

**CHANGE ORDER MEMORANDUM**

CEM-4903 (REV 2/2014)

DATE \_\_\_\_\_

TO			FILE	
FROM			CONTRACT NO. _____	
CHANGE ORDER NO.			CO-RTE-PM _____	
SUPPLEMENT NO.			FED NO. _____	
CATEGORY CODE			CONTINGENCY BALANCE (Including this change)	
CHANGE ORDER AMOUNT			\$	
\$			HEADQUARTERS APPROVAL REQUIRED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
SUPPLEMENTAL FUNDS PROVIDED			IS THIS REQUEST IN ACCORDANCE WITH ENVIRONMENTAL DOCUMENTS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
\$				
ORIGINAL CONTRACT TIME:	TIME ADJUSTMENT THIS CHANGE:	PREVIOUSLY APPROVED TIME ADJUSTMENTS:	PERCENTAGE TIME ADJUSTED (Including this change)	TOTAL # OF UNRECONCILED DEFERRED TIME (Including this change)
_____ DAY(S)	_____ DAY(S)	_____ DAY(S)	_____ %	_____

THIS CHANGE ORDER PROVIDES FOR (Use additional pages as needed):

Producing asphalt binder blending charts to determine the maximum percentage of reclaimed asphalt pavement (RAP) that may be used in hot mix asphalt (HMA). RAP binder must be extracted and recovered to be tested. RAP extraction must be done under AASHTO T 164, Method A. RAP asphalt binder recovery must be done under either ASTM D 1856 or AASHTO R 59. The virgin asphalt binder used on the project and recovered RAP binder must be true graded for high, intermediate, and low critical temperatures under ASSHTO T 313 and AASHTO T 315. Preparing blending calculation sheets and blending charts based on the seventh edition of *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute. The blending charts will show the allowable range of RAP pavement binder ratios (RPBR) that may be used based on the project's specified virgin binder quality characteristics requirements and the test results from true grading the virgin and recovered binder from RAP. The maximum allowable percentage of RAP will be calculated based on the lowest maximum RPBR shown on the blending charts.

**Reason for Change**

Nationwide there have been several premature asphalt pavement failures that have been related to high asphalt binder replacement from recycled materials. Asphalt binder replacement (ABR) is a term used for the asphalt from either RAP or recycled asphalt shingles (RAS) used to replace a portion of the total asphalt binder in new pavements. RAP is commonly used to replace from 15 to 25 percent of the total virgin aggregate in HMA. There have been increased concerns with the use of recycled materials in pavements because of how the ABR effects the combined asphalt binder properties and, therefore, HMA performance. Based on the percentage of ABR, varying degrees of stiffness can be experienced by the in-service pavements. Increased stiffness can have a positive impact on performance by preventing rutting and may reduce cracking potential due to less pavement deflection under loads. However, increased stiffness can also have a negative impact on performance with increased cracking in low temperatures or thin pavement sections. This change order is being implemented to prevent potential premature asphalt pavement failures in California due to increased asphalt binder stiffness caused by using RAP.

**Concurrence**

This change order is in accordance with Division of Construction CPD 16-8, dated June 22, 2016. FHWA gave blanket prior approval for this change on February 17, 2016.

**Extra Work at Agreed Lump Sum Price**

The agreed extra work at lump sum \$ <lump sum price> is based on a force account analysis filed in the project records, and represents the costs for performing asphalt binder testing, extracting and recovering RAP binder, testing recovered RAP binder, and furnishing asphalt blending charts based on the seventh edition of *MS-2 Asphalt Mix Design Methods* by the Asphalt Institute.

Estimated Extra Work at Agreed Lump Sum Price \$ \_\_\_\_\_.

**Time Adjustment**

This change order will not affect the controlling activity; therefore, no time adjustment is warranted.

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CHANGE ORDER NUMBER	SUPPLEMENT NO	CONTRACT NUMBER
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<b>CONCURRED BY:</b>		<b>ESTIMATE OF COST</b>	
CONSTRUCTION ENGINEER/BRIDGE ENGINEER	DATE	ITEMS	
PROJECT ENGINEER	DATE	FORCE ACCOUNT	
PROJECT MANAGER	DATE	AGREED PRICE	
FHWA REP.	DATE	ADJUSTMENT	
ENVIRONMENTAL	DATE	<b>TOTAL</b>	<b>\$0.00</b>
OTHER (SPECIFY)	DATE		<b>\$0.00</b>
HQ OR DISTRICT PRIOR APPROVAL BY	DATE	<b>FEDERAL PARTICIPATION</b>	
RESIDENT ENGINEER SIGNATURE	DATE	<input type="checkbox"/> PARTICIPATING <input type="checkbox"/> PARTICIPATING IN PART <input type="checkbox"/> NONE <input type="checkbox"/> NON-PARTICIPATING (Maintenance) <input type="checkbox"/> NON-PARTICIPATING	
		<b>FEDERAL SEGREGATION (If more than one funding source or P.I.P. type)</b>	
		<input type="checkbox"/> CHANGE ORDER FUNDED PER CONTRACT <input type="checkbox"/> CHANGE ORDER FUNDED AS FOLLOWS	
		FEDERAL FUNDING SOURCE	PERCENT
		_____	_____
		_____	_____
		_____	_____