing plant controller proportioning the HMA must produce a production data log. The log consists of a series of data sets captured at 10-minute intervals throughout daily production. The data must be a production activity register and not a summation. The material represented by the data is the quantity produced 5 minutes before and 5 minutes after the capture time. For the duration of the Contract, collected data must be stored by the plant controller or a computer's memory at the plant.

**39-1.20D Payment**

Not Used

**BID ITEM LIST  
12-0L74U4**

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61	206401	MAINTAIN EXISTING IRRIGATION FACILITIES	LS	LUMP SUM	LUMP SUM	
62	206560	CONTROL AND NEUTRAL CONDUCTORS	LS	LUMP SUM	LUMP SUM	
63	206604	1 1/2" ELECTRIC REMOTE CONTROL VALVE	EA	3		
64	208465	SPRINKLER (TYPE A-5)	EA	6		
65	208466	SPRINKLER (TYPE A-6)	EA	6		
66	208467	SPRINKLER (TYPE A-7)	EA	11		
67	208468	SPRINKLER (TYPE A-8)	EA	11		
68 (F)	208595	1" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	540		
69 (F)	208596	1 1/4" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	530		
70 (F)	208597	1 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	600		
71 (F)	208599	2 1/2" PLASTIC PIPE (SCHEDULE 40) (SUPPLY LINE)	LF	400		
72	208905	EXTEND 6" CONDUIT	LF	15		
73	250201	CLASS 2 AGGREGATE SUBBASE	CY	1,920		
74	260203	CLASS 2 AGGREGATE BASE (CY)	CY	1,650		
75	280015	LEAN CONCRETE BASE RAPID SETTING	CY	160		
76	374002	ASPHALTIC EMULSION (FOG SEAL COAT)	TON	69		
77	390132	HOT MIX ASPHALT (TYPE A)	TON	2,220		
78	390134	HOT MIX ASPHALT (OPEN GRADED)	TON	1,280		
79	390140	RUBBERIZED HOT MIX ASPHALT (GAP GRADED)	TON	43,500		
80	394060	DATA CORE	LS	LUMP SUM	LUMP SUM	