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**\*\* WARNING \*\* WARNING \*\* WARNING \*\* WARNING \*\***  
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April 10, 2008

06-Ker-58-77.3/R107.6  
06-0H8404

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in KERN COUNTY NEAR TEHACHAPI FROM 1.7 MILE EAST OF ROUTE 223 TO CACHE 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 April 16, 2008.

This addendum is being issued to revise the Notice to Contractors and Special Provisions.

In the Special Provisions, Section 10-1.18, "HOT MIX ASPHALT," subsection "MATERIALS," the third paragraph is revised as follows:

"Treat aggregate with lime slurry under "HOT MIX ASPHALT AGGREGATE LIME TREATMENT - SLURRY METHOD." For the mix design, use Lab Procedure LP-7."

In the Special Provisions, Section 10-1.19, "HOT MIX ASPHALT OPEN GRADED FRICTION COURSE," subsection "MATERIALS", the third paragraph is revised as follows:

"Treat aggregate with lime slurry under "HOT MIX ASPHALT AGGREGATE LIME TREATMENT - SLURRY METHOD." For the mix design, use Lab Procedure LP-7."

In the Special Provisions, Section 10-1.20, "RUBBERIZED BONDED WEARING COURSE - GAP GRADED," is replaced as attached.

In the Special Provisions, Section 10-1.21, "RUBBERIZED BONDED WEARING COURSE - OPEN GRADED," subsection "MATERIALS," sub-subsection "Aggregate", the following paragraph is added after the second paragraphs.

"Treat aggregate with lime slurry under "HOT MIX ASPHALT AGGREGATE LIME TREATMENT - SLURRY METHOD." For the mix design, use Lab Procedure LP-7."

In the Special Provisions, Section 10-1.25, "HOT MIX ASPHALT AGGREGATE LIME TREATMENT – DRY LIME METHOD," is deleted.

In the Special Provisions, Section 10-1.26, "LIQUID ANTISTRIP TREATMENT," is deleted.

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April 10, 2008

06-Ker-58-77.3/R107.6  
06-0H8404

To Proposal and Contract book holders:

Inquiries or questions in regard to this addendum must be communicated as a bidder inquiry and must be made as noted in the NOTICE TO CONTRACTORS section of the Notice to Contractors 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 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 confirmed facsimile to all book holders to ensure that each receives it. A copy of this addendum is available for the contractor's use on the Internet Site:

**[http://www.dot.ca.gov/hq/esc/oe/weekly\\_ads/addendum\\_page.html](http://www.dot.ca.gov/hq/esc/oe/weekly_ads/addendum_page.html)**

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**

MALCOLM DOUGHERTY  
District Director  
District 6 Central Region

Attachments

## **10-1.20 RUBBERIZED BONDED WEARING COURSE – GAP GRADED**

### **GENERAL**

#### **Summary**

This work includes producing and placing bonded wearing course. Bonded wearing course consists of gap graded rubberized hot mix asphalt (RHMA-G) placed over a membrane of polymer modified asphaltic emulsion in a single pass with an integrated paving machine.

Comply with the specifications for RHMA-G under Section 39, "Hot Mix Asphalt," of the Standard Specifications. Use the QC/QA process.

#### **Submittals**

With the job mix formula (JMF) submittal, submit:

1. Target residual rate for asphaltic emulsion membrane

With the first delivery of asphaltic emulsion, submit test results for asphaltic emulsion properties performed by an AASHTO-accredited laboratory.

Within 1 business day of each job site delivery of asphaltic emulsion, submit to the Transportation Laboratory a 2-quart sample and a Certificate of Compliance in compliance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. Ship each sample so that it is received at the Transportation Laboratory within 48 hours of sampling. Label each asphaltic emulsion sampling container with:

1. Emulsion producer and location
2. Asphaltic emulsion type
3. Percent of water
4. Application rate
5. Sampling location and date
6. Contract number

Each day bonded wearing course is placed, submit the application rate for asphaltic emulsion membrane. During production, submit certified volume or weight slips for the materials supplied.

### Quality Control and Assurance

Perform sampling and testing at the specified frequency for the following quality characteristics:

#### Minimum Quality Control

Quality Characteristic	Test Method	Minimum Sampling and Testing Frequency	Requirement
Aggregate gradation	CT 202	1 per 750 tons and any remaining part	JMF $\pm$ Tolerance <sup>a</sup>
Sand equivalent (min.) <sup>b</sup>	CT 217		47
Cleanness value (min.) <sup>c</sup>	CT 227		57
Asphalt binder content	CT 379 or 382 <sup>d</sup>		JMF $\pm$ 0.50%
HMA moisture content (max.)	CT 370 <sup>d</sup>	1 per 2,500 tons but not less than 1 per paving day	1.0%
Aggregate moisture content at continuous mixing plants <sup>e</sup>	CT 226 or CT 370	One per 4,000 tons or 2 per 5 business days, whichever is more	--
Percent of crushed particles Coarse aggregate (% min.) Two fractured faces Fine aggregate (% min.) (Passing No. 4 sieve and retained on No. 8 sieve.)	CT 205	2 per day during production	90
			85
Los Angeles Rattler (% max.) Loss at 250 rev. Loss at 500 rev.	CT 211	As necessary and designated in the QCP. At least once per project	12 35
Fine aggregate angularity (% min.)	AASHTO T 304, Method A		45
Flat and elongated particles (% max. @ 3:1)	ASTM D 4791		25
Smoothness	Standard Specifications Section 39-1.12		12-foot straightedge and must-grind
Asphaltic emulsion membrane		At least once per paving day	Submitted application rate $\pm$ 0.02 gallons per square yard
Asphalt rubber binder viscosity @ 350 °F, centipoises	Standard Specifications Section 39-1.02D		1,500 – 4,000
Crumb rubber modifier	Standard Specifications Section 39-1.02D		Standard Specifications Section 39-1.02D

Notes:

<sup>a</sup>The tolerances must comply with the allowable tolerances in "Aggregate."

<sup>b</sup>Report the average of 3 tests from a single split sample.

<sup>c</sup>Test procedure must comply with Note b in the aggregate quality table.

<sup>d</sup>Sample HMA from the hopper.

<sup>e</sup>For adjusting the plant controller at the HMA plant.

The Engineer samples for acceptance testing and tests for:

**HMA Acceptance – QC/QA**

Index (i) <sup>a</sup>	Quality Characteristic	Weighting Factor (w) <sup>a</sup>	Test Method	Requirement
	Sieve		CT 202	JMF ± Tolerance <sup>b</sup>
1	No. 4	0.20		
2	No. 8	0.20		
3	No. 200	0.20		
4	Asphalt binder content	0.40	CT 379 or 382 <sup>c</sup>	JMF ± 0.45%
	Sand equivalent (min.) <sup>d</sup>		CT 217	47
	Cleanness value (min.) <sup>e</sup>		CT 227	57
	Percent of crushed particles coarse aggregate (% min.) Two fractured faces		CT 205	90
	Fine aggregate (% min.) (Passing No. 4 sieve and retained on No. 8 sieve.)			85
	HMA moisture content (max.)		CT 370 <sup>c</sup>	1.0%
	Los Angeles Rattler (% max.) Loss at 100 rev. Loss at 500 rev.		CT 211	12 35
	Fine aggregate angularity (% min.)			AASHTO T 304, Method A
	Flat and elongated particle (% max. @ 3:1)		ASTM D 4791	25
	Smoothness		Standard Specifications Section 39-1.12	12-foot straightedge and must-grind
	Asphalt binder		Various	Standard Specifications Section 92
	Asphaltic emulsion membrane		Various	"Materials"
		--		Submitted application rate ± 0.02 gallons per square yard
	Asphalt rubber binder viscosity @ 350 °F, centipoises		Section 39-1.02D	1,500 – 4,000
	Crumb rubber modifier		Section 39-1.02D	Standard Specifications Section 39-1.02D

Notes:

<sup>a</sup> Used to determine payment for QC / QA construction process projects.

<sup>b</sup> The tolerances must comply with the allowable tolerances in "Aggregate."

<sup>c</sup> Sample HMA from the hopper.

<sup>d</sup> The Engineer reports the average of 3 tests from a single split sample.

<sup>e</sup> Test procedure must comply with Note b in the aggregate quality table.

Sample asphaltic emulsion under AASHTO T 40. For each job site delivery of asphaltic emulsion, take a 2-quart sample in the presence of the Engineer. Take samples from the delivery truck mid-load from a sampling tap or thief. If the sample is taken from the tap, draw and discard 4 quarts before sampling.

If you unload asphalt binder or asphaltic emulsion into bulk storage tanks, do not use material from the tanks until you submit a Certificate of Compliance.

**MATERIALS**

**Asphaltic Emulsion Membrane**

Asphaltic emulsion membrane must comply with:

**Asphaltic Emulsion Membrane**

Properties	Test Method	Specification	
		Min.	Max.
Saybolt-Furol viscosity, at 25°C, s	AASHTO T59	20	100
Sieve test on original emulsion (at time of delivery), %		-	0.05
24-hour storage stability (see note), %		-	1
Residue by evaporation, %	California Test 331	63	--
Tests on residue from evaporation test:			
Torsional recovery, measure entire arc of recovery, at 25°C, %	California Test 332	40	--
Penetration (0.01 mm) at 25°C	AASHTO T49	70	150

Note: After standing undisturbed for 24 hours, the surface must be a smooth homogeneous color throughout and show no white, milky colored substance.

**Asphalt Binder**

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

**Aggregate**

Aggregate for RHMA-G in bonded wearing course must comply with the 3/8-inch grading. Choose a sieve size target value (TV) within each target value limit presented in the aggregate gradation table:

**Aggregate Gradation  
(Percentage Passing)**

**Rubberized Hot Mix Asphalt (Bonded Wearing Course – Gap Graded)**

3/8-inch RHMA-G		
Sieve Sizes	Target Value Limits	Allowable Tolerance
1/2"	100	—
3/8"	95 - 100	TV ±6
No. 4	42 - 55	TV ±7
No. 8	19 - 32	TV ±6
No. 16	16 - 22	TV ±5
No. 30	10 - 18	TV ±5
No. 50	8 - 13	TV ±4
No.100	6 - 10	TV ±2
No. 200	4 - 7	TV ±2

Before the addition of asphalt binder, aggregate must comply with:

**Aggregate Quality**

Quality Characteristic	Test Method	Requirement
Percent of crushed particles Coarse aggregate (% min.) Two fractured faces	CT 205	90
Fine aggregate (% min.) (Passing No. 4 sieve and retained on No. 8 sieve.)		85
Los Angeles Rattler (% Max.) Loss at 100 Rev. Loss at 500 Rev.	CT 211	12
		35
Sand equivalent <sup>a</sup> (min.)	CT 217	47
Cleanness value <sup>b</sup> (min.)	CT 227	57
Plasticity index (max.)	CT 204	10
Fine aggregate angularity (% min.)	AASHTO T 304 Method A	45
Flat and elongated particles (% max. @ 3:1)	ASTM D 4791	25
K <sub>c</sub> factor (max.)	CT 303	1.7
K <sub>f</sub> factor (max.)	CT 303	1.7

Note:

<sup>a</sup> Reported value must be the average of 3 tests from a single sample.

<sup>b</sup> Determine the cleanness value under California Test 227 modified as follows:

1. Perform the test on material retained on the No. 8 sieve from each bin.
2. Prepare each test specimen by hand shaking the entire sample for 30 seconds in a 12 inch diameter No. 4 sieve nested on top of a 12 inch diameter No. 8 sieve.
3. Use the test specimen mass and volume of wash water specified for 1 inch x No. 4 aggregate when a coarse aggregate bin contains material which will pass the maximum size specified and be retained on a 3/8 inch sieve.
4. Obtain samples from the weigh box area during or immediately after discharge from each bin at a batch mixing plant or immediately prior to mixing with asphalt binder at a continuous mixing plant.
5. The cleanness value of the sample from each of the bins will be separately computed and reported.

**Reclaimed Asphalt Pavement**

Do not use reclaimed asphalt pavement in bonded wearing course.

## **HOT MIX ASPHALT DESIGN REQUIREMENTS**

### **Asphalt Rubber Binder Content**

Determine the amount of asphalt rubber binder to be mixed with the aggregate for RHMA-G under California Test 367 except:

1. Determine the specific gravity used in California Test 367, Section B, "Void Content of Specimen," using California Test 308, Method A.
2. California Test 367, Section C, "Optimum Bitumen Content," is revised as follows:
  - 2.1. Base the calculations on the average of 3 briquettes produced at each asphalt rubber binder content.
  - 2.2. Use California Test 309 to determine theoretical maximum specific gravity and density of the RHMA-G.
  - 2.3. Plot asphalt rubber binder content versus average air voids content based on California Test 309 for each set of three specimens on Form TL-306 (Figure 3), and connect adjacent points with a best-fit curve.
  - 2.4. Plot asphalt rubber binder content versus average Hveem stability for each set of three specimens and connect adjacent points with a best-fit curve.
  - 2.5. Calculate voids in mineral aggregate (VMA) and voids filled with asphalt (VFA) for each specimen, average each set, and plot the average versus asphalt rubber binder content.
  - 2.6. Calculate the dust proportion and plot versus asphalt rubber binder content.
  - 2.7. From the curve plotted in Step 2.3, select the theoretical asphalt rubber binder content that has 5.0 percent air voids.
  - 2.8. At the selected asphalt rubber binder content, evaluate corresponding voids in mineral aggregate, voids filled with asphalt, and dust proportion to verify compliance with requirements. If necessary, develop an alternate composite aggregate gradation to conform to the RHMA-G requirements.
  - 2.9. Record the asphalt rubber binder content in Step 2.7 as the Optimum Bitumen Content (OBC).
  - 2.10. To establish a recommended range, use the OBC as the high value and 0.3 percent less as the low value. Notwithstanding, the recommended range must not extend below 7.0 percent. If the OBC is 7.0 percent, then there is no recommended range, and 7.0 percent is the recommended value.
3. Laboratory mixing and compaction must comply with California Test 304, except the mixing temperature of the aggregate must be between 300 °F and 325 °F. The mixing temperature of the asphalt-rubber binder must be between 350 °F and 425 °F. The compaction temperature of the combined mixture must be between 290 °F and 300 °F.

### **Antistrip Treatment**

Treat aggregate with lime slurry under "Hot Mix Asphalt Aggregate lime Treatment - Slurry Method." For the mix design, use Lab Procedure LP-7.

### **Job Mix Formula Verification**

The Engineer verifies the JMF by testing plant-produced samples for:

1. Aggregate quality (before lime marination, if used)
2. Aggregate gradation (JMF TV  $\pm$  tolerance)
3. Asphalt binder content (JMF TV  $\pm$  tolerance)
4. Quality characteristics specified in the table Hot Mix Asphalt for Job Mix Formula

## **CONSTRUCTION**

### **Prepaving Conference**

Meet with the Engineer at a prepaving conference. The Engineer must agree with the time and place. Discuss methods of performing production and paving.

Attendance at the prepaving conference is mandatory for:

1. Emulsion supplier
2. Paving foreman
3. HMA plant manager
4. Project superintendent
5. Project Manager

### Spreading and Compacting Equipment

Use an integrated distributor-paver capable of spraying the asphaltic emulsion membrane, spreading the bonded wearing course, and leveling the mat surface in 1 pass.

Apply asphaltic emulsion membrane at a uniform rate for the full paving width. The asphaltic emulsion membrane must not be touched by any part of the paver including wheels or tracks.

If the spray bar is adjusted for changing pavement widths, the paver must prevent excess spraying of asphaltic emulsion. Operate the sump pump during the paving operation to prevent tray overflow. The pump must have a warning light within the operator's sight that indicates tray overflow.

The paver must have a receiving hopper or feed system.

Use a material transfer vehicle (MTV) to receive bonded wearing course directly from the truck and deliver to the paver's receiving hopper or feed system. The MTV must:

1. Remix the bonded wearing course before loading the paver
2. Be self propelled and independent of the paver
3. Have sufficient capacity to prevent stopping the paver

The paver must have a full-width, heated vibratory screed that uniformly spreads and finishes the bonded wearing course to the required cross section and grade free from tearing or blemishes. The paver must have sensing devices and automatically control the screed's longitudinal grade and transverse slope. If using a ski device, it must be at least 30 feet long and the entire length must activate the sensor.

After the paving operation's first pass, you may request substitution of a joint matching referencing system for the sensing devices. Obtain the Engineer's authorization before substituting.

Compact bonded wearing course with steel-tired, 2-axle tandem rollers. Each roller must weigh between 126 pounds and 172 pounds per linear inch of drum width.

### Transporting, Spreading, and Compacting

Apply asphaltic emulsion membrane on dry or damp pavement with no free water.

Before spreading bonded wearing course, apply asphaltic emulsion membrane under Section 94, "Asphaltic Emulsions," of the Standard Specifications. Apply emulsion at a temperature between 120 °F and 180 °F and in 1 application at the minimum residual rate specified for the condition of the underlying surface:

**Asphaltic Emulsion Membrane Minimum Residual Rates**

Surface to Receive Asphaltic Emulsion Membrane	Minimum Residual Rates (gallons per square yard)
PCC pavement	0.09
Dense, compacted, new AC pavement	0.11
Open textured, dry, aged or oxidized AC pavement	0.13

Manually apply asphaltic emulsion membrane to pavement outside the spray bar's range. Do not exceed the asphaltic emulsion membrane application rate.

If you request in writing and the Engineer authorizes, you may change asphaltic emulsion membrane application rates.

Spread bonded wearing course within 5 seconds after applying asphaltic emulsion membrane.

Construct a transverse joint when bonded wearing course remains in the paver for more than 30 minutes.

Do not apply asphaltic emulsion membrane more than once. Do not reintroduce into the paving process bonded wearing course spread over asphaltic emulsion membrane.

Do not overlap or hot lap bonded wearing course. Pave through lanes after paving adjacent:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Private drives
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Left turn pockets
10. Median borders

For bonded wearing course placed on areas adjacent to through lanes that extends into the through lanes, cut the bonded wearing course to a neat vertical line at the lane line.

If you spill asphaltic emulsion into the paver hopper, stop paving and remove and dispose of the contaminated material.

Bonded wearing course must be at least 285 °F when measured on the surface behind the screed.

For each paver used, compact bonded wearing course with 2 coverages using 2 rollers with the vibrators turned off. Complete the first coverage before the surface temperature drops below 240 °F. Complete all compaction before the surface temperature drops below 200 °F.

If the atmospheric temperature is below 70 °F, cover loads in trucks with tarpaulins. The tarpaulins must completely cover the exposed load until you transfer the mixture to the MTV. You may omit tarpaulins if the time from discharge to truck until transfer to the MTV is less than 30 minutes.

Do not allow traffic on bonded wearing course until the surface temperature is below 160 °F.

### **Smoothness**

Only determine must-grinds when placing bonded wearing course over HMA constructed under the same project. The top layer of the underlying HMA must comply with the smoothness specifications before placing bonded wearing course.

Remove and replace bonded wearing course not complying with the must-grind and straightedge specifications, except you may grind bonded wearing course for correcting smoothness:

1. At a transverse joint separating the bonded wearing course from pavement not constructed under the same project
2. Within 12 feet of a transverse joint separating the pavement from a bridge deck or approach slab

### **Shoulder Rumble Strips**

Construct shoulder rumble strips in the bonded wearing course.

Place bonded wearing course on adjacent traveled way lanes so that at the end of each work shift, the distance between the ends of bonded wearing course layers on adjacent lanes is between 5 feet and 10 feet. Place additional bonded wearing course along the transverse edge at each lane's end and along the exposed longitudinal edges between adjacent lanes. Hand rake and compact the additional bonded wearing course to form temporary conforms. You may place Kraft paper, or another approved bond breaker, under the conform tapers to facilitate the taper removal when paving operations resume.

### **Conform Tapers**

Place shoulder conform tapers concurrently with the adjacent lane's paving.

Place additional bonded wearing course along the pavement's edge to conform to road connections and private drives. Hand rake, if necessary, and compact the additional bonded wearing course to form a smooth conform taper.

## **MEASUREMENT AND PAYMENT**

Bonded wearing course is paid for as rubberized hot mix asphalt (Bonded Wearing Course – Gap Graded) and asphaltic emulsion membrane (Bonded Wearing Course). Rubberized hot mix asphalt (Bonded Wearing Course – Gap Graded) is measured and paid for as specified in Section 39-5, "Measurement and Payment," of the Standard Specifications. Asphaltic emulsion membrane (Bonded Wearing Course) is measured as specified for asphaltic emulsion in Section 94, "Asphaltic Emulsions," of the Standard Specifications.

The contract price paid per ton for asphaltic emulsion membrane (Bonded Wearing Course) includes full compensation for furnishing all labor, tools, materials, equipment and incidentals, and for doing all the work involved in asphaltic emulsion membrane, 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 using an integrated paving machine is included in the contract price paid per ton for rubberized hot mix asphalt (Bonded Wearing Course – Gap Graded) and no additional compensation is allowed therefor.