

Caltrans

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

BID

FOR CONSTRUCTION ON STATE HIGHWAY IN TEHAMA COUNTY AT AND NEAR
PAYNES CREEK FROM 0.1 MILE WEST OF MANTON ROAD TO 0.2 MILE EAST OF
LATKA ROAD

In District 02 On Route 36

Under

Notice to Bidders and Special Provisions dated January 22, 2013

Standard Specifications dated 2010

Project plans approved October 10, 2012

Standard Plans dated 2010

Identified by

Contract No. 02-4E9704

02-Teh-36-55.2/67.5

Project ID 0212000114

Federal-Aid Project

ACSTP-P036(094)E

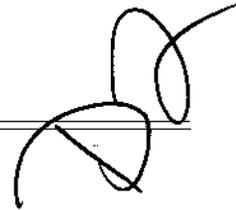
**THIS PROJECT HAS ADDENDUM(S)
INFORMATION AT:
www.dot.ca.gov/addenda/**

Electronic Advertising Contract

Bids open Tuesday, February 12, 2013

Dated January 22, 2013
AADD





CONTRACT NO. 02 - 4E9704

NAME OF BIDDER VSS International Inc.
BUSINESS P.O. BOX PO box 981330
CITY, STATE, ZIP West Sacramento, CA 95798
BUSINESS STREET ADDRESS 3785 Channel Drive
(include even if P.O. Box used)
CITY, STATE, ZIP West Sacramento CA 95691
TELEPHONE NO: AREA CODE (916) 373-1500
FAX NO: AREA CODE (916) 373-0183
CONTRACTOR LICENSE NO. 293727

1. Bidder agrees, if this bid is accepted, to enter into a contract with the Department, in the form included in the Standard Specifications, to perform the work provided in the Contract under the terms of the Contract for the price or prices bid.

For a lump sum or unit price based bid, Bidder additionally agrees to perform the work within the number of working days shown on the *Notice to Bidders*.

For a cost plus time based bid on a contract without a plant establishment period, Bidder additionally agrees to perform the work within the number of working days bid.

For a cost plus time based bid on a contract with a plant establishment period, Bidder additionally agrees to perform the non-plant establishment work within the number of working days bid for non-plant establishment work.

2. For a lump sum based bid, Bidder submits this bid with a total price in the total bid space provided on the Bid Item List. For a unit price or cost plus time based bid, Bidder submits this bid with a unit price and the item total (the product of the unit price and the quantity) for each item and a total price (the sum of the item totals) in the spaces provided on the attached Bid Item List. For a unit price with additive item based bid, Bidder submits this bid with a unit price and an item total for each item and a total base bid (the sum of the item totals) and the additive items in the spaces provided on the attached Bid Item List. Additionally, for a cost plus time based bid, Bidder submits this bid with working days bid for non-plant establishment work, total bid for time, and total bid for bid comparison in the spaces provided on the Bid Item List. Bidder agrees:

- 2.1. If a discrepancy between the unit price and the item total exists, the unit price prevails except:

- 2.1.1. If the unit price is illegible, omitted, or the same as the item total, item total prevails and the unit price is the quotient of the item total and the quantity.

- 2.1.2. If a decimal error is apparent in the product of the unit price and the quantity, the Department will use either the unit price or item total based on the closest by percentage to the unit price or item total in the Department's Final Estimate.

- 2.2. If the unit price and the item total are illegible or are omitted, the bid may be determined nonresponsive. If a lump sum total price is illegible or is omitted, the bid may be determined nonresponsive.

- 2.3. Bids on lump sum items are item totals. If a unit price for a lump sum item is entered and it differs from the item total, the item total prevails.

- 2.4. Entries are to be expressed in dollars or decimal fractions of a dollar. Symbols such as commas and dollar signs are ignored and have no significance in establishing unit price or item total.

- 2.5. Unit prices and item totals are interpreted by the number of digits and decimal placement. Do not round item totals or the total bid.

2.6. For a lump sum based bid, the item total is the bid amount the Department uses for bid comparison.

For a unit price based bid, the sum of the item totals is the bid amount the Department uses for bid comparison.

For a cost plus time based bid, the sum of the item totals and the total bid for time is the bid amount the Department uses for bid comparison.

2.7. The Department's decision on the bid amount is final.

3. Bidder has and acknowledges the following addenda:

1, 2, 3

4. Bidder submits this bid with one of the following forms of bidder's security equal to at least 10 percent of the bid:

Cash \$ _____, Cashiers Check, Certified Check, Bidder's Bond

5. Bidder's signature is an affirmation of the included certifications. Bidder is cautioned that making a false certification may result in one or more of the following:

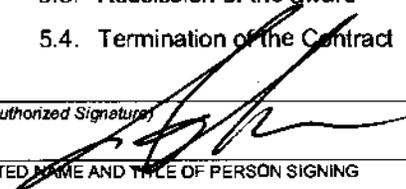
5.1. Criminal prosecution

5.2. Rejection of the bid

5.3. Rescission of the award

5.4. Termination of the Contract

BY (Authorized Signature)



DATE SIGNED (Do not type)

4/16/13

PRINTED NAME AND TITLE OF PERSON SIGNING

Alan S. Berger
Vice President

BID ITEM LIST
02-4E9704

Item No.	Item Code	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	070030	LEAD COMPLIANCE PLAN	LS	LUMP SUM	LUMP SUM	1,500.00
2	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	2,050.00
3	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	32,500.00
4	130100	JOB SITE MANAGEMENT	LS	LUMP SUM	LUMP SUM	1,000.00
5	130200	PREPARE WATER POLLUTION CONTROL PROGRAM	LS	LUMP SUM	LUMP SUM	2,500.00
6	150715	REMOVE THERMOPLASTIC PAVEMENT MARKING	SQFT	360	12.00	4,320.00
7	370001	SAND COVER (SEAL)	TON	490	55.00	26,950.00
8	370120	ASPHALT-RUBBER BINDER	TON	410	910.00	373,100.00
9	BLANK					
10	BLANK					
11	BLANK					
12	374004	ASPHALTIC EMULSION (FLUSH COAT)	TON	61	700.00	42,700.00
13	375030	SCREENINGS (HOT-APPLIED)	TON	3,780	90.00	340,200.00
14	840515	THERMOPLASTIC PAVEMENT MARKING	SQFT	810	8.30	6,723.00
15	840560	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE)	LF	130,000	0.21	27,300.00
16	025191	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE 2-COAT)	LF	63,100	0.44	27,764.00
17	025541	ASPHALT-RUBBER BINDER (TYPE II), WMA ADDITIVE	TON	50	1,283.00	64,150.00
18	025542	CRUMB RUBBER R18 MODIFIED BINDER	TON	50	1,000.00	50,000.00
19	025543	CRUMB RUBBER R18 MODIFIED BINDER, WMA ADDITIVE	TON	49	1,100.00	53,900.00

TOTAL BID:

\$ 1,056,657.00

M71

SUBCONTRACTOR LIST

DES-OE-0102.2 (REV 3/2011)

VSS International, Inc.

Bidder Name: _____

The bidder must identify each subcontractor performing work in an amount in excess of 1/2 of 1 percent of the total bid or \$10,000, whichever is greater (Pub Cont Code § 4100 et seq.). Complete columns 1 and 4 and submit with the bid. Complete columns 2 and 3 and submit with the bid or fax to (916) 227-6282 within 24 hours after the bid opening. Failure to provide complete information in columns 1 through 4 within the time specified will result in a nonresponsive bid.

Column 1: Business Name and Location	Column 2: Bid Item NDS.	Column 3: Percentage of Bid Item Subcontracted	Column 4: Description of Subcontracted Work
Apply-A-Line 19652 N. Hirsch Ct. Anderson, CA 96007	1,6,14,15,16	100 %	LEAD COMPLIANCE PLAN, STRIPING, STRIPING REMOVAL
STATEWIDE TRAFFIC SAFETY 130 GROBRIC COURT FAIRFIELD, CA 94533	2	100 %	CONSTRUCTION AREA SIGNS

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 854-6410 or TDD (916) 854-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

MA

We VSS International, Inc.

P.O. Box 981330, West Sacramento, CA 95798

as Principal, and

Western Surety Company

as Surety are bound unto the State of California, Department of Transportation, hereafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for Contract #02-4E9704, For Construction on State Highway on
(Copy here the exact description of work, including location, as it appears on the proposal)

Tehama County at and near Paynes Creek from 0.1 mile west of Manton Road to 0.2 mile east of Latka Road

for which bids are to be opened at Sacramento, CA

(insert place where bids will be opened)

April 16, 2013

on

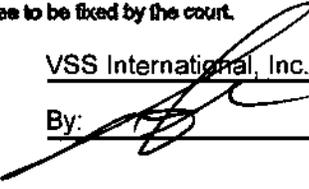
(insert date of bid opening)

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance (if specified in the contract) of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event a suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: April 2, 2013

VSS International, Inc.

By: 

Principal

Alan S. Berger
Vice President

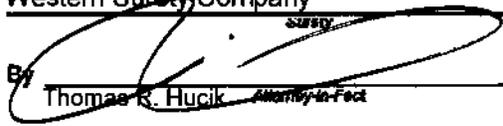
Correspondence or claims relating to this bond should be sent to the surety at the following address: Western Surety Company

P. O. Box 5077

Sioux Falls, SD 57117-5077

Western Surety Company

surety

By: 

Thomas R. Hucik Attorney-in-Fact

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California

County of Sacramento

On this April 2, 2013

Date

before me, Rosalie A. Miskiel, Notary Public

Here insert Name and Title of the Officer

personally appeared Thomas R. Hucik

Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.



WITNESS my hand and official seal

Signature


Signature of Notary Public
Rosalie A. Miskiel

ACKNOWLEDGMENT

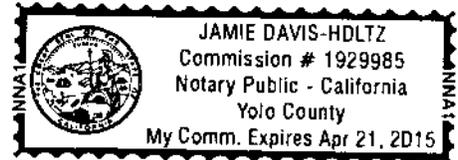
State of California
County of Yolo)

On April 3, 2013 before me, Jamie Davis-Holtz, Notary Public
(insert name and title of the officer)

personally appeared Alan S. Berger,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are
subscribed to the within instrument and acknowledged to me that he/she/they executed the same in
his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the
person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing
paragraph is true and correct.

WITNESS my hand and official seal.



Signature  (Seal)

Western Surety Company

POWER OF ATTORNEY APPOINTING INDIVIDUAL ATTORNEY-IN-FACT

Know All Men By These Presents, That WESTERN SURETY COMPANY, a South Dakota corporation, is a duly organized and existing corporation having its principal office in the City of Sioux Falls, and State of South Dakota, and that it does by virtue of the signature and seal herein affixed hereby make, constitute and appoint

David Weise, Thomas R Hucik, Rosalie A Miszkiel, P A Gouker, Nicki Moon, Individually

of Rancho Cordova, CA, its true and lawful Attorney(s)-in-Fact with full power and authority hereby conferred to sign, seal and execute for and on its behalf bonds, undertakings and other obligatory instruments of similar nature

- In Unlimited Amounts -

and to bind it thereby as fully and to the same extent as if such instruments were signed by a duly authorized officer of the corporation and all the acts of said Attorney, pursuant to the authority hereby given, are hereby ratified and confirmed.

This Power of Attorney is made and executed pursuant to and by authority of the By-Law printed on the reverse hereof, duly adopted, as indicated, by the shareholders of the corporation.

In Witness Whereof, WESTERN SURETY COMPANY has caused these presents to be signed by its Senior Vice President and its corporate seal to be hereto affixed on this 14th day of April, 2011.



WESTERN SURETY COMPANY

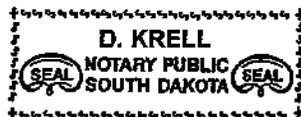
Paul T. Bruflat, Senior Vice President

State of South Dakota }
County of Minnehaha } ss

On this 14th day of April, 2011, before me personally came Paul T. Bruflat, to me known, who, being by me duly sworn, did depose and say: that he resides in the City of Sioux Falls, State of South Dakota; that he is the Senior Vice President of WESTERN SURETY COMPANY described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to the said instrument is such corporate seal; that it was so affixed pursuant to authority given by the Board of Directors of said corporation and that he signed his name thereto pursuant to like authority, and acknowledges same to be the act and deed of said corporation.

My commission expires

November 30, 2012



D. Krell, Notary Public

CERTIFICATE

I, L. Nelson, Assistant Secretary of WESTERN SURETY COMPANY do hereby certify that the Power of Attorney hereinabove set forth is still in force, and further certify that the By-Law of the corporation printed on the reverse hereof is still in force. In testimony whereof I have hereunto subscribed my name and affixed the seal of the said corporation this 2nd day of April, 2013.



WESTERN SURETY COMPANY

L. Nelson, Assistant Secretary

BIDDER'S BOND

DES-OE-0102.3 (REV 3/2008)

We _____

_____ as Principal, and

as Surety are bound unto the State of California, Department of Transportation, hereafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, jointly and severally,

THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:

WHEREAS, the Principal is submitting a bid to the Obligee, for _____
(Copy here the exact description of work, including location, as it appears on the proposal)

for which bids are to be opened at _____
(Insert place where bids will be opened)

on _____
(Insert date of bid opening)

NOW, THEREFORE, if the Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files two bonds with the Obligee, one to guarantee faithful performance (if specified in the contract) of the contract and the other to guarantee payment for labor and materials as provided by law, then this obligation shall be null and void; otherwise, it shall remain in full force.

In the event a suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

Dated: _____, 20 _____

Correspondence or claims relating to this bond should be sent to the surety at the following address: _____

Principal

Surety

By _____
Attorney-in-Fact

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

State of California }
County of _____

On this _____ before me, _____
Date Here Insert Name and Title of the Officer

personally appeared _____
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

(SEAL)

Signature _____
Signature of Notary Public

ADA Notice For individuals with sensory disabilities, this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3680 or write Records and Forms Management, 1120 N Street, MS-69, Sacramento, CA 95814.

OPT OUT OF PAYMENT ADJUSTMENTS FOR PRICE INDEX FLUCTUATIONS

DES-OE-0102.12A (REV. 8/2012)

To opt out of payment adjustments for price index fluctuations as specified, complete this form.

VSS International, Inc.

Bidder's Name: _____

Contract No. 02 - 469704

I opt out of the payment adjustments for price index fluctuations.

Date: 4/16/13

Signature: _____



Alan S. Berger
Vice President

SMALL BUSINESS STATUS

DES-OE-0102.4 (REV 3/2008)

CONTRACT NO. 02 - 4E9704

Are you certified as a "Small Business" by the Office of Small Business and DVBE Services of the Department of General Services of the State of California? Check one:

Yes: Certification number? _____

No

Note: This small business questionnaire is included for statistical reporting only.

ADA Notice

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CERTIFICATIONS

FEDERAL-AID PROJECTS DISCLOSURE OF LOBBYING ACTIVITIES CERTIFICATION

Bidder certifies, to the best of his or her knowledge and belief:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure of Lobbying Activities," in conformance with its instructions.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 USC § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Bidder also agrees by submitting a bid that it must require the language of this certification be included in subcontracts over \$100,000 and these subcontractors shall certify and disclose.

**INSTRUCTIONS FOR COMPLETION OF SF-LLL,
DISCLOSURE OF LOBBYING ACTIVITIES**

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence, the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last, previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitments for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.
(b) Enter the full names of the individual(s) performing services and include full address if different from 10(a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

N/A

DISCLOSURE OF LOBBYING ACTIVITIES

Approved by OMB

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

0348-0046

1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. Report Type: <input type="checkbox"/> a. initial <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, <i>if known</i> Congressional District, <i>if known</i> :	5. If Reporting Entity in No. 4 is Subawardee Enter Name and Address of Prime: Congressional District, <i>if known</i> :	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, if applicable _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$	
10 a. Name and Address of Lobby Registrant <i>(if individual, last name, first name, MI):</i>	b. Individuals Performing Services (including address if different from No. 10a) <i>(last name, first name, MI):</i>	
11. Information requested through this form is authorized by Title 31 U.S.C. Section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Authorized for Local Reproduction Standard Form - LLL (Rev. 7-97)		

EQUAL EMPLOYMENT OPPORTUNITY REGULATION CERTIFICATION

Bidder proposed subcontractor _____, certifies that he has has not participated in a previous contract or subcontract subject to the equal opportunity clauses, as required by Executive Orders 10925, 11114, or 11246, and that, if required, he has filed with the Joint Reporting Committee, the Director of the Office of Federal Contract Compliance, a Federal Government contracting or administering agency, or the former President's Committee on Equal Employment Opportunity, all reports due under the filing requirements.

Notes:

- The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)
- Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.
- Prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless the Contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29, DEBARMENT AND SUSPENSION CERTIFICATION

Bidder, under penalty of perjury, certifies that, except as noted below, it or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgement rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

UNDOCUMENTED ALIENS EMPLOYMENT

Under Pub Cont Code § 6101, the Bidder certifies compliance with state and federal law respecting the employment of undocumented aliens.

NONCOLLUSION

NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

Under PCC 7106 and 23 USC 112, the bidder declares as follows:

State of California County of Yolo

Alan S. Berger, being first duly sworn, deposes and says that he or she is Vice President of VSS International Surfacing Systems, Inc. the party

making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

CHILD SUPPORT COMPLIANCE ACT

Under Pub Cont Code § 7110, the contractor acknowledges that:

1. The contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with section 5200) of Part 5 of Division 9 of the Family Code; and
2. The contractor to the best of its knowledge is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the Employment Development Department.

NATIONAL LABOR RELATIONS BOARD

Under Pub Cont Code § 10232, the contractor, swears under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the contractor within the immediately preceding two year period because of the contractor's failure to comply with an order of a federal court which orders the contractor to comply with an order of the National Labor Relations Board.

VIOLATION OF LAW OR A SAFETY REGULATION

Under Pub Cont Code § 10162, the Bidder must complete, under penalty of perjury, the following questionnaire:

Has the Bidder, any officer of the Bidder, or any employee of the Bidder who has a proprietary interest in the Bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes No

If the answer is yes, explain the circumstances in the following space.

ANTITRUST LAW

Under Pub Con Code § 10285.1, the Bidder declares under penalty of perjury under the laws of the State of California that the Bidder has has not been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Pub Cont Code § 1101, with any public entity, as defined in Pub Cont Code § 1100, including the Regents of the University of California or the Trustees of the California State University. The term "Bidder" includes any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

If the Bidder has been convicted of an offense within the past 3 years, provide the conviction details including the date and ultimate resolution of each conviction in the space below.

PERMITS, LICENSES, AGREEMENTS, CERTIFICATIONS, AND RAILROAD RELATIONS AND INSURANCE REQUIREMENTS

Bidder acknowledges that permits, licenses, agreements, certifications, and the requirements in the document titled "Railroad Relations and Insurance Requirements" are components of the Contract under section 5-1.02 of the *Standard Specifications*.

BIDDER RESPONSIBILITY QUESTIONNAIRE

Failure to truthfully answer the following questions will result in a finding that the bid is nonresponsive. The Bidder must complete, under penalty of perjury, the following questionnaire:

1. Within the past 10 years, has the Bidder been found to be a nonresponsible bidder by any public entity, including federal, State, local, or regional entities?
 Yes No
2. Within the past 10 years, have any of the Bidder's officers or employees with a proprietary interest in the Bidder been determined to be a nonresponsible bidder by a public entity, including federal, State, local or regional entities?
 Yes No
3. Is there any officer or employee of the Bidder who now has or has had any proprietary interest in another company that bid or bids on public works projects whose company has been determined to be a nonresponsible bidder by any public entity including federal, State, local, or regional entities?
 Yes No
4. If the answer to any of the 3 preceding questions is yes, disclose all pertinent details of the determination of nonresponsibility, including:
 - 4.1. Date of each nonresponsibility determination
 - 4.2. Name of each public agency issuing the nonresponsibility determination and a contact person at that agency who would have information about the determination
 - 4.3. Contract number for each nonresponsibility determination

END CERTIFICATIONS

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

1727 30th Street MS-43

P.O. BOX 168041

SACRAMENTO, CA 95816-8041

FAX (916) 227-8214

TTY 711



*Flex your power!
Be energy efficient!*

January 30, 2013

02-Teh-36-55.2/67.5
02-4E9704
Project ID 0212000114
ACSTP-P036(094)E

Addendum No. 1

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN TEHAMA COUNTY AT AND NEAR PAYNES CREEK FROM 0.1 MILE WEST OF MANTON ROAD TO 0.2 MILE EAST OF LATKA RDAD.

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 Tuesday, February 12, 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 1 is revised. A copy of the revised sheet is attached for substitution for the like-numbered sheet.

Project Plan Sheets 5A and 5B are added. Copies of the added sheets are attached for addition to the project plans.

In the Notice to Bidders and Special Provisions, in the "STANDARD PLANS LIST," the following Standard Plans are deleted:

"T-13 and T-17."

In the Special Provisions, Section 37 BITUMINOUS SEALS is revised as attached.

Addendum No. 1
Page 2
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02-Teh-36-55.2/67.5
02-4E9704
Project ID 0212000114
ACSTP-P036(094)E

in the Bid book, in the "Bid Item List," items 12 and 16 are revised as attached.

To Bid book holders:

Replace page 3 of the "Bid Item List" in the Bid book with the attached revised page 3 of the Bid Item List. The revised 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/02/02-4E9704

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,



JOHN BULINSKI
District Director

Attachments

Add to section 37-2.01A:

Asphalt rubber seal coat includes applying heated asphalt rubber binder, followed by heated screenings precoated with asphalt binder, followed by a flush coat.

Asphalt rubber binder used for asphalt rubber seal coat must be Field Blend Asphalt Rubber Binder (Type II), except for test sections.

This project includes test sections as shown for the evaluation of asphalt rubber seal coats constructed with different asphalt rubber binder types including evaluation of sections with and without warm mix asphalt (WMA) additive technologies. The following asphalt rubber binder types will be evaluated on this project:

1. Field Blend Asphalt Rubber Binder (Type II) with WMA additive technology
2. Rubberized Asphalt Terminal Blend Binder
3. Rubberized Asphalt Terminal Blend Binder with WMA additive technology

The Department will not consider a VECP that eliminates the use of asphalt rubber binder types or WMA additive technology.

You must select WMA additive used in asphalt rubber binder from Department-approved WMA additive technologies. Not all Department-approved WMA technologies for HMA are appropriate for use in asphalt rubber binder for seal coats. For Department-approved WMA technologies, go to:

http://www.dot.ca.gov/hq/esc/approved_products_list/

For Laboratory Procedures, go to:

<http://www.dot.ca.gov/hq/esc/Translab/ofpm/fpmlab.htm>

For Vialit Test Method, go to:

<http://www.dot.ca.gov/hq/esc/ctms/index.html>

Replace section 37-2.01B with:

37-2.01B Definitions

crumb rubber modifier: Ground or granulated high natural crumb rubber and/or scrap tire crumb rubber.

descending viscosity reading: subsequent viscosity reading that must be at least 12 percent lower than the previous viscosity reading.

high natural crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of:

1. Automobile tires
2. Truck tires
3. Tire buffings

Replace section 37-2.01C(5) with:

37-2.01C(5) Asphalt Rubber Seal Coat

37-2.01C(5)(a) General

For each delivery of asphalt rubber binder ingredients and asphalt rubber binder to the job site, submit a certificate of compliance and a copy of the specified test results.

Submit MSDS for each asphalt rubber binder ingredient and the asphalt rubber binder.

At least 15 days before use, submit:

1. Four 1-quart cans of mixed asphalt rubber binder
2. Samples of each asphalt rubber binder ingredient
3. Asphalt rubber binder formulation and data as follows:
 - 3.1. For asphalt binder, submit source and grade of asphalt binder
 - 3.2. For asphalt modifier, submit:
 - 3.2.1. Source and type of asphalt modifier
 - 3.2.2. Percentage of asphalt modifier by weight of asphalt binder
 - 3.2.3. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
 - 3.2.4. Test results for the specified quality characteristics
 - 3.3. For crumb rubber modifier, submit:
 - 3.3.1. Each source and type of scrap tire crumb rubber and high natural rubber
 - 3.3.2. Test results for the specified quality characteristics
 - 3.4. For WMA additive technology, submit:
 - 3.4.1. Name of technology
 - 3.4.2. Percent admixture by weight of asphalt rubber binder as recommended by the manufacturer
 - 3.5. For asphalt rubber binder, submit:
 - 3.5.1. Test results for the specified quality characteristics
 - 3.5.2. Test results for AASHTO T 228. Report test results in pounds per gallon
 - 3.5.3. For field blend asphalt rubber binder:
 - 3.5.3.1. Minimum reaction time and temperature
 - 3.5.3.2. Percentage of scrap tire crumb rubber and high natural rubber by total weight of asphalt rubber binder
 - 3.5.4. For rubberized asphalt terminal blend binder, percentage of scrap tire crumb rubber by total weight of asphalt rubber binder
 - 3.6. Test result for Vialit Test Method for aggregate in Chip Seals, French Chip
 - 3.7. For precoated screenings, submit:
 - 3.7.1. Name of proposed aggregate source
 - 3.7.2. California mine number
 - 3.7.3. SMARA identification number
 - 3.7.4. Aggregate test results performed within past 60 days for:
 - 3.7.4.1. California Test 202
 - 3.7.4.2. California Test 211
 - 3.7.4.3. California Test 302
 - 3.7.4.4. California Test 227
 - 3.7.4.5. California Test 229
 - 3.7.5. Name of HMA plant producing precoated screenings
 - 3.7.6. Asphalt binder grade for coating
 - 3.7.7. Precoated screenings asphalt binder coating percentage by weight of dry screenings
 - 3.8. For asphalt rubber seal coat, submit the proposed:
 - 3.8.1. Asphalt rubber binder temperature range
 - 3.8.2. Asphalt rubber binder application rate
 - 3.8.3. Precoated screenings spread rate

At least 5 business days before use, submit the permit issued by the local air quality agency for asphalt rubber binder:

1. Field blending equipment
2. Application equipment

For each delivery of asphalt rubber binder ingredients, submit:

1. A certified volume or weight slip
2. Certificate of compliance with manufactures test results for the specified quality characteristics

Submit for each delivery of asphalt rubber binder:

1. A certified volume or weight slip
2. Percentage of crumb rubber modifier by weight of asphalt rubber binder
3. Certificate of compliance for the specified quality characteristics

37-2.01C(5)(b) Prepaving Conference

Submit a list of names participating in the prepaving conference. Identify each participant's name, employer, title, and role in the production and placement of asphalt rubber seal coat.

37-2.01C(5)(c) Tests and Samples

At least 10 days before starting seal coat activities, submit the name of an independent testing laboratory that participates in the AASHTO Materials Reference Laboratory (AMRL) program and the Department's Independent Assurance Program.

The independent testing laboratory must submit asphalt rubber seal coat tests results to the Engineer.

Submit a certificate of compliance and accuracy verification of test results for viscometers.

Upon request, submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

37-2.01C(5)(d) Daily Production Log

Submit log of production data daily and upon request.

Submit log of asphalt rubber binder production viscosity test results each day of asphalt rubber seal coat work.

Replace "Reserved" in section 37-2.01D(1) with:

Equipment used in producing field blend asphalt rubber binder must be permitted for use by local air quality agency. If an air quality permit is not required by local air quality agency for producing asphalt rubber binder, submit project specific verification from the local air quality agency that an air quality permit is not required.

Equipment used in spreading asphalt rubber binder must be permitted for use by local air quality agency. If an air quality permit is not required by local air quality agency for spray applying asphalt rubber binder, submit project specific verification from the local air quality agency that an air quality permit is not required.

Replace section 37-2.01D(4) with:

37-2.01D(4) Asphalt Rubber Seal Coat

37-2.01D(4)(a) General

Not Used

37-2.01D(4)(b) Technical Representatives

37-2.01D(4)(b)(i) General

Technical representatives for the following must participate in the prepaving conference and be present during placement of the portion of the seal coat related to the product they represent:

1. Field Blend Asphalt Rubber Binder Producer
2. Rubberized Asphalt Terminal Blend Binder Producer
3. WMA Additive Technology Supplier

37-2.01D(4)(b)(ii) Field Blend Asphalt Rubber Binder Producer

A technical representative from the field blend asphalt rubber binder producer must be present during the production and placement of asphalt rubber seal coat using field blend asphalt rubber binder. The technical representative may advise you and the Engineer during the asphalt rubber seal coat application as it relates to the field blend asphalt rubber binder including asphalt rubber binder placement temperature, asphalt rubber binder application rate and other placement issues.

37-2.01D(4)(b)(iii) Rubberized Asphalt Terminal Blend Binder Producer

A technical representative from the rubberized asphalt terminal blend binder producer must be present during the placement of asphalt rubber seal coat using rubberized asphalt terminal blend binder. The technical representative may advise you and the Engineer during the asphalt rubber seal coat application as it relates to the rubberized asphalt terminal blend binder including placement temperature, asphalt rubber binder application rate, and other placement issues.

37-2.01D(4)(b)(iv) WMA Additive Technology Supplier

A technical representative from the WMA technology supplier must be present during the production and placement of asphalt rubber seal coat with WMA additives. The technical representative may advise you, the Engineer, and the asphalt rubber binder producer. The technical representative may advise the asphalt rubber binder mix operation as it relates to the WMA technology. The WMA technology representative may advise you of placement temperature and potential placement issues.

The technical representative for WMA technology may advise the asphalt rubber binder producer regarding asphalt rubber binder plant and asphalt rubber binder plant process-controller modifications necessary for integrating WMA additive technology equipment with asphalt rubber binder plant. Asphalt rubber binder plant modifications and WMA technology equipment, scales, and meters must comply with Department's Materials Plant Quality Program (MPQP).

37-2.01D(4)(c) Preparing Conference

Schedule a preparing conference with the Engineer at a mutually agreed time and place. Make arrangements for the conference facility. Be prepared to discuss:

1. Asphalt rubber seal coat production and placement
2. Method for incorporating WMA technology and any impacts on asphalt rubber binder production and asphalt rubber seal coat placement including requirements for compaction, sweeping, and workmanship
3. Proposed application rates for asphalt rubber binder and precoated screenings and who in the field has authority to adjust application rates and how adjustments are documented
4. When initial sweeping will be done, including any issues when WMA additives are used, and schedule for maintenance sweepings
5. Opening to traffic requirements including any concerns when WMA additives are used
6. Quality control testing
7. Contingency plan for material deliveries, equipment breakdowns, and traffic handling

The following personnel must attend the preparing conference:

1. Project manager
2. Superintendent
3. Technical representative for WMA additive technology
4. Technical representative for field blend asphalt rubber binder producer
5. Field blend asphalt rubber binder plant operators
6. Technical representative for rubberized asphalt terminal blend binder producer

37-2.01D(4)(d) Quality Control Testing

37-2.01D(4)(d)(i) General

The independent testing laboratory must conduct quality control testing on asphalt rubber binder ingredients at the following frequencies:

1. For crumb rubber modifier except for grading, one per 250 tons. Samples of scrap tire crumb rubber and high natural crumb rubber must be sampled and tested separately. Test each delivery of crumb rubber modifier for grading.
2. For asphalt modifier, one per 25 tons of asphalt modifier.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the asphalt rubber production site in separate bags.

37-2.01D(4)(d)(ii) Field Blend Asphalt Rubber Binder

For field blend asphalt rubber binder with WMA additives, test asphalt rubber binder before the addition of the WMA additive and with the WMA additive. The quality control test results for asphalt rubber binder with WMA additive are report only.

The independent testing laboratory must take viscosity readings of asphalt rubber binder under ASTM D7741 during asphalt rubber binder production. Begin taking viscosity readings of samples taken from the reaction vessel at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 15 minutes until two consecutive descending viscosity readings have been obtained. After meeting the two descending viscosity readings requirement, continue to take viscosity readings hourly and before use. Log the test results, including time of testing and temperature of the asphalt rubber binder.

For field blend asphalt rubber binder, the independent testing laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Field Blend Asphalt Rubber Binder

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Sampling location	Maximum reporting time allowance
Original binder					
Flash point, min, °C	AASHTO T 48	1 per 100 tons	Report Only	Spray bar sampling port ^a	3 business days
Solubility, min, %	AASHTO T 44 or ASTM D 5546		Report Only		
Viscosity at 135°C, max, Pa·s	AASHTO T 316		Report Only		
Dynamic shear, test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315		Report Only Report Only		
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM O 2872		Report Only		
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217		25 60		
Resilience at 25 °C, percent rebound min max	ASTM D 5329		18 50		
Softening point, °C min max	ASTM O 36		55 88		
Viscosity at 375°F, Pa·s (x10-3)	ASTM D 7741		1500 - 2500		

RTFO test aged binder					
Dynamic shear, test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315	1 per 100 tons	Report Only Report Only	Spray bar sampling port ^a	3 business days
Dynamic shear, test temperature at 10 rad/s, °C, Phase Angle, %	AASHTO T 315		Report Only Report Only		
Elastic recovery, test temperature, °C min recovery, %	AASHTO T 301		Report Only Report Only		
PAV aging, temperature, °C	AASHTO R 28		Report Only		
RTFO test and PAV aged binder					
Dynamic shear, test temperature at 10 rad/s, °C max G*/sin(delta), kPa	AASHTO T 315	1 per 100 tons	Report Only Report Only	Spray bar sampling port ^a	3 business days
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313		Report Only Report Only Report Only		

^a For field blend asphalt rubber binder with WMA additives, you may sample asphalt rubber binder before the addition of the WMA additive from the reaction vessel.

37-2.01D(4)(d)(iii) Rubberized Asphalt Terminal Blend Binder

Asphalt rubber binder must comply with the Department's *Certification Program for Suppliers of Asphalt*. For program requirements, procedures, and a list of authorized material sources, go to the METS Web site.

For rubberized asphalt terminal blend binder with WMA additives, test asphalt rubber binder before the addition of the WMA additive and with the WMA additive. The quality control test results for asphalt rubber binder with WMA additive are report only.

Before the application of rubberized asphalt terminal blend binder, sample asphalt rubber binder from spray bar sampling port and test for viscosity under ASTM D7741. Take at least 1 viscosity reading for each distributor truck load at the project site. Log the test results, including time of testing and temperature of the asphalt rubber binder.

For rubberized asphalt terminal blend binder, the independent testing laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Rubberized Asphalt Terminal Blend Binder for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Sampling location	Maximum reporting time allowance
			Binder grade PG 76-22 R		
Original binder					
Flash point, min, °C	AASHTO T 48	1 per 100 tons	230	Spray bar sampling port ^e	3 business days
Solubility, min, %	AASHTO T 44 or ASTM D 5546		97.5		
Viscosity at 135°C, max, Pa·s	AASHTO T 316		3.0		
Dynamic shear, Test temperature at 10 rad/s, °C min, G°/sin(delta), kPa	AASHTO T 315		76		
			1.00		
RTFO test ^a , mass loss, max, %	AASHTO T 240 or ASTM D 2872		1.00		
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217		25		
			60		
Resilience at 25 °C, percent rebound min max	ASTM D 5329		18		
		50			
Softening point, °C min max	ASTM D 36	55			
		88			
Viscosity at 375°F, Pa·s (x10 ⁻³)	ASTM D 7741	Report Only			

RTFO test aged binder					
Dynamic shear, test temperature at 10 rad/s, °C min $G^*/\sin(\delta)$, kPa	AASHTO T 315	1 per 100 tons	76 2.20	Spray bar sampling port ^e	3 business days
Dynamic shear, test temperature at 10 rad/s, °C max (δ) , %	AASHTO T 315		Note b 80		
Elastic recovery ^d , test temperature, °C min recovery, %	AASHTO T 301		25 65		
PAV ^a Aging, temperature, °C	AASHTO R 28		110		
RTFO test and PAV aged binder					
Dynamic shear, test temperature at 10 rad/s, °C max $G^*\sin(\delta)$, kPa	AASHTO T 315	1 per 100 tons	31 5000	Spray bar sampling port ^e	3 business days
Creep stiffness, test temperature, °C max S-value, MPa min M-value, MPa	AASHTO T 313		-12 300 0.300		

^a"RTFO" means the asphaltic residue obtained using the Rolling Thin Film Oven Test. The residue from mass change determination may be used for other tests.

^bTest temperature is the temperature at which $G^*/\sin(\delta)$ is 2.2 kPa. A graph of $\log G^*/\sin(\delta)$ plotted against temperature may be used to determine the test temperature when $G^*/\sin(\delta)$ is 2.2 kPa. A graph of (δ) versus temperature may be used to determine (δ) at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa. The Engineer also accepts direct measurement of (δ) at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa.

^cTests without a force ductility clamp may be performed.

^d"PAV" means Pressure Aging Vessel

^e For rubberized asphalt terminal blend binder with WMA additives, sample asphalt rubber binder before the addition of the WMA additive at sampling location you choose and the engineer authorizes.

37-2.01D(4)(d)(iv) Precoated Screenings

For precoated screenings, the independent testing laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics. All tests, except the film stripping, must be performed on uncoated screenings.

Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Location of sampling	Maximum reporting time allowance
Los Angeles Rattler Loss, %, max Loss at 100 revolutions Loss at 500 revolutions	California Test 211	1st day of production	10 40	See California Test 125	48 hours
Gradation, percentage passing	California Test 202	2 per day	Asphalt Rubber Seal Coat Screenings Gradation table under Materials	See California Test 125	24 hours
Film stripping, %, max	California Test 302	1st day of production	25	See California Test 125	48 hours
Cleanness value, min	California Test 227	2 per day	80	See California Test 125	24 hours
Durability, min	California Test 229	1st day of production	52	See California Test 125	48 hours

37-2.01D(4)(d)(v) Asphalt Rubber Seal Coat

For asphalt rubber seal coat, the independent testing laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Location of sampling	Maximum reporting time allowance
Asphalt binder spread rate, gal/sq yd	California Test 339	2 per day	Target value ± 0.05 gal/sq yd	Pavement surface	24 hours
Chip retention, %	Vialit test method for aggregate in chip seals, French chip (modified)	1 per day	95	Pavement surface after chip application and rolling	48 hours

For field testing asphalt rubber seal coat chip retention the Vialit Test Method for Aggregate in Chip seals, French Chip is modified as follows:

1. Use a 20 cm x 20 cm galvanized plate 2.0 mm thick and determine the tare weight of the galvanized plate.
2. Place the plate on the existing pavement surface before placing chip seal. After finish rolling the asphalt rubber seal coat and initial surface sweeping, remove the specimen. Place the specimen in a plastic bag.
3. Cure the specimen, except cure at 100 degree F for the first 2 hours.
4. Condition the specimen.
5. Weigh the test specimen and any loose chips in the sample bag.
6. Perform the Vialit test and reweight the test specimen.
7. Calculate the binder weight as follows:

Binder weight = BAR (gallons/sq yd) X 0.0478 (sq yd) X SG_{ARB} (lbs per gallon)

Where:

BAR = binder application rate in gallons per square yard

Plate dimension = 20 cm X 20 cm = 0.0478 sq yd

SG_{ARB} = specific gravity of asphalt rubber binder determined under ASSHTO T 228

8. Calculate the chip retention by weight as follows:

Percent retention = $[SW_{\text{initial}} - (BW + TW)] / [SW_{\text{final}} - (BW + TW)]$

Where:

SW_{initial} = initial specimen weight

SW_{final} = final specimen weight

BW = binder weight

TW = tare weight

Add section 37-2.01D(5):

37-2.01D(5) Acceptance Criteria

Asphalt rubber seal coat acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits.
 - 1.2. Raveling consists of the separation of the aggregate from the binder.
 - 1.3. Flushing consists of the occurrence of a film of bituminous material on the surface of the asphalt-rubber seal coat.
 - 1.4. Streaking consists of alternating longitudinal bands of binder without uniform aggregate retention, approximately parallel with the lane line.
2. For field blend asphalt rubber binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics shown in section 37-2.02G with the following table titles:
 - 2.1. Field Blend Asphalt Rubber Binder for Hot Applied Seal Coat Applications, except asphalt rubber binder with WMA additives acceptance is based on asphalt rubber binder sampled before the addition of WMA additive
 - 2.2. Asphalt Modifier for Asphalt Rubber Binder
 - 2.3. Crumb Rubber Modifier
 - 2.4. Scrap Tire Crumb Rubber Gradation
 - 2.5. High Natural Crumb Rubber Gradation
3. For rubberized asphalt terminal blend binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics shown in table titled "Rubberized Asphalt Terminal Blend Binder for Hot Applied Seal Coat Applications" in section 37-2.02G, except asphalt rubber binder with WMA additives acceptance is based on asphalt rubber binder sampled before the addition of WMA additive.
4. Compliance with the table titled "Asphalt Rubber Seal Coat Acceptance Criteria Testing Precoated Screenings."

**Asphalt Rubber Seal Coat Acceptance Criteria Testing
Precoated Screenings**

Quality Characteristic	Test Method	Requirements
Los Angeles Rattler Loss, %, max Loss at 100 revolutions Loss at 500 revolutions	California Test 211	10 40
Gradation	California Test 202	Asphalt Rubber Seal Coat Screenings Gradation table under Materials
Film stripping, %, max	California Test 302	25
Cleanness value, min	California Test 227	80
Durability, min	California Test 229	52

Replace section 37-2.02G with:

37-2.02G Asphalt Rubber Binder

37-2.02G(1) General

Asphalt rubber binder includes field blend asphalt rubber binder and rubberized asphalt terminal blend binder.

37-2.02G(2) Field Blend Asphalt Rubber Binder

37-2.02G(2)(a) General

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

Field blend asphalt rubber binder must be 79 ± 1 percent by weight asphalt binder and 21 ± 1 percent by weight crumb rubber modifier. The minimum percentage of crumb rubber modifier must be 20.0 percent and lower values must not be rounded up.

37-2.02G(2)(b) Field Blend Asphalt Rubber Binder (Type II)

Field blend asphalt rubber binder (Type II) must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. Crumb rubber modifier

Crumb rubber modifier must be 76 ± 2 percent by weight scrap tire crumb rubber and 24 ± 2 percent by weight high natural crumb rubber.

37-2.02G(2)(c) Field Blend Asphalt Rubber Binder Production

Asphalt modifier and asphalt binder must be blended at the production site. Asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder producer determines the exact percentage.

When blended, the asphalt binder must be from 375 to 440 degrees F when asphalt modifier is added and the mixture must circulate for at least 20 minutes.

The asphalt binder or blend of asphalt binder and asphalt modifier must be combined with crumb rubber modifier at the asphalt rubber binder production site. The asphalt binder or asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when crumb rubber modifier is added. Asphalt binder, asphalt modifier, and crumb rubber modifier may be proportioned and combined simultaneously. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must have the values for the quality characteristics shown in the following table:

Field Blend Asphalt Rubber Binder for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Requirement
		Field Blend Asphalt Rubber
Original binder		
Flash point, min, °C	AASHTO T 48	Report Only
Solubility, min, %	AASHTO T 44 or ASTM D 5546	Report Only
Viscosity at 135°C, max, Pa's	AASHTO T 316	Report Only
Dynamic shear ^a , test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315	Report Only ^b
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM D 2872	Report Only
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217	25 60
Resilience at 25 °C, percent rebound min max	ASTM D 5329	18 50
Softening point, °C min max	ASTM D 36	55 88
Viscosity at 375 °F, centipoises	ASTM D 7741	1500 - 2500
RTFO test aged binder		
Dynamic shear, test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315	Report Only ^b Report Only
Dynamic shear, test temperature at 10 rad/s, °C, Phase Angle, %	AASHTO T 315	Report Only ^d Report Only
Elastic recovery, test temperature, °C min recovery, %	AASHTO T 301	Report Only Report Only
PAV ^e aging, temperature, °C	AASHTO R 28	Report Only
RTFO test and PAV aged binder		
Dynamic shear, test temperature at 10 rad/s, °C max G*/sin(delta), kPa	AASHTO T 315	Report Only ^f Report Only
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313	Report Only ^g Report Only Report Only

^aTest original binder and RTFO aged binder on the DSR using 25mm plates and a 3mm gap. Test the PAV aged binder using 8mm plates and a 3mm gap. All samples are trimmed at 3.15mm. Ensure that the DSR software allows for the 3mm gap in its calculations.

^bAASHTO R29 can be used as a guideline for Grade Determination. Report G*/sin(delta) for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^cRTFO means the asphaltic residue obtained using the rolling thin film oven test. The residue from mass change determination may be used for other tests.

^dReport the phase angle measured at both the pass and fail temperature of the RTFO aged binder.

^ePAV means pressure aging vessel.

¹AASHTO R29 can be used as a guideline for Grade Determination. Report $G^*\sin(\delta)$ for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

²AASHTO R29 can be used as a guideline for Grade Determination. Report stiffness S and m -value for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after two descending viscosity readings have been obtained. Reheating asphalt rubber binder that cools below 375 degrees F is considered a reheat cycle. Do not exceed 2 reheat cycles. If reheating, asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add scrap tire crumb rubber. Scrap tire crumb rubber must not exceed 10 percent by weight of the asphalt rubber binder. Allow added scrap tire crumb rubber to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

37-2.02G(3) Rubberized Asphalt Terminal Blend Binder

Rubberized Asphalt Terminal Blend Binder must be a combination of:

1. Asphalt binder
2. Crumb rubber modifier

Crumb rubber modifier must be scrap tire crumb rubber.

Rubberized asphalt terminal blend binder must be 80 ± 2 percent by weight asphalt binder and 20 ± 2 percent by weight crumb rubber modifier. Rubberized asphalt terminal blend binder must have the values for the quality characteristics shown in the following table:

Rubberized Asphalt Terminal Blend Binder for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Requirements
		Binder grade PG 76-22 R ^{a,b}
Original binder		
Flash point, min, °C	AASHTO T 48	230
Solubility, min, %	AASHTO T 44 or ASTM D 5546	97.5
Viscosity at 135°C, max, Pa·s	AASHTO T 316	3.0
Dynamic shear, test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315	76 1.00
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM D 2872	1.00
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217	25 60
Resilience at 25 °C, percent rebound min max	ASTM D 5329	18 50
Softening point, °C min max	ASTM D 36	55 88
RTFO test aged binder		
Dynamic shear, test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315	76 2.20
Dynamic shear, test temperature at 10 rad/s, °C max (delta), %	AASHTO T 315	Note d 80
Elastic recovery ^a , test temperature, °C min recovery, %	AASHTO T 301	25 65
PAV aging, temperature, °C	AASHTO R 28	110
RTFO test and PAV aged binder		
Dynamic shear, test temperature at 10 rad/s, °C max G*/sin(delta), kPa	AASHTO T 315	31 5000
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313	-12 300 0.300

^aDo not modify binder using polyphosphoric acid modification. Report type and dosage if any acid modification other than polyphosphoric acid modification is used.

^bSupplier is required to certify asphalt rubber binder contains 20 ± 2 percent by weight crumb rubber modifier.

^c"RTFO" means the asphaltic residue obtained using the rolling thin film oven test. The residue from mass change determination may be used for other tests.

^aTest temperature is the temperature at which $G^*/\sin(\delta)$ is 2.2 kPa. A graph of $\log G^*/\sin(\delta)$ plotted against temperature may be used to determine the test temperature when $G^*/\sin(\delta)$ is 2.2 kPa. A graph of (δ) versus temperature may be used to determine δ at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa. The Engineer also accepts direct measurement of (δ) at the temperature when $G^*/\sin(\delta)$ is 2.2 kPa.

^bTests without a force ductility clamp may be performed.

^c“PAV” means pressure aging vessel

37-2.02G(4) Asphalt Binder

Asphalt binder for field blend asphalt rubber binder seal coat must be Grade PG 64-16. Do not modify asphalt binder with polymer.

Asphalt binder for rubberized asphalt terminal blend binder seal coat must be Grade PG 76-22 R.

37-2.02G(5) Asphalt Modifier

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. Asphalt modifier must have the values for the quality characteristics shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder		
Quality characteristic	Test method	Requirements
Viscosity, m^2/s ($\times 10^{-6}$) at 100 °C	ASTM D 445	$X \pm 3^a$
Flash point, C.L.O.C., °C	ASTM D 92	207 min
Molecular analysis		
Asphaltenes, percent by mass	ASTM D 2007	0.1 max
Aromatics, percent by mass	ASTM D 2007	55 min

^a “X” denotes the proposed asphalt modifier viscosity from 19 to 36. A change in “X” requires a new asphalt rubber binder submittal.

Asphalt modifier must be sampled and tested for compliance with the specifications by the manufacturer.

37-2.02G(6) Crumb Rubber Modifier

Crumb rubber modifier must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, the separation must occur before grinding and granulating. Cryogenically-produced crumb rubber modifier particles must be large enough to be ground or granulated.

Crumb rubber modifier must be free of contaminants except wire and fabric. Determine the percent weight of wire and fabric under Laboratory Procedure LP-10. Contaminants percentage by weight of crumb rubber modifier must not exceed:

1. 0.01 percent wire
2. 0.05 percent fabric

The length of an individual crumb rubber modifier particle must not exceed 3/16 inch.

Crumb rubber modifier must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of crumb rubber modifier may be added. Crumb rubber modifier must not cause foaming when combined with the asphalt binder and asphalt modifier.

Specific gravity of crumb rubber modifier must be from 1.1 to 1.2 determined under California Test 208.

Crumb rubber modifier must comply with the requirements for quality characteristics shown in the following table:

Crumb Rubber Modifier					
Quality characteristic	Test method	Requirements			
		Scrap tire crumb rubber		High natural crumb rubber	
		Min	Max	Min	Max
Acetone extract, %	ASTM D 297	6.0	16.0	4.0	16.0
Rubber hydrocarbon, %		42.0	65.0	50.0	—
Natural rubber content, %		22.0	39.0	40.0	48.0
Carbon black content, %		28.0	38.0	—	—
Ash content, %		—	6.0	—	—

Scrap tire crumb rubber must have the gradation requirements shown in the following table:

Scrap Tire Crumb Rubber Gradation			
Percentage passing			
Sieve size	Gradation requirement	Operating range	Contract compliance
No. 8	100	100	100
No. 10	98–100	95–100	90–100
No. 16	45–75	35–85	32–88
No. 30	2–20	2–25	1–30
No. 50	0–6	0–10	0–15
No. 100	0–2	0–5	0–10
No. 200	0	0–2	0–5

NDTE: Determine gradation under Laboratory Procedure LP-10.

High natural crumb rubber must comply with the gradation requirements shown in the following table:

High Natural Crumb Rubber Gradation			
Percentage passing			
Sieve size	Gradation requirement	Operating range	Contract compliance
No. 10	100	100	100
No. 16	95–100	92–100	85–100
No. 30	35–85	25–95	20–98
No. 50	10–30	6–35	2–40
No. 100	0–4	0–7	0–10
No. 200	0–1	0–3	0–5

NOTE: Determine gradation under Laboratory Procedure LP-10.

The scrap tire crumb rubber and high natural crumb rubber gradations requirements do not apply to rubberized asphalt terminal blend binder.

Each asphalt rubber binder ingredient must be sampled and tested for compliance with the specifications by the manufacturer.

37-2.02G(7) Warm Mix Asphalt Additive Technology

WMA additive technology must be on the Department's-approved WMA technologies list. Approved WMA additive technologies are for Hot Mix Asphalt and you must choose WMA additive technology appropriate for use in asphalt rubber binder for asphalt rubber seal coat.

Percent WMA additive by weight of asphalt rubber binder used in asphalt rubber binder must be as recommended by the manufacturer.

37-2.02G(8) Asphalt Rubber Seal Coat

The independent testing laboratory must conduct testing using the proposed asphalt rubber binders, including asphalt rubber binder with and without WMA, and aggregate for compliance with the design requirements shown in the following table:

Quality characteristic	Test method	Requirement
Chip retention, %	Vialit test method for aggregate in chip seals, French chip (Modified) ^a	95

^a Cure the specimen, except cure at 100 degree F for the first 2 hours.

For the Vialit test, the asphalt rubber binders must be placed within the proposed asphalt rubber binder placement temperature range.

Replace section 37-2.02H(4) with:

37-2.02H(4) Asphalt Rubber Seal Coat

Before precoating with asphalt binder and when tested under California Test 202, screenings for asphalt rubber seal coat must have the gradation shown in the following table:

Asphalt Rubber Seal Coat Screenings Gradation

Sieve sizes	Percentage passing		
	Coarse 1/2" max	Medium 1/2" max	Fine 3/8" max
3/4"	100	100	100
1/2"	75-90	85-90	95-100
3/8"	0-20	0-30	70-85
No. 4	0-2	0-5	0-15
No. 8	-	-	0-5
No. 200	0-1	0-1	0-1

Screenings must have the values for the quality characteristics shown in the following table:

Quality Characteristic	Test method	Requirement
Los Angeles Rattler Loss, %, max	California Test 211	
Loss at 100 revolutions		10
Loss at 500 revolutions		40
Film stripping, %, max	California Test 302	25
Cleanness value, min	California Test 227	80
Durability, min	California Test 229	52

Screenings for asphalt rubber seal coat must comply with the 3/8-inch grading.

Add to section 37-2.03A:

Remove pavement markers before applying seal coat.

Add item 1.5 to the list in section 37-2.03B(1):

- 1.5. Tarpaulins to cover precoated screenings when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F.

Replace section 37-2.03B(2) with:

37-2.03B(2) Asphalt Rubber Seal Coat

37-2.03B(2)(a) General

Field blend asphalt rubber binder production plants must comply with the Materials Plant Quality Program (MPQP) starting July 1, 2013.

Rubberized asphalt terminal blend binder manufacturing facility for PG 76-22R must comply with the MPQP.

37-2.03B(2)(b) Field Blend Asphalt Rubber Binder without Warm Mix Asphalt Additive Technology

Equipment for field blend asphalt rubber binder without WMA additive technology must include and comply with the following:

1. Tank to heat and maintain the temperature of blended asphalt binder and asphalt modifier before adding crumb rubber modifier. The tank must have a thermostatic heat control device and a temperature reading device accurate to within 5 degrees F. The heat control device must be the recording type.
2. Mechanical mixer for complete, homogeneous blending of asphalt binder, asphalt modifier, and crumb rubber modifier. Asphalt binder and asphalt modifier must be introduced into the mixer through meters. The blending system must vary the rate of delivery for asphalt binder and asphalt modifier proportionate to crumb rubber modifier delivery. The mixer must not allow the temperature of asphalt binder and asphalt modifier to vary more than 25 degrees F. Each ingredient feed must be equipped with a rate-of-feed indicator for determining the amount delivered during production. The meters used to proportion each liquid ingredient must be equipped with rate-of-flow indicators with resettable totalizers so that the total amount can be determined. Feed liquid and dry ingredients directly into the mixer at a uniform and controlled rate. Reduce the quantity of ingredients in the mixer if dead areas occur. The reaction vessel must have a safe sampling device that delivers completed asphalt rubber binder in the quantity needed for testing.
3. Storage tank for asphalt rubber binder. The storage tank must have a heating system to maintain the temperature and an internal mixing device to prevent separation.

4. Under supports for scale bearing points for scale structures where the total load, the live load plus dead load is less than 17 tons, must be constructed as follows:
 - 4.1. Use 4 legs. Total load on any leg may not exceed 14.5 psi.
 - 4.2. Use structural grade steel with a minimum cross sectional dimension of 20 inches and a minimum thickness of 1.5 inches.
 - 4.3. Construct under supports in a way that they do not move or deflect during production operations.
 - 4.4. Install mechanical indicating elements level, plumb, and rigidly mounted on the under supports.
 - 4.5. Prevent saturation of the ground under the scale with adequate drainage and provide support of 14.5 psi at each support.
 - 4.6. Scale structure may be installed using concrete under supports and comply with Section 9.

37-2.03B(2)(c) Field Blend Asphalt Rubber Binder with Warm Mix Asphalt Additive Technology

Equipment for field blend asphalt rubber binder with WMA additive technology must be produced at a stand-alone plant unit.

Perform all asphalt rubber binder proportioning at the asphalt rubber binder production site.

Asphalt rubber binder proportioning must either be accomplished by proportioning all ingredients simultaneously or must be proportioned using the 3-stage process as follows:

1. Stage 1 must proportion asphalt modifier with paving grade asphalt.
2. Stage 2 must proportion scrap tire crumb rubber and high natural rubber.
3. Stage 3 must proportion the preblended liquids, combine with the proportioned ground rubbers, and mix further for the specified time and temperatures.

When the asphalt and asphalt modifier are preblended, provide an asphalt heating tank equipped to maintain the blended ingredients at the necessary temperature before blending with the dry ingredients.

The method and equipment for combining the liquid and dry ingredients must be such that the Engineer can readily determine compliance with proportioning requirements for each material and the completed asphalt rubber binder. All required equipment must be authorized before use.

The plant process controller must assure that combined liquids and combined dry ingredients have been proportioned to within their own ratio limits before proportioning the final liquid and dry mixtures for asphalt rubber binder.

The plant process controller must assign a lot number to each volume of asphalt rubber binder moved from the initial mixing chamber to reaction storage. The product volume represented by each lot must be the amount set aside for the reaction period. Leftovers and portions of lots may be combined and assigned a new nonrepeating lot number. Reassigned lots must include all electronic data captured for the previous original lots used to generate the new lot.

Feed the liquid and dry ingredients directly into the mixer at a uniform rate. Asphalt rubber binder must be mechanically mixed to provide for the complete blending of liquid and dry ingredients in a controlled fashion.

Produce asphalt rubber binder by either a batch or continuous method. Regardless of production method, proportion all ingredients by weight. Proportion liquid ingredients with a meter that complies with Chapter 2, Section IC, "Liquid Ingredient Measurement," of the MPQP.

37-2.03B(2)(c)(i) Asphalt Rubber Binder Additives

Asphalt rubber binder additives include those used for anti-strip and warm mix properties and may be either in a liquid or dry state. Dry additive ingredients must be measured by weight. Liquid additives must be measured with a mass-flow meter. Additives must be added at least 30 minutes before end use to facilitate mixing.

The asphalt rubber binder plant must have a sampling device in the feed line connecting the additive storage to the additive metering system. The additive sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(c)(i)(a) Batch Method Proportioning

Use a plant process controller complying with Chapter 2, Section IIF, "Batch Mixing HMA Plants," of the MPQP. The plant process controller must proportion all ingredients used in the production of the asphalt rubber binder.

The hopper scale system must include interlocks which prevent filling the hopper while drawing ingredients from the same hopper.

The zero tolerance for dry ingredient scales must be 0.5 percent of the total draft being weighed.

The indicated weight of material drawn from storage must not vary from the preselected target weight setting by more than 1.0 percent of the total draft target.

37-2.03B(2)(c)(i)(b) Continuous Method Proportioning

Proportion dry ingredients with a conveyor scale or a loss-weight meter. Continuous proportioning must be fully automatic. This automatic system must proportion total asphalt binder to total rubber to within 0.5 percent of the target rate.

37-2.03B(2)(c)(ii) Asphalt Rubber Binder Transportation

During transportation between the asphalt rubber binder production location and the end-use facility or project site, the mixture must comply with all requirements for agitation, temperature control, and data log.

37-2.03B(2)(c)(iii) Asphalt Rubber Binder Storage

During the proportioning and blending of the liquid ingredients, maintain the temperature of asphalt and the asphalt modifier to within 25 degrees F of the specified temperature. Asphalt rubber binder mixing and temperature control must be continuous from initial ingredient blending until the product end use.

When asphalt rubber binder is produced at a site remote from the end-use plant site, the receiving tank at the end-use site must comply with all agitation, heating, temperature, and data-reporting requirements.

Provide a safe sampling device capable of delivering a representative sample of the completed asphalt rubber binder. The device must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(c)(iv) Ingredient and Asphalt Rubber Binder Temperatures

During production, use automatic and continuous temperature sensing and recording equipment to control and document asphalt rubber binder and liquid asphalt rubber binder ingredient temperatures accurately. Continuous recording occurs when production temperature data are collected electronically at intervals of 1 minute or less. Temperature-sensing devices must be accurate to within 5 degrees F.

Place temperature-sensing points at each liquid feed line where the blend is reacted and at each storage tank for completed asphalt rubber binder.

Install and maintain temperature indicators at the point where the asphalt rubber binder proportioning operation is controlled.

37-2.03B(2)(c)(v) Asphalt Rubber Binder Production Data Log

Subsequent to the lot number designation, correlate all captured data to the lot number. The plant process controller used for asphalt rubber binder production must produce a log of production data consisting of a series of snapshots captured at a maximum of 1-minute intervals throughout the period of daily production. Each snapshot of production data must be a register of production activity at the time and not a summation of the data over the preceding interval to the previous snapshot. The amount of material represented by each snapshot is the amount produced during the 0.5-minute interval before and the 0.5-minute interval after the capture time.

Asphalt rubber binder temperature need not be captured during periods where the product temperature is below 370 degrees F.

When asphalt rubber binder proportioning is used, the following data must be captured:

1. Date of production.
2. Production location.
3. Time of day the data is captured.
4. Assigned, non-repeating lot number.
5. Certification of compliance numbers for dry and liquid ingredients currently used in the production process. Input liquid ingredients certificate numbers to the nearest 25-ton increment.
6. Viscosity test results including sampling time.
7. Asphalt rubber binder temperature at each required sensing point.
8. Ratio A—The high natural rubber to scrap tire crumb rubber ratio calculated from metered ingredient output.
9. Ratio B—The asphalt modifier to asphalt ratio calculated from metered ingredient output.
10. Ratio C—The total dry ingredient to total liquid ingredient ratio calculated from metered ingredient output.
11. Total reacting time and the reaction ending time.
12. Asphalt rubber binder additive type and asphalt rubber binder to additive target ratio.
13. Asphalt rubber binder to additive ratio calculated from individual metered output.

When a batch type proportioning system is used, capture the following data:

1. Batch weight for each dry ingredient as determined by its scale system.
2. Batch weight for each liquid ingredient as determined by its meter.

When a continuous type proportioning system is used, capture the rate of flow for each dry and liquid ingredient determined by its metering system.

37-2.03B(2)(c)(vi) Asphalt Rubber Binder Production Data Reports

Make as-collected raw data available to the Engineer during production.

Submit the production report generated from data collected at remote end-use sites to the Engineer within 7 days of production date. A remote end-use site is one at a distance greater than 5 miles from the asphalt rubber binder production location.

Submit the report generated from production data for non-remote production sites to the Engineer daily.

37-2.03B(2)(c)(vii) Electronic Media

Present the electronic media in a comma-separated values (CSV) format. Captured data for the ingredients represented by production snapshots must have allowances for sufficient fields to satisfy the amount of data required and include data titles at least once per report. The Engineer must approve report formats.

Collect and hold data for the duration of the contract. All collected data must be submitted as electronic media. No handwritten reports or data will be accepted.

37-2.03B(2)(d) Rubberized Asphalt Terminal Blend Binder

When WMA additives are added to the asphalt rubber binder in the field the additives may be either in a liquid or dry state. Dry additive ingredients must be measured by weight. Liquid additives must be measured with a mass-flow meter. Additives must be added at least 30 minutes before end use to facilitate mixing or as recommended by the WMA additive manufacturer. If WMA additives are added at refinery, the proportioning must comply with the MPQP requirement.

The feed line connecting the WMA additive storage to the additive metering system must have a sampling device. The additive sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

Asphalt rubber binder must be mechanically mixed to provide for the complete blending of liquid or dry ingredients in a controlled fashion.

The tank used for mixing asphalt rubber binder and WMA additive must have a sampling device. The sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(e) Distributor Trucks for Placing Asphalt Rubber Binder

Distributor truck for spreading asphalt rubber binder must have the following features:

1. Be self-propelled
2. Heating unit
3. Internal mixing unit, except for rubberized asphalt terminal blend binder
4. Pumps that spray asphalt rubber binder within 0.03 gal/sq yd of the specified rate
5. Fully circulating spray bar that applies asphalt rubber binder uniformly
6. Tachometer
7. Pressure gages
8. Volume measuring devices
9. Thermometer
10. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed, except for rubberized asphalt terminal blend binder

Replace section 37-2.03E with:

37-2.03E Precoating Screenings

For asphalt rubber seal coat, screenings must be preheated from 260 to 325 degrees F. Coat with any of the asphalts specified in the table titled "Performance Graded Asphalt Binder" in section 92. Coat at a central mixing plant. The asphalt must be from 0.5 to 1.0 percent by weight of dry screenings.

Plant must be authorized under the Department's MPQP.

Do not stockpile preheated or precoated screenings.

Replace section 37-2.03F with:

37-2.03F Applying Asphalt Rubber Binder

37-2.03F(1) General

For areas not accessible to a truck's distributor bar, apply the asphalt rubber binder with a squeegee, rake, or other authorized means.

Prevent spray on existing pavement not intended for seal coat or on previously applied seal coat. Use a material such as building paper and remove the material after use. At longitudinal joints, you may overlap the asphalt rubber binder applications before application of screenings if the overlap is dispersed with squeegees or rakes.

Align longitudinal joints between seal coat applications with designated traffic lanes. Overlap longitudinal joints by not more than 4 inches. If the Engineer authorizes your request, the overlap may be up to 8 inches.

Do not apply the asphalt rubber binder unless there are sufficient precoated screenings at the job site to cover the asphalt rubber binder.

Discontinue the application of asphalt rubber binder early enough to comply with lane closure specifications and darkness. Apply to 1 lane at a time and cover the lane entirely in 1 operation.

37-2.03F(2) Asphalt Rubber Binder

For field blend asphalt rubber binder without WMA additive technology, at the time of application, the temperature of asphalt rubber binder must be from 385 to 415 degrees F. For field blend asphalt rubber binder with WMA additive technology, at the time of application, the temperature of asphalt rubber binder must be from 330 to 375 degrees F.

For rubberized asphalt terminal blend binder with and without WMA additive technology, at the time of application, the temperature of asphalt rubber binder must be from 330 to 375 degrees F.

For field blend asphalt rubber binder, determine the asphalt rubber binder application rate from 0.55 to 0.65 gal/sq yd. For rubberized asphalt terminal blend binder, determine the asphalt rubber binder application rate from 0.40 to 0.65 gal/sq yd. if you use a variable application rate apparatus the asphalt rubber binder application rate in the wheel paths may be reduced by 0.05 gal/sq yd.

Apply asphalt rubber binder when the atmospheric temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply asphalt rubber binder unless there are sufficient precoated screenings available to cover the asphalt rubber binder within 2 minutes. Asphalt rubber binder applied at intersections, turn lanes, gore points, and irregular areas must be covered with precoated screenings within 15 minutes.

Do not apply asphalt rubber binder when weather or road conditions are unsuitable, including high wind or when the pavement is damp. In windy conditions you may adjust the distributor bar height and distribution speed, and use shielding equipment, if authorized.

Replace the 1st paragraph of section 37-2.03G(1) with:

Prevent vehicles from driving on asphalt rubber binder before spreading precoated screenings.

Replace section 37-2.03G(4) with:

37-2.03G(4) Asphalt Rubber Seal Coat

During transit, cover precoated screenings for asphalt rubber seal coat with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

At the time of application, precoated screenings for asphalt rubber seal coat must be from 225 to 325 degrees F.

Spread precoated screenings at a rate from 25 to 40 lb/sq yd. Spread to within 10 percent of the determined rate.

Replace section 37-2.03H(2) with:

37-2.03H(2) Asphalt Rubber Seal Coat

Perform initial rolling within 90 seconds of spreading precoated screenings. Do not spread precoated screenings more than 200 feet ahead of the initial rolling.

For final rolling, you may request use of a steel-wheeled roller weighing from 8 to 10 tons, static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge screenings.

Remove collected seal coat screenings from paved shoulders, drain inlets, other drainage areas, curbs, dikes and sidewalks. You may stockpile collected material at the jobsite. Remove and dispose of collected material.

Add to section 37-2.04:

Screenings for asphalt rubber seal coat are measured by coated weight after they are preheated and precoated with asphalt binder.

Screenings for asphalt rubber seal coat is paid for as screenings (hot-applied).

Asphalt-rubber binder is measured under the specifications for asphalts.

Deductions for crumb rubber gradations are taken based on:

1. Each gradation test for scrap tire crumb rubber represents 10,000 lbs or the amount used in that day's production, whichever is less.
2. Each gradation test for high natural crumb rubber represents 3,400 lbs or the amount used in that day's production, whichever is less.

For each gradation test, the following pay deductions will be taken for noncompliant material:

Material	Test result ^a	Deduction
Scrap tire crumb rubber	Operating range < TR < Contract compliance	\$250
Scrap tire crumb rubber	TR > Contract compliance	\$1,100
High natural crumb rubber	Operating range < TR < Contract compliance	\$250
High natural crumb rubber	TR > Contract compliance	\$600

^aTest Result = TR

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
OFFICE ENGINEER
1727 30th Street MS-43
P.O. BOX 168041
SACRAMENTO, CA 95816-8041
FAX (916) 227-6214
TTY 711



*Flex your power!
Be energy efficient!*

February 11, 2013

02-Teh-36-55.2/67.5
02-4E9704
Project ID 0212000114
ACSTP-P036(094)E

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN TEHAMA COUNTY AT AND NEAR PAYNES CREEK FROM 0.1 MILE WEST OF MANTON ROAD TO 0.2 MILE EAST OF LATKA ROAD.

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.

This addendum is being issued to postpone the bid opening indefinitely, instead of the original date of Tuesday, February 12, 2013.

To Bid 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 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 is available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/02/02-4E9704

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,

A handwritten signature in black ink, appearing to read "John Bulinski", written over a circular stamp.

JOHN BULINSKI
District Director

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES

OFFICE ENGINEER

1727 30th Street MS-43

P.O. BOX 168041

SACRAMENTO, CA 95816-8041

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TTY 711

*Flex your power!
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March 21, 2013

02-Teh-36-55.2/67.5

02-4E9704

Project ID 0212000114

ACSTP-P036(094)E

Addendum No. 3

Dear Contractor:

This addendum is being issued to the contract for CONSTRUCTION ON STATE HIGHWAY IN TEHAMA COUNTY AT AND NEAR PAYNES CREEK FROM 0.1 MILE WEST OF MANTON ROAD TO 0.2 MILE EAST OF LATKA ROAD.

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, 2013. The original bid opening date was previously postponed indefinitely under Addendum No. 2 dated February 11, 2013.

This addendum is being issued to set a new bid opening date as shown herein and revise the Project Plans, the Notice to Bidders and Special Provisions, the Bid book, and the Federal Minimum Wages with Modification Number 4 dated March 8, 2013.

Project Plan Sheets 2 and 5 are revised. Copies of the revised sheets are attached for substitution for the like-numbered sheets.

In the Special Provisions, Section 1-1.01 is replaced as attached.

In the Special Provisions, Section 37, "BITUMINOUS SEALS" is replaced as attached.

Addendum No. 3
Page 2
March 21, 2013

02-Teh-36-55.2/67.5
02-4E9704
Project ID 0212000114
ACSTP-P036(094)E

In the Bid book, in the "Bid Item List," Item 13 is revised, Items 17, 18, and 19 are added and Items 9, 10, and 11 are deleted as attached.

To Bid book holders:

Replace page 3 of the "Bid Item List" in the Bid book with the attached revised page 3 of the Bid Item List. The revised 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, attachments and the modified wage rates are available for the Contractors' download on the Web site:

http://www.dot.ca.gov/hq/esc/oe/project_ads_addenda/02/02-4E9704

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,


JOHN BULINSKI
District Director

Attachments

Bid Items and Applicable Sections

Item code	Item description	Applicable section
025541	ASPHALT-RUBBER BINDER (TYPE II), WMA ADDITIVE	37
025542	CRUMB RUBBER R18 MODIFIED BINDER	37
025543	CRUMB RUBBER R18 MODIFIED BINDER, WMA ADDITIVE	37
025191	THERMOPLASTIC TRAFFIC STRIPE (SPRAYABLE 2-COAT)	84

CONTRACT NO. 02-4E9704
REPLACED PER ADDENDUM NO. 3 DATED MARCH 21, 2013

Add to section 1-1.01:

37 BITUMINOUS SEALS

Replace the 2nd paragraph of section 37-2.01A with:

Seal coat includes applying heated asphalt rubber binder or crumb rubber R18 modified binder, followed by heated screenings precoated with asphalt binder, then a flush coat.

Seal coat binder used for seal coat must be asphalt rubber binder (Type II), except for test sections.

This project includes test sections as shown for the evaluation of seal coats constructed with different seal coat binders including evaluation of test sections with and without warm mix asphalt (WMA) additive technologies. The following seal coat binder types will be evaluated on this project:

1. Asphalt rubber binder (Type II) with WMA additive technology
2. Crumb rubber R18 modified binder
3. Crumb rubber R18 modified binder with WMA additive technology

The Department will not consider a VECF that eliminates the use of the above seal coat binder types or WMA additive technology for the test sections.

Select a WMA additive to be used in the specified test sections from Department-approved WMA additive technologies. Some Department-approved WMA technologies for HMA are not appropriate for use in the above seal coat binders for seal coats. For Department-approved WMA technologies, go to:

http://www.dot.ca.gov/hq/esc/approved_products_list/

For Laboratory Procedures, go to:

<http://www.dot.ca.gov/hq/esc/Translab/ofpm/fpmlab.htm>

For Vialit Test Method, go to:

<http://www.dot.ca.gov/hq/esc/ctms/index.html>

Replace "Reserved" In section 37-2.01B with:

crumb rubber modifier: Ground or granulated high natural crumb rubber and/or scrap tire crumb rubber.

descending viscosity reading: Subsequent viscosity reading that must be at least 5 percent lower than any previous viscosity reading.

high natural crumb rubber: Material containing 40 to 48 percent natural rubber.

scrap tire crumb rubber: Any combination of:

1. Automobile tires
2. Truck tires
3. Tire buffings

Replace section 37-2.01C(5) with:

37-2.01C(5) Seal Coat

37-2.01C(5)(a) General

For seal coat using asphalt rubber binder (Type I) and (Type II) submit a certificate of compliance and a copy of the specified test results for each delivery of asphalt rubber binder ingredients and asphalt rubber binder to the job site.

Submit MSDS for each seal coat binder ingredient and the seal coat binder.

At least 15 days before use, submit:

1. Four 1-quart cans of mixed seal coat binder
2. Samples of each seal coat binder ingredient
3. Seal coat binder formulation and data as follows:
 - 3.1. For asphalt binder, submit source and grade of asphalt binder
 - 3.2. For asphalt modifier, submit:
 - 3.2.1. Source and type of asphalt modifier
 - 3.2.2. Percentage of asphalt modifier by weight of asphalt binder
 - 3.2.3. Percentage of combined asphalt binder and asphalt modifier by weight of asphalt rubber binder
 - 3.2.4. Test results for the specified quality characteristics
 - 3.3. For crumb rubber modifier, submit:
 - 3.3.1. Each source and type of scrap tire crumb rubber and high natural rubber
 - 3.3.2. Test results for the specified quality characteristics
 - 3.4. For WMA additive technology, submit:
 - 3.4.1. Name of technology
 - 3.4.2. Percent admixture by weight of seal coat binder as recommended by the manufacturer
 - 3.5. For seal coat binder, submit:
 - 3.5.1. Test results for the specified quality characteristics
 - 3.5.2. Test results for AASHTO T 228. Report test results in pounds per gallon
 - 3.5.3. For asphalt rubber binder (Type I) and (Type II):
 - 3.5.3.1. Minimum reaction time and temperature
 - 3.5.3.2. Percentage of scrap tire crumb rubber and high natural rubber by total weight of asphalt rubber binder
 - 3.5.4. For crumb rubber R18 modified binder, percentage of scrap tire crumb rubber by total weight of crumb rubber R18 modified binder
 - 3.6. Test result for Vialit Test Method for aggregate in Chip Seals, French Chip.
 - 3.7. For precoated screenings, submit:
 - 3.7.1. Name of proposed aggregate source
 - 3.7.2. California mine number
 - 3.7.3. SMARA identification number
 - 3.7.4. Aggregate test results performed within past 60 days for:
 - 3.7.4.1. California Test 202
 - 3.7.4.2. California Test 211
 - 3.7.4.3. California Test 302
 - 3.7.4.4. California Test 227
 - 3.7.4.5. California Test 229
 - 3.7.5. Name of HMA plant producing precoated screenings
 - 3.7.6. Asphalt binder grade for coating
 - 3.7.7. Precoated screenings asphalt binder coating percentage by weight of dry screenings
 - 3.8. For seal coat, submit the proposed:
 - 3.8.1. Seal coat binder temperature range
 - 3.8.2. Seal coat binder application rate
 - 3.8.3. Precoated screenings spread rate

At least 5 days before use, submit permit issued by local air quality agency for seal coat binder:

1. Field blending equipment
2. Application equipment

For each delivery of seal coat binder ingredients, submit:

1. A certified volume or weight slip
2. Certificate of compliance with manufactures test results for the specified quality characteristics

Submit for each delivery of seal coat binder:

1. A certified volume or weight slip
2. Percentage of crumb rubber modifier by weight of seal coat binder
3. Certificate of compliance for the specified quality characteristics

37-2.01C(5)(b) Prepaving Conference

Submit a list of names participating in the prepaving conference. Identify each participant's name, employer, title, and role in the production and placement of seal coat.

37-2.01C(5)(c) Tests and Samples

At least 10 days before starting seal coat activities, submit the name of an independent testing laboratory that participates in the AASHTO Materials Reference Laboratory (AMRL) program and the Department's Independent Assurance Program.

The independent testing laboratory must submit seal coat tests results to the Engineer.

Submit a certificate of compliance and accuracy verification of test results for viscometers.

Upon request, submit notification 15 minutes before each viscosity test or submit a schedule of testing times.

37-2.01C(5)(d) Daily Production Log

Submit log of production data daily and upon request.

Submit log of seal coat binder production viscosity test results each day of seal coat work.

Replace "Reserved" in section 37-2.01D(1) with:

Equipment used in producing asphalt rubber binder (Type I) and (Type II) must be permitted for use by local air quality agency. If an air quality permit is not required by local air quality agency for producing asphalt rubber binder (Type I) and (Type II) submit a project specific verification from the local air quality agency that an air quality permit is not required.

Equipment used in spreading seal coat binder must be permitted for use by local air quality agency. If an air quality permit is not required by local air quality agency for spray applying seal coat binder, submit project specific verification from the local air quality agency that an air quality permit is not required.

Replace section 37-2.01D(4) with:

37-2.01D(4) Seal Coat

37-2.01D(4)(a) General

Not Used

37-2.01D(4)(b) Technical Representatives

37-2.01D(4)(b)(i) General

Technical representatives for the following must participate in the prepaving conference and be present during placement of the portion of the seal coat related to the product they represent:

1. Asphalt rubber binder (Type I) and (Type II) producer
2. Crumb rubber R18 modified binder producer
3. WMA additive technology supplier

37-2.01D(4)(b)(ii) Asphalt Rubber Binder (Type I) and (Type II) Producer

A technical representative from the asphalt rubber producer must be present during the production and placement of seal coat using asphalt rubber binder. The technical representative may advise you and the Engineer during the seal coat application as it relates to the asphalt rubber binder placement temperature, asphalt rubber binder application rate and other placement issues.

37-2.01D(4)(b)(iii) Crumb Rubber R18 Modified Binder Producer

A technical representative from the crumb rubber R18 modified binder producer must be present during the placement of seal coat using crumb rubber R18 modified binder. The technical representative may advise you and the Engineer during the seal coat application as it relates to the crumb rubber R18 modified binder placement temperature, crumb rubber R18 modified binder application rate, and other placement issues.

37-2.01D(4)(b)(iv) WMA Additive Technology Supplier

A technical representative from the WMA technology supplier must be present during the production and placement of seal coat using asphalt rubber binder or crumb rubber R18 modified binder with WMA additives. The technical representative may advise you, the Engineer, and the asphalt rubber binder producer or crumb rubber R18 modified binder producer. The technical representative may advise the seal coat binder mix operation as it relates to the WMA technology. The WMA technology representative may advise you of placement temperature and other potential placement issues.

The technical representative for WMA technology may advise the seal coat binder producer regarding seal coat binder plant and seal coat binder plant process-controller modifications necessary for integrating WMA additive technology equipment with seal coat binder plant. Seal coat binder plant modifications and WMA technology equipment, scales, and meters must comply with Department's Materials Plant Quality Program (MPQP).

37-2.01D(4)(c) Preparing Conference

Schedule a preparing conference with the Engineer at a mutually agreed time and place. Make arrangements for the conference facility. Be prepared to discuss:

1. Seal coat production and placement
2. Method for incorporating WMA technology and any impacts on seal coat binder production and seal coat placement including requirements for compaction, sweeping, and workmanship
3. Proposed application rates for seal coat binder and precoated screenings and who in the field has authority to adjust application rates and how adjustments are documented
4. When initial sweeping will be done, including any issues when WMA additives are used, and schedule for maintenance sweepings
5. Opening to traffic requirements including any concerns when WMA additives are used
6. Quality control testing
7. Contingency plan for material deliveries, equipment breakdowns, and traffic handling

The following personnel must attend the preparing conference:

1. Project manager
2. Superintendent
3. Technical representative for WMA additive technology
4. Technical representative for asphalt rubber binder producer
5. Technical representative for crumb rubber R18 modified binder producer

37-2.01D(4)(d) Quality Control Testing

37-2.01D(4)(d)(i) General

The independent testing laboratory must conduct quality control testing on asphalt rubber binder ingredients at the following frequencies:

1. For crumb rubber modifier except for grading, one per 250 tons. Samples of scrap tire crumb rubber and high natural crumb rubber must be sampled and tested separately. Test each delivery of crumb rubber modifier for grading.
2. For asphalt modifier, one per 25 tons of asphalt modifier.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the asphalt rubber binder production site in separate bags.

37-2.01D(4)(d)(ii) Asphalt Rubber Binder (Type I) and (Type II)

For asphalt rubber binder (Type I) and (Type II) with WMA additives, sample and test asphalt rubber binder:

1. Immediately before the addition of the WMA additive after the asphalt rubber binder has two consecutive descending viscosities and the viscosity meets the specification requirements.
2. 30 minutes after the addition of the WMA additive.
3. 15 minutes before use.

The quality control test results for asphalt rubber binder with WMA additive are report only.

The independent testing laboratory must take viscosity readings of asphalt rubber binder under ASTM D7741 during asphalt rubber binder production. Begin taking viscosity readings of samples taken from the reaction vessel at least 45 minutes after adding crumb rubber modifier and continue taking viscosity readings every 15 minutes until two consecutive descending viscosity readings have been obtained and the final viscosity meets the specification requirement. After meeting the specification requirement, continue to take viscosity readings hourly and within 15 minutes before use. Log the test results, including time of testing and temperature of the asphalt rubber binder.

For asphalt rubber binder, the independent testing laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Asphalt Rubber Binder (Type I) and (Type II) for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Sampling location	Maximum reporting time allowance
Original binder					
Flash point, min, °C	AASHTO T 48	1 per 100 tons	230	Spray bar sampling port ^h	3 business days
Solubility, min, %	AASHTO T 44 or ASTM D 5546		Report only		
Viscosity at 135°C, max, Pa·s	AASHTO T 316		Report only		
Dynamic shear ^a , test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315		Report only ^b 1.00		
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM D 2872		Report only		
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217		25 60		
Resilience at 25 °C, percent rebound min max	ASTM D 5329		18 50		
Softening point, °C min max	ASTM D 36		55 88		
Viscosity at 375°F, Pa · s (x10-3)	ASTM D 7741		1500 - 2500		
RTFO test aged binder					
Dynamic shear, test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315	1 per 100 tons	Report only ^b 2.20	Spray bar sampling port ^h	3 business days
Dynamic shear, test temperature at 10 rad/s, °C, Phase Angle,%	AASHTO T 315		Report only ^d Report only		
Elastic recovery, test temperature, °C min recovery, %	AASHTO T 301		25 Report only		
PAV ^e aging, temperature, °C	AASHTO R 28		110		

RTFO test and PAV aged binder					
Dynamic shear, test temperature at 10 rad/s, °C max $G^* \sin(\delta)$, kPa	AASHTO T 315	1 per 100 tons	Report only ^f 5000	Spray bar sampling port ^h	3 business days
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313		Report only ^g 300 0.300		

^a Test original binder and RTFO aged binder on the DSR using 25mm plates and a 3 mm gap. Test the PAV aged binder using 8 mm plates and a 3 mm gap. All samples are trimmed at 3.15 mm.

Ensure that the DSR software allows for the 3 mm gap in its calculations.

^b AASHTO R29 can be used as a guideline for Grade Determination. Report $G^* \sin(\delta)$ for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^c RTFO means the asphaltic residue obtained using the rolling thin film oven test. The residue from mass change determination may be used for other tests.

^d Report the phase angle measured at both the pass and fail temperature of the RTFO aged binder.

^e PAV^m means pressure aging vessel.

^f AASHTO R29 can be used as a guideline for Grade Determination. Report $G^* \sin(\delta)$ for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^g AASHTO R29 can be used as a guideline for Grade Determination. Report stiffness S and m-value for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^h For asphalt rubber binder (Type I) and (Type II) with WMA additives, you may sample asphalt rubber binder before the addition of the WMA additive from the reaction vessel

37-2.01D(4)(d)(iii) Crumb Rubber R18 Modified Binder

Crumb rubber R18 modified binder must comply with the Department's *Certification Program for Suppliers of Asphalt*. For program requirements, procedures, and a list of authorized material sources, go to the METS Web site.

For crumb rubber R18 modified binder with WMA additives, sample and test crumb rubber R18 modified binder:

1. Immediately before the addition of the WMA additive.
2. 30 minutes after the addition of the WMA additive.
3. 15 minutes before use.

The quality control test results for crumb rubber R18 modified binder with WMA additive are report only.

Before the application of crumb rubber R18 modified binder, sample crumb rubber R18 modified binder from spray bar sampling port and test for viscosity under ASTM D7741. Take at least 1 viscosity reading for each distributor truck load at the project site and within 15 minutes before use. Log the test results, including time of testing and temperature of the crumb rubber R18 modified binder.

For crumb rubber R18 modified binder, the independent testing laboratory must perform quality control sampling and testing at the specified frequency and location for the following quality characteristics:

Crumb Rubber R18 Modified Binder for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Sampling location	Maximum reporting time allowance
			Binder grade PG 76-22 R		
Original binder					
Flash point, min, °C	AASHTO T 48	1 per 100 tons	230	Spray bar sampling port ^e	3 business days
Solubility, min, %	AASHTO T 44 or ASTM D 5546		97.5		
Viscosity at 135°C, max, Pa·s	AASHTO T 316		3.0		
Dynamic shear, Test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315		76		
			1.00		
RTFO test ^a , mass loss, max, %	AASHTO T 240 or ASTM D 2872		1.00		
Cone penetration at 25 °C, 1/10 mm	ASTM D 217		Report only		
Resilience at 25 °C, percent rebound	ASTM D 5329		Report only		
Softening point, °C	ASTM D 36		Report only		
Viscosity at 375°F, Pa · s (x10-3)	ASTM D 7741		Report only		
RTFO test aged binder					
Dynamic shear, test temperature at 10 rad/s, °C min, G*/sin(delta), kPa	AASHTO T 315	1 per 100 tons	76	Spray bar sampling port ^e	3 business days
			2.20		
Dynamic shear, test temperature at 10 rad/s, °C max (delta), %	AASHTO T 315		Note b		
			80		
Elastic recovery ^c , test temperature, °C min recovery, %	AASHTO T 301		25		
			65		
PAV ^d Aging, temperature, °C	AASHTO R 28		110		

RTFO test and PAV aged binder					
Dynamic shear, test temperature at 10 rad/s, °C max G*/sin(delta), kPa	AASHTO T 315		31 5000		
Creep stiffness, test temperature, °C max S-value, MPa min M-value, MPa	AASHTO T 313	1 per 100 tons	-12 300 0.300	Spray bar sampling port ^e	3 business days

^a"RTFO" means the asphaltic residue obtained using the Rolling Thin Film Oven Test. The residue from mass change determination may be used for other tests.

^bTest temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.

^cTests without a force ductility clamp may be performed.

^d"PAV" means Pressure Aging Vessel

^eFor crumb rubber R18 modified binder with WMA additives, sample crumb rubber R18 modified binder before the addition of the WMA additive at sampling location you choose and the engineer authorizes.

37-2.01D(4)(d)(iv) Precoated Screenings

For precoated screenings, the independent testing laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics. All tests, except the film stripping, must be performed on uncoated screenings.

Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Location of sampling	Maximum reporting time allowance
Los Angeles Rattler Loss, %, max Loss at 100 revolutions Loss at 500 revolutions	California Test 211	1st day of production	10 40	See California Test 125	48 hours
Gradation, percentage passing	California Test 202	2 per day	Seal coat screenings gradation table under Materials	See California Test 125	24 hours
Film stripping, %, max	California Test 302	1st day of production	25	See California Test 125	48 hours
Cleanness value, min	California Test 227	2 per day	80	See California Test 125	24 hours
Durability, min	California Test 229	1st day of production	52	See California Test 125	48 hours

37-2.01D(4)(d)(v) Seal Coat

For seal coat, the independent testing laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Location of sampling	Maximum reporting time allowance
Seal coat binder spread rate, gal/sq yd	Modified California Test 339	2 per day	Target value ± 0.05 gal/sq yd	Pavement surface	24 hours

For determining seal coat binder spread rate California Test 339 is modified as follows:

A. Scope

Modified California Test 339 describes the procedure for determining the transverse spread rate of a bituminous distributor in gallons per square yard.

B. Apparatus

1. Balance sensitive to 0.1 gram with a minimum capacity of $\pm 2,000$ grams.
2. Suitable weighing box with windshield or enclosed area for balance to ensure no impacts from wind conditions.
3. Balance table and/or work bench.

C. Materials

1. 8" x 12" Galvanized Sheet Metal Plates -28 gauge. Verify size of the metal plates used in calculations in Section F.
2. Polyester Filter Roll material.
3. Cementing material.
4. 10" x 13" min. - Manila Envelopes.
5. 30 pound Roofing Felt Paper.

Note:

The roofing felt paper is available at most home supply stores or roofing suppliers.

D. Preparation of the Test Plates

1. Cut the polyester material from the roll to an 8" x 12" size and cement to the 8" x 12" plate.
2. Number the bottom of each metal plate. One plate for each one (1) foot of roadway surface to be sprayed.
3. Number each manila envelope.
4. Weigh each test plate + polyester filter placed in each manila envelope.
5. Cut the roofing felt paper to a width of 18".

E. Sampling

1. Prior to the distributor approaching, place the roofing felt paper transversely across the pavement surface at the test location and secure with duct tape.
2. Place the metal plates with the 12" width, transversely across the pavement surface, centered on the roofing felt paper.
3. If desired, mark the test location outside the spray area for future reference.
4. After the distributor vehicle has passed, slide the roofing felt paper off the roadway with the test plates remaining in place, and let cool for a minimum of five minutes.
5. Remove each separate metal plate with the polyester material and binder and place in the properly numbered manila envelope. Care should be taken to ensure that each plate has no material loss.
6. Proceed to weighing area and weigh each of the test plates and the manila envelopes and record as the Gross Weight.
7. Determine the Net Weight of the binder and record the weight.

F. Calculations

To determine the spread rate the following is required:

1. The Specific Gravity of the binder.
2. The field application temperature.

Calculate the spread rate as follows for each plate:

Where:

Application Temperature Factor – Use Column A from Temperature Conversion Table in Section 93 of the Standard Specifications when the density at 60°F is greater than 60.3 lbs/cf (0.9963).

cf - cubic feet

gal - gallon

lbs - pounds

Sp. Gr. – Binder Specific Gravity

sq. in. – square inches

1. $Sp.Gr. \times 62.4 \text{ lbs/cf} \times \frac{1}{7.48 \text{ lbs/gal}} \times \text{Application Temperature Factor} = \text{_____ lbs/gal at } 60^\circ\text{F}.$
2. $\text{_____ lbs/gal} \times 0.074 \text{ SQYD}^{**} \times 454 \text{ grams/lbs} = \text{_____ grams} \times \text{SQYD/gal}$
 $\frac{96 \text{ sq.in.}}{1,296 \text{ sq.in./SQYD}} = 0.0741 \text{ SQYD. Verify plate dimensions and adjust accordingly.}$
 $\frac{\text{Net Weight of Binder grams}}{\#2 \text{ Above grams} \times \text{SQYD/gal}} = \text{_____ gal/SQYD (spread rate).}$
- 3.
4. Record the spread rate for each plate across the lane.

For seal coat, the independent testing laboratory must perform sampling and testing at the specified frequency and location for the following quality characteristics:

Minimum Quality Control

Quality characteristic	Test method	Minimum sampling and testing frequency	Requirement	Location of sampling	Maximum reporting time allowance
Chip retention, %	Field modified Vialit test method for aggregate in chip seals, French chip (modified)	1 per day	Report only	Pavement surface after chip application and rolling	48 hours

For field testing seal coat chip retention the Field Modified Vialit Test Method for Aggregate in Chip seals, French Chip is revised as follows:

1. Use a 20 cm x 20 cm galvanized plate 2.0 mm thick and determine the tare weight of the galvanized plate.
2. Place the plate on the existing pavement surface before placing chip seal. After finish rolling the seal coat and initial surface sweeping, remove the specimen. Place the specimen in a plastic bag.
3. Cure the specimen, except cure at 100 degree F for the first 2 hours.
4. Condition the specimen.
5. Weigh the test specimen and any loose chips in the sample bag.
6. Perform the Vialit test and reweight the test specimen.
7. Calculate the binder weight as follows:

$$\text{Binder weight} = \text{BAR (gallons/sq yd)} \times 0.0478 \text{ (sq yd)} \times \text{SG}_{\text{ARB}} \text{ (lbs/gal)}$$

Where:

BAR = seal coat binder application rate in gal/sq yd

Plate dimension = 20 cm X 20 cm = 0.0478 sq yd

SG_{ARB} = specific gravity of seal coat binder determined under ASSHTO T 228

8. Calculate the chip retention by weight as follows:

$$\text{Percent retention} = \frac{[\text{SW}_{\text{initial}} - (\text{BW} + \text{TW})]}{[\text{SW}_{\text{final}} - (\text{BW} + \text{TW})]}$$

Where:

SW_{initial} = initial specimen weight

SW_{final} = final specimen weight

BW = seal coat binder weight

TW = tare weight

Add section 37-2.01D(5):

37-2.01D(5) Acceptance Criteria

Seal coat acceptance is based on:

1. Visual inspection for the following:
 - 1.1. Uniform surface texture throughout the work limits.
 - 1.2. Raveling consists of the separation of the aggregate from the binder.
 - 1.3. Flushing consists of the occurrence of a film of bituminous material on the surface of the seal coat.
 - 1.4. Streaking consists of alternating longitudinal bands of binder without uniform aggregate retention, approximately parallel with the lane line.

2. For asphalt rubber binder (Type I) and (Type II), acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics shown in section 37-2.02G with the following table titles:
 - 2.1. Asphalt Rubber Binder (Type I) and (Type II) for Hot Applied Seal Coat Applications, except asphalt rubber binder with WMA additives acceptance is based on asphalt rubber binder sampled before the addition of WMA additive
 - 2.2. Asphalt Modifier for Asphalt Rubber Binder
 - 2.3. Crumb Rubber Modifier
 - 2.4. Scrap Tire Crumb Rubber Gradation
 - 2.5. High Natural Crumb Rubber Gradation
3. For crumb rubber R18 modified binder, acceptance is based on the Department's sampling and testing for compliance with the requirements for the quality characteristics shown in table titled "Crumb Rubber R18 Modified Binder for Hot Applied Seal Coat Applications" in section 37-2.02G, except crumb rubber R18 modified binder with WMA additives acceptance is based on crumb rubber R18 modified binder sampled before the addition of WMA additive.
4. Compliance with the table titled "Seal Coat Acceptance Criteria Testing Precoated Screenings."

Seal Coat Acceptance Criteria Testing Precoated Screenings		
Quality Characteristic	Test Method	Requirements
Los Angeles Rattler Loss, %, max Loss at 100 revolutions Loss at 500 revolutions	California Test 211	10 40
Gradation	California Test 202	Seal coat screenings gradation table under Materials
Film stripping, %, max	California Test 302	25
Cleanness value, min	California Test 227	80
Durability, min	California Test 229	52

Replace section 37-2.02G with:

37-2.02G Seal Coat Binder

37-2.02G(1) General

Seal coat binder includes asphalt rubber binder (Type I), asphalt rubber (Type II), and crumb rubber R18 modified binder.

37-2.02G(2) Asphalt Rubber Binder (Type I) and (Type II)

37-2.02G(2)(a) General

The blending equipment must allow the determination of weight percentages of each asphalt rubber binder ingredient.

37-2.02G(2)(b) Asphalt Rubber Binder (Type I)

Asphalt rubber binder (Type I) must be a combination of:

1. Asphalt binder
2. Crumb rubber modifier

Crumb rubber modifier must be scrap tire crumb rubber.

Asphalt rubber binder (Type I) must be 80 ± 2 percent by weight asphalt binder and 20 ± 2 percent by weight crumb rubber modifier. The minimum percentage of crumb rubber modifier must be 18.0 percent and lower values must not be rounded up.

37-2.02G(2)(c) Asphalt Rubber Binder (Type II)

Asphalt rubber binder (Type II) must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. Crumb rubber modifier

Asphalt rubber binder (Type II) must be 79 ± 1 percent by weight asphalt binder and 21 ± 1 percent by weight crumb rubber modifier. The minimum percentage of crumb rubber modifier must be 20.0 percent and lower values must not be rounded up.

Crumb rubber modifier must be 76 ± 2 percent by weight scrap tire crumb rubber and 24 ± 2 percent by weight high natural crumb rubber.

37-2.02G(2)(d) Asphalt Rubber Binder (Type I) and (Type II) Production

For asphalt rubber binder (Type II) asphalt modifier and asphalt binder must be blended at the production site. Asphalt modifier must be from 2.5 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder. The asphalt rubber binder producer determines the exact percentage.

When blended, the asphalt binder must be from 375 to 440 degrees F when asphalt modifier is added and the mixture must circulate for at least 20 minutes.

The asphalt binder or blend of asphalt binder and asphalt modifier must be combined with crumb rubber modifier at the asphalt rubber binder production site. The asphalt binder or asphalt binder and asphalt modifier blend must be from 375 to 440 degrees F when crumb rubber modifier is added. Asphalt binder, asphalt modifier, and crumb rubber modifier may be proportioned and combined simultaneously. Combined ingredients must be allowed to react at least 45 minutes at temperatures from 375 to 425 degrees F except the temperature must be at least 10 degrees F below the flash point of the asphalt rubber binder.

After reacting, the asphalt rubber binder must have the values for the quality characteristics shown in the following table:

Asphalt Rubber Binder (Type I) and (Type II) for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Requirement
		Asphalt rubber binder
Original binder		
Flash point, min, °C	AASHTO T 48	230
Solubility, min, %	AASHTO T 44 or ASTM D 5546	Report only
Viscosity at 135°C, max, Pa s	AASHTO T 316	Report only
Dynamic shear ^a , test temperature at 10 rad/s, °C min. $G^*/\sin(\delta)$, kPa	AASHTO T 315	Report only ^b 1.00
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM D 2872	Report only
Cone penetration at 25 °C, 1/10 mm min max	ASTM D 217	25 60
Resilience at 25 °C, percent rebound min max	ASTM D 5329	18 50
Softening point, °C min max	ASTM D 36	55 88
Viscosity at 375 °F, centipoises	ASTM D 7741	1500 - 2500
RTFO test aged binder		
Dynamic shear, test temperature at 10 rad/s, °C min, $G^*/\sin(\delta)$, kPa	AASHTO T 315	Report only ^b 2.20
Dynamic shear, test temperature at 10 rad/s, °C, Phase Angle,%	AASHTO T 315	Report only ^d Report only
Elastic recovery, test temperature, °C min recovery, %	AASHTO T 301	25 Report only
PAV ^e aging, temperature, °C	AASHTO R 28	110
RTFO test and PAV aged binder		
Dynamic shear, test temperature at 10 rad/s, °C max $G^*\sin(\delta)$, kPa	AASHTO T 315	Report only ^f 5000
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313	Report only ^g 300 0.300

^aTest original binder and RTFO aged binder on the DSR using 25 mm plates and a 3 mm gap. Test the PAV aged binder using 8 mm plates and a 3mm gap. All samples are trimmed at 3.15 mm. Ensure that the DSR software allows for the 3 mm gap in its calculations.

^bAASHTO R29 can be used as a guideline for Grade Determination. Report $G^*/\sin(\delta)$ for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^cRTFO means the asphaltic residue obtained using the rolling thin film oven test. The residue from mass change determination may be used for other tests.

^dReport the phase angle measured at both the pass and fail temperature of the RTFO aged binder.

^ePAV means pressure aging vessel.

^fAASHTO R29 can be used as a guideline for Grade Determination. Report $G^*\sin(\delta)$ for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

^gAASHTO R29 can be used as a guideline for Grade Determination. Report stiffness S and m-value for the initial fail temperature and the passing temperature one grade below the initial fail temperature.

Maintain asphalt rubber binder at a temperature from 375 to 415 degrees F.

Stop heating unused asphalt rubber binder 4 hours after two descending viscosity readings have been obtained. Reheating asphalt rubber binder that cools below 375 degrees F is considered a reheat cycle. Do not exceed 2 reheat cycles. If reheating, asphalt rubber binder must be from 375 to 415 degrees F before use.

During reheating, you may add scrap tire crumb rubber. Scrap tire crumb rubber must not exceed 10 percent by weight of the asphalt rubber binder. Allow added scrap tire crumb rubber to react for at least 45 minutes. Reheated asphalt rubber binder must comply with the specifications for asphalt rubber binder.

37-2.02G(3) Crumb Rubber R18 Modified Binder

Crumb rubber R18 modified binder must be a combination of:

1. Asphalt binder
2. Crumb rubber modifier

Crumb rubber modifier must be scrap tire crumb rubber.

Crumb rubber R18 modified binder must be 80 ± 2 percent by weight asphalt binder and 20 ± 2 percent by weight crumb rubber modifier. Crumb rubber R18 modified binder must have the values for the quality characteristics shown in the following table:

Crumb Rubber R18 Modified Binder for Hot Applied Seal Coat Applications

Quality characteristic	Test method	Requirements
		Binder grade PG 76-22 R ^{a,b}
Original binder		
Flash point, min, °C	AASHTO T 48	230
Solubility, min, %	AASHTO T 44 or ASTM D 5546	97.5
Viscosity at 135°C, max, Pa·s	AASHTO T 316	3.0
Dynamic shear, test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315	76 1.00
RTFO test ^c , mass loss, max, %	AASHTO T 240 or ASTM D 2872	1.00
Cone penetration at 25 °C, 1/10 mm	ASTM D 217	Report Only
Resilience at 25 °C, percent rebound	ASTM D 5329	Report Only
Softening point, °C	ASTM D 36	Report Only
RTFO test aged binder		
Dynamic shear, test temperature at 10 rad/s, °C min. G*/sin(delta), kPa	AASHTO T 315	76 2.20
Dynamic shear, test temperature at 10 rad/s, °C max (delta), %	AASHTO T 315	Note d 80
Elastic recovery ^e , test temperature, °C min recovery, %	AASHTO T 301	25 65
PAV ^f aging, temperature, °C	AASHTO R 28	110
RTFO test and PAV aged binder		
Dynamic shear, test temperature at 10 rad/s, °C max G*/sin(delta), kPa	AASHTO T 315	31 5000
Creep stiffness, test temperature, °C max S-value, MPa min M-value	AASHTO T 313	-12 300 0.300

^aDo not modify binder using polyphosphoric acid modification. Report type and dosage if any acid modification other than polyphosphoric acid modification is used.

^bSupplier is required to certify crumb rubber R18 modified binder contains 20 ± 2 percent by weight crumb rubber modifier.

^c"RTFO" means the asphaltic residue obtained using the rolling thin film oven test. The residue from mass change determination may be used for other tests.

^dTest temperature is the temperature at which G*/sin(delta) is 2.2 kPa. A graph of log G*/sin(delta) plotted against temperature may be used to determine the test temperature when G*/sin(delta) is 2.2 kPa. A graph of (delta) versus temperature may be used to determine delta at the temperature when G*/sin(delta) is 2.2 kPa. The Engineer also accepts direct measurement of (delta) at the temperature when G*/sin(delta) is 2.2 kPa.

^eTests without a force ductility clamp may be performed.

^f"PAV" means pressure aging vessel.

37-2.02G(4) Asphalt Binder

Asphalt binder for asphalt rubber binder (Type I) and (Type II) must be Grade PG 64-16. Do not modify asphalt binder with polymer.

Crumb rubber R18 modified binder must be Grade PG 76-22 R.

37-2.02G(5) Asphalt Modifier

Asphalt modifier must be a resinous, high flash point, and aromatic hydrocarbon. Asphalt modifier must have the values for the quality characteristics shown in the following table:

Asphalt Modifier for Asphalt Rubber Binder		
Quality characteristic	Test method	Requirements
Viscosity, m ² /s (x 10 ⁻⁶) at 100 °C	ASTM D 445	X ± 3 ^a
Flash point, C.L.O.C., °C	ASTM D 92	207 min
Molecular analysis		
Asphaltenes, percent by mass	ASTM D 2007	0.1 max
Aromatics, percent by mass	ASTM D 2007	55 min

^a "X" denotes the proposed asphalt modifier viscosity from 19 to 36. A change in "X" requires a new asphalt rubber binder submittal.

Asphalt modifier must be sampled and tested for compliance with the specifications by the manufacturer.

37-2.02G(6) Crumb Rubber Modifier

Crumb rubber modifier must be ground or granulated at ambient temperature.

Scrap tire crumb rubber and high natural crumb rubber must be delivered to the seal coat binder production site in separate bags.

Steel and fiber must be separated. If steel and fiber are cryogenically separated, the separation must occur before grinding and granulating. Cryogenically-produced crumb rubber modifier particles must be large enough to be ground or granulated.

Crumb rubber modifier must be free of contaminants except wire and fabric. Determine the percent weight of wire and fabric under Laboratory Procedure LP-10. Contaminants percentage by weight of crumb rubber modifier must not exceed:

1. 0.01 percent wire
2. 0.05 percent fabric

The length of an individual crumb rubber modifier particle must not exceed 3/16 inch.

Crumb rubber modifier must be dry, free-flowing particles that do not stick together. A maximum of 3 percent calcium carbonate or talc by weight of crumb rubber modifier may be added. Crumb rubber modifier must not cause foaming when combined with the asphalt binder and asphalt modifier.

Specific gravity of crumb rubber modifier must be from 1.1 to 1.2 determined under California Test 208.

Crumb rubber modifier must comply with the requirements for quality characteristics shown in the following table:

Crumb Rubber Modifier

Quality characteristic	Test method	Requirements			
		Scrap tire crumb rubber		High natural crumb rubber	
		Min	Max	Min	Max
Acetone extract, %	ASTM D 297	6.0	16.0	4.0	16.0
Rubber hydrocarbon, %		42.0	65.0	50.0	--
Natural rubber content, %		22.0	39.0	40.0	48.0
Carbon black content, %		28.0	38.0	--	--
Ash content, %		--	8.0	--	--

Scrap tire crumb rubber must have the gradation requirements shown in the following table:

Scrap Tire Crumb Rubber Gradation
Percentage passing

Sieve size	Gradation requirement	Operating range	Contract compliance
No. 8	100	100	100
No. 10	98-100	95-100	90-100
No. 16	45-75	35-85	32-88
No. 30	2-20	2-25	1-30
No. 50	0-6	0-10	0-15
No. 100	0-2	0-5	0-10
No. 200	0	0-2	0-5

NOTE: Determine gradation under Laboratory Procedure LP-10.

High natural crumb rubber must comply with the gradation requirements shown in the following table:

High Natural Crumb Rubber Gradation
Percentage passing

Sieve size	Gradation requirement	Operating range	Contract compliance
No. 10	100	100	100
No. 16	95-100	92-100	85-100
No. 30	35-85	25-95	20-98
No. 50	10-30	6-35	2-40
No. 100	0-4	0-7	0-10
No. 200	0-1	0-3	0-5

NOTE: Determine gradation under Laboratory Procedure LP-10.

The scrap tire crumb rubber and high natural crumb rubber gradations requirements do not apply to crumb rubber R18 modified binder.

Each seal coat binder ingredient must be sampled and tested for compliance with the specifications by the manufacturer.

37-2.02G(7) Warm Mix Asphalt Additive Technology

WMA additive technology must be on the Department-approved WMA technologies list. Approved WMA additive technologies are for Hot Mix Asphalt and you must choose WMA additive technology appropriate for use in seal coat binder.

Percent WMA additive by weight of seal coat binder must be as recommended by the manufacturer.

37-2.02G(8) Seal Coat

The independent testing laboratory must conduct testing using the proposed seal coat binders, including seal coat binders with and without WMA, and aggregate for compliance with the design requirements shown in the following table:

Quality characteristic	Test method	Requirement
Chip retention, %	Vialit test method for aggregate in chip seals, French chip (Modified) ^a	95

^a Cure the specimen, except cure at 100 degree F for the first 2 hours.

For the Vialit test, the seal coat binders must be placed within the proposed seal coat binder placement temperature range.

Replace section 37-2.02H(4) with:

37-2.02H(4) Seal Coat

Before precoating with asphalt binder and when tested under California Test 202, screenings for seal coat must have the gradation shown in the following table:

Seal Coat Screenings Gradation

Sieve sizes	Percentage passing		
	Coarse 1/2" max	Medium 1/2" max	Fine 3/8" max
3/4"	100	100	100
1/2"	75-90	85-90	95-100
3/8"	0-20	0-30	70-85
No. 4	0-2	0-5	0-15
No. 8	--	--	0-5
No. 200	0-1	0-1	0-1

Screenings must have the values for the quality characteristics shown in the following table:

Seal Coat Screenings

Quality Characteristic	Test method	Requirement
Los Angeles Rattler Loss, %, max	California Test 211	
Loss at 100 revolutions		10
Loss at 500 revolutions		40
Film stripping, %, max	California Test 302	25
Cleanness value, min	California Test 227	80
Durability, min	California Test 229	52

Screenings for seal coat must comply with the 3/8-inch grading.

Add to section 37-2.03A:

Remove pavement markers before applying seal coat.

Add to item 1 in the list in the 1st paragraph of section 37-2.03B(1):

- 1.5. Tarpaulins to cover precoated screenings when haul distance exceeds 30 minutes or ambient temperature is less than 65 degrees F.

Replace section 37-2.03B(2) with:

37-2.03B(2) Seal Coat Binder

37-2.03B(2)(a) General

Asphalt rubber binder (Type I) and (Type II) production plants must comply with the Materials Plant Quality Program (MPQP) starting July 1, 2013.

Crumb rubber R18 modified binder manufacturing facility for PG 76-22R must comply with the MPQP.

37-2.03B(2)(b) Asphalt Rubber Binder (Type I) and (Type II) without Warm Mix Asphalt Additive Technology

Equipment for asphalt rubber binder (Type I) and (Type II) without WMA additive technology must include and comply with the following:

1. Tank to heat and maintain the temperature of blended asphalt binder and asphalt modifier before adding crumb rubber modifier. The tank must have a thermostatic heat control device and a temperature reading device accurate to within 5 degrees F. The heat control device must be the recording type.
2. Mechanical mixer for complete, homogeneous blending of asphalt binder, asphalt modifier, and crumb rubber modifier. Asphalt binder and asphalt modifier must be introduced into the mixer through meters. The blending system must vary the rate of delivery for asphalt binder and asphalt modifier proportionate to crumb rubber modifier delivery. The mixer must not allow the temperature of asphalt binder and asphalt modifier to vary more than 25 degrees F. Each ingredient feed must be equipped with a rate-of-feed indicator for determining the amount delivered during production. The meters used to proportion each liquid ingredient must be equipped with rate-of-flow indicators with resettable totalizers so that the total amount can be determined. Feed liquid and dry ingredients directly into the mixer at a uniform and controlled rate. Reduce the quantity of ingredients in the mixer if dead areas occur. The reaction vessel must have a safe sampling device that delivers completed asphalt rubber binder in the quantity needed for testing.
3. Storage tank for asphalt rubber binder. The storage tank must have a heating system to maintain the temperature and an internal mixing device to prevent separation.
4. Under supports for scale bearing points for scale structures where the total load, the live load plus dead load is less than 17 tons. The under supports must be constructed as follows:
 - 4.1. Use 4 legs. Total load on any leg may not exceed 14.5 psi.
 - 4.2. Use structural grade steel with a minimum cross sectional dimension of 20 inches and a minimum thickness of 1.5 inches.
 - 4.3. Construct under supports in a way that they do not move or deflect during production operations.
 - 4.4. Install mechanical indicating elements level, plumb, and rigidly mounted on the under supports.
 - 4.5. Prevent saturation of the ground under the scale with adequate drainage and provide support of 14.5 psi at each support.
 - 4.6. Scale structure may be installed using concrete under supports and comply with Section 9.

37-2.03B(2)(c) Asphalt Rubber Binder (Type I) and (Type II) with Warm Mix Asphalt Additive Technology

Equipment for asphalt rubber binder (Type I) and (Type II) with WMA additive technology must be produced at a stand-alone plant unit.

Perform all asphalt rubber binder (Type I) and (Type II) proportioning at the asphalt rubber binder production site.

Asphalt rubber binder proportioning must either be accomplished by proportioning all ingredients simultaneously or must be proportioned using the 3-stage process as follows:

1. Stage 1 must proportion asphalt modifier with paving grade asphalt.
2. Stage 2 must proportion scrap tire crumb rubber and high natural rubber.
3. Stage 3 must proportion the preblended liquids, combine with the proportioned ground rubbers, and mix further for the specified time and temperatures.

When the asphalt and asphalt modifier are preblended, provide an asphalt heating tank equipped to maintain the blended ingredients at the necessary temperature before blending with the dry ingredients.

The method and equipment for combining the liquid and dry ingredients must be such that the Engineer can readily determine compliance with proportioning requirements for each material and the completed asphalt rubber binder. All required equipment must be authorized before use.

The plant process controller must assure that combined liquids and combined dry ingredients have been proportioned to within their own ratio limits before proportioning the final liquid and dry mixtures for asphalt rubber binder.

The plant process controller must assign a lot number to each volume of asphalt rubber binder moved from the initial mixing chamber to reaction storage. The product volume represented by each lot must be the amount set aside for the reaction period. Leftovers and portions of lots may be combined and assigned a new nonrepeating lot number. Reassigned lots must include all electronic data captured for the previous original lots used to generate the new lot.

Feed the liquid and dry ingredients directly into the mixer at a uniform rate. Asphalt rubber binder must be mechanically mixed to provide for the complete blending of liquid and dry ingredients in a controlled fashion.

Produce asphalt rubber binder by either a batch or continuous method. Regardless of production method, proportion all ingredients by weight. Proportion liquid ingredients with a meter that complies with Chapter 2, Section IC, "Liquid Ingredient Measurement," of the MPQP.

37-2.03B(2)(c)(I) Asphalt Rubber Binder (Type I) and (Type II) Additives

Asphalt rubber binder (Type I) and (Type II) additives include those used for anti-strip and warm mix properties and may be either in a liquid or dry state. Dry additive ingredients must be measured by weight. Liquid additives must be measured with a mass-flow meter. Additives must be added at least 30 minutes before end use to facilitate mixing.

The asphalt rubber binder (Type I) and (Type II) plant must have a sampling device in the feed line connecting the additive storage to the additive metering system. The additive sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(c)(I)(a) Batch Method Proportioning

Use a plant process controller complying with Chapter 2, Section IIF, "Batch Mixing HMA Plants," of the MPQP. The plant process controller must proportion all ingredients used in the production of the asphalt rubber binder (Type I) and (Type II).

The hopper scale system must include interlocks which prevent filling the hopper while drawing ingredients from the same hopper.

The zero tolerance for dry ingredient scales must be 0.5 percent of the total draft being weighed.

The indicated weight of material drawn from storage must not vary from the preselected target weight setting by more than 1.0 percent of the total draft target.

37-2.03B(2)(c)(i)(b) Continuous Method Proportioning

Proportion dry ingredients with a conveyor scale or a loss-weight meter. Continuous proportioning must be fully automatic. This automatic system must proportion total asphalt binder to total crumb rubber modifier to within 0.5 percent of the target rate.

37-2.03B(2)(c)(ii) Asphalt Rubber Binder (Type I) and (Type II) Transportation

During transportation between the asphalt rubber binder production location and the end-use facility or project site, the mixture must comply with all requirements for agitation, temperature control, and data log.

37-2.03B(2)(c)(iii) Asphalt Rubber Binder (Type I) and (Type II) Storage

During the proportioning and blending of the liquid ingredients, maintain the temperature of asphalt and the asphalt modifier to within 25 degrees F of the specified temperature. Asphalt rubber binder mixing and temperature control must be continuous from initial ingredient blending until the product end use.

When asphalt rubber binder is produced at a site remote from the end-use plant site, the receiving tank at the end-use site must comply with all agitation, heating, temperature, and data-reporting requirements.

Provide a safe sampling device capable of delivering a representative sample of the completed asphalt rubber binder. The device must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(c)(iv) Ingredient and Asphalt Rubber Binder (Type I) and (Type II) Temperatures

During production, use automatic and continuous temperature sensing and recording equipment to control and document asphalt rubber binder and liquid asphalt rubber binder ingredient temperatures accurately. Continuous recording occurs when production temperature data are collected electronically at intervals of 1 minute or less. Temperature-sensing devices must be accurate to within 5 degrees F.

Place temperature-sensing points at each liquid feed line where the blend is reacted and at each storage tank for completed asphalt rubber binder.

Install and maintain temperature indicators at the point where the asphalt rubber binder proportioning operation is controlled.

37-2.03B(2)(c)(v) Asphalt Rubber Binder (Type I) and (Type II) Production Data Log

Subsequent to the lot number designation, correlate all captured data to the lot number. The plant process controller used for asphalt rubber binder production must produce a log of production data consisting of a series of snapshots captured at a maximum of 1-minute intervals throughout the period of daily production. Each snapshot of production data must be a register of production activity at the time and not a summation of the data over the preceding interval to the previous snapshot. The amount of material represented by each snapshot is the amount produced during the 0.5-minute interval before and the 0.5-minute interval after the capture time.

Asphalt rubber binder (Type I) and (Type II) temperature need not be captured during periods where the product temperature is below 370 degrees F.

When asphalt rubber binder (Type I) and (Type II) proportioning is used, the following data must be captured:

1. Date of production.
2. Production location.
3. Time of day the data is captured.
4. Assigned, non-repeating lot number.
5. Certification of compliance numbers for dry and liquid ingredients currently used in the production process. Input liquid ingredients certificate numbers to the nearest 25-ton increment.
6. Viscosity test results including sampling time.
7. Asphalt rubber binder temperature at each required sensing point.
8. Ratio A—The high natural rubber to scrap tire crumb rubber ratio calculated from metered ingredient output.
9. Ratio B—The asphalt modifier to asphalt binder ratio calculated from metered ingredient output.
10. Ratio C—The total dry ingredient to total liquid ingredient ratio calculated from metered ingredient output.
11. Total reacting time and the reaction ending time.
12. Asphalt rubber binder additive type and asphalt rubber binder to additive target ratio.
13. Asphalt rubber binder to additive ratio calculated from individual metered output.

When a batch type proportioning system is used, record the batch weight for each :

1. Dry ingredient as determined by its scale system
2. Liquid ingredient as determined by its meter

When a continuous type proportioning system is used, capture the rate of flow for each dry and liquid ingredient determined by its metering system.

37-2.03B(2)(c)(vi) Asphalt Rubber Binder (Type I) and (Type II) Production Data Reports

Make as-collected raw data available to the Engineer during production.

Submit the production report generated from data collected at remote end-use sites to the Engineer within 7 days of production date. A remote end-use site is one at a distance greater than 5 miles from the asphalt rubber binder production location.

Submit the report generated from production data for non-remote production sites to the Engineer daily.

37-2.03B(2)(c)(vii) Electronic Media

Present the electronic media in a comma-separated values (CSV) format. Recorded data for the ingredients represented by production snapshots must have allowances for sufficient fields to satisfy the amount of data required and include data titles at least once per report. The Engineer must authorize report formats.

Collect and hold data for the duration of the contract. All collected data must be submitted as electronic media. No handwritten reports or data will be accepted.

37-2.03B(2)(d) Crumb Rubber R18 Modified Binder

When WMA additives are added to the crumb rubber R18 modified binder in the field the additives may be either in a liquid or dry state. Dry additive ingredients must be measured by weight. Liquid additives must be measured with a mass-flow meter. Additives must be added at least 30 minutes before end use to facilitate mixing or as recommended by the WMA additive manufacturer. If WMA additives are added at refinery, the proportioning must comply with the MPQP requirement.

The feed line connecting the WMA additive storage to the additive metering system must have a sampling device. The additive sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

Crumb rubber R18 modified binder must be mechanically mixed to provide for the complete blending of liquid or dry ingredients in a controlled fashion.

The tank used for mixing crumb rubber R18 modified binder and WMA additive must have a sampling device. The sampling equipment must meet the requirements of California Test 125 and section 92-1.01D(3).

37-2.03B(2)(e) Distributor Trucks for Placing Seal Coat Binder

Distributor truck for spreading seal coat binder must have the following features:

1. Be self-propelled
2. Heating unit
3. Internal mixing unit, except for crumb rubber R18 modified binder
4. Pumps that spray seal coat binder within 0.03 gal/sq yd of the specified rate
5. Fully circulating spray bar that applies seal coat binder uniformly
6. Tachometer
7. Pressure gages
8. Volume measuring devices
9. Thermometer
10. Observation platform on the rear of the truck for an observer on the platform to see the nozzles and unplug them if needed, except for crumb rubber R18 modified binder

Replace section 37-2.03E with:

37-2.03E Precoating Screenings

For seal coat, screenings must be preheated from 260 to 325 degrees F. Coat with any of the asphalt binders specified in the table titled "Performance Graded Asphalt Binder" in section 92. Coat at a central mixing plant. The asphalt binder must be from 0.5 to 1.0 percent by weight of dry screenings.

Plant must be authorized under the Department's MPQP.

Do not stockpile preheated or precoated screenings.

Do not recombine fine materials collected in dust control systems except cyclone collectors or knock-out boxes with any other aggregate utilized in the production of screenings.

Replace the heading of section 37-2.03F with:

37-2.03F Applying Seal Coat Binder

Replace the paragraphs of section 37-2.03F(1) with:

For areas not accessible to a truck's distributor bar, apply the seal coat binder with a squeegee, rake, or other authorized means.

Prevent spray on existing pavement not intended for seal coat or on previously applied seal coat. Use a material such as building paper and remove the material after use. At longitudinal joints, you may overlap the seal coat binder applications before application of screenings if the overlap is dispersed with squeegees or rakes.

Align longitudinal joints between seal coat applications with designated traffic lanes. Overlap longitudinal joints by not more than 4 inches. If the Engineer authorizes your request, the overlap may be up to 8 inches.

Do not apply the seal coat binder unless there are sufficient precoated screenings at the job site to cover the seal coat binder.

Discontinue the application of seal coat binder early enough to comply with lane closure specifications and darkness. Apply to 1 lane at a time and cover the lane entirely in t operation.

Replace section 37-2.03F(6) with:

37-2.03F(6) Seal Coat Binder

For asphalt rubber binder (Type II) without WMA additive technology, the temperature of asphalt rubber binder must be from 385 to 415 degrees F at the time of application. For asphalt rubber binder (Type I) without WMA additive technology, the temperature of asphalt rubber binder must be from 350 to 375 degrees F at the time of application. For asphalt rubber binder (Type I) and (Type II) with WMA additive technology, the temperature of asphalt rubber binder must be from 330 to 375 degrees F at the time of application.

For crumb rubber R18 modified binder with and without WMA additive technology, at the time of application, the temperature of crumb rubber R18 modified binder must be from 330 to 375 degrees F.

For asphalt rubber binder (Type I) and (Type II) determine the seal coat binder application rate from 0.55 to 0.65 gal/sq yd. For crumb rubber R18 modified binder, determine the seal coat binder application rate from 0.30 to 0.45 gal/sq yd.

Apply seal coat binder when the atmospheric temperature is from 60 to 105 degrees F and the pavement surface temperature is at least 55 degrees F.

Do not apply seal coat binder unless there are sufficient precoated screenings available to cover the seal coat binder within 2 minutes. Seal coat binder applied at intersections, turn lanes, gore points, and irregular areas must be covered with precoated screenings within 15 minutes.

Do not apply seal coat binder when weather or road conditions are unsuitable, including high wind or when the pavement is damp. In windy conditions you may adjust the distributor bar height and distribution speed, and use shielding equipment, if authorized.

Replace the 1st paragraph of section 37-2.03G(1) with:

Prevent vehicles from driving on seal coat binder before spreading precoated screenings.

Replace section 37-2.03G(4) with:

37-2.03G(4) Seal Coat

During transit, cover precoated screenings for seal coat with tarpaulins if the ambient air temperature is below 65 degrees F or the haul time exceeds 30 minutes.

At the time of application, precoated screenings for seal coat must be from 225 to 325 degrees F.

For seal coat using asphalt rubber binder (Type I) and (Type II), spread precoated screenings at a rate from 28 to 40 lb/sq yd. For seal coat using crumb rubber R18 modified binder, spread precoated screenings at a rate from 20 to 34 lb/sq yd. Spread to within 10 percent of the determined rate.

Replace section 37-2.03H(2) with:

37-2.03H(2) Seal Coat

Perform initial rolling within 90 seconds of spreading precoated screenings. Do not spread precoated screenings more than 200 feet ahead of the initial rolling.

For final rolling, you may request use of a steel-wheeled roller weighing from 8 to 10 tons, static mode only.

Perform a final sweeping before Contract acceptance. The final sweeping must not dislodge screenings.

Remove collected seal coat screenings from paved shoulders, drain inlets, other drainage areas, curbs, dikes and sidewalks. You may stockpile collected material at the jobsite. Remove and dispose of collected material.

Add to section 37-2.04:

Screenings for seal coat are measured by coated weight after they are preheated and precoated with asphalt binder.

Screenings for seal coat is paid for as screenings (hot-applied).

Seal coat binder is measured under the specifications for asphalts.

Deductions for crumb rubber gradations are taken based on:

1. Each gradation test for scrap tire crumb rubber represents 10,000 lbs or the amount used in that day's production, whichever is less.
2. Each gradation test for high natural crumb rubber represents 3,400 lbs or the amount used in that day's production, whichever is less.

For each gradation test, the following pay deductions will be taken for noncompliant material:

Gradation Test		
Material	Test result^a	Deduction
Scrap tire crumb rubber	Operating range < TR < Contract compliance	\$250
Scrap tire crumb rubber	TR > Contract compliance	\$1,100
High natural crumb rubber	Operating range < TR < Contract compliance	\$250
High natural crumb rubber	TR > Contract compliance	\$600

^a Test Result = TR

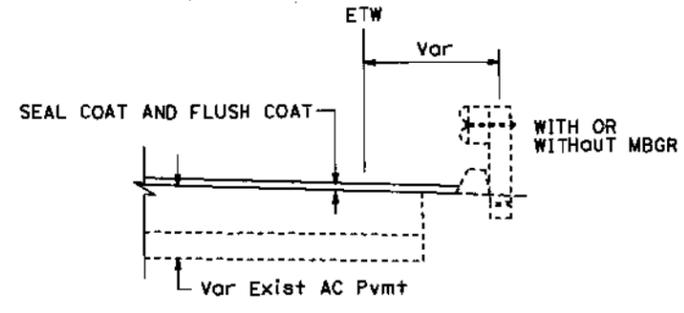
P:\proj\1\02\4E970\plans\contract\plans\addenda\3_03-20-13\24e970c001.dgn
 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans MAINTENANCE
 FUNCTIONAL SUPERVISOR DON ANDERSON
 CHECKED BY SCOTT GREGORY
 DESIGNED BY DENISE FUZERE
 REVISIONS BY DATE REVISIONS

NOTES:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.
2. SUPERELEVATIONS AS SHOWN OR AS DETERMINED BY THE ENGINEER.
3. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
4. EXISTING UTILITY FACILITIES HAVE NOT BEEN PLOTTED ON THESE PLANS.
5. DO NOT PLACE SEAL COAT ON BRIDGE DECKS.

ABBREVIATIONS:

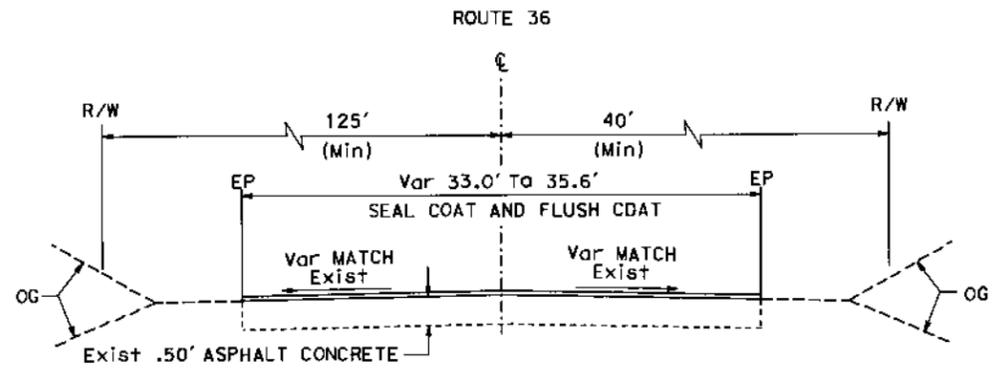
WMA WARM MIX ASPHALT



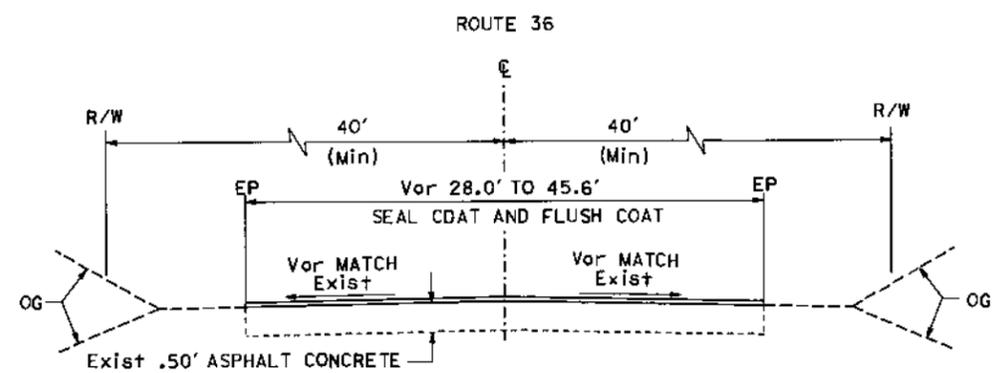
DIKE DETAILS
TYPICAL BOTH DIRECTIONS

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
02	Teh	36	55.2/67.5	2	6

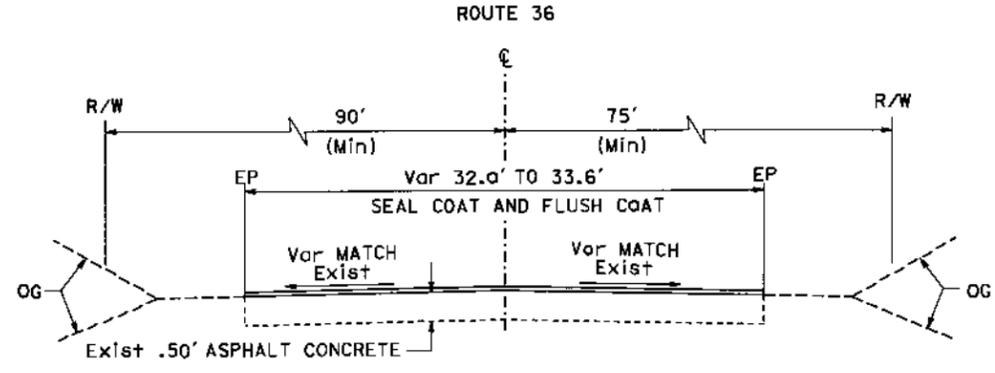
Denise Fuzere 10-10-12
 REGISTERED CIVIL ENGINEER DATE
 10-10-12
 PLANS APPROVAL DATE
 No. C69865
 Exp. 09-30-14
 CIVIL
 STATE OF CALIFORNIA



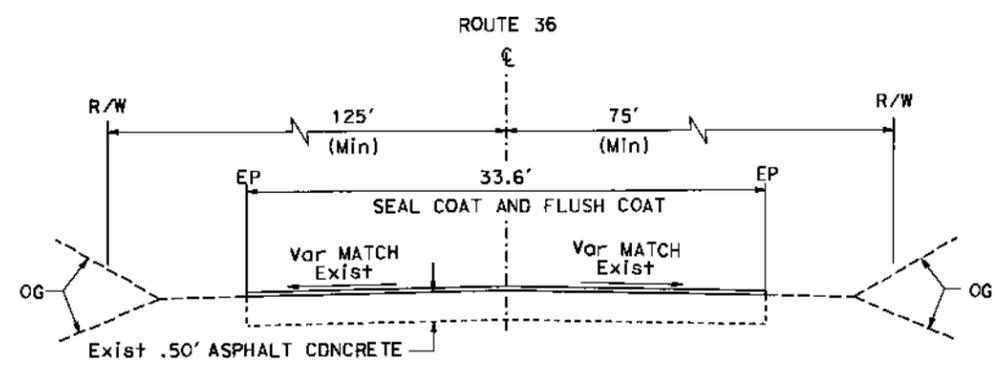
ASPHALT RUBBER SEAL COAT (TYPE II), WMA ADDITIVE
63.5/64.5



ASPHALT RUBBER SEAL COAT
55.2/63.5



CRUMB RUBBER R18 SEAL COAT, WMA ADDITIVE
66.0/67.5



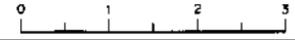
CRUMB RUBBER R18 SEAL COAT
64.5/66.0

3 REVISED PER ADDENDUM No. 3 DATED MARCH 21, 2013

TYPICAL CROSS SECTIONS

NO SCALE

X-1



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 STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Maintenance
 FUNCTIONAL SUPERVISOR: DON ANDERSON
 CALCULATED/DESIGNED BY: DENISE FUZERE
 CHECKED BY: SCOTT GREGORY
 REVISED BY: DENISE FUZERE
 DATE REVISED:

NOTES:

- (N) NOT A SEPARATE PAY ITEM, FOR INFORMATION ONLY.
- EXISTING UTILITY FACILITIES HAVE NOT BEEN PLOTTED ON THESE PLANS.

ABBREVIATIONS:
WMA WARM MIX ASPHALT

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
02	Teh	36	55.2/67.5	5	6

Denise Fuze' 10-10-12
 REGISTERED CIVIL ENGINEER DATE
 10-10-12
 PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

EXISTING LOOP DETECTORS (N)

IO No.	ELEMENT	LOCATION Co-Rte-PM	DESCRIPTION
2B6	CONTROL	Teh-36-PM 52.274	1.97 MILES WEST OF MANTON Rd (2 LOOPS)
P61	PROFILE	Teh-36-PM 55.196	339' WEST OF MANTON Rd (2 LOOPS)
134	PROFILE	Teh-36-PM R64.487	250' EAST OF LANES VALLEY Rd (2 LOOPS)

ROADWAY QUANTITIES SUMMARY

POSTMILE LIMITS	(N) LENGTH	(N) WIDTH	SEAL COAT				FLUSH COAT		
			ASPHALT-RUBBER BINDER	ASPHALT-RUBBER BINDER (TYPE II), WMA ADDITIVE	CRUMB RUBBER R18 MODIFIED BINDER	CRUMB RUBBER R18 MODIFIED BINDER WMA ADDITIVE	SCREENINGS (HOT-APPLIED)	ASPHALTIC EMULSION (FLUSH COAT)	SAND COVER (SEAL)
PM - PM	LF	LF	TON	TON	TON	TON	TON	TON	
55.20 TO 55.22	105.6	30.0-49.6							
55.22 TO 55.34	633.6	49.6							
55.34 TO 55.42	422.4	49.6-40.0							
55.42 TO 55.50	422.4	40.0							
55.50 TO 56.00	2640.0	40.0-32.1							
56.00 TO 57.00	5280.0	32.1-28.9							
57.00 TO 57.50	2640.0	28.9-28.1							
57.50 TO 58.00	2640.0	28.1-28.0							
58.00 TO 58.50	2640.0	28.0-28.2							
58.50 TO 59.00	2640.0	28.2-28.5							
59.00 TO 59.50	2640.0	28.5-28.3							
59.50 TO R59.61	580.8	28.3-28.4							
R59.61 TO R59.70	475.2	28.4-33.8							
R59.70 TO R59.80	528.0	33.8-32.7							
R59.80 TO R59.90	528.0	32.7-37.3							
R59.90 TO R60.00	528.0	37.3-37.1	405.8			2637.6	40.6	324.6	
R60.00 TO R60.10	528.0	37.1-37.0							
R60.10 TO R60.20	528.0	37.0-31.3							
R60.20 TO R60.30	528.0	31.3-32.2							
R60.30 TO R60.50	1056.0	32.2-33.0							
R60.50 TO R60.58	422.4	33.0-40.3							
R60.58 TO R60.78	1056.0	40.3-45.6							
R60.78 TO R61.10	1689.6	45.6-42.4							
R61.10 TO R61.15	264.0	42.4-37.1							
R61.15 TO R61.20	264.0	37.1-34.1							
R61.20 TO R61.30	528.0	34.1-39.6							
R61.30 TO R61.50	1056.0	39.6-42.2							
R61.50 TO R61.60	528.0	42.2-43.6							
R61.60 TO R62.00	2112.0	43.6-32.7							
R62.00 TO R62.24	1267.2	32.7							
62.27 TO 63.50	6494.4	32.7-35.7							
63.50 TO 64.00	2640.0	35.7-33.0		49.6		322.2	5.0	39.7	
64.00 TO 64.50	2640.0	33.0-33.6			49.3	414.0	7.4	59.1	
64.50 TO 66.00	7920.0	33.6				404.1	7.2	57.7	
66.00 TO 67.50	7920.0	33.6-32.0							
TOTAL			405.8	49.6	49.3	48.1	3777.9	60.2	481.1

REVISED PER ADDENDUM No. 3 DATED MARCH 21, 2013

SUMMARY OF QUANTITIES
Q-1

LAST REVISION DATE PLOTTED => 20-MAR-2013 10-10-12 TIME PLOTTED => 13:02