

CITY OF CAPITOLA

SPECIAL PROJECT SPECIFICATIONS

FOR CONSTRUCTION OF

BROMMER STREET COMPLETE STREET IMPROVEMENT PROJECT

**FOR USE IN CONJUNCTION WITH
STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION
STANDARD SPECIFICATIONS AND STANDARD PLANS
DATED 2018 WITH MOST RECENT REVISIONS**

**BIDS OPEN:
WEDNESDAY, APRIL 1, 2020 at 11:00 A.M.**

THIS IS A PREVAILING WAGE PROJECT

**DO NOT DETACH THE PROPOSAL FROM
THE SPECIAL PROJECT SPECIFICATIONS**



CITY OF CAPITOLA
420 Capitola Avenue
Capitola, CA 95010
(831) 475-7300 – Phone
(831) 479-8879 – Fax
www.cityofcapitola.org

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CITY OF CAPITOLA
SANTA CRUZ COUNTY, CALIFORNIA

NOTICE INVITING SEALED BIDS

Brommer Street Complete Street Improvement Project

NOTICE IS HEREBY GIVEN that sealed bids will be received by the Director of Public Works of the City of Capitola, California, on or before 1st April 2020 at the hour of 11:00 a.m. in his office at 420 Capitola Avenue, Capitola, California, 95010, for the following work and improvements in and for the City, at which time they will be publicly opened and read:

General Description:

Construct complete street improvements on Brommer Street in the City of Capitola to improve access for vehicles, bicycles, and pedestrians. Project improvements include pavement reconstruction, construction of sidewalk, curb and gutter, driveway approaches, and related items of work along the north side of the roadway; striping and pavement marking. Demolition of existing improvements, traffic control, and stormwater pollution prevention are included. Project site is on Brommer Street from the Capitola western city limit boundary to 41st Avenue.

The estimated cost of construction is \$605,700.

The plans, specifications and contract documents may be examined and copies secured from the Director of Public Works, City Hall, 420 Capitola Avenue, Capitola, California 95010 or accessible from the City's website at www.cityofcapitola.org

This project contains one (1) Add Alternative, all bids must include pricing for both the Base Bid and the Add Alternative. The City reserves the right to award a contract for the Base Bid only or the Base Bid plus Add Alternative 1 on the bid proposal page subject to the available funds at the time of the award.

No contractor or subcontractor shall be qualified to bid on, be listed in the bid proposal, or enter into any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. By submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the DIR in compliance with Labor Code Sections 1771.1 and 1725.5, and Contractor shall provide proof of registration to the City.

In accordance with California Labor Code Section 1771, all workers engaged in performance of the specified contract work shall be paid not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the project is to be performed, including for holiday and overtime work as determined by the Director of Industrial Relations. Prevailing rate of per diem wages are available online at:

<http://www.dir.ca.gov/dlsr/DPreWageDetermiantion.htm>

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

No sealed proposal or bid will be accepted from a contractor who has not been licensed in accordance with the provisions of Chapter 9, Division III of the Business and Professions Code, as amended. In

In addition, the project requires a valid California contractor's license for the following classification(s): California Class A and/or C-12 and/or C-8 license(s). Bidder must provide satisfactory evidence of such license at the time of bid.

Each sealed proposal or bid shall be accompanied by a cashier's check, certified check, or Bidder's Bond executed by a corporate surety authorized to engage in such business in the State of California, payable to the order of the City of Capitola, for an amount not less than 10 percent of the amount of the total bid (including Add Alternatives). The above-mentioned bid deposit shall be given as a guarantee that the bidder will enter into a contract, if awarded, and will be declared forfeited if the successful bidder refuses, or fails, to enter into said contract, and to furnish required bonds within the time specified after being notified to do so by the City.

All bid proposals for the above-mentioned work will be received by the Director of Public Works of the City of Capitola, County of Santa Cruz, State of California by **11:00 A.M. on Wednesday, April 1, 2020** at the City of Capitola, City Hall, 420 Capitola Avenue, Capitola, California. All bid proposals shall be submitted in a single sealed envelope plainly endorsed: **Brommer Street Complete Street Improvement Project**. Bid proposals will be opened publicly and read aloud on **Wednesday, April 1, 2020 at 11:00 A.M.** at the City of Capitola, City Hall, 420 Capitola Avenue, Capitola, CA 95010.

The successful bidder will be required to furnish a Labor and Material Bond in the amount equal to 100 percent of the contract price, and a Faithful Performance Bond in an amount equal to 100 percent of the contract price, and a Defective Materials and Workmanship Bond in an amount equal to 10 percent of the contract price, said bonds to be issued by a corporate surety company. The contractor will be allowed ten calendar days after he/she has received written notice that the contract has been awarded to him/her by the City Council within which to deliver the agreement with his/her signature affixed thereto, together with the completed aforementioned bonds and insurance certificates, to the Director of Public Works of the City of Capitola.

The City Council reserves the right to reject any and all bids and waive any irregularity or minor defects in any bid proposal; and its determination as to which bid is the lowest responsible bid and is for the best interest of the City shall be final. The City Council shall have 15 calendar days from and after the opening of the bids within which to make its determination.

The Contractor receiving the award of the contract shall begin work within 15 calendar days after receipt of the Notice to Proceed and shall diligently prosecute the same to completion within 45 working days.

The City of Capitola hereby notifies all bidders that it will affirmatively insure that in any agreement entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex or national origin, religion, age, or disability in consideration for an award.

Dated: 28 February 2020



Steven E. Jesberg
Public Works Director

Attest: Linda Fridy
City Clerk

CITY OF CAPITOLA
SANTA CRUZ COUNTY, CALIFORNIA

BID PROPOSAL

Brommer Street Complete Street Improvement Project

Enclosed is Bidder's proposal to furnish and deliver all materials and to do and perform all work in accordance with the plans and contract documents of the City of Capitola for:

Brommer Street Complete Street Improvement Project

Construct complete street improvements on Brommer Street in the City of Capitola to improve access for vehicles, bicycles, and pedestrians. Project improvements include pavement reconstruction, construction of sidewalk, curb and gutter, driveway approaches, and related items of work along the north side of the roadway; striping and pavement marking. Demolition of existing improvements, traffic control, and stormwater pollution prevention are included. Project site is on Brommer Street from the Capitola western city limit boundary to 41st Avenue and referred to the "Notice to Contractors/Notice Inviting Sealed Proposals of Bids" dated March 2, 2020, and to provide all necessary machinery, tools, apparatus, and other means of construction and do all work and furnish all materials required by said specifications, plans, and drawings in the manner prescribed therein.

The undersigned bidder understands that any quantities of work shown herein are approximate only and are subject to increase or decrease and offers to do the work whether the quantities are increased or decreased at the unit prices, if required, as stated in the following tabulation. The undersigned bidder agrees to take in full payment for the work, including all applicable State and local taxes, the amount shown on the bid sheet.

The undersigned also agrees as follows:

IT IS UNDERSTOOD THAT THIS BID IS BASED UPON COMPLETION OF THE WORK AS SPECIFIED IN THE SPECIAL PROVISIONS, WITHIN 45 WORKING DAYS.

To do any extra work, not covered by the schedule of price, which may be ordered by the City, and to accept as full compensation therefore such prices as may be agreed upon in writing by the City and the Contractor in accordance with the Standard Specifications.

If awarded the contract, the undersigned hereby agrees to execute said contract, with necessary bonds and insurance certificates, of which this Proposal and Notice Inviting Bids, Standard Specifications, Plans and any and all other Contract Documents shall be a part, within 20 calendar days after receipt of notice of the award of said contract, and to begin work within 10 working days after receiving Notice to Proceed with the contract.

THE UNDERSIGNED BIDDER HAS CAREFULLY EXAMINED THE FORM OF THIS CONTRACT, THE STANDARD SPECIFICATIONS, THE PLANS, THE DRAWINGS, THE NOTICE TO CONTRACTORS/NOTICE INVITING SEALED PROPOSALS OR BIDS, AND ALSO THE SITE OF THE WORK, AND WILL PROVIDE ALL NECESSARY MACHINERY, TOOLS, APPARATUS AND OTHER MEANS OF CONSTRUCTION AND DO ALL THE WORK AND FURNISH ALL MATERIALS REQUIRED THEREIN.

No bid will be considered for less than all items of this schedule and one contract will be awarded for the entire project.

The undersigned has carefully checked the bid prices, and all computations involved in the preparation of this bid and understands that the City of Capitola will not be responsible for any errors or omission on the part of the undersigned in making up this bid.

This proposal is made with a full knowledge of the kind, quantities and quality of the work and of the materials, equipment and plans required. This proposal is also made after a complete, careful and independent examination and investigation of the site of the work, local conditions affecting the same, and materials to be encountered.

The bidder furthermore agrees that in case of his/her default in executing said contract with necessary bonds and insurance certificates, the check or bond accompanying this Proposal and money payable shall become and remain the property of the City of Capitola.

Enclosed is bidder's bond, certified check or cashier's check no. _____ of the _____ Bank for \$_____ which is not less than 10 percent of the bid submitted by the undersigned, payable to the City of Capitola, California, and which is given as a guarantee that the undersigned will enter into the contract if awarded the work.

The City Council will award one contract to the lowest responsible bidder for any combination of bid schedules; however, it is understood and agreed that the City may reject any or all proposals or waive any informalities or minor defects in proposals received.

It is agreed that this bid may not be withdrawn over a period of 30 days from the opening thereof.

NOTE: Bidders must not add any conditions of qualifying statement to this bid as otherwise the bid may be declared irregular as being not responsive to the Advertisement for Bids.

Dated: _____

Firm Name: _____

Business Address: _____

Mailing Address: _____

Phone: _____

Email Address: _____

Signature of Bidder _____

By: _____

Title: _____

State Contractor's License No.: _____ Expiration Date: _____

CA State DIR Registration No.: _____

BASE BID – SCHEDULE A

Item	Description	Estimated Quantity	Unit	Unit Price	Total
1	Mobilization	1	LS		
2	Construction Area Signs	1	LS		
3	Traffic Control System	1	LS		
4	Survey and Construction Staking	1	LS		
5	Survey Monumentation and Preservation	1	LS		
6	Temporary Water Pollution Control and Erosion Control	1	LS		
7	Lead Compliance Plan	1	LS		
8	Clearing and Grubbing	1	LS		
9	Remove Thermoplastic Traffic Stripe	2,450	LF		
10	Remove Thermoplastic Pavement Marking	412	SQFT		
11	Reset Roadside Sign	1	EA		
12	Relocate Mailbox	2	EA		
13	Adjust Sewer Utility Manhole Cover to Grade	3	EA		
14	Adjust Water Utility Manhole Cover to Grade	4	EA		
15	Adjust Water Valve / Water Meter Box Cover to Grade	6	EA		
16	Remove Culvert	36	LF		
17	Cold Plan Asphalt Concrete Pavement	64	SY		
18	Roadway Excavation	58	CY		
19	Hot Mix Asphalt (Type A)	892	TON		
20	Aggregate Base (Class 2)	60	CY		
21	Cement (Full Depth Reclamation - Cement)	26	CY		
22	Full Depth Reclamation (FDR-C)	2,644	SY		
23	Stress Absorbing Membrane Interlayer (SAMI)	2,644	SY		
24	Minor Concrete (Curb and Gutter)	310	LF		
25	Minor Concrete (Curb Type D)	209	LF		
26	Minor Concrete (Driveway Conform)	545	SQFT		
27	Minor Concrete (Sidewalk)	695	SQFT		
28	Minor Concrete (Depressed Driveway)	740	SQFT		
29	Roadside Sign (One Post - Metal)	11	EA		
30	Thermoplastic Traffic Stripe	2,886	LF		
31	Thermoplastic Pavement Marking	408	SQFT		
32	Thermoplastic Pavement Marking (Green)	201	SQFT		
33	Object Marker (Type OM2-2H)	2	EA		
34	Inductive Loop Detector (Type A and Type D)	5	EA		
TOTAL BASE BID – SCHEDULE A					\$

ADD ALTERNATIVE 1 – SCHEDULE B

Item	Description	Estimated Quantity	Unit	Unit Price	Total
1	Mobilization	1	LS		
2	Construction Area Signs	1	LS		
3	Traffic Control System	1	LS		
4	Survey and Construction Staking	1	LS		
5	Survey Monumentation and Preservation	1	LS		
6	Temporary Water Pollution Control and Erosion Control	1	LS		
7	Lead Compliance Plan	1	LS		
8	Clearing and Grubbing	1	LS		
9	Remove Thermoplastic Traffic Stripe	958	LF		
10	Remove Thermoplastic Pavement Marking	61	SQFT		
11	Reset Roadside Sign	0	EA		
12	Relocate Mailbox	0	EA		
13	Adjust Sewer Utility Manhole Cover to Grade	1	EA		
14	Adjust Water Utility Manhole Cover to Grade	2	EA		
15	Adjust Water Valve / Water Meter Box Cover to Grade	0	EA		
16	Remove Culvert	0	LF		
17	Cold Plan Asphalt Concrete Pavement	40	SY		
18	Roadway Excavation	2	CY		
19	Hot Mix Asphalt (Type A)	303	TON		
20	Aggregate Base (Class 2)	9	CY		
21	Cement (Full Depth Reclamation - Cement)	9	CY		
22	Full Depth Reclamation (FDR-C)	896	SY		
23	Stress Absorbing Membrane Interlayer (SAMI)	896	SY		
24	Minor Concrete (Curb and Gutter)	0	LF		
25	Minor Concrete (Curb Type D)	0	LF		
26	Minor Concrete (Driveway Conform)	0	SQFT		
27	Minor Concrete (Sidewalk)	0	SQFT		
28	Minor Concrete (Depressed Driveway)	0	SQFT		
29	Roadside Sign (One Post - Metal)	0	EA		
30	Thermoplastic Traffic Stripe	1,201	LF		
31	Thermoplastic Pavement Marking	57	SQFT		
32	Thermoplastic Pavement Marking (Green)	0	SQFT		
33	Object Marker (Type OM2-2H)	0	EA		
34	Inductive Loop Detector (Type A and Type D)	0	EA		
TOTAL ADD ALTERNATIVE 1 – SCHEDULE B					\$

TOTAL BASE BID plus ADD ALTERNATIVE 1	\$
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The City will award the contract to the lowest responsible bidder complying with the instructions in the Notice Inviting Sealed Bids. The lowest bidder will be determined on the basis of either the total of the Base Bid (Schedule A) solely or the base Base Bid (Schedule A) plus Add Alternative 1 (Schedule B) items alone. In the event that the product of a unit price and an estimated quantity does not equal the extended amount quoted, the unit price shall govern and the corrected product of the unit price and the estimated quantity shall be deemed to be the amount bid. If the sum of two or more item totals in the bid schedule does not equal the total amount bid, the individual item totals shall govern and the corrected sum shall be deemed to be the amount bid.

The City reserves the right to award a contract for the Base Bid (Schedule A) only or the Base Bid (Schedule A) plus Add Alternative 1 (Schedule B) on the bid proposal page subject to the available funds at the time of the award.

The bidder agrees, if this bid proposal is accepted by the City Council and if a contract for the performance of the work is entered into by and between the City of Capitola and the bidder, to plan the work and prosecute it with such diligence that all of the work shall be completed within 45 working days after receipt of the Notice to Proceed.

The undersigned further agrees that if this bid proposal is accepted, to sign the agreement and to furnish the required bonds with satisfactory surety or sureties within 10 calendar days after the award of the contract and if the undersigned fails to contract as aforesaid, it shall be understood that the contract has been abandoned and therefore that this bid proposal and the bid guaranty shall be forfeited to and become the property of the City. Otherwise, the bid guaranty accompanying this bid shall be returned to the undersigned.

Dated this _____ day of _____, 20_____.

Signature of Bidder

Bidder's Address

Printed Name of Bidder

City, State, Zip Code

Email Address:

Telephone No.

REQUIRED CONTRACTOR INFORMATION

NOTICE: In the case of a corporation, give below the address of the principal office thereof and the names and addresses of the president, secretary, treasurer and manager:

Tax ID No. or Social Security No _____

Contractor's License No. _____ Classification(s) _____

Expiration date: _____

Classification of workers used on job:

Acknowledgement of Addendum(s): Receipt of the following addendum(s) issued during the time of bidding is acknowledged and the information contained therein has been considered in the preparation of this bid proposal.

Note: Failure to execute the following may be considered as an irregularity in the bid proposal.

Addendum No. (None ___), (1 ___), (2 ___), (3 ___), (4 ___), (5 ___)
Check appropriate space(s).

I certify under penalty of perjury that the representations made herein are true and correct to the best of my knowledge.

Signature of Bidder

Printed Name of Bidder

LIST OF PROPOSED SUBCONTRACTORS

List the name and address of each subcontractor who will perform work or labor or render service to the Contractor on the project in an amount in excess of one half of one percent (1/2%) of the total bid, or, if it exceeds \$10,000.00, whichever is greater, and the portion of the work to be done by each subcontractor.

Work to be Performed	License Number and type	% Of Total Contract	Subcontractor's Name Address & Telephone	Classification of Workers used on job
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Note: Attach additional sheets if required.

General Contractor shall perform a minimum of 30% of the contract work.

NONCOLLUSION DECLARATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. 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. All statements contained in the bid are true. 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, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____[date], at _____[city], _____[state].

Contractor/Bidder

JURAT CERTIFICATE

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of _____)

County of _____)

Subscribed and sworn to (or affirmed) before me on this _____ day of _____, by _____, proved to me on the basis of satisfactory evidence to be the persons who appeared before me.

(This area for official notary seal)

Signature _____

BIDDER’S BOND

KNOW ALL MEN BY THESE PRESENT:

THAT WE, _____

AS PRINCIPAL, AND _____

AS SURETY, are held and firmly bound unto the City of Capitola in the penal sum of 10 PERCENT OF THE TOTAL AMOUNT OF THE BID of the Principal above named, submitted by said Principal to the City of Capitola for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made to the City of Capitola to which said bid was submitted, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents. In no case shall the liability of the surety hereunder exceed the sum of \$ _____

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, WHEREAS, the Principal has submitted the above-mentioned bid to the City of Capitola, aforesaid, for certain construction specifically described as follows, for which bids are to be opened at:

Wednesday, April 1, 2020 at 11:00 a.m., Capitola City Hall, 420 Capitola Avenue, Capitola, CA 95010

For: **Brommer Street Complete Street Improvement Project**

Construct complete street improvements on Brommer Street in the City of Capitola to improve access for vehicles, bicycles, and pedestrians. Project improvements include pavement reconstruction, construction of sidewalk, curb and gutter, driveway approaches, and related items of work along the north side of the roadway; striping and pavement marking. Demolition of existing improvements, traffic control, and stormwater pollution prevention are included. Project site is on Brommer Street from the Capitola western city limit boundary to 41st Avenue.

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

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this _____ day of _____, 2020.

_____(Seal)_____ (Seal)

_____(Seal)_____ (Seal)

Principal

Surety

Address _____ Address _____

Note: Signatures of those executing for the surety must be properly acknowledged.

CITY OF CAPITOLA
SANTA CRUZ COUNTY, CALIFORNIA

AGREEMENT

Brommer Street Complete Street Improvement Project

THIS AGREEMENT, made this _____ day of _____, 2020, by and between the City of Capitola, a Municipal Corporation, in Santa Cruz County, California, hereinafter called the City, and _____ hereinafter called the Contractor.

WITNESSETH:

WHEREAS, the City has caused to be prepared in accordance with law, specifications, plans and other contract documents, for the work herein described and shown and has approved and adopted these contract documents, specifications and plans and has caused to be published in the manner and for the time required by law, a Notice Inviting Sealed Bids for doing the work in accordance with the terms of this contract, and

WHEREAS, the Contractor in response to said notice has submitted to the City a sealed bid proposal accompanied by a bid guaranty in an amount not less than 10 percent of the amount bid for the construction of all of the proposed work in accordance with the terms of this contract, and

WHEREAS, the City, in the manner prescribed by law, has publicly opened, examined and canvassed the bids submitted and as a result has determined and declared the Contractor to be the lowest responsible bidder and has duly awarded to the Contractor a contract for all of the work and for the sum or sums named in the bid and in this agreement.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

ARTICLE I. WORK TO BE DONE:

That the Contractor shall provide all necessary labor, machinery, tools, apparatus and other means of construction; shall furnish all materials, superintendence and overhead expenses of whatever nature necessary to construct all of the improvements for the City of Capitola in conformity with the specifications and plans and other contract documents and according to such instructions as may be given by the City of Capitola Director of Public Works or its authorized agent.

ARTICLE II. CONTRACT PRICES:

Except as provided in Section IV B of the Specifications ("Changes and Extra Work"), the City shall pay the Contractor according to the unit prices stated in the bid submitted by the Contractor or the total amount of the contract, whichever is less, which shall include all applicable taxes, for complete performance of the work.

The Contractor hereby agrees to accept such payment as full compensation for all materials and appliances necessary to complete the work; for all loss or damage arising from the work or from action of the elements, or from any unforeseen obstruction or difficulties which may be encountered in the prosecution of the work; incurred in and in consequence of the suspension or discontinuance of the work; as hereby specified; for all liability and other insurance; for all fees or royalties or other expenses on

account of any patent or patents; for all overhead and other expenses incident to the work and expected profits; and for well and faithfully performing and completing the work within thirty (30) calendar days from the date of the Notice to Proceed; all according to the contract plans and specifications, the details and instructions, and the requirements of the City Council.

ARTICLE III. PARTS OF THE CONTRACT:

That the complete contract document consists of the following:

- | | |
|----------------------------------|----------------------------|
| 1. Notice Inviting Sealed Bids | 2. Hold Harmless Clause |
| 3. Bid Proposal | 4. Performance Bond |
| 5. Non-collusion Affidavit | 6. Labor and Material Bond |
| 7. Bidder's Bond or Bid Guaranty | 8. Specifications |
| 9. Agreement | 10. Insurance Certificates |

In case of any conflict between this Agreement and any other part of the contract, this Agreement shall be binding.

IN WITNESS WHEREOF, the City has caused its corporate name to be hereunto subscribed and its corporate seal to be hereunto affixed by its City Manager and its City Clerk thereunto duly authorized and the Contractor has executed these presents the day and year herein above written.

This Agreement shall be effective at such time as each party is in possession of a copy (i.e. either an original or facsimile) executed by the other party.

SO AGREED,

CITY OF CAPITOLA
A Municipal Corporation

CONTRACTOR:

License No. _____

Tax ID or SSN _____

By: _____

By: _____

Benjamin Goldstein
City Manager

Title: _____

Date: _____

Date: _____

Awarded by the City Council on

By signing above on behalf of the corporation, the individual so signing warrants that he/she has authority to sign this agreement on behalf of the corporation and legally bind the company to all of the obligations contained therein.

ATTEST:

Linda Fridy
City Clerk

HOLD HARMLESS CLAUSE

WHEREAS, _____, (Contractor), has been awarded a contract with the City of Capitola to perform certain work described as follows:

Construct complete street improvements on Brommer Street from City of Capitola western city limits to 41st Avenue to improve access for vehicles, bicycles, and pedestrians. The project scope includes repaving the Brommer Street roadway and constructing a sidewalk on the northside.

Contractor hereby agrees to indemnify, defend and hold harmless the City, its officers, agents and employees from any and all demands, claims or liabilities of any nature caused by or arising out of Contractor's negligent acts, errors, or omissions, or willful misconduct, or conduct for which the law imposes strict liability on Contractor in the performance or nonperformance of this agreement.

Dated _____, 20____.

Contractor

By _____

Title _____

Address _____

Telephone _____

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That _____(Contractor)

of _____
(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation/Partnership/Individual)

_____ (Surety)

of _____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto CITY OF CAPITOLA, 420 Capitola Avenue, Capitola, CA 95010, hereinafter called OWNER, in the penal sum of _____ DOLLARS (\$_____) (100% of contract amount), in lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20____, a copy of which is hereto attached and made part hereof for the construction of:

Brommer Street Complete Street Improvement Project

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county (or city) in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

PROVIDED, FURTHER, that the said surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder of the specifications accompanying the same shall in any ways affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in four (4) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20_____.

ATTEST:

Principal/Secretary

Principal (type)

By: _____

Address: _____

Telephone No. _____

SEAL:

Witness as to Principal

Surety (type)

By: _____

Address: _____

Telephone No. _____

ATTEST:

Surety/Secretary

Attorney-in-fact (type)

By: _____

Address: _____

Telephone No. _____

SEAL:

Witness as to Surety

By: _____

Address: _____

Telephone No. _____

NOTE: Date of Bond must not be prior to date of Contract.
If Contractor is Partnership, all partners should execute bond.

IMPORTANT: Surety companies executing bonds must be admitted sureties in possession of a valid current certification to that effect issued by the Commissioner of Insurance. (See Insurance Code Section 706.5.)

BOND FOR SECURITY OF LABOR AND MATERIALS

WHEREAS, The City Council of the City of Capitola, State of California, and _____
_____ (hereinafter designated as "principal") have entered into an agreement whereby
principal agrees to install and complete certain designated public improvements, which said agreement,
dated _____, 20____, and identified as BROMMER STREET COMPLETE STREET IMPROVEMENT
PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, under the terms of said agreement, principal is required before entering upon the
performance of the work, to file a good and sufficient payment bond with the City of Capitola, 420 Capitola
Avenue, Capitola, CA 95010, to secure the claims to which reference is made in Title 15 (commencing
with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California.

Now, therefore, said principal and the undersigned as corporate surety, are held firmly bound unto the
City of Capitola and all contractors, subcontractors, laborers, material men and other persons employed
in the performance of the aforesaid agreement and referred to in the aforesaid Code of Civil Procedure
in the sum of _____

_____ dollars (\$ _____), for materials furnished or labor
thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such
work or labor, that said surety will pay the same in an amount not exceeding the amount herein above
set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof,
costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county (or
city) in successfully enforcing such obligation, to be awarded and fixed by the court, and to be taxed as
costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall insure to the benefit of any and all
persons, companies and corporations entitled to file claims under Title 15 (commencing with Section
3082) of Part 4 of Division 3 of the Civil Code, so as to give a right of action to them or their assigns in
any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void,
otherwise it shall be and remain in full force and effect.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the
terms of said agreement or the specifications accompanying the same shall in any manner affect its
obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or
addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above
named, on _____, 20_____.

IN WITNESS WHEREOF, this instrument is executed in four (4) counter-parts, each one of which shall be deemed an original, this _____ day of _____, 20_____.

ATTEST:

Principal/Secretary

Principal (type)

By: _____

Address: _____

Telephone No. _____

SEAL:

Witness as to Principal

Surety (type)

By: _____

Address: _____

Telephone No. _____

ATTEST:

Surety/Secretary

Attorney-in-fact (type)

By: _____

Address: _____

Telephone No. _____

SEAL:

Witness as to Surety

By: _____

Address: _____

Telephone No. _____

NOTE: Date of Bond must not be prior to date of Contract.
If Contractor is Partnership, all partners should execute bond.

IMPORTANT: Surety companies executing bonds must be admitted sureties in possession of a valid current certification to that effect issued by the Commissioner of Insurance. (See Insurance Code Section 706.5.)

**ESCROW AGREEMENT TO SUBSTITUTE SECURITIES FOR WITHHOLD MONEYS IN
PUBLIC CONTRACTS (OPTIONAL)**

THIS AGREEMENT, made this _____ day of _____, 20____, by and between the City of Capitola, hereafter called "City", and

hereafter called "Contractor", having its main office at

WHEREAS, Contractor has been awarded a contract by City for

and has executed a contract dated _____, 20____ with City under which contract the Contractor is obligated to construct the above project and for which City shall pay Contractor certain progress payments from which moneys will be withheld as retention to insure performance of the contract by Contractor; and

WHEREAS, Contractor elects to substitute, at Contractor's expense, certain securities as eligible under Section 16430 of the Government Code or bank or savings and loan certificates of deposit equivalent to the amount withheld from progress payments.

NOW, THEREFORE, the parties agree as follows:

1. City shall hold in escrow the sum of _____ Dollars for the account of Contractor as represented by securities identified below:

(Cash Rec. No. _____ dated _____)

2. Contractor shall be the beneficial owner of any securities held by City substituted for moneys withheld and Contractor shall receive any interest thereon.

3. City will not pay out or release any escrow funds or securities except as provided in this agreement.

4. In the event Contractor or Contractor's agents fail to perform each and every obligation of its contract with City in the manner and within the time set forth in the contract for the project, the entire amount of escrow funds or securities held in escrow shall become the property of City upon certification from the Director of Public Works that Contractor has failed to perform its contract with City and Contractor has been given thirty (30) days written notice of its default under the contract. The escrow funds and securities which become the property of City shall be used and retained by City for the purpose set forth in the contract regarding withholding and retention of funds from progress payments, and such provisions are incorporated herein as if fully set forth.

5. Upon satisfaction in full and the time expiration set forth in the contract regarding withholding and retention of funds from progress payments, the amount held in escrow or securities held by City for the benefit of Contractor shall be released to Contractor by City upon certification of the Director of Public Works that Contractor has fully performed all obligations under the contract with City.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed as of the day and year first above written.

CITY OF CAPITOLA:

By _____

CONTRACTOR:

By _____

Title _____

Address _____

Telephone _____

APPROVED AS TO FORM:

City Attorney

SPECIAL PROVISIONS

The following special provisions shall add to or modify the General Provisions of the State of California, Department of Transportation, Standard Specifications, dated October 2018 as amended.

SECTION I. DEFINITIONS AND TERMS

Whenever the following terms or pronouns in place of them are used in these specifications or in any documents or instruments where these specifications govern, the intent and meaning shall be interpreted as follows:

- A. **ADDENDUM**. Written or graphic instrument issued prior to the opening of bid proposals which interprets, corrects, or changes the bidding or contract documents. The term "addendum" shall include bulletins and all other types of written notices issued to potential bidders prior to opening bid proposals.
- B. **CITY**. The City of Capitola, located in Santa Cruz County, California; also sometimes referred to as the "City."
- C. **ENGINEER OR CITY ENGINEER**. The City Engineer of the City of Capitola or the Director of Public Works, acting either directly or through properly authorized agents.
- D. **BIDDER**. Any individual, firm, or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- E. **CONTRACTOR**. The person or persons, co-partnership, or corporation who have entered into a contract with the City for performance of work covered by this contract, and its authorized agents or legal representatives.
- F. **INSPECTOR**. Shall mean the technical inspector or inspectors duly authorized or appointed by the Engineer.
- G. **PLANS**. The word "plans" shall denote drawings. The word "drawings" shall denote plans. Plans and/or drawings are a part of the specifications.
- H. **SPECIFICATIONS**. The directions, provisions and requirements contained herein and supplemented by such special provisions as may be necessary, pertaining to the method and manner of performing the work, or to the quantities and qualities of materials to be furnished under the contract.
- I. **PROPOSAL FORM**. The approved form on which the City Engineer requires formal bids to be prepared and submitted for the work.
- J. **BID PROPOSAL**. The offer of the bidder for the work when made out and submitted on the prescribed proposal form, properly signed and guaranteed.
- K. **CONTRACT, AGREEMENT, OR CONTRACT DOCUMENTS**. The written agreement covering the performance of the work and the furnishing of labor, materials, tools, and equipment in the construction of the work. The contract shall include the notice to contractors, proposal, plans, specifications, special provisions, and contract bonds; also any and all supplemental agreements amending or extending the work contemplated and which may be required to complete the work in

a substantial and acceptable manner. Supplemental agreements are written agreements covering alterations, amendments, or extensions to the contract and include contract change orders.

- L. WORK. All the work specified in the special provisions, proposal and contract.
- M. INSTALL. Where the word install is used, it shall also mean that the Contractor shall provide all of the materials necessary to install the item as shown on the plans or in these specifications, unless stated otherwise.
- N. CONSTRUCT. Where the word construct is used, it shall also mean that the Contractor shall provide all of the materials necessary to construct the item as shown on the plans or in these specifications, unless stated otherwise.
- O. PLACE. Where the word place is used, it shall also mean to provide all of the materials for the complete installation of the item denoted.
- P. ADVERTISEMENT. The published Notice Inviting Sealed Bids for the construction of the project.
- Q. STANDARD SPECIFICATIONS. The State of California, Department of Transportation, Standard Specifications, dated October 2018 as amended, also referred to as the State Specifications.
- R. STANDARD PLANS. The State of California, Department of Transportation, Standard Plans, dated October 2018 as amended, also referred to as the State Standard Plans.
- S. STATE. The State of California, including the Department of Transportation (Caltrans), California Highway Patrol, or any other State of California agency whose action or oversight is related to the work.

SECTION II. BID REQUIREMENTS AND CONDITIONS

The bidder's attention is directed to the provisions of Section 2 of the State Specifications for the requirements and conditions which must be observed in the preparation of the bid proposal forms and the submission of the bid and these special provisions.

- A. **CONTENTS OF BID PROPOSAL FORMS.** Prospective bidders will be furnished with forms which will state the location and description of the contemplated work to be performed, for which a bid is asked.
- B. **EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS AND SITE OF WORK.** The bidder shall examine carefully the site of the work contemplated and the plans, specifications and proposal and contract forms thereof. It will be assumed that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character and quality of work to be performed and as to the materials to be furnished, as to the requirements of these specifications, the special provisions and the contract.

For convenience in designation on the plans or in the specifications, certain materials or articles to be incorporated in the work may be designated under a trade name or the name of a manufacturer and the manufacturer's catalog information. The request for substitution of a similar or equivalent material or article shall not be made before the submission of a bid proposal and/or award of the contract. Attention is directed to the provisions under "Submittals," of Section VI elsewhere in the special provisions.

If any person contemplating submitting a bid proposal for proposed contract is in doubt as to the true meaning of or finds discrepancies in or omissions from any part of the plans, specifications, or other contract documents, the person may submit to the City a written request for an interpretation or correction thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation or correction of the contract documents will be made only by addendum duly issued and a copy of such addendum will be delivered to each person receiving a copy of the contract documents. No person is authorized to make any oral interpretation or correction of any provision in the contract documents to any bidder, and no bidder shall rely on any such oral interpretation or correction.

- C. **BID PROPOSAL FORMS. All bids shall be made upon the blank forms provided herein, which shall be void if detached from these specifications.** All items shall be properly filled out. Numbers shall be stated in figures. The signatures of all persons signing shall be in long hand. If the bid is submitted by an individual, the individual's name and post office address must be shown. If submitted by a firm or partnership, the name and post office address of each member of the firm or partnership must be shown. If submitted by a corporation, the bid proposal shall show the name of the State under the laws of which the corporation was chartered and the names, titles and business addresses of the president, secretary, treasurer and manager.
- D. **REJECTION OF BIDS CONTAINING ALTERATIONS, ERASURES OR IRREGULARITIES.** Bids may be rejected if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind.
- E. **BID GUARANTEE.** All bids shall be presented under sealed cover and shall be accompanied by a cashier's check, certified check or Bidder's Bond made payable to the City of Capitola, for an amount equal to at least TEN PERCENT (10%) of the amount of said bid.

- F. WITHDRAWAL OF BIDS. Any bid may be withdrawn by the bidder prior to but not after the time fixed for the opening of bids, provided that a request in writing for the withdrawal of such bid, executed by the bidder or bidder's duly authorized representative, is filed with the Director of Public Works of the City of Capitola. The withdrawal of a bid shall not prejudice the right of a bidder to file a new bid.

- G. DISQUALIFICATIONS OF BIDDERS. More than one bid from an individual, a firm or partnership, a corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any bidder is interested in more than one bid for the work contemplated will cause the rejection of all bids in which said bidder is interested.

- H. COMPETENCY OF BIDDERS. With each and every bid and forming a part thereof, the City Council will require the bidder to furnish a statement of bidder's financial responsibility, technical ability, and experience.

SECTION III. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3 of the State Specifications for the requirements and conditions concerning award and execution of contract and these special provisions.

- A. **AWARD OF CONTRACT OR REJECTION OF BIDS.** All bids shall be subject to the approval of the City Council, which reserves unto itself the right to accept or reject any or all bids and waive any irregularities or informalities of bids as it may deem for the best interest of the City, and whose determination as to whose bid is the lowest responsible bid shall be final and conclusive. The award, if made, will be made within fifteen (15) calendar days after the opening of the bids. City shall not be bound until the contract has been fully executed.

- B. **RETURN OF BID GUARANTEES.** Within thirty (30) calendar days after the award of the contract, the City will return the bid guarantees accompanying the bids, which are not being considered in making the award. All other bid guarantees will be held until the contract has been finally executed, after which they will be returned to the respective bidders whose bids they accompany.

- C. **CONTRACT BONDS.** The successful bidder simultaneously with the execution of the agreement will be required to furnish, on forms provided herein:
 - 1. **PERFORMANCE BOND** in the amount equal to one hundred percent (100%) of the contract price, and must be by a corporate surety authorized to engage in such business in California, payable to the City of Capitola.

 - 2. **LABOR AND MATERIAL BOND** in an amount equal to one hundred percent (100%) of the contract price, and must be by a corporate surety authorized to engage in such business in California, payable to the City of Capitola.

 - 3. **DEFECTIVE MATERIALS AND WORKMANSHIP BOND** in an amount equal to ten (10%) of the contract price, and must be by a corporate surety authorized to engage in such business in California, payable to the City of Capitola and valid for a one (1) year period commencing on the date of contract completion.

This bond shall be provided to the City prior to release of the ten (10%) project retention.

- D. **EXECUTION OF CONTRACT.** The contract shall be signed by the successful bidder and returned, together with the contract bonds and insurance certificates, within ten (10) calendar days after the award of the contract. If bidder fails to do so, the City Council without further proceedings may declare the bid guarantee forfeited.

- E. **PENALTY FOR FAILURE TO SIGN CONTRACT.** A successful bidder who fails, neglects or refuses to sign the contract and file acceptable bonds as required, within the time specified, shall have the bid guarantee forfeited to the City as liquidated damages.

- F. **SUBSTITUTION OF SECURITIES FOR WITHHELD AMOUNTS.** For any moneys earned by the Contractor and withheld by the City to ensure the performance of the contract, the Contractor may, at Contractor's request and expense, substitute securities equivalent to the amount withheld in the form and manner and subject to the conditions provided in Chapter 13 (commencing with Section 4590), Division 5, Title 1 of the Government Code of the State of California. This substitution shall be effected prior to submittal of Contractor's first progress billing to the City for work under this contract.

- G. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES. Attention is directed to the provisions of Section 8-1.03, "Beginning of Work," Section 8-1.06, "Time of Completion," and Section 8-1.07, "Liquidated Damages," of the State Specifications and these special provisions.

The counting of calendar days shall commence upon on upon the date stated in the "Notice to Proceed." The Contractor shall begin work within fifteen (15) calendar days after receiving the Notice to Proceed and shall diligently prosecute the same to completion before the expiration of 45 working days from the date of the Notice to Proceed.

The Contractor shall pay to the City of Capitola the sum of \$800.00 (Eight Hundred Dollars and Zero Cents) per day for each and every calendar day delay in finishing the work in excess of the number of calendar days prescribed herein.

SECTION IV. SCOPE OF WORK

- A. **WORK TO BE DONE.** The work to be done on this project consists, in general, of the following:

Construct complete street improvements on Brommer Street from City of Capitola western City limits to 41st Avenue to improve access for vehicles, bicycles, and pedestrians. The project scope includes pavement reconstruction Brommer Street, constructing curb, gutter, and sidewalk with driveways on the northside, and installing striping and pavement markings

Base Bid (Schedule A) includes the items above for the construction improvements on Brommer Street between 38th Avenue and 41st Avenue.

Add Alternative (Schedule B) includes the items above for the construction improvements on Brommer Street between City of Capitola western City limits and 38th Avenue.

- B. **CHANGES AND EXTRA WORK.** Changes and extra work, if found necessary, shall be done in accordance with the provisions of Section 4-1.05, "Changes and Extra Work," of the Standard Specifications and these special provisions.

The City may require changes in, additions to or deductions from, the work to be performed or the materials to be furnished under this Contract pursuant to the provisions of the Contract Documents.

No change to the work shall be made, extra work performed, or deduction from the work made unless in pursuance of a written change order from the City, signed by the Director of Public Works or its authorized representative, stating that the change, addition, deletion, or any combination thereof is authorized. Written field orders may be issued to the contractor pending the issuance of a formal change order. No claim for additional payment shall be considered unless so ordered.

Adjustments to the contract amount by reason of a duly authorized change order shall be determined on the basis of one of the following methods, at the option of the Director of Public Works:

1. On the basis of an acceptable lump sum proposal from the Contractor in response to a quotation request.
2. On the basis of unit prices specified in the Contractor's proposal.
3. On the basis of actual necessary cost plus fifteen (15) percent to cover superintendence, general expense and profit, hereinafter referred to as "Force Account Work."

Force Account Work, if ordered, shall be adjusted and certified daily on record sheets acceptable to the Director of Public Works and signed by both he and the Contractor. Such daily report sheets shall thereafter be considered as the true record of Force Account Work done. Computation of actual costs shall include wages paid for workers and any employer payment made to, or on behalf of, workers for health, welfare, pension, vacation plans or similar purposes. Equipment costs shall be on the basis of generally accepted rental schedules for the locality. Material costs shall be supported by supplier's invoices.

When a lump sum proposal for extra work is requested from the Contractor, such quotation request shall be furnished by the Contractor, and a quotation for the work involved delivered to the Director of Public Works within five (5) calendar days. If the Director of Public Works finds said proposal

unacceptable, he may then proceed with such extra work by Force Account or such other means as are available under the provisions of the contract.

- C. INTERPRETATION OF SPECIFICATIONS AND DRAWINGS. The specifications and the contract drawings are intended to be explanatory of each other. Any work indicated in the contract drawings and not in the specifications, or vice versa, is to be executed as if indicated in both. Should it appear that the work to be done, or any of the matters relative thereto, are not sufficiently detailed or explained in these contract documents, including the contract drawings, the Contractor shall apply to the Engineer for such further explanations as may be necessary, and shall conform thereto as part of this contract, so far as may be consistent with the terms of this contract. In the event of any doubt or question arising respecting the true meaning of the specifications, reference shall be made to the City and its decision thereon shall be final.
- D. FIGURED DIMENSIONS. All work shown on the contract drawings, the dimensions of which are not figured, shall be accurately followed to the scale to which the drawings are made, but figured dimensions where given are in all cases to be followed, though they may differ from scaled measurements. Large scale and full size drawings shall be followed in preference to small scale drawings.
- E. ERRORS OR DISCREPANCIES. If the Contractor, in the course of the work, discovers any discrepancies between the drawings and the conditions of the ground, or any errors or omissions in the drawings or in the layout given by stakes, points or instructions, it shall be Contractor's duty to inform the Engineer immediately in writing and the Engineer shall promptly verify the same. Any work done after such discovery until authorized will be done at the Contractor's risk.
- F. DRAWINGS TO BE FURNISHED BY CONTRACTOR. The bidder's attention is directed to the provisions in Section 5-1.23, "Submittals" of the State Specifications for the requirements concerning submittals. As soon as practicable and proper after the execution of this contract, the Contractor shall supply such working drawings or devices to be furnished hereunder as are called for herein or as are required by the Engineer, to make clear the details of construction and of devices and to demonstrate fully that all materials and equipment comply with the intent and provisions of this contract. Unless otherwise herein specified, such drawings shall be submitted to the Engineer for this approval upon Engineer's request. Should any drawings furnished by the Contractor not be approved by the Engineer, the Contractor shall make the revisions required and again submit them to the Engineer for approval. After due approval by the Engineer, these drawings shall become a part of this contract and the work shall be done in conformity therewith. No such work shall begin or devices purchased until the drawings covering it or they have been approved. The approval of the drawings shall not relieve the Contractor of responsibility or waive or modify any of the provisions or requirements of this contract.
- G. ADDITIONAL DRAWINGS BY CITY. The drawings made a part of this contract at the time of its execution are intended to be fairly specific and to indicate the detail of the scope of the work. In addition to these drawings, however, the Engineer shall furnish such additional drawings from time to time during the progress of the work as are necessary to make clear or to define in greater detail the intent of the specifications and contract drawings, and the Contractor shall make the work conform to all such drawings.
- H. CLEANING UP. The Contractor shall not allow the site of the work to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction period in conformance with Section 5-1.31, "Job Site Appearance," of the Standard

Specifications and these special provisions. The Engineer shall have the right to determine what is or is not waste material or rubbish and the place and manner of disposal.

On or before the completion of the work the Contractor shall, without charge therefore, tear down and remove all temporary structures built by Contractor, and shall remove rubbish of all kinds from any of the grounds which Contractor has occupied and leave them in a condition acceptable to the Engineer.

Full compensation for conforming to the provisions of “Cleaning Up,” of this article shall be considered as included in the various contract items, and no additional allowance will be made therefore.

- I. SALVAGE FOR THE CITY. None

SECTION V. CONTROL OF WORK

The bidder's attention is directed to the provisions in Section 5 of the State Specifications for the requirements and conditions concerning Control of Work and these special provisions.

A. **AUTHORITY OF THE ENGINEER.** The Engineer shall decide any and all questions which may arise as to the quality and acceptability of the work performed, as to the quality and acceptability of materials furnished, and as to the manner of performance and the rate of progress of the work, and shall decide all questions which may arise as to the interpretation of the Plans and Specifications, and all questions as to the acceptable fulfillment of the contract on the part of the Contractor, and as to compensation. The Engineer's decisions shall be final; the Engineer shall have authority to enforce and make effective such decisions and orders as the Contractor fails to carry out promptly.

B. **COOPERATION OF THE CONTRACTOR.** Whenever the Contractor is not present on any part of the work where it may be desired to give directions, orders will be given by the Engineer in writing and shall be received and obeyed by the Superintendent or Foreman who may have charge of the particular work in question.

The representative must be present at the job site while work is in progress. The Contractor must submit the representatives contact information (name, telephone number) so the representative can be easily contacted to perform emergency work while work is not in progress.

C. **COOPERATION BETWEEN CONTRACTORS.** Where two or more contractors are employed on related or adjacent work, each shall conduct their operation in such a manner as not to cause any unnecessary delay or hindrance to the other. Each Contractor shall be responsible to the other for all damage to work, to persons or property, or for loss caused by failure to finish the work within the time specified for completion.

D. **CHARACTER OF WORKERS.** If any person employed by the Contractor, or by a subcontractor, shall fail or refuse to carry out the directions of the Engineer, or shall appear to the Engineer to be incompetent, or to act in a disorderly or improper manner, that person shall be discharged immediately upon the recommendation of the Engineer, and shall not again be employed on the work.

E. **PERMITS AND LICENSES.** The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices incident to the lawful prosecution of the work.

F. **ACCESS TO WORK.** The Engineer and the Engineer's authorized assistants shall at all times have access to the work during its progress. All work done and all materials furnished shall be subject to the inspection of the Engineer.

G. **INSPECTION.** The inspection of the work shall not relieve the Contractor of its obligation to fulfill the contract as prescribed, and defective work shall be made good and unsuitable materials may be rejected, notwithstanding that such defective work and materials have been previously overlooked by the Engineer and accepted or estimated for payment.

H. **REMOVAL OF DEFECTIVE OR UNAUTHORIZED WORK.** All work which has been rejected shall be remedied or removed and replaced in an acceptable manner by the Contractor at the Contractor's own expense, and no compensation will be allowed Contractor for such removal or replacement.

F. **LANDSCAPE DAMAGES.** Repair slopes or other existing facilities that were damaged after starting job site activities and before starting plant establishment.

As ordered, replace plants that have been damaged from either or both of the following conditions:

1. Ambient air temperature falling below 32 degrees F during the plant establishment period
2. Department or its supplier restricting or stopping water delivery during the plant establishment period

This plant replacement work is change order work.

- J. EQUIPMENT. The use of equipment which is obsolete as to type, in bad condition or worn out will not be permitted on the work. The Contractor shall provide adequate and suitable equipment and plans to meet the requirements of the work, and when ordered by the Engineer shall remove unsuitable equipment from the work.
- K. FINAL INSPECTION. When the work performed by the Contractor shall have been satisfactory and the final cleaning up performed, the Engineer will make the final inspection.

SECTION VI. CONTROL OF MATERIALS

The Bidder's attention is directed to the provisions in Section 6 of the State Specifications for the requirements and conditions concerning Control of Materials and these special provisions.

- A. **DEFECTIVE MATERIALS.** All materials not conforming to the requirements of these specifications shall be considered as defective, and all such materials -- whether in place or not -- shall be rejected and shall be removed immediately from the site of the work.
- B. **REMOVAL OF CONDEMNED MATERIALS AND STRUCTURES.** The Contractor shall remove from the site of the work, without delay, all rejected and condemned materials or structures of any kind brought to or incorporated in the work; upon failure to do so or to make satisfactory progress in so doing within forty-eight (48) hours after the service of a written notice by the Engineer, the condemned materials or work may be removed by the City and the cost of such removal shall be taken out of the contract price. No such rejected or condemned material shall again be offered for use by the Contractor under this contract.
- C. **SUBMITTALS.** Attention is directed to Section 5-1.23, "Submittals," of the State Specifications. Within fifteen (15) calendar days after award of the contract, before any materials are purchased, brought to the site or installed, the Contractor shall submit to the Engineer a complete listing of the manufacturers of each item of equipment or assembly fabricated off the site which the Contractor proposes to furnish on the project, together with sufficient information including shop assembly and detail drawings, manufacturers' specifications, and performance data to demonstrate clearly that the materials and equipment to be furnished comply with the provisions and intent of the contract specifications, contract drawings and contract documents. If the information shows any deviation from the contract requirements, the Contractor shall, by a statement in writing accompanying the submittal, advise the Engineer of the deviation and state the reason therefore.

Approval by the Engineer of shop drawings and other data submitted by the Contractor shall not relieve the Contractor from responsibility for any errors therein or of furnishing the materials and equipment of proper dimension, size, quantity, quality, and all performance characteristics to meet the requirements and intent of the contract documents. The Contractor shall have no claim for damages or extension of time on account of any delay in the work resulting from the rejection of materials or from revision and resubmittal of drawings and other data for approval. All submittals and shop drawings shall be furnished to the City in quadruplicate.

- D. **TRADE NAMES, ALTERNATIVES, OR EQUALS.** Attention is directed to Section 6-1.05, "Trade Names and Alternatives," of the Standard Specifications.
- E. **STORAGE OF MATERIALS.** Unless specifically authorized by the Engineer, no materials shall be stored overnight upon any public road or right of way within the City.

SECTION VII. LEGAL RELATIONS AND RESPONSIBILITY

The Bidder's attention is directed to the provisions in Section 7 of the State Specifications for the requirements and conditions concerning Legal Relations and Responsibility to the Public and these special provisions.

- A. **LEGAL RESTRICTIONS.** The Contractor shall stay fully informed of all existing and future state and national laws and municipal ordinances and regulations which in any manner affect those engaged or employed on the work, or which in any manner affect the conduct of the work. The Contractor shall at all times observe and comply with all such existing and future laws, ordinances and regulations.
- B. **PATENTS.** The Contractor shall assume all costs arising from the use of patented materials, equipment, devices or processes used on or incorporated in the work.
- C. **SANITARY PROVISIONS.** The Contractor shall comply with all of the sanitary regulations prescribed by the California Department of Health Services.
- D. **PUBLIC CONVENIENCE AND SAFETY.** Contractor's attention is directed to the provisions in Section 7-1.03, "Public Convenience" and Section. 7-1.04, "Public Safety" of the Standard Specifications. The Contractor shall so conduct its operations as to offer the least possible obstruction and inconvenience to the public. It shall be the responsibility of the Contractor to protect and guard the public from injury or damage due to any cause.
- E. **RESPONSIBILITY FOR WORK.** Accepting as herein otherwise provided, until the formal acceptance of all work by the City, the Contractor shall have the charge and care thereof, and shall take every necessary precaution against injury or damage to any part thereof from any cause whatever. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the work occasioned by any cause before its acceptance, and shall bear the expense thereof.
- F. **HOURS OF LABOR.** The Contractor shall forfeit as penalty to the City, Fifty Dollars (\$50.00) for each laborer, worker, or mechanic employed in the execution of the contract by the Contractor, or by any subcontractor, upon any of the work hereinafter mentioned, for each working day during which said laborer, worker or mechanic is required or permitted to labor more than eight hours per day or forty hours per week in violation of the provisions of Labor Code §1815.
- G. **PREVAILING WAGE.** The Contractor shall, as a penalty to the City, forfeit Fifty Dollars (\$50.00) for each working day or portion thereof for each worker paid less than the stipulated prevailing rates for such work or craft in which such worker is employed for any public work done under the contract by the Contractor or any of Contractor's subcontractors. The difference between such stipulated prevailing wage rates and the amount paid to each worker for each working day or portion thereof for which each worker was paid less than the stipulated prevailing wage rate shall be paid to each worker by the Contractor. The provisions of Labor Code §1773, §1773.2, §1773.4 and §1775 of the will be complied with.

Pursuant to the State of California, or local law thereto applicable, the City Council hereby determines that the general prevailing per diem rate in the locality in which the work is to be performed, for laborers and for each craft or type of worker and mechanic employed in the execution of this contract, is the Union Wage Scale established for Santa Cruz County, which wage scale as of the execution date of this contract is incorporated herein as if fully set forth.

Copies of the prevailing rate of per diem wages prepared and available by the California State Department of Industrial Relations.

- H. COMPLIANCE WITH DIVISION OF APPRENTICESHIP STANDARDS. The Contractor to whom the contract is awarded shall, in compliance with the California Labor Code § 1777.5 , be required to adhere to the provisions of the ratio of apprentices to journeymen as more particularly defined in the aforementioned Labor Code section. Notice is given that the City of Capitola will, within five (5) days of awarding of contract, notify the Division of Apprenticeship Standards of such awarding and will notify said Division of any findings of any discrepancies regarding the ratio of apprentices to journeymen.
- I. CERTIFIED PAYROLL RECORDS. The Contractor and each subcontractor shall keep or cause to be kept an accurate record showing the names and occupations of all laborers, workers and mechanics employed by the Contractor in connection with the execution of this contract or any subcontracts thereunder and also showing the actual per diem wages paid to each of such workers, which record shall be open at all reasonable hours to the inspection of the City awarding this contract, its officers and agents, and to the Chief of the Division of Labor Statistics and Law Enforcement and the State Department of Industrial Relations, its deputies and agents.

All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement).
- J. POSTING MINIMUM WAGE RATES/ JOB SITE POSTINGS. The Contractor shall post at conspicuous points on the site of the project a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned. The contractor shall post job site notices prescribed by regulation (See 8 Calif. Code Reg §16451 (d) for the notice that previously was required for project monitored by the CMU).
- K. PAYMENT OF EMPLOYEES. The Contractor and each subcontractor shall pay each employee engaged in work on the project under this contract in full (less deductions made mandatory by law) and not less often than once a week.
- L. REGISTRATION OF CONTRACTORS. At the time of award of the contract, the Contractor shall be licensed in accordance with the provisions of Chapter 9 of Division III of the Business and Professions Code.
- M. RESPONSIBILITY FOR DAMAGE. The City of Capitola, the City Council, or the Engineer shall not be answerable or accountable in any manner for any loss or damage that may happen to the work or any part thereof; or for any of the materials or other things used or employed in performing the work; or for injury to any person or persons, either workers or the public; for damage to property from any cause which might have been prevented by the Contractor, Contractor's workers, or anyone employed by the Contractor; against all of which injuries or damages to persons and property the Contractor having control over such work must properly guard. The Contractor shall be responsible for any liability imposed by law for any damage to any person or property resulting from defects or obstructions or from any cause whatsoever during the progress of the work or at any time before its completion and final acceptance, and shall indemnify and save harmless the City of Capitola, the City Council, and the Engineer from all suits or actions of every name and description brought forth or on account of any injuries or damages received or sustained by any person or persons by or from the Contractor, Contractor's servants or agents, in the construction of the work or by or in consequence of any negligence in guarding against such injuries or damages or on the

account of any act or omission of the Contractor or Contractor's agents, and in addition to any remedy authorized by law so much as shall be considered necessary by the City Council may be retained by the City of Capitola until disposition has been made of such suits or claims for damages as aforesaid.

The Contractor shall be responsible for any liability imposed by law or for any damage to any person or property and shall indemnify and hold harmless the City of Capitola, its officers and employees, all in the same manner and to the same extent as provided above for the protection of the City, the City Council and the Engineer, except that no retention of money due the Contractor under and by virtue of the contract will be paid by the City of Capitola, pending disposition of suits or claims for damages brought against the City.

- N. TERMINATION OF CONTRACT. If the work provided for under this contract shall be abandoned, or if the contract shall be sublet or assigned without the consent of the City, or if at any time the Engineer shall be of the opinion that the conditions specified as to the rate of progress are not being fulfilled, or that the work or any part thereof is unnecessarily delayed, or that the Contractor is willfully violating any of the conditions or provisions of this contract or is executing the same in bad faith, the City shall notify the Contractor to fulfill the conditions of this contract. Should the Contractor fail to begin compliance with said notice within five (5) calendar days, the City may, at its discretion, notify the Contractor to discontinue all work under this contract or any part thereof, and thereupon the Contractor shall discontinue work, and the City may, by contract or otherwise, at its discretion, complete the work or such part thereof, and may take possession of the work and use therein such materials, machinery, implements and tools of every description as shall be found upon the work, or provide whatever is needed for the completion of the work and charge the expense thereof to the Contractor. In order to meet the expenses so incurred, the City is hereby authorized by the Contractor to draw a warrant in the name of the Contractor and in favor of these persons, firms or corporations doing the work or providing the materials or labor therefore, against the fund or appropriation set aside for the purpose of this contract. When a warrant is so drawn it shall be conclusive upon the Contractor and shall be to all intent and purposes the same as drawn by the Contractor in person. When any of the said demands have been audited and paid, the amount of the same shall be deducted from the fund or appropriation set-aside for the purposes of this contract being so terminated. The Contractor shall immediately, upon due notice from the Engineer to do so, remove from the premises all materials and personal property belonging to the Contractor which have not already been used in the construction of the work or which are not in place in the work, and the Contractor shall forfeit all rights under this contract, and both the Contractor and Contractor's sureties shall be liable for the bond for all damages caused the City by reason of Contractor's failure to complete this contract.

Neither the extension of time for any reason beyond the date fixed for the completion of this work, nor the doing and acceptance of any part of the work called for by the terms of this contract, subsequent to the said date, shall be deemed to be a waiver by the City of the right to abrogate, annul, or terminate this contract for abandonment or other cause as provided above.

During the performance of this contract, the Contractor, its assignees and successors in interest (hereinafter referred to as "Contractor") agree as follows:

1. COMPLIANCE WITH REGULATIONS. The Contractor will comply with the Regulations of the Department of Transportation relative to nondiscrimination in federally-assisted programs of the Department of Transportation (Title 15, Code of Federal Regulations, Part 8, hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. NONDISCRIMINATION. The Contractor, with regard to the work performed by it after award and prior to completion of the contract work, will not discriminate on the grounds of race, color, sex, or national origin, ancestry, physical handicap, medical condition, marital status, or religion in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Contractor will not participate either directly or indirectly in the discrimination prohibited by Section 1735 of the Labor Code.
 3. SOLICITATIONS FOR SUBCONTRACTS, INCLUDING PROCUREMENT OF MATERIALS AND EQUIPMENT. In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurement of materials or equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, sex, ancestry, physical handicap, medical condition, marital status, or religion.
 4. INFORMATION AND REPORTS. The Contractor will provide all information and reports required by the Regulations, or orders and instructions issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the City to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of the Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the City, and shall set forth what efforts it has made to obtain the information.
 5. SANCTIONS FOR NONCOMPLIANCE. In the event of the Contractor's noncompliance with the nondiscrimination provisions of this contract, the City shall impose such contract sanctions as it may determine to be appropriate, including but not limited to:
 - a. Withholding of payments to the Contractor under the contract until the Contractor complies, and/or
 - b. Cancellation, termination or suspension of the contract, in whole or in part.
 6. INCORPORATION OF PROVISIONS. The Contractor will include the provisions of Paragraphs 1 through 5 in every subcontract, including procurement of materials and leases of equipment, unless exempt by the regulations, order or instructions issued pursuant thereto. The Contractor will take such action with respect to any subcontract or procurement as the City may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided, however, that in the event the Contractor becomes involved in or is threatened with litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the City to enter into such litigation to protect the interests of the City.
- O. WATER POLLUTION. Attention is directed to Section 13, "Water Pollution Control," of the Standard Specifications and Section 10-2.05, "Temporary Water Pollution and Erosion Control" elsewhere in the special provisions.
- P. CONSTRUCTION HOURS. Construction hours shall be limited between the hours of 8:00 a.m. and 5:00 p.m. on weekdays. Construction shall be prohibited on weekends except for emergency work approved by the Engineer.

SECTION VIII. PROSECUTION, PROGRESS AND PAYMENT

Attention is directed to Sections 8 and 9 of the State Specifications for the requirements and conditions concerning Prosecution, Progress and Payment and these special provisions.

- A. **COMPLETION AND PAYMENT.** All work completed under the contract shall be paid for in accordance with the provisions of these specifications. The Contractor shall accept the compensation as provided in the contract in full payment for furnishing all materials, labor, tools and equipment, including all applicable taxes and fees, necessary to complete the work and for performing all work completed and embraced under the contract.
- B. **PROGRESS ESTIMATE AND PAYMENT.** The Engineer shall, on or around the twentieth (20th) day of each month, make an estimate of the value of the work performed and materials furnished in accordance with this contract. The first estimate shall be of the value of the work done and of the materials proposed and suitable for permanent incorporation in the work delivered and suitably and safely stored at the site of the work since the Contractor began the performance of this Contract.

Every subsequent estimate, except the final estimate, shall be of the value of the work done and materials delivered and suitably stored at the site of the work since the last preceding estimate was made; provided, however, that should the Contractor fail to adhere to the program of completion fixed in this contract, the Engineer shall deduct from the next and all subsequent estimates the full calculated accruing amount of the liquidated damages to the date of said estimate, until such time as the compliance with the program has been restored; and provided, further, that no estimate shall be required to be made when in the judgment of the Engineer the total value of the work done and materials incorporated into the work under this contract since the last preceding estimate amounts to less than One Thousand Dollars (\$1,000.00); and provided, also, that materials so delivered and estimated shall not be removed from the site of the work prior to its completion without the written consent of the Engineer.

The estimates shall be signed by the Engineer, and after approval by the City the City shall pay or cause to be paid to the Contractor, in the manner provided by law, an amount equal to ninety per cent (90%) of the estimated value of the work performed and of the value of the materials furnished and delivered and unused, such materials to be those which are proposed and suitable for permanent incorporation in the work.

Items for which quantities are indicated lump sum shall be paid for at the unit price indicated in the bid proposal. Such payment shall be full compensation for the items of work and all work appurtenant thereto.

When required by the specifications or requested by the Engineer, the Contractor shall submit to the Engineer within fifteen (15) calendar days after award of contract, a detailed schedule in triplicate, to be used only as a basis for determining progress payments on a lump sum contract or designated lump sum bid item. This schedule shall equal the lump sum bid and shall be in such form and sufficiently detailed as to satisfy the Engineer that it correctly represents a reasonable apportionment of the lump sum.

- C. **SUBSTITUTION OF SECURITIES FOR WITHHELD AMOUNTS.** Pursuant to Chapter 13 (commencing with Section 4590), Division 5, Title 1 of the Government Code of the State of California, securities may be substituted for any moneys withheld by public agency to ensure performance under a contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the public agency, or with a state or federally

chartered bank as the escrow agent, who shall pay such moneys to the Contractor upon satisfactory completion of the contract.

Securities eligible for substitution under this section shall include those listed in Section 16430 of the Government Code of the State of California or bank or savings and loan certificate of deposit. The Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon. Any escrow agreement entered into pursuant to this section shall contain as a minimum the following provisions: (a) The amount of securities to be deposited; (b) The terms and conditions of conversion to cash in case of the default of the Contractor; and (c) The termination of the escrow upon completion of the contract.

- D. FINAL ACCEPTANCE. The Engineer shall, as soon as practical after the final acceptance of the work done under this contract, make a final estimate of the amount of work done there under and the value thereof. Such final estimate shall be signed by the Engineer, and after approval the City shall pay or cause to be paid to the Contractor in the manner provided by law, the entire sum so found to be due hereunder, after deducting therefrom all previous payments and such other lawful amounts as the terms of this contract prescribe.

In no case will final payment be made in less than thirty-five (35) calendar days after the filing of a "Notice of Completion" in the County Recorder's Office, Santa Cruz County, California.

SECTION IX. INSURANCE

- A. **PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE.** The Contractor shall take out and maintain during the life of this contract such public liability and property damage insurance, by an insurer acceptable to the City, that shall protect Contractor and any subcontractor performing work covered by this contract from any claims for property damage which may arise because of the nature of the work or from operations under this contract, whether such operations are performed by the Contractor or by any subcontractor or anyone directly or indirectly employed by either of them, even though such damages may not be caused by the negligence of the Contractor or any subcontractor, or anyone employed by either of them. The public liability and property damage insurance shall name the City, its officers, agents and employees as insured's, and all insurance policies issued hereunder shall so state. The amounts of such insurance shall be as follows:
1. **CONTRACTORS LIABILITY INSURANCE.** Shall provide bodily injury liability limits of not less than \$1,000,000 for each person, and \$2,000,000 for each accident or occurrence, and property damage liability limits of not less than \$1,000,000 for each accident or occurrence with an aggregate limit of \$2,000,000 for claims which may arise from the operations of the Contractor in the performance of the work hereunder provided. This insurance must include coverage for contractual liability assumed by the Contractor under Paragraph F, Section VII, Responsibility for Work.
 2. **AUTOMOBILE LIABILITY INSURANCE.** Covering all vehicles used in the performance of the contract providing bodily injury liability limits of not less than \$500,000 for each person and \$1,000,000 for each accident or occurrence, and property damage liability limits of not less than \$500,000 for each accident or occurrence which may arise from the operations of the Contractor in performing the work provided for herein.

Before the execution of the contract, the successful bidder shall file with the City a certificate or certificates of insurance, covering the specified insurance. Each such certificate shall bear an endorsement precluding the cancellation or reduction in coverage of any policy evidenced by such certificate, before the expiration of thirty (30) calendar days after the City shall have received notifications by registered mail from the insurance carrier.

All policies shall name the City of Capitola as an insured under all terms of the policy.

- B. **WORKER'S COMPENSATION INSURANCE.** Before beginning the work, the Contractor shall furnish to the City satisfactory proof that Contractor has taken out for the period covered by the work under this contract, full compensation insurance for all persons employed directly by Contractor or through subcontractors in carrying out the work contemplated under this contract, in accordance with the "Worker's Compensation and Insurance Act," Division IV of the Labor Code of the State of California and any acts amendatory thereof. Such insurance shall be maintained in full force and effect during the period covered by this contract.

SECTION X. TECHNICAL PROVISIONS

Whenever reference is made to "Standard Specifications", it shall be interpreted to mean the State of California Department of Transportation Standard Specifications 2018 as revised by the "Revised Standard Specifications," dated 10-18-2019, issued by the State of California Department of Transportation. here the term "Special Provisions" is used in the Standard Specifications, it shall be understood to mean these Specifications.

The *Standard Specifications* including *Revised Standard Specifications (RSS)* as revised by these special provisions will apply to this project.

Special provisions are under headings that correspond with the main-section headings of the *Standard Specifications*. A main-section heading is a heading shown in the table of contents of the *Standard Specifications*.

Each special provision begins with a revision clause that describes or introduces a revision to the *Standard Specifications* or *Revised Standard Specifications (RSS)*.

Any paragraph added or deleted by a revision clause does not change the paragraph numbering of the *Standard Specifications* or *RSS* for any other reference to a paragraph of the *Standard Specifications* or *RSS*.

When the word "Department" appears in the Specifications, it refers to the "City."

REVISIONS TO STANDARD SPECIFICATIONS AND REVISED STANDARD SPECIFICATIONS (RSS)

In the event of conflict between the Standard Specifications and these Special Provisions, the latter shall take precedence over and be used in lieu of such conflicting portions. The listing of certain salient sections from the Standard Specifications and these Special Provisions shall not in any way relieve the Contractor of complying with each and every section of the Standard Specifications.

SECTION 10-1. GENERAL

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 10, "General," of the Standard Specifications and these special provisions.

The Contractor shall prepare a traffic control plan that conforms to Section 12, Traffic Control Plan. The work shall be performed in conformance with the phases of construction shown on the Contractor's approved Traffic Control Plan. Non-conflicting work in subsequent phases may proceed concurrently with work in preceding phases.

The first order of work shall be to contact Underground Service Alert (U.S.A.). The Contractor shall contact Underground Service Alert to mark out and locate all existing utility facilities within the project area. The Contractor is responsible for repairing and restoring any damaged utility facilities to a condition satisfactory to the utility owner at no cost to the City of Capitola or County of Santa Cruz.

The second order of work shall be to place Best Management Practices (BMP). BMP's shall remain in place until the project is complete.

The order of all other work shall be such as to assure the completion of the project within the allotted time as described herein while complying with the requirements set forth in the contract documents.

The Contractor is responsible for all material and/or equipment needed to perform the project. Should the City have to supply the Contractor with material and/or equipment to do the work, the Contractor will be charged accordingly.

Full compensation for preparing roadway and coordinating with utility companies and property owners is considered included in various bid items and no additional compensation shall be provided therefore.

10-1.03 PROGRESS SCHEDULE

The Contractor shall submit a detailed construction schedule to the Engineer for review and approval prior to the pre-construction meeting for the project. Construction schedules shall conform to the provisions in Section 8-1.02, "Schedule," of the Standard Specifications.

The construction schedule shall be consistent in all respects with the times and order of work requirements in Section 10-1.01, "Order of Work," elsewhere in the special provisions.

10-1.04 OBSTRUCTIONS

Attention is directed to Section 5-1.36, "Property and Facility Preservation," and 10-1.06, "Existing Facilities" of the Standard Specifications and these special provisions.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workmen and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 6 inches in diameter or pipelines operating at pressures greater than 60 psi (gage); underground electric supply system conductors or cables either directly buried or in duct or conduit which do not have concentric neutral conductors or other effectively grounded metal shields or sheaths; and underground electrical conductors with potential to ground of more than 300 volts.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

Underground Service Alert
Northern California (USA) Telephone: 811 or (800) 227-2600

Pursuant to Government Code Section 4216.e, the inquiry identification number from the regional notification center shall remain valid for not more than 14 calendar days from the date of issuance, and after that date shall require regional notification center revalidation. Inquiry identification number means the number which is provided by a regional notification center to every person who contacts the center pursuant to Government Code Section 4216.2.

The Contractor is responsible for locating all underground utilities (utility location, type, size, and depth) prior to any excavation and protecting facilities in place. The existing utilities shown on the plans are approximate locations established from information available and do not include all the existing utilities. The Contractor shall use extreme caution when excavating, grading, raising manholes, and paving in the vicinity of such facilities.

The Contractor shall visit the site of the proposed work and determine the quantity and location of the manholes, valve covers and utility appurtenances to be encountered in the proposed work area and his/her bid accordingly. Damage to such utilities resulting from the Contractor's operations to complete the Project shall be repaired at the Contractor's expense.

Where possible conflicts may exist, the Contractor shall verify the grade and location of existing underground utility prior to any work by careful hand digging. It is recognized by the City and the Contractor that the locations of existing utilities as shown on the plans are approximate, their actual location is unknown. Recognition is given to the fact there may be additional existing utilities unknown to either party to the contract. Location of utilities, as shown on the drawings, represent the best information obtainable from utility maps and information furnished by the various agencies and companies involved. The City warrants neither the accuracy nor the extent of the actual utilities involved.

Contractor shall be responsible for locating all existing utilities. All existing utilities within the project limits shall remain in use during construction.

In the event the Contractor discovers existing utilities within the limits of the excavation, the Contractor shall immediately notify the Engineer and the affected utility owner by the most reasonable expeditious method and later confirm in writing. All required relocation of existing facilities that interfere with the work shall be made by the owning agencies.

Facilities damaged or disturbed shall be reset, repaired, or replaced, as directed by the Engineer, at the Contractor's expense.

Full compensation for conforming to the requirements of this Section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

10-1.05 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.03, "Public Convenience," 7-1.04, "Public Safety," and 12, "Temporary Traffic Control," of the Standard Specifications, the provisions under "Traffic Control System and Construction Area Signs" elsewhere in the special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from responsibility as provided in said Section 7-1.04.

Vehicular and pedestrian access to private property shall be maintained at all times unless the closing of such access is approved by the Engineer. The Contractor shall request in writing permission from the Engineer a minimum of five (5) working days in advance of making such closing.

Detours and all lights, signs, barricades, flag persons or other devices necessary to provide for safety and convenience shall be furnished, installed and maintained by the Contractor. Lighted or flashing barricades shall be used during hours of darkness.

Existing traffic signs shall be protected in place by the Contractor during the construction period.

The Contractor shall place, remove, store, maintain, relocate, replace, and dispose construction area traffic control devices and traffic control and construction area signs.

No trench shall be permitted to remain open overnight or when construction activities are not in progress. Each trench shall be backfilled to the surface. The Contractor shall not open more trench than can be successfully completed and backfilled in one day. Where this requirement is impracticable, the Contractor

shall request in writing permission from the Engineer to extend the trench to its practical limit and to bridge the trench with steel plates. When necessary, trenches and other excavations shall be bridged with steel plates as required by the Engineer. The bridging shall be placed to permit an unobstructed flow of traffic. Advanced warning signs shall be required when trenches and other excavation are bridged in the travel way.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders, including any section closed to the public traffic.

The Contractor shall notify local public safety authorities of this intent to begin work at least 5 working days before work is begun. The Contractor shall cooperate with local public safety authorities relative to handling traffic through the area and shall make its own arrangements relative to keeping the working area clear of parked vehicles.

The full width of the traveled way shall be open for use by public traffic on Saturdays, Sundays and designated legal holidays, after 3:00 p.m. on Fridays and the day preceding designated legal holidays, and when construction operations are not actively in progress.

Designated legal holidays are: January 1, the third Monday in February, the last Monday in May, July 4, the first Monday in September, November 11, Thanksgiving Day, and December 25. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11 falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the Engineer public traffic will be better served and the work expedited. Such deviations shall not be implemented until the Engineer has issued written approval. All other modifications will be made by Contract Change Order.

10-1.06 EXISTING FACILITIES

Existing facilities which are to remain in place shall be protected in conformance with the provisions in Sections 5-1.36, "Property and Facility Preservation," 7-1.15, "Indemnification," and 7-1.06, "Insurance" of the Standard Specifications.

10-1.07 WATERING

Watering shall conform to the provisions in Section 10-6, "Watering," of the Standard Specifications.

10-1.08 LINES AND GRADES

Lines and grades shall conform to the provisions in the Standard Specifications and these special provisions except that the Contractor shall be responsible for setting all lines and grades necessary to establish the lines and grades required for the completion of the work specified in these specifications, on the plans, and in the special provisions.

The City shall not provide these services. The Contractor shall be responsible for the accuracy of his/her own layout and staking work. The Contractor shall be responsible for the preservation of all established signal lines, grades, and layout points. Stakes damaged or destroyed by the Contractor, his/her employees, subcontractors, utility company employees, or the public shall be replaced by the Contractor at the Contractor's expense. Signal pole, cabinet, and striping locations shall be verified by the City prior to installation.

Full compensation for compliance with this section shall be considered included in the various items of work and no additional compensation shall be allowed.

10-1.09 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8-1.07, " Delays," of the Standard Specifications.

SECTION 10-2. SPECIAL PROVISIONS

10-2.01 MOBILIZATION

This work shall conform to the provisions in Section 9-1.16D, "Mobilization," of the Standard Specifications, and shall consist of preparatory work and operations, including but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, buildings and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the project site.

Measurement and Payment-The contract lump sum price paid for "Mobilization" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in mobilization as specified herein. Partial payment for mobilization shall be made consistent with Section 9-1.16D, "Mobilization," of the Standard Specifications.

10-2.02 TRAFFIC CONTROL SYSTEM AND CONSTRUCTION AREA SIGNS

This work shall conform to the provisions in Section 12, " Temporary Traffic Control," of the Standard Specifications and the provisions under "Maintaining Traffic" elsewhere in the special provisions, and shall consist of installing traffic and pedestrian signing, delineators, fencing, barricades, temporary base rock or plywood walkways, temporary driveways and flaggers as necessary to maintain safe passage, and in conformance with these special provisions.

Walkways shall be open to pedestrian traffic at all times. The Contractor shall provide and install temporary fencing, signing and ramping to provide safe pedestrian traffic through the project site and shall maintain safe access to all properties at all times.

The Contractor shall submit a Traffic Control Plan at least 5 working days to the Engineer prior to beginning construction operations. The Contractor shall revise and resubmit the Traffic Control Plan until it is approved by the Engineer. The Contractor shall not begin work without an approved Traffic Control Plan.

The roadway shall be open to emergency vehicles at all times. The Contractor shall provide vehicular access to all residences and businesses at all times except when concrete, asphalt, or grading work is actively in progress next to driveway(s). The Contractor shall provide vehicular access to all residences and businesses at all times during non-working hours. When work is not actively in progress the full width of the traveled way shall be open for traffic.

The Contractor shall comply with regulatory requirements for closure of streets. At least 48 hours in advance of closing any street, alley, or other public thoroughfare, the Contractor shall notify the Police and Fire Departments, and shall comply with their requirements.

The Contractor shall notify the following waste disposal and recycling company at least 2 working days prior to performing construction operations:

Green Waste Recovery, Inc.

Telephone: (831) 768-9505 or (800) 665-2209

No streets shall be closed or construction operations done on day of waste disposal and recycling collection.

The provisions of this section shall not relieve the Contractor from its responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions of Section 7-1.04, "Public Safety," of the Standard Specifications.

Construction area signs shall conform to the provisions of Section 12-3.11, "Construction Area Signs," of the Standard Specifications. Excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes. Locations of signs shall be approved by the Engineer prior to their placement.

Temporary "No Parking" signs shall be attached to existing poles, street light standards or parkway trees. Temporary "No Parking" signs shall conform to the provisions in Section 12.3.06B, "Portable Mounted Signs," of the Standard Specifications. The signs shall be in place not less than 48 hours prior to starting work. Signs shall be posted at a maximum of 200 feet between signs.

Message signs notifying the public of the period of construction shall be installed at least 5 working days prior to start of construction at each end of the street and at the leg of each intersection.

The Contractor shall conduct all construction operations with the least possible obstruction and inconvenience to the public. The Contractor shall have no greater length or amount of work under construction than can be completed within a workday.

The Contractor shall provide access to all intersecting streets and properties whenever possible. If access to any property cannot be provided, then parking shall be provided and maintained until access can again be restored. If it is necessary to restrict access to certain driveways for an extended period of time, the Contractor shall notify the affected residents in writing at least 48 hours in advance.

The Contractor shall minimize the disruption to traffic by:

1. Permitting traffic to pass with the least possible inconvenience or delay.
2. Maintaining existing driveways and keeping them open and in safe condition at all times.
3. Removing or repairing any condition impeding traffic or creating a hazard.
4. Keeping existing traffic signal and roadway lighting systems in operation.

The Contractor shall protect property owner right of way by:

1. Providing the least possible inconvenience or delay.
2. Maintaining access to property.
3. Notifying in writing property owners at least 10 calendar days and again in 48 hours in advance of construction operations.

The Contractor shall be responsible for providing safeguards, safety devices, protective equipment, and any other needed actions to protect life, health, and safety of the public, and to protect property in connection with its construction operations.

The full width of the traveled way shall be open for use by traffic on Saturdays, Sundays and designated legal holidays, and when construction operations are not in progress.

The Contractor may request in writing to the Engineer deviation from the requirements of these special provisions. Such deviation shall not be implemented until the Engineer has issued written approval.

The adjustment provisions in Section 4.1.05, "Changes and Extra Work," of the Standard Specifications shall not apply to the item of traffic control system. Any adjustment in compensation for traffic control systems due to an increase or decrease in the amount of traffic control system required by changes ordered by the Engineer will be made on the basis of the cost of the increased or decreased traffic control necessary. Such adjustment will be made based on provisions in Section 4-1.05, "Changes and Extra Work," of the Standard Specifications for increased work.

Measurement and Payment--The contract lump sum price paid for "Traffic Control System" and "Construction Area Signs" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in preparing and revising the Traffic Control Plan, placing, removing, storing, maintaining, relocating, replacing, and disposing of the components of the traffic control system, including supervision, as shown on the approved Traffic Control Plan, and for doing all the work involved in placing, maintaining, and removing construction area signs, special signs and barricades as shown on the approved Traffic Control Plan, including compliance with the provisions in Section 12, "Temporary Traffic Control," of the Standard Specifications.

10-2.03 SURVEY AND CONSTRUCTION STAKING

The Contractor shall provide field surveying services to establish elevations and slopes required to layout the Brommer Street Complete Street improvements. All Field Surveying work shall be considered included in the price bid for "Surveying and Construction Staking" and no additional compensation will be allowed.

The Contractor shall employ a civil engineer or land surveyor registered in the State of California to perform site surveying and construction staking to establish line and grade. Construction surveys shall comply with Section 5-1.26, "Construction Surveys," of the Standard Specifications and these special provisions except that the Contractor shall be responsible for setting all lines and grades necessary to establish the lines and grades required for the completion of the work specified on the Plans, and in these special provisions.

Contractor is to use the control monuments, horizontal and vertical datum as specified on the plans. Contractor must independently verify the primary horizontal and vertical control and inform the Engineer of any significant differences between the provided values and found values.

Contractor will use said primary control to set such stakes or marks as it determines necessary to establish the line and grades required for the performance of the work specified in the Contract. Contractor is responsible for all construction staking on the project.

Contractor shall notify the Engineer of any conflicts between the design and existing conditions and submit a Request for Information (RFI) before commencing survey.

Contractor shall maintain a complete and accurate log of control, and all survey field notes. Name of firm, job description, party chief, crew members, and date of survey shall appear on all field notes and cut sheets.

Contractor shall notify the Engineer of any existing monuments which will be disturbed or destroyed during the course of construction and Contractor will be responsible – and bear the full costs - for tying out the existing monuments and setting new monuments, per the Professional Land Surveyors’ Act, Business and Professions Code Section 8771 through 8773, and to the requirements of the County Surveyor of the County of Santa Cruz.

Attention is also directed to Section 8771 of the California Business and Professions Code for the requirements concerning survey monumentation. Existing survey monuments shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior to construction operations, and a corner record or record of survey shall be filed with the County Surveyor of the County of Santa Cruz. Existing survey monuments shall be reset to finish grade, and a corner record or record of survey shall be filed with the County Surveyor of the County of Santa Cruz prior to the recording of the certificate of completion for the project.

Contractor shall place new monuments (when possible) in a location to minimize traffic exposures for surveyors. Existing monuments to be replaced by the new monuments shall be removed and disposed of by the Contractor. New monuments shall be established before existing monuments are removed so that vertical and horizontal control shall be available at all times.

Upon completion of construction the contractor shall perform an as-built survey of the pathway improvements and submit a letter to the Engineer certifying the elevation and grades are consistent with the plans and meet the latest CBC ADA Code requirements.

Measurement and Payment--The contract lump sum price paid for “Surveying and Construction Staking” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in surveying and construction staking, and no additional allowance will be made therefore.

10-2.04 SURVEY MONUMENTATION AND MONUMENT PRESERVATION

The work performed in connection with “Survey Monumentation and Monument Preservation” shall conform to the requirements of the County Surveyor of the County of Santa Cruz, and shall consist of locating, referencing, resetting existing survey monuments to finish grade, and in conformance with these special provisions.

Attention is also directed to Section 8771 of the California Business and Professions Code for the requirements concerning survey monumentation. Existing survey monuments shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior to construction operations, and a corner record or record of survey shall be filed with the County Surveyor of the County of Santa Cruz. Existing survey monuments shall be reset to finish grade, and a corner record or record of survey shall be filed with the County Surveyor of the County of Santa Cruz prior to the recording of the certificate of completion for the project.

Measurement and Payment- contract lump sum price paid for “Survey Monumentation and Monument Preservation” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in locating, referencing, preserving, and resetting existing survey monuments, and record of survey (if needed), complete in place, in compliance with the Standard Specifications and these special provisions.

10-2.05 TEMPORARY WATER POLLUTION CONTROL AND EROSION CONTROL

This work shall conform to the provisions in Section 13, " Water Pollution Control", Section 21, “Erosion Control,” of the Standard Specifications and these special provisions and shall consist of the preparation

for developing and implementing a Water Pollution Control Program and installing temporary best management practices (BMPs).

The Contractor shall submit a Water Quality Control Plan that identifies the specific facilities and slopes to be protected, BMP's to be implemented, and meets all NPDES requirements in conformance with the Section 13-2, "Water Pollution Control Program", of the Standard Specifications.

The Contractor shall comply with all appropriate Best Management Practices and applicable design recommendations of the Engineer and Regional Water Quality Control Board (RWQCB) for preventing and removing pollutants, specifying erosion control measures, including sedimentation basins, infiltration basins, and re-vegetation of graded slopes.

Construction water quality control measures shall include the following:

1. Existing vegetation shall be retained where possible,
2. Grading activities will be limited to the immediate area required for construction,
3. Erosion control measures such as silt fences, staked straw bales, and temporary re-vegetation shall be employed for disturbed areas to prevent soil, dirt and debris from entering the storm drain system;
4. No disturbed surfaces shall be left without erosion control measures in place during the winter and spring months; Sediment shall be retained onsite by a system of sediment basins, traps, or other appropriate measures;
5. Measures shall be taken to ensure proper collection and disposal of all pollutants handled or produced on the site during construction, including sanitary wastes, cement, and petroleum products;
6. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

Maintenance:

1. Repair of BMP deficiencies caused by soil erosion or construction must begin within 72 hours of identification and completed as soon as possible.
2. Water pollution control materials such as, but not limited to silt fence and fiber rolls, shall be stockpiled on the site in sufficient quantities to stabilize any BMP deficiencies within 24 hours prior to a forecasted rain event. The Contractor shall replenish stockpiled materials as required to quickly install measures prior to forecasted rain event.
3. The Contractor shall have adequate labor on hand to install and maintain water pollution control measures within 24 hours following notification by the Engineer or before the forecasted rain, whichever is sooner.

Good Housekeeping:

1. Construction operations shall be carried out in such a manner that erosion and water pollution will be minimized, including the implementation of "good housekeeping" source control measures. Contractor shall comply with WPCP, state and local laws concerning pollution abatement.
2. Extreme care shall be taken when hauling any earth, sand, gravel, stone, debris, or any other substance over any public street. Occurrences of material blown, spilled, or tracked over and upon said public or adjacent private property are prohibited and shall be immediately remedied. Discharge of debris is prohibited.

3. All paved areas shall be kept clear of earth material and debris. The site shall be maintained so as to prevent sediment-laden runoff to any storm drainage system, including existing drainage swales and watercourse.
4. Contractor shall install and maintain construction entrances prior to commencement of grading. All construction vehicle traffic entering onto the paved roads must cross stabilized construction entrance ways as specified in the CASQA BMP Handbook Portal. Tracking of mud or debris onto public streets, or onto adjacent public or private property, is prohibited and shall be removed immediately as required by the Engineer.
5. Staging and work areas shall be kept orderly with neat stockpiling of construction materials. Measures shall be installed at the entrance and exits of staging and work areas to control mud from entering the roadway pavement.
6. No earthen materials shall be stockpiled within 25 feet of drainage inlets. All stockpiles of earthen materials shall have appropriate erosion control measures installed to abate and control erosion, as well as perimeter sediment controls.
7. Sanitary facilities shall be maintained on the site in a manner to prevent inadvertent discharge or leakage of sanitary wastes into the storm drain system either by placing sanitary facilities in locations that do not drain to the storm drain system and by providing secondary containment systems to capture leaked wastes.
8. Contractor shall provide dust control as required by the appropriate federal, state, and the City of Capitola requirements.

Erosion and Sediment Control Measures

Grading and Earthwork:

1. Protect areas which have been cleared and grubbed prior to excavation or embankment operations, and which are subject to runoff.
2. If the earthwork in any area has not progressed to a point where all or part of the facilities on the WPCP for that area can be constructed, the Contractor shall construct such supplementary temporary erosion control facilities as are necessary to protect adjacent private and public property at all time.
3. Water pollution control measures shall be constructed and functioning to prevent water pollution from areas where portions of the contract have been completed and no further earthwork is planned.

Inlet Protection:

1. The Contractor shall conduct his operations in such a manner that storm runoff will be contained within the project or channeled into the storm drain system which serves the runoff area. Storm runoff from one area shall not be allowed to divert to another runoff area.
2. Active drainage inlets where runoff is likely to go shall have drainage inlet protection installed around the immediate perimeter of the inlet. The perimeter of each individual work area shall have measures installed to control sediments that would otherwise leave the work area and enter the drainage system. Regular cleaning of gravel bag inlet protection so that sediment depth never exceeds a maximum of 3 inches.
3. If there is no active drainage system within each individual work area, the Contractor shall submit a WPCP proposing measures to de-silt and remove runoff from active construction areas. This may include the use of sediment basins, sediment traps and a pumping system to remove de-silted runoff from basins or traps.

4. Construction shall conform to the provisions of Section 13, “Water Pollution Control”, and Section 21, “Erosion Control”, of the Standard Specifications and to these special provisions.

Temporary Drainage Inlet Protection:

1. Temporary drainage inlet protection shall be installed, maintained and later removed as shown on the Plans, as specified in these technical specifications. Temporary drainage inlet protection shall be installed at each drainage system box location where runoff will enter the storm water system.
2. The Contractor shall use temporary drainage inlet protection as one of the various measures to prevent water pollution.

Temporary Gravel Filled Bag Dikes:

1. Temporary gravel filled bag dikes consisting of gravel bags placed in multiple layers shall be installed as shown on the plans.
2. Gravel filled bag dikes installed as part of temporary drainage inlet protection shall be maintained to provide for adequate sediment holding capacity. Sediment deposits shall be removed when the deposit reaches one-half of the temporary dike height. Removed sediment shall be deposited within the project in such a way that it is not subject to erosion by wind or water.

Stockpiles

1. Stockpiled material shall be located within the limits of construction delineated on the erosion control plan. Soils from the stockpile shall be self-contained and remain completely separate at all times. Contractor shall install weighted fiber rolls around the perimeter of the stockpile. The stockpile shall be covered with MIRAFLI 140N or approved tarp material that is securely weighted around the entire perimeter with gravel bags.
2. All stockpiled materials shall be removed from the site prior to final inspection.

Street Sweeping

1. Maintain continuous street sweeping operation during all earth hauling operations. Dry brooming is not permitted. Street sweeping shall be conducted where sediment is tracked from the job site onto paved roads in accordance with the CASQA BMP Handbook.
2. Street sweeping shall start at the beginning of clearing and grubbing and shall continue until completion of the project. Street sweeping shall be performed immediately after soil disturbing activities occur or offsite tracking of material is observed, at a minimum frequency of daily.
3. Street sweeping shall be performed so that dust is minimized. If dust generation occurs during sweeping or sediment pickup is ineffective as determined by the Engineer, the use of additional best management practices will be required.
4. At the option of the Contractor, collected material may be temporarily stockpiled in accordance with the approved WPCP. Collected material shall be disposed of at least once per week.

Measurement and Payment- The contract lump sum price paid for “Temporary Water Pollution Control and Erosion Control” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and no additional allowance will be made therefore.

10-2.06 LEAD COMPLIANCE PLAN

This work shall conform to the provisions in Section 14-11.12, “Removal of Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue,” of the Standard Specifications for removing, handling, and disposing of yellow thermoplastic and yellow painted traffic stripe and pavement marking.

Measurement and Payment-The contract lump sum price paid for “Lead Compliance Plan” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, for doing all the work involved as shown on the plans and as specified in the Standard Specifications and these special provisions, and no additional allowance will be made therefore.

10-2.07 CLEARING AND GRUBBING

The work performed in connection with “Clearing and Grubbing” shall conform to the provisions in Section 17, “Clearing and Grubbing”, of the Standard Specifications.

Contractor shall consult with City Arborist prior to construction to determine necessary measures for addressing tree protection, pruning and/or removal. Contractor shall conform to the following provisions for tree root excavation and treatment:

1. Hand excavate sections within 15 feet of tree trunks greater than 12 diameter inches
 - a. Sections where trees are less than 12 diameter inches should be hand excavated within 6 feet of tree trunks
2. Carefully expose roots without damaging bark coverings or shattering wood fibers
 - a. Roots should be located using non-invasive procedures. Exploration can be done either by hand, using small tools, or an AirSpade®. This tool uses compressed air to displace soil without damage to roots.
 - b. Once exposed, the roots can be examined, and determinations can be made regarding the feasibility of root removal or root severance.
 - c. If roots need to be pruned the following procedures shall be employed:
3. Post excavation root pruning is to be performed by skilled labor. Roots are to be pruned cleanly. Bark should adhere to the wood without tearing. Wood fibers should remain intact without shattering. The following tools should be used:
 - a. Hand-pruners
 - b. Loppers
 - c. Handsaw
 - d. Reciprocating saw
 - e. Chainsaw
4. When completed, the pruned portions should be covered with burlap or similar material and kept moist until backfilled.

Measurement and Payment-The contract lump sum price paid for “Clearing and Grubbing” shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all work involved in performing clearing and grubbing complete in place, including limb and root pruning, existing stumps, and rock wall, as shown on the plans, as specified in the Standard Specifications, and these Special Provisions.

10-2.08 EARTHWORK

The work performed in connection with “Grading” shall conform to the provisions in Section 17, “Clearing and Grubbing” and Section 19, “Earthwork” of the Standard Specifications and these special provisions.

Submittals

Test Reports: Submit gradation tests for all furnished material.

Materials

- A. Satisfactory Soils: Sand, gravel, friable earth, or non-expansive clays, subject to Testing Laboratory's approval. Fill and backfill material shall be free of organic material, slag, cinders, expansive soils, trash or rubble and stones having maximum dimension greater than 6 inches. Soil shall be free of regulated contaminants as defined by the California Environmental Protection Agency.

- B. Unsatisfactory Soils: Expansive and other soils containing organic material, slag, cinders, trash or rubble and stones having maximum dimension greater than 6 inches. Unsatisfactory materials also include soils not maintained within 2 percent of optimum moisture content at time of compaction.

Execution

- A. Preparation –
 - 1. Notify the Engineer at least 48 hours before beginning any excavation.
 - 2. Notify Underground Service Alert (USA) at 1-800-227-2600 at least 48 hours before beginning excavation work and have it locate and mark the facilities within the area of excavation. Notify utility companies which do not participate in USA which have underground facilities within the limits of work before beginning excavation work in accordance with each utility's notification requirements and have them locate and mark the facilities within the area of excavation. Keep marking current in accordance with the requirements of USA and other utility companies.
 - 3. Do not proceed with underground installations until related pothole work has been completed. Determine the method and equipment required to perform potholing without damage to existing facilities. Locate existing facilities by hand digging where necessary. At a minimum, the Contractor shall utilize hand digging where recommended by Call USA guidelines. In addition to hand digging, the Contractor shall use means of potholing required by the facility owner and the Engineer.
 - 4. Notify the Engineer immediately of any conflicts in which there is less than one foot of separation between the existing and proposed facility.
 - 5. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 - 6. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface shall conform to Section 16, "Clearing and Grubbing" of the Standard Specifications.
 - 7. Protect and maintain erosion and sedimentation controls, as specified in Section 10-2.06, "Temporary Water Pollution Control and Erosion Control" of these special provisions.

- B. Excavation
 - 1. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, except as directed by the Engineer based upon the Contractor's arborist recommendations. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

2. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 3. Excavation Drainage: Operate pumping equipment, and/or provide other materials, means and equipment as required to keep excavation free of water and subgrade dry, firm, and undisturbed until approval of permanent work has been received from Resident Engineer. Approval by the Engineer is also required before placement of the permanent work on all subgrades.
- C. Excavation for Walks and Roadway Pavements-
1. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.
 2. Below proposed roadway pavement scarify and re-compact top 8" thick minimum native soil to 95 percent relative compaction.
- D. Excavation for Conduits and Utility Trenches
1. Excavate trenches to indicated gradients, lines, depths, and elevations.
 2. Excavate trenches to uniform widths to provide 6 inch clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
 3. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 4. Excavate trenches at least 6 inches deeper than elevation required in rock or other unyielding bearing material, at least 4 inches deeper elsewhere, to allow for bedding course.
- E. Subgrade Inspection
1. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 2. Reconstruct subgrades damaged by rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.
- F. Storage of Soil Materials
1. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 2. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
- G. Utility Trench Backfill
1. Place backfill on subgrades free of mud and standing water.
 2. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
 3. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the utility pipe or conduit.
 4. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
 5. Place and compact final backfill of satisfactory soil to final subgrade elevation.
 6. Install warning tape directly above utilities, minimum 6 inches above top of pipe, minimum 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

H. Soil Moisture Control

1. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
2. Do not place backfill or fill soil material on surfaces that are muddy.
3. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

I. Compaction of Soil Backfills and Fills

1. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
2. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.
3. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
4. Retain applicable subparagraphs below. Percentages of maximum dry unit weight are examples only; revise to suit Project.
5. Under pavements, scarify and re-compact top 8 inches of existing subgrade and each layer of backfill or fill soil material to 95 percent.
6. Under walkways, scarify and re-compact top 8 inches below subgrade and compact each layer of backfill or fill soil material to 95 percent.
7. Under lawn or unpaved areas, scarify and re-compact top 8 inches below subgrade and compact each layer of backfill or fill soil material to 85 percent.
8. For utility trenches, compact each layer of initial and final backfill soil material to 95 percent.

J. Grading

1. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
2. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within tolerances specified in Section 19-1.03C, "Grade Tolerance" of the Standard Specifications.

K. Base Courses

- A. Place base course on subgrades free of mud, and standing water frost, snow, or ice.
- B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
 - a. Shape base course to required crown elevations and cross-slope grades.
 - b. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 90 percent of maximum dry unit weight according to ASTM D 1557.

L. Field Quality Control

1. Testing Agency: Contractor will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.
2. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
3. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other

footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

4. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.
5. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; compact and retest until specified compaction is obtained.

M. Protection

1. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
2. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
3. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
4. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

N. Disposal of Surplus and Waste Materials

1. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it.

Measurement and Payment- Full compensation for conforming to the provisions of this section shall be considered as included in the various contract items, and no additional allowance will be made therefore.

10-2.09 REMOVE THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKING

The work performed in connection with "Remove Thermoplastic Traffic Stripe and Pavement Marking" shall conform to the provisions in Sections 10-1.02D "Traffic Stripes, Pavement Markings, and Pavement Markers", and 84-2, "Traffic Stripes and Pavement Markings" of the Standard Specifications and shall consist of removing existing traffic stripe, pavement markings and pavement markers, and in conformance with designs and details shown on the plans and these special provisions.

Measurement and Payment-The quantity for "Remove Thermoplastic Traffic Stripe" shall be measured by linear foot. Payment for this item is for the actual length of striping removed and does not include measurement of gaps between existing stripes. The contract price paid per linear foot for "Remove Thermoplastic Traffic Stripe" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work as shown on the plans and as specified in the Standard Specifications and these special provisions.

The contract price paid per square foot for "Remove Thermoplastic Pavement Marking" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.10 RELOCATE MAILBOX

The work performed in connection with "Relocate Mailbox" shall conform to the provisions in Section 78-21, "Resetting and Relocating Mailboxes" of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

The Contractor shall supply new mailbox posts should the existing posts are not re-usable for relocation. The Contractor shall notify the local postmaster general at least 2 working days prior to performing construction operations:

Capitola Post Office, 826 Bay Avenue, Capitola CA 95010 Telephone: (831) 475-5948

Measurement and Payment- The unit price paid per each "Relocate Mailbox" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work as shown on the plans, as specified in the Standard Specifications, and these special provisions and no additional allowance will be made therefore.

10-2.11 ADJUST SEWER UTILITY MANHOLE COVER TO GRADE, ADJUST WATER UTILITY MANHOLE COVER TO GRADE, AND ADJUST WATER VALVE / WATER METER BOX COVER TO GRADE

The work performed in connection with "Adjust Sewer Utility Manhole Cover to Grade", "Relocate Water Utility Manhole Cover to Grade", and "Adjust Water Valve / Water Meter Box Cover to Grade" shall conform to the provisions in Section 17-5.03B, "Frames, Covers, Grates, and Manholes," Section 5-1.30, "Noncompliant and Unauthorized Work," of the Standard Specifications, and shall consist of adjusting or relocating existing water valves and covers to finish grade, and in conformance with designs and details shown on the plans and these special provisions.

The Contractor shall contact City of Santa Cruz Water Department (SCWD) for coordination and requirements of water valve, meter box, and in-line water main adjustments at the following phone number:

City of Santa Cruz Water Department Telephone: (831) 420-5200

The Contractor shall be solely responsible for coordinating with City of Santa Cruz Water Department before water utilities are adjusted and shall attend a pre-construction meeting with SCWD to review water system work requirements. If water utilities are needed to be shut down due to construction activities, the Contractor shall submit a shutdown notice least 5 working days prior to beginning construction operations.

The following work shall be performed in accordance with the Santa Cruz Water Department (SCWD) Water System Standard Specifications dated December 2009, and as instruction herein. SCWD Standard Specifications and Standard Plans are available at:

<http://www.cityofsantacruz.com/government/city-departments/water/engineering/standard-specifications>

Measurement and Payment-The quantity for "Adjust Water Valve / Water Meter Box Cover to Grade" shall be measured by each (EA) unit as set forth in the Bid Proposal. The contract unit price paid for "Adjust Water Valve / Water Meter Box Cover to Grade" shall include full compensation for furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved in adjusting existing water valve covers to finish grade, complete in place, as shown on the plans and these special provisions.

The quantity for "Adjust Water Utility Manhole Cover to Grade" shall be measured by each (EA) unit as set forth in the Bid Proposal. The contract unit price paid for "Adjust Water Utility Manhole Cover to Grade" shall include full compensation for furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved in adjusting existing water valve covers to finish grade, complete in place, as shown on the plans and these special provisions.

The quantity for “Adjust Sewer Utility Manhole Cover to Grade” shall be measured by each (EA) unit as set forth in the Bid Proposal. The contract unit price paid for “Adjust Sewer Utility Manhole Cover to Grade” shall include full compensation for furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved in adjusting existing water valve covers to finish grade, complete in place, as shown on the plans and these special provisions.

10-2.12 REMOVE CULVERT

The work performed in connection with “Remove Culvert” shall conform to the provisions in Sections 15, “Existing Facilities,” and 71, “Existing Drainage Facilities” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Where shown on the plans, existing pipes and culverts shall be completely removed and disposed of outside the right-of-way.

Measurement and Payment- The contract unit price per linear foot (LF) paid for “Remove Culvert” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in removing the existing pipe in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

10-2.13 COLD PLANE ASPHALT CONCRETE PAVEMENT

The work performed in connection with “Cold Plane Asphalt Concrete Pavement” shall conform to the provisions in Section 39-3.04 “Cold Planning Asphalt Concrete Pavement” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Measurement and Payment- The contract unit price paid per square yard for “Cold Plane Asphalt Concrete Pavement” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

10-2.14 ROADWAY EXCAVATION

The work performed in connection with “Roadway Excavation” shall conform to the provisions in Sections 15, “Existing Facilities,” and 19-2, “Roadway Excavation” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Work included in “Roadway Excavation” shall include, but not be limited to:

1. Sawcutting – Asphalt and Concrete Pavement.
2. The removal and disposal of existing asphalt pavement, PCC sidewalks, PCC pavement, curb and gutter, dikes and as identified on the plans.
3. Excavating and off-hauling demolished material.
4. Removal and disposal of other materials necessary to accommodate the proposed work, including but not limited to:
 - a. Roadside signs and delineators
 - b. Existing vegetation
 - c. Other items not shown on the plans.

Contractor shall take precautionary measures to protect the existing improvements and landscaping to remain in place. Replacement and/or repair of these existing improvement resulting from damage by the Contractor will be done at the Contractor’s sole expense.

Prior to demolition Contractor shall inspect the site to confirm limits and removal as shown on the plans. The drawings do not purport to show all objects existing on the site. Before commencing the demolition work, the Contractor shall verify with the Engineer all objects to be removed and all objects to be preserved.

Contractor shall provide the protections necessary to prevent damage to existing improvements, and existing utilities, indicated to remain in place. Contractor shall protect improvements and landscaping on adjoining properties. All damaged improvements and landscaping shall be replaced or restored to their original condition at the Contractor’s sole expense in conformance with Section 5-1.39 “Damage Repair and Restoration,” of the Standard Specifications.

Contractor shall sawcut asphalt and concrete pavement in a neat line along the edge of the portions to remain prior to removal. Sawcuts shall be smooth and vertical.

All concrete, AC pavement, and aggregate base shall be hauled off site and disposed of in a legal matter at the Contractor’s sole expense.

Measurement and Payment-The contract unit price paid per cubic yard for “Roadway Excavation” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in performing roadway excavation complete in place, including excavating, sloping, rounding, loading, hauling, disposal, depositing, spreading, compacting and preparing subgrade, as shown on the plans, as specified in the Standard Specifications and these Special Provisions. This item of work is a “Final Pay Item” as defined in Section 2-1.02C of the Standard Specifications.

10-2.15 HOT MIX ASPHALT (TYPE A)

Section 39 of the Standard Specifications is deleted in its entirety and replaced with the version of Section 39 contained in the Appendix to these special provisions.

Add to section 39-1.02C:

- 1. Use for HMA Type A including Air Perm mix

Asphalt binder used in HMA Type A must be PG 64-10.

Add to section 39-1.02E:

- 1. Use for HMA Type A. Use 1/2-inch in most cases except as described in Para 2 or a very thin overlay less than 0.13' thickness - then use 3/8". Specify the aggregate gradation using the titles in the tables in section 39-1.02E. Use the following table for Standard construction process projects to determine the grading and minimum/maximum lift thickness.

Specified total thickness range	Gradation
At least 0.08 foot and <0.13 foot	3/8-inch
At least 0.13 foot and <0.20 foot	1/2-inch
0.20 foot and above	3/4-inch

Aggregate used in HMA Type A must comply with the 1/2-inch HMA Types A.

Measurement and Payment-The contract unit price paid per ton for “Hot Mix Asphalt (Type A)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing

all work involved in placing “Hot Mix Asphalt (Type A)” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.16 AGGREGATE BASE (CLASS 2)

The work performed in connection with “Aggregate Base (Class 2)” and “Gravel Backfill” shall conform to the provisions in Section 26, “Aggregate Bases,” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Measurement and Payment-The contract unit price paid per cubic yard for “Aggregate Base (Class 2)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in placing “Aggregate Base (Class 2)” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

The contract unit price paid per cubic yard for “Gravel Backfill” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in placing “Gravel Backfill” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.17 FULL DEPTH RECLAMATION

The work performed in connection with “Full Depth Reclamation (FDR-C)” and “Full Depth Reclamation - Cement” shall conform to the provisions in Section 30-4, “Full Depth Reclamation - Cement,” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Geotechnical Investigation – Design Phase, prepared by Butano Geotechnical Engineers, Inc., is provided for additional information. The finished grade of the installed HMA pavement within the FDR-C section, as shown on the plans, is to conform to the existing lip of gutter. The post-construction roadway grade is to match the existing, preconstruction roadway grade.

Contractor shall determine the final lime/cement ratio of the FDR-C mix design prior to construction and submit mix design to the Engineer. Contractor shall remove existing material, as needed according to the Contractor-submitted and City approved FDR-C mix design, accounting for proposed HMA design section and swell associated with FDR-C material processing. Contractor shall adjust existing pavement material removal, as necessary, based on Contractor-submitted mix design.

Add to section 30-4.02A:

Quicklime Plus (QLP) work consists of mixing in-place material with Quicklime Plus and water, including spreading, mixing, and compacting the mixture as specified in these specifications.

Materials

- A. In-place material shall be the native material containing no rocks or solids larger than 4 inches in any dimension. Removing and disposing of said rocks or solids larger than 4 inches will be paid for as extra work.
- B. Quicklime Plus – Quicklime Plus (QLP) is a mixture of Quicklime and General Use Ordinary Portland Cement. The Quicklime Plus shall be protected from moisture until used and be sufficiently dry to flow freely when handled. The certificate of compliance is printed on each delivery tag.

- C. Water shall be clean and potable and shall be added as needed during mixing and re-mixing operations, during compacting, during the curing period, and to keep the cured material moist until covered.

Add to section 30-4.03D:

Proportioning / Spreading

- A. The QLP shall be spread in one operation to the required width, grade and cross section. QLP shall be evenly spread at the designated rate. Only a calibrated spreader able to provide a uniform distribution of the QLP throughout the treatment area shall spread the QLP. The lime and cement components shall not be spread separately.
- B. Tailgate spreading of the QLP will not be permitted. Tailgating is defined as having manual control of the spread rate, instead of automatic computer control. The spreader truck shall demonstrate the ability to maintain a consistent spread rate over variable travel speeds.
- C. The contractor shall demonstrate the consistency of the spread rate and shall conduct a "pan test" in the presence of the engineer.
- D. Quicklime Plus to be mixed with the native material shall be furnished in bulk.
- E. The Quicklime Plus shall be added in a dry state and every precaution shall be taken to prevent dusting. The spreading operations shall be conducted in such a manner that a hazard is not present to construction personnel or the public.
- F. The spreading equipment shall have an operating baghouse with a positive vacuum system to mitigate the release of any fugitive dust.
- G. The rate of QLP spread shall not vary more than +/-Five (5) percent from the designated rate.
- H. It is recommended that 3 percent lime and 3 percent cement mix be used for bidding purposes. The soil lime/cement mixture shall achieve a minimum unconfined compressive strength of 300 psi at 28 days. The exact ratios required to achieve the design strength of 300 psi shall be determined by the contractor prior to construction. The contractor should employ the services of the geotechnical engineer of record to determine the exact lime/cement ratios.
- I. All QLP spread shall be thoroughly mixed into the soil within the same day Quicklime Plus spreading operations are performed.
- J. In areas where mixer cannot access, such as around manholes or curbs, the grading contractor shall process the material the same day by pulling the material away from obstacles immediately after initial mixing.
- K. No traffic other than the mixing equipment or other related construction equipment will be allowed to pass over the spread Quicklime Plus until after completion of mixing.

Add to section 30-4.03E:

Mixing / Re-mixing

- A. The mixer machine shall be a cross-shaft type mixer capable of providing a uniform homogeneous mixture throughout the depth indicated on the plans.

- B. The mixer machine shall be capable of automatically adjusting itself to maintain a constant depth.
- C. The Engineer shall determine the depth of treatment during and after the mixing operations. Mixing equipment shall be equipped with a visible depth indicator showing mixing depth, an odometer or foot meter to indicate travel speed, and a controllable water additive system for regulating water added to the mixture.
- D. Mixing equipment shall be of the type that can mix the full depth of the desired thickness and leave a relatively smooth bottom of the treated section. Mixing and re-mixing, regardless of equipment used will continue until the material is uniformly mixed, free of streaks or pockets of reagent.
- E. The treated material moisture content shall be approximately 3 percent over optimum and all material other than rock or aggregate will be $1 \frac{1}{2}$".
- F. Non-uniformity of color reaction when the treated material, exclusive of one inch or larger clods, is tested with the standard phenolphthalein alcohol indicator, will be considered evidence of inadequate mixing.
- G. Treated material shall not be mixed or spread while the soil temperature is below 40 F or below 1.67 C.
- H. The final mixing and initial compaction shall not be performed prior to the designated number of mellowing hours. The mellowing period shall be a minimum of 16 hours. The entire mixing operation shall be completed within 48 hours of the initial spreading of Quicklime Plus, unless otherwise permitted by the Engineer.

Add to section 30-4.03F:

Compacting

- A. The Quicklime Plus treated soils shall be compacted to a minimum relative compaction of 95% as determined by ASTM 1556, ASTM 1557 based on wet density and shall be completed after the mellowing period and second mixing.
- B. The maximum compacted thickness of a single layer may be any thickness the contractor can demonstrate to the Engineer that his equipment and method of operation will provide the required compacted density the layer.
- C. Initial compaction shall be performed by means of segmented sheepsfoot compactor. Final rolling shall be by means of steel-tired or pneumatic-tired rollers. Areas inaccessible to rollers shall be compacted to the required compaction by other means satisfactory to the Engineer.
- D. Compaction testing by nuclear gauge will be calibrated for inaccurate moisture readings as per the manufacturer owner's manual. Any compaction issues will be moderated by the use of a sand cone.

Add to section 30-4.03G:

Curing

- A. The surface of each compacted layer of treated material shall be kept moist until covered by a subsequent layer (“moist blanket cure”, i.e. base rock). If the treated section is to be exposed for more than 4 days, then a curing seal may be considered. The cure seal shall consist of SS or CSS grade asphaltic emulsion and can be applied as an option to continued water curing after the initial 3 days.
- B. Curing seal shall be applied at a rate of between 0.45- and 0.90-L per square meter of surface. Curing seal shall not be placed when the atmospheric temperature is below 5°C.

Measurement and Payment-The contract unit price paid per square yard for “Full Depth Reclamation (FDR-C)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in placing “Full Depth Reclamation (FDR-C)” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions. The removal and pulverization of existing asphalt pavement and underlying material used for “Full Depth Reclamation (FDR-C)” shall be considered as included in the prices paid for the various contract items and no additional compensation shall be allowed therefore.

The contract unit price paid per cubic yard for “Cement (Full Depth Reclamation - Cement)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in placing “Full Depth Reclamation - Cement” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.18 STRESS ABSORBING MEMBRANE INTERLAYER

The work performed in connection with “Stress Absorbing Membrane Interlayer (SAMI)” shall conform to the provisions in Section 37-2.05, “Stress Absorbing Membrane Interlayers” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions. Contractor to provide material submittal for City approval.

Measurement and Payment-The contract unit price paid per square yard for “Stress Absorbing Membrane Interlayer (SAMI)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in placing “Stress Absorbing Membrane Interlayer (SAMI)” complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.19 MINOR CONCRETE

The work performed in connection with “Minor Concrete” shall conform to the provisions in Sections 73, “Concrete Curbs and Sidewalks” and 90 “Concrete” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Work included in “Minor Concrete” shall include, but not be limited to:

1. Curb and Gutter
2. Sidewalk
3. Curb Ramp
4. Median Curb
5. Depressed Driveway per City of Capitola Standard Drawings
6. Driveway Conform specified on the plans

Measurement and Payment- The contract unit price paid per linear foot for “Minor Concrete (Curb and Gutter)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing curb and gutter complete in place as shown on the plans and

as specified in the Standard Specifications and these special provisions. The quantity of curb and gutter shall include that portion of the curb and gutter depressed for curb ramps and no additional allowance will be made, therefore.

The contract unit price paid per linear foot for “Minor Concrete (Curb Type D)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing curb and gutter complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

The contract unit price paid per square foot for “Minor Concrete (Curb Ramp)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing curb ramps complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

The contract unit price paid per square foot for “Minor Concrete (Sidewalk)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing sidewalks complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

The contract unit price paid per square foot for “Minor Concrete (Depressed Driveway)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing sidewalks complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions. The quantity of depressed driveway shall include that portion of the sidewalk depressed within the driveway and no additional allowance will be made, therefore.

The contract unit price paid per square foot for “Minor Concrete (Driveway Conform)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing driveway complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions.

10-2.20 ROADSIDE SIGN AND RESET ROADSIDE SIGN

The work performed in connection with “Roadside Sign (One Post – Metal)” and “Relocate Roadside Sign” shall comply with Section 82, “Signs and Markers” and Section 15, “Existing Facilities,” of the Standard Specifications, the 2014 California Manual on Uniform Traffic Control Devices (MUTCD) Revision 3, and in conformance with designs and details shown on the plans and these special provisions.

Submittals

- A. Certificate of compliance shall be provided for all products and materials proposed to be used under this section.

Materials

- A. Sign Plates: Roadside sign faces shall be “retro-reflective sheeting material adhered to 0.080 gauge minimum) anodized aluminum blank. The size, shape, color and legend of the sign shall conform to Section 82-2, “Sign Panels” of the Standard Specifications.
- B. Sign Posts: Sign Posts and Hardware: As shown on the Plans and specified in Section 82-3, “Roadside Signs,” of the Caltrans Standard Specifications.

Execution

A. Remove Roadside Sign

Existing roadside signs and sign posts shall be removed as shown on the plans. Contractor shall coordinate signs to be salvaged with the Engineer. Contractor shall dispose of all roadside signs that are not to be relocated or salvaged at the Contractor’s expense.

Existing roadside signs shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

B. Roadside Sign Relocation and Installation

Contractor shall provide and install roadside signs at locations shown on the Plans. The Contractor shall install new and relocated roadside signs on new posts and with new hardware and footings as detailed on the plans.

Installation and relocation of signs shall comply with Section 82-3, “Roadside Signs,” of the Standard Specifications.

Measurement and Payment- The contract unit price paid per each "Reset Roadside Sign" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work as shown on the plans, as specified in the Standard Specifications, and these special provisions and no additional allowance will be made therefore.

The contract unit price paid per each "Roadside Sign (One Post - Metal)" shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work as shown on the plans, as specified in the Standard Specifications, and these special provisions and no additional allowance will be made therefore.

10-2.21 THERMOPLASTIC TRAFFIC STRIPE AND PAVEMENT MARKINGS

The work performed in connection with “Thermoplastic Traffic Stripe” and “Thermoplastic Pavement Marking” shall conform to the provisions in Section 84-2, “Traffic Stripes and Pavement Markings,” of the Standard Specifications and shall consist of reinstalling thermoplastic stripes, pavement markings, glass beads, and in conformance with designs and details shown on the plans and these special provisions.

Paint traffic stripes (traffic lines) and pavement markings in accordance with the provisions in Sections 84-1, “General,” and 84-2, “Traffic Stripes and Pavement Markings,” of the Standard Specifications and as indicated on the Plans.

Thermoplastic material for pavement markings shall be applied at a thickness of 0.100-inch. Thermoplastic pavement markings shall not be installed on pavement markers, manhole and water valve covers, survey monuments, and any utility facilities. Crosswalk markings near schools shall be yellow thermoplastic marking per California MUTCD and CVC 21368.

Replace section 84-1.03:

Cat tracking approval is required. City needs 48 hours’ notice and 48 hours to review.

Measurement and Payment- The contract unit price paid per linear foot for “Thermoplastic Traffic Stripe” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the thermoplastic traffic stripe in place as shown on the plans and as

specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

The payment quantity for a traffic stripe is the length measured along the line of the traffic stripe without deductions for gaps in the broken traffic stripe. A double extruded thermoplastic traffic stripe consisting of two 6-inch-wide yellow stripes is measured as 2 traffic stripes. A double sprayable thermoplastic traffic stripe consisting of two 6-inch-wide yellow stripes is measured as 1 traffic stripe. A double traffic stripe consisting of two 6-inch-wide yellow stripes separated by a 3-inch-wide black stripe is measured as a single traffic stripe.

The contract unit price paid per square foot for “Thermoplastic Pavement Marking” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the thermoplastic traffic stripe in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

Thermoplastic material applied in excess of the thickness specified herein these special provisions shall not be paid for.

10-2.22 THERMOPLASTIC PAVEMENT MARKING (GREEN)

The work performed in connection with “Thermoplastic Pavement Marking (Green)” shall conform to the provisions in Section 84-2, “Traffic Stripes and Pavement Markings,” of the Standard Specifications and shall consist of reinstalling thermoplastic stripes, pavement markings, glass beads, and in conformance with designs and details shown on the plans and these special provisions.

General-

- A. Use a durable, high skid resistant, retroreflective pavement marking material suitable for use as bike path, roadway, intersection, airport, commercial, or private pavement delineation and markings.
- B. The material shall be a resilient light green color thermoplastic product, the surface of which must contain glass beads and abrasives in an alternating pattern optimizing both skid resistance and retro reflectivity.
- C. The material shall be resistant to the detrimental effects of motor fuels, lubricants, hydraulic fluids etc.
- D. The material shall be capable of being affixed to bituminous and/or Portland cement concrete pavements by the use of the normal heat of a propane torch.
- E. The material shall be capable of conforming to pavement contours, breaks and faults through the action of traffic at normal pavement temperatures. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastic.
- F. The material shall not have minimum ambient and road temperature requirements for normal application, storage, or handling. When manufacture’s standard application procedures require the use of a 2-component sealer, the material shall be capable of being applied with a compatible 2-component sealer recommended by the manufacturer, at a minimum ambient and surface temperatures of 45 degrees Fahrenheit without any special storage, preheating, or treatment of the material before application.
- G. The manufacturer must be ISO 9001:2008 certified and provide proof of current certification. The scope of the certification shall include manufacture of reflective highway markings.

Materials-

- A. The pavement marking material must be composed of an ester modified resin resistant to degradation by motor fuels, antifreeze, lubricants, etc. in conjunction with aggregates, pigments, binders, abrasives, and glass beads which have been factory produced as a finished product and meets the requirements of the current edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. The thermoplastic material shall conform to AASHTO designation M249-79 (98) with the exception of the relevant differences due to the material being supplied in a preformed state.
- B. Graded Glass Beads:
1. The material must contain a minimum of thirty percent (30%) intermixed graded glass beads by weight. The intermixed beads shall be clear and transparent. Not more than twenty percent (20%) consists of irregular fused spheroids, or silica. The index of refraction shall not be less than 1.50.
 2. The material must have factory applied coated surface beads and abrasives in addition to the intermixed beads at a rate of ½ lb. (± 20%) per 11 square feet. The surface beads and abrasives must be applied in an alternating arrangement across the surface of the material so that the surface is covered in what is best described as a “checkerboard” pattern of glass beads and abrasive materials. The abrasive material must have a minimum hardness of 7 (Mohs scale). The factory applied coated surface beads shall have the following specifications:
 - i. Minimum 80% rounds
 - ii. Minimum refractive index of 1.50
 - iii. Minimum SiO2 content of 70%
 - iv. Maximum Iron content of 0.1%

Size Gradation		%	%
US Mesh	Um	Retained	Passing
12	1700	0-2	98-100
14	1400	0-6	94-100
16	1180	1-21	79-99
18	1000	28-62	38-72
20	850	62-71	29-38
30	600	67-77	23-33
50	300	86-95	5-14
80	200	97-100	0-3

- C. Pigments (Light Green):
1. The material shall be manufactured with appropriate pigment to ensure that the resulting colors complies with the Light Green color as specified in the FHWA Memorandum dated April 15th, 2011: Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14)
 2. Daytime chromaticity coordinates for the color used for green colored pavement shall be as follows:

1		2		3		4	
X	Y	X	Y	X	Y	X	Y
0.230	0.754	0.226	0.500	0.367	0.500	0.444	0.555

3. Night time chromaticity coordinates for the color used for green colored pavement shall be as follows:

1	2	3	4

X	Y	X	Y	X	Y	X	Y
0.230	0.754	0.336	0.540	0.450	0.500	0.479	0.520

4. The pigment system must not contain heavy metals or any carcinogen, as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant Federal Regulations.
- D. Heating Indicators: The top surface of the material shall have regularly spaced indents. The closing of these indents during application shall act as a visual cue that the material has reached a molten state allowing for satisfactory adhesion and proper bead embedment and as a post-application visual cue that the application procedures have been followed.
 - E. Skid Resistance: The surface of the preformed retroreflective marking materials, wherein every other shaped portion contains glass beads, or abrasives with a minimum hardness of 7 (Mohs scale), shall upon application provide a minimum skid resistance value of 60 BPN when tested according to ASTM: E 303.
 - F. Thickness: The material must be supplied at a minimum thickness of 90 mils (2.29 mm)
 - G. Retroreflectivity: The preformed retroreflective marking materials, upon application, shall exhibit adequate and uniform night time retroreflectivity of 50 mcd-m-2-lx-1 when measured using a Delta LTL 2000 or LTL-X Retroreflectometer using the ASTM E1710 method. Note: Initial retroreflection and skid resistance are affected by the amount of head applied during installation. When ambient temperatures are such that greater amounts of heat are required for proper installation, initial retroreflection and skid resistance levels may be affected.
 - H. Environmental Resistance: The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to oil and gasoline.
 - I. Abrasives: The abrasives and surface beads must be applied in an alternating arrangement across the surface of the material so that the surface is covered in what is best described as a “checkerboard” pattern of glass beads and abrasive materials. The abrasive material must have a minimum hardness of 7 (Mohs scale).
 - J. Sealer: A two-component sealer must be used for the installation of preformed thermoplastic material.
 1. Use a two-component epoxy sealer to enhance the bond strength between the substrate (Portland cement concrete or asphalt) and preformed thermoplastic materials made from resins and/or polymers and inorganic fillers. The sealer must be environmentally friendly and contain no VOC solvents. The sealer must bond to dry and damp surfaces. The sealer must have a low viscosity that allows it to penetrate into concrete and in particular penetrate through laitance, if present.
 2. To allow application area to be re-opened to traffic, the sealer must cure rapidly. During a normal application process the sealer will have cured and bonded to the preformed thermoplastic material in less than 10 minutes. To allow for work time for corrective positioning of the performed thermoplastic material, the sealer must have a gel time of at least 20 minutes at 80 degrees Fahrenheit

Application-

- A. Asphalt: The material shall be capable of being applied using the propane torch method recommended by the manufacturer, without minimum requirements for ambient and road temperatures, and without any preheating of the pavement to a specified temperature. The material

- shall be capable of being applied without the use of a thermometer. The pavement shall be clean, dry, and free of debris. Supplier must enclose application instructions with each box/package.
- B. Portland Concrete: The same application procedure shall be used as described under the “Asphalt” section; however, a compatible primer sealer, recommended by the manufacturer, shall be applied to the surface prior to the application of materials to ensure proper adhesion.
 - C. Packaging: the preformed thermoplastic markings shall be placed in protective plastic film with cardboard stiffeners where necessary to prevent damage in transit. Linear material must be cut to a maximum of 3-foot long pieces. Legends and symbols must also be supplied in flat pieces. The cartons shall be non-returnable, shall not exceed 40 inches in length and 25 inches in width, and be labeled for ease of identification. The weight of the individual carton must not exceed seventy (70) pounds. A protective film around the box must be applied in order to protect the material from rain or premature aging.
 - D. Sealer: The sealer shall be capable of being applied to the substrate either by brush, roller, or sprayer. It shall be capable of being applied in a thin, even, uniform coat. Each cartridge must be properly labeled and packed in a heat-sealed polyethylene bag.

Measurement and Payment- The contract unit price paid per square foot for “Thermoplastic Pavement Marking (Green)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the thermoplastic traffic stripe in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

Thermoplastic material applied in excess of the thickness specified herein these special provisions shall not be paid for.

10-2.23 REFLECTIVE PAVEMENT MARKER

The work performed in connection with “Reflective Pavement Marker (Type D)” shall conform to the provisions in Section 81-3, “Pavement Markers” of the Standard Specifications and these special provisions.

Measurement and Payment- The contract unit price paid per each “Reflective Pavement Marker (Type D)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the reflective pavement marker, in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

10-2.24 OBJECT MARKER

The work performed in connection with “Object Marker (Type OM2-2H)” shall conform to the provisions in Section 82-5, “Markers” of the Standard Specifications and these special provisions.

Measurement and Payment- The contract unit price paid per each “Object Marker (Type OM2-2H)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the object marker, in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

10-2.25 INDUCTIVE LOOP DETECTOR

The work performed in connection with “Inductive Loop Detector (Type A and Type D)” shall conform to the provisions in Sections 87, “Electrical Systems” of the Standard Specifications and in conformance with designs and details shown on the plans and these special provisions.

Measurement and Payment- The contract unit price paid per each “Inductive Loop Detector (Type A and Type D)” shall include full compensation for providing all labor, materials, equipment, tools, and incidentals and for doing all work involved in installing the loop detector complete in place as shown on the plans and as specified in the Standard Specifications and these special provisions and no additional allowance will be made therefore.

APPENDIX

SECTION 39 ASPHALT CONCRETE – CALTRANS STANDARD SPECIFICATIONS, 2010

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(COPY OF SECTION 39, CALTRANS STANDARD SPECIFICATIONS, 2010.)

39 HOT MIX ASPHALT

39-1 GENERAL

39-1.01 GENERAL

39-1.01A Summary

Section 39-1 includes general specifications for producing and placing HMA by mixing aggregate and asphalt binder at a mixing plant and spreading and compacting the HMA mixture.

HMA includes one or more of the following types:

1. Type A
2. Type B
3. OGFC, including HMA-O, RHMA-O, and RHMA-O-HB
4. RHMA-G

The HMA construction process includes one or more of the following:

1. Standard
2. Method
3. QC/QA

39-1.01B Definitions

coarse aggregate: Aggregate retained on a no. 4 sieve.

fine aggregate: Aggregate passing the no. 4 sieve.

supplemental fine aggregate: Aggregate passing the no. 30 sieve, including hydrated lime, Portland cement, and fines from dust collectors.

39-1.02 MATERIALS

39-1.02A Geosynthetic Pavement Interlayer

Geosynthetic pavement interlayer must comply with the specifications for pavement fabric, paving mat, paving grid, paving geocomposite grid, or geocomposite strip membrane.

39-1.02B Tack Coat

Tack coat must comply with the specifications for asphaltic emulsion or asphalts. Choose the type and grade.

Notify the Engineer if you dilute asphaltic emulsion with water. The weight ratio of added water to asphaltic emulsion must not exceed 1 to 1.

Measure added water either by weight or volume in compliance with section 9-1.02 or you may use water meters from water districts, cities, or counties. If you measure water by volume, apply a conversion factor to determine the correct weight.

With each dilution, submit:

1. Weight ratio of water to bituminous material in the original asphaltic emulsion
2. Weight of asphaltic emulsion before diluting
3. Weight of added water
4. Final dilution weight ratio of water to asphaltic emulsion

39-1.02C Asphalt Binder

Asphalt binder in HMA must comply with the specifications for asphalts or section 39-1.02D.

Asphalt binder for geosynthetic pavement interlayer must comply with the specifications for asphalts. Choose from Grades PG 64-10, PG 64-16, or PG 70-10.

39-1.02D Asphalt Rubber Binder

39-1.02D(1) General

Use asphalt rubber binder in RHMA-G, RHMA-O, and RHMA-O-HB. Asphalt rubber binder must be a combination of:

1. Asphalt binder
2. Asphalt modifier
3. CRM

The combined asphalt binder and asphalt modifier must be 80.0 ± 2.0 percent by weight of asphalt rubber binder.

39-1.02D(2) Asphalt Modifier

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

Asphalt Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Value
Viscosity, m ² /s (x 10 ⁻⁶) at 100 °C	ASTM D 445	X ± 3 ^a
Flash point, Cleveland Open Cup, °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 The symbol "X" is the proposed asphalt modifier viscosity. "X" must be from 19 to 36. A change in "X" requires a new asphalt rubber binder design.

Asphalt modifier must be from 2.0 to 6.0 percent by weight of the asphalt binder in the asphalt rubber binder.

39-1.02D(3) Crumb Rubber Modifier

CRM consists of a ground or granulated combination of scrap tire crumb rubber and high natural rubber. CRM must be 75.0 ± 2.0 percent scrap tire rubber and 25.0 ± 2.0 percent high natural rubber by total weight of CRM. Scrap tire crumb rubber must be from any combination of automobile tires, truck tires, or tire buffings.

Sample and test the scrap tire crumb rubber and high natural rubber separately. CRM must have the values for the quality characteristics shown in the following table:

Crumb Rubber Modifier for Asphalt Rubber Binder

Quality characteristic	Test method	Value
Scrap tire crumb rubber gradation (% passing no. 8 sieve)	LP-10	100
High natural rubber gradation (% passing no. 10 sieve)	LP-10	100
Wire in CRM (% max.)	LP-10	0.01
Fabric in CRM (% max.)	LP-10	0.05
CRM particle length (inch max.) ^a	--	3/16
CRM specific gravity ^a	California Test 208	1.1–1.2
Natural rubber content in high natural rubber (%) ^a	ASTM D 297	40.0–48.0

^a Test at mix design and for certificate of compliance.

CRM must be ground and granulated at ambient temperature. If steel and fiber are cryogenically separated, it must occur before grinding and granulating. If cryogenically produced, CRM particles must be large enough to be ground or granulated and not pass through the grinder or granulator.

CRM must be dry, free-flowing particles that do not stick together. CRM must not cause foaming when combined with the asphalt binder and asphalt modifier. You may add calcium carbonate or talc up to 3 percent by weight of CRM.

39-1.02D(4) Asphalt Rubber Binder Design and Profile

Submit a proposal for asphalt rubber binder design and profile. In the design, include the asphalt, asphalt modifier, and CRM and their proportions. The profile is not a performance specification and only serves to indicate expected trends in asphalt rubber binder properties during binder production. The profile must include the same component sources for the asphalt rubber binder used.

Design the asphalt rubber binder from testing you perform for each quality characteristic and for the reaction temperatures expected during production. The 24-hour (1,440-minute) interaction period determines the design profile. At a minimum, mix asphalt rubber binder components, take samples, and perform and record the tests shown in the following table:

Asphalt Rubber Binder Reaction Design Profile

Test	Minutes of reaction ^a							Limits
	45	60	90	120	240	360	1440	

Cone penetration @ 77 °F, 0.10-mm (ASTM D 217)	X ^b				X		X	25–70
Resilience @ 77 °F, percent rebound (ASTM D 5329)	X				X		X	18 min.
Field softening point, °F (ASTM D 36)	X				X		X	125–165
Viscosity, centipoises (LP-11)	X	X	X	X	X	X	X	1,500–4,000

^a Six hours (360 minutes) after CRM addition, reduce the oven temperature to 275 °F for 16 hours. After the 16-hour (1,320-minutes) cooldown after CRM addition, reheat the binder to the reaction temperature expected during production for sampling and testing at 24 hours (1,440 minutes).

^b "X" denotes required testing

39-1.02D(5) Asphalt Rubber Binder

After interacting for at least 45 minutes, asphalt rubber binder must have the values for the quality characteristics shown in the following table:

Asphalt Rubber Binder

Quality characteristic	Test for quality control or acceptance	Test method	Value	
			Minimum	Maximum
Cone penetration @ 77 °F, 0.10 mm	Acceptance	ASTM D 217	25	70
Resilience @ 77 °F, percent rebound	Acceptance	ASTM D 5329	18	--
Field softening point, °F	Acceptance	ASTM D 36	125	165
Viscosity @ 375 °F, centipoises	Quality control	LP-11	1,500	4,000

39-1.02E Aggregate

Aggregate must be clean and free from deleterious substances.

The specified aggregate gradation must be determined before the addition of asphalt binder and includes supplemental fine aggregate. The Department tests for aggregate grading under California Test 202, modified by California Test 105 if there is a difference in specific gravity of 0.2 or more between the coarse and fine parts of different aggregate blends.

Choose sieve size TV within each TV limit presented in the aggregate gradation tables.

The proposed aggregate gradation must be within the TV limits for the specified sieve sizes shown in the following tables:

**Aggregate Gradation
 (Percentage Passing)
 HMA Types A and B**

3/4-inch HMA Types A and B

Sieve sizes	TV limits	Allowable tolerance
1"	100	--
3/4"	90–100	TV ± 5
1/2"	70–90	TV ± 6
No. 4	45–55	TV ± 7
No. 8	32–40	TV ± 5
No. 30	12–21	TV ± 4
No. 200	2.0–7.0	TV ± 2

1/2-inch HMA Types A and B

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	—
1/2"	95–99	TV ± 6
3/8"	75–95	TV ± 6
No. 4	55–66	TV ± 7
No. 8	38–49	TV ± 5
No. 30	15–27	TV ± 4
No. 200	2.0–8.0	TV ± 2

3/8-inch HMA Types A and B

Sieve sizes	TV limits	Allowable tolerance
1/2"	100	--
3/8"	95–100	TV ± 6
No. 4	58–72	TV ± 7
No. 8	34–48	TV ± 6
No. 30	18–32	TV ± 5
No. 200	2.0–9.0	TV ± 2

No. 4 HMA Types A and B

Sieve sizes	TV limits	Allowable tolerance
3/8"	100	--
No. 4	95–100	TV ± 7
No. 8	72–77	TV ± 7
No. 30	37–43	TV ± 7
No. 200	2.0–12.0	TV ± 4

RHMA-G

3/4-inch RHMA-G

Sieve sizes	TV limits	Allowable tolerance
1"	100	—
3/4"	95–100	TV ± 5
1/2"	83–87	TV ± 6
3/8"	65–70	TV ± 6
No. 4	28–42	TV ± 7
No. 8	14–22	TV ± 5
No. 200	0–6.0	TV ± 2

1/2-inch RHMA-G

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	--
1/2"	90–100	TV ± 6
3/8"	83–87	TV ± 6
No. 4	28–42	TV ± 7
No. 8	14–22	TV ± 5
No. 200	0–6.0	TV ± 2

OGFC

1-inch OGFC

Sieve sizes	TV limits	Allowable tolerance
1 1/2"	100	—
1"	99–100	TV ± 5
3/4"	85–96	TV ± 5
1/2"	55–71	TV ± 6
No. 4	10–25	TV ± 7
No. 8	6–16	TV ± 5
No. 200	1.0–6.0	TV ± 2

1/2-inch OGFC

Sieve sizes	TV limits	Allowable tolerance
3/4"	100	--
1/2"	95–100	TV ± 6
3/8"	78–89	TV ± 6
No. 4	28–37	TV ± 7
No. 8	7–18	TV ± 5
No. 30	0–10	TV ± 4
No. 200	0–3.0	TV ± 2

3/8-inch OGFC

Sieve sizes	TV limits	Allowable tolerance
1/2"	100	--
3/8"	90–100	TV ± 6
No. 4	29–36	TV ± 7
No. 8	7–18	TV ± 6
No. 30	0–10	TV ± 5
No. 200	0–3.0	TV ± 2

Before the addition of asphalt binder and lime treatment, aggregate must have the values for the quality characteristics shown in the following table:

Aggregate Quality

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC

Percent of crushed particles Coarse aggregate (% min.) One fractured face Two fractured faces	California Test 205	90 75	25 --	-- 90	90 75
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face		70	20	70	90
Los Angeles Rattler (% max.) Loss at 100 rev. Loss at 500 rev.	California Test 211	12 45	-- 50	12 40	12 40
Sand equivalent (min.) ^a	California Test 217	47	42	47	--
Fine aggregate angularity (% min.) ^b	California Test 234	45	45	45	--
Flat and elongated particles (% max. by weight @ 5:1)	California Test 235	10	10	10	10

^a Reported value must be the average of 3 tests from a single sample.

^b The Engineer waives this specification if HMA contains less than 10 percent of nonmanufactured sand by weight of total aggregate. Manufactured sand is fine aggregate produced by crushing rock or gravel.

39-1.02F Reclaimed Asphalt Pavement

You may produce HMA Type A or B, using RAP. HMA produced using RAP must comply with the specifications for HMA, except aggregate quality specifications do not apply to RAP. You may substitute RAP aggregate for a part of the virgin aggregate in HMA in a quantity not exceeding 15.0 percent of the aggregate blend. Do not use RAP in OGFC and RHMA-G.

Assign the substitution rate of RAP aggregate for virgin aggregate with the JMF submittal. The JMF must include the percent of RAP used. If you change your assigned RAP aggregate substitution rate by more than 5 percent (within the 15.0 percent limit), submit a new JMF.

Process RAP from asphalt concrete. You may process and stockpile RAP during the entire project. Prevent material contamination and segregation. Store RAP in stockpiles on smooth surfaces free of debris and organic material. Processed RAP stockpiles must be only homogeneous RAP.

39-1.03 HOT MIX ASPHALT MIX DESIGN REQUIREMENTS

39-1.03A General

The mix design process consists of performing California Test 367 and laboratory procedures on combinations of aggregate gradations and asphalt binder contents to determine the OBC and HMA mixture qualities. The results become the proposed JMF.

Use the *Contractor Hot Mix Asphalt Design Data* form to record aggregate quality and mix design data. Use the *Contractor Job Mix Formula Proposal* form to present the JMF.

Laboratories testing aggregate qualities and preparing the mix design and JMF must be qualified under the Department's Independent Assurance Program. Take samples under California Test 125.

The Engineer reviews the aggregate qualities, mix design, and JMF and verifies and authorizes the JMF.

You may change the JMF during production. Do not use the changed JMF until it is authorized. Except if adjusting the JMF as specified in section 39-1.03E, perform a new mix design and submit a new JMF submittal if you change any of the following:

1. Target asphalt binder percentage
2. Asphalt binder supplier
3. Asphalt rubber binder supplier
4. Component materials used in asphalt rubber binder or percentage of any component materials
5. Combined aggregate gradation
6. Aggregate sources
7. Substitution rate for RAP aggregate of more than 5 percent
8. Any material in the JMF

For OGFC, submit a complete JMF submittal, except for asphalt binder content. The Department determines the asphalt binder content under California Test 368 within 20 days of your complete JMF submittal and provides you a *Caltrans Hot Mix Asphalt Verification* form.

39-1.03B Hot Mix Asphalt Mix Design

Perform a mix design that produces HMA with the values for the quality characteristics shown in the following table:

HMA Mix Design Requirements

Quality characteristic	Test method	HMA type		
		A	B	RHMA-G
Air void content (%)	California Test 367	4.0	4.0	Section 39-1.03B
Voids in mineral aggregate (% min.)	California Test 367	17.0	17.0	--
No. 4 grading		15.0	15.0	--
3/8" grading		14.0	14.0	18.0–23.0 ^a
1/2" grading		13.0	13.0	18.0–23.0 ^a
3/4" grading				
Voids filled with asphalt (%)	California Test 367	76.0–80.0	76.0–80.0	Note c
No. 4 grading		73.0–76.0	73.0–76.0	
3/8" grading		65.0–75.0	65.0–75.0	
1/2" grading		65.0–75.0	65.0–75.0	
3/4" grading				
Dust proportion	California Test 367	0.9–2.0	0.9–2.0	Note c
No. 4 and 3/8" gradings		0.6–1.3	0.6–1.3	
1/2" and 3/4" gradings				
Stabilometer value (min.) ^b	California Test 366	30	30	--
No. 4 and 3/8" gradings		37	35	23
1/2" and 3/4" gradings				

^a Voids in mineral aggregate for RHMA-G must be within this range.

^b California Test 304, Part 2.13.

^c Report this value in the JMF submittal.

Report the average of 3 tests. If the range of stability for the 3 briquettes is more than 8 points, prepare new briquettes and test again. The average air void content may vary from the specified air void content by ±0.5 percent.

39-1.03C Job Mix Formula Submittal

Each JMF submittal must consist of:

1. Proposed JMF on a *Contractor Job Mix Formula Proposal* form
2. Mix design records on a *Contractor Hot Mix Asphalt Design Data* form dated within 12 months of submittal
3. JMF verification on a *Caltrans Hot Mix Asphalt Verification* form, if applicable
4. JMF renewal on a *Caltrans Production Start-Up Evaluation* form, if applicable
5. MSDS for the following:
 - 5.1. Asphalt binder
 - 5.2. Base asphalt binder used in asphalt rubber binder
 - 5.3. CRM and asphalt modifier used in asphalt rubber binder
 - 5.4. Blended asphalt rubber binder mixture
 - 5.5. Supplemental fine aggregate except fines from dust collectors
 - 5.6. Antistrip additives

If the Engineer requests, sample the following materials in the presence of the Engineer and place in labeled containers weighing no more than 50 lb each:

1. Coarse, fine, and supplemental fine aggregate from stockpiles, cold feed belts, or hot bins. Samples must be at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for each type of supplemental fines. The Department combines these aggregate samples to comply with the JMF TVs submitted on a *Contractor Job Mix Formula Proposal* form.
2. RAP from stockpiles or RAP system. Samples must be at least 60 lb.
3. Asphalt binder from the binder supplier. Samples must be in two 1-quart cylindrical-shaped cans with open top and friction lids.
4. Asphalt rubber binder with the components blended in the proportions to be used. Samples must be in four 1-quart cylindrical-shaped cans with open top and friction lids.

Notify the Engineer at least 2 business days before sampling materials. For aggregate and RAP, split the samples into at least 4 parts. Submit 3 parts to the Engineer and use 1 part for your testing.

For HMA Type A or B produced under the QC/QA construction process, submit with the JMF submittal:

1. California Test 204 plasticity index results
2. California Test 371 tensile strength ratio results for untreated HMA
3. California Test 371 tensile strength ratio results for treated HMA if untreated HMA tensile strength ratio is below 70

For RHMA-G produced under the QC/QA construction process, submit with the JMF submittal:

1. California Test 371 tensile strength ratio results for untreated RHMA-G
2. California Test 204 plasticity index results on the aggregate blend if untreated RHMA-G tensile strength ratio is below 70
3. California Test 371 tensile strength ratio results for treated RHMA-G if untreated RHMA-G tensile strength ratio is below 70

For any HMA produced under the QC/QA construction process, submit the California Test 371 test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

39-1.03D Job Mix Formula Review

The Engineer reviews each mix design and proposed JMF within 5 business days from the complete JMF submittal. The review consists of reviewing the mix design procedures and comparing the proposed JMF with the specifications.

The Engineer may verify aggregate quality characteristics during this review period.

39-1.03E Job Mix Formula Verification

If you cannot submit a Department-verified JMF on a *Caltrans Hot Mix Asphalt Verification* form dated within 12 months before HMA production, the Engineer verifies the JMF.

Based on your testing and production experience, you may submit an adjusted JMF on a *Contractor Job Mix Formula Proposal* form before verification testing. JMF adjustments may include a change in the:

1. Asphalt binder content TV up to ± 0.6 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form, except for RHMA-G, do not adjust the TV for asphalt rubber binder below 7.0 percent
2. Aggregate gradation TVs within the TV limits specified in the aggregate gradation tables

For HMA Type A, Type B, and RHMA-G, the Engineer verifies the JMF from samples taken from HMA produced by the plant to be used. Notify the Engineer at least 2 business days before sampling materials.

In the Engineer's presence and from the same production run, take samples of:

1. Aggregate
2. Asphalt binder
3. RAP
4. HMA

Sample aggregate from cold feed belts or hot bins. Sample RAP from the RAP system. Sample HMA under California Test 125, except if you request and if authorized, you may sample from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

You may sample from a different project, including a non-Department project, if you make arrangements for the Engineer to be present during sampling.

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 split parts and keep 1 part for your testing.

The Engineer verifies each proposed JMF within 20 days of receiving all verification samples and the JMF submittal has been accepted. If you request, the Engineer verifies RHMA-G quality requirements within 3 business days of sampling. Verification is testing for compliance with the specifications for:

1. Aggregate quality
2. Aggregate gradation TVs within the TV limits
3. Asphalt binder content TV within the TV limit

4. HMA quality specified in the table HMA Mix Design Requirements except:
 - 4.1. Air void content, design value ± 2.0 percent
 - 4.2. Voids filled with asphalt, report only if an adjustment for asphalt binder content TV is less than ± 0.3 percent from OBC
 - 4.3. Dust proportion, report only if an adjustment for asphalt binder content TV is less than ± 0.3 percent from OBC

The Engineer prepares 3 briquettes from a single split sample. To verify the JMF for stability and air void content, the Engineer tests the 3 briquettes and reports the average of 3 tests. The Engineer prepares new briquettes if the range of stability for the 3 briquettes is more than 8 points.

The Engineer may use the briquettes used for stability testing to determine bulk specific gravity under California Test 308. If the same briquettes are used and the tests using bulk specific gravity fail, the Engineer prepares 3 new briquettes and determines a new bulk specific gravity.

If the JMF is verified, the Engineer provides you a *Caltrans Hot Mix Asphalt Verification* form.

If tests on plant-produced samples do not verify the JMF, the Engineer notifies you and you must submit a new JMF submittal or submit an adjusted JMF based on your testing. JMF adjustments may include a change in:

1. Asphalt binder content TV up to ± 0.6 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form except do not adjust the TV for asphalt rubber binder for RHMA-G below 7.0 percent
2. Aggregate gradation TVs within the TV limits specified in the aggregate gradation tables

You may adjust the JMF only once due to a failed verification test. An adjusted JMF requires a new *Contractor Job Mix Formula Proposal* form and verification of a plant-produced sample.

The Engineer re-verifies the JMF if HMA production has stopped for longer than 30 days and the verified JMF is older than 12 months.

For each HMA type and aggregate size specified, the Engineer verifies at the Department's expense up to 2 proposed JMF, including a JMF adjusted after verification failure. The Engineer deducts \$3,000 from payments for each verification exceeding this limit. This deduction does not apply to verifications initiated by the Engineer or if a JMF expires while HMA production is stopped longer than 30 days.

For any HMA produced under the QC/QA construction process, the Department does not use California Test 371 test results for JMF verification.

39-1.03F Job Mix Formula Renewal

You may request a JMF renewal by submitting:

1. Proposed JMF on a *Contractor Job Mix Formula Proposal* form
2. Previously verified JMF documented on a *Caltrans Hot Mix Asphalt Verification* form dated within 12 months
3. Mix design documentation on a *Contractor Hot Mix Asphalt Design Data* form used for the previously verified JMF

If the Engineer requests, sample the following materials in the presence of the Engineer and place in labeled containers weighing no more than 50 lb each:

1. Coarse, fine, and supplemental fine aggregate from stockpiles, cold feed belts, or hot bins. Samples must include at least 120 lb for each coarse aggregate, 80 lb for each fine aggregate, and 10 lb for

each type of supplemental fines. The Department combines these aggregate samples to comply with the JMF TVs submitted on a *Contractor Job Mix Formula Proposal* form.

2. RAP from stockpiles or RAP system. Samples must be at least 60 lb.
3. Asphalt binder from the binder supplier. Samples must be in two 1-quart cylindrical-shaped cans with open top and friction lids.
4. Asphalt rubber binder with the components blended in the proportions to be used. Samples must be in four 1-quart cylindrical-shaped cans with open top and friction lids.

Notify the Engineer at least 2 business days before sampling materials. For aggregate, RAP, and HMA, split samples into at least 4 parts. Submit 3 parts to the Engineer and use 1 part for your testing.

The Engineer reviews each complete JMF renewal submittal within 5 business days.

The Engineer may verify aggregate qualities during this review period.

The Engineer verifies the JMF under section 39-1.03E except:

1. Engineer retains samples until you provide test results for your part on a *Contractor Job Mix Formula Renewal* form.
2. Department tests samples of materials obtained from the HMA production unit after you submit test results that comply with the specifications for the quality characteristics in section 39-1.03E.
3. Engineer verifies each proposed JMF within 30 days of receiving verification samples.
4. You may not adjust the JMF due to a failed verification.
5. For each HMA type and aggregate gradation specified, the Engineer verifies at the Department's expense 1 proposed JMF.

If the Engineer verifies the JMF renewal, the Engineer provides you a *Caltrans Hot Mix Asphalt Verification* form.

39-1.03G Job Mix Formula Acceptance

You may start HMA production if:

1. Engineer's review of the JMF shows compliance with the specifications
2. Department has verified the JMF within 12 months before HMA production
3. Engineer authorizes the verified JMF

39-1.04 CONTRACTOR QUALITY CONTROL

39-1.04A General

Establish, maintain, and change a quality control system to ensure materials and work comply with the specifications. Submit quality control test results within 3 days of a request, except if the QC/QA construction process is specified.

You must identify the HMA sampling location in your QC plan. During production, take samples under California Test 125, except if you request and if authorized, sample HMA from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

39-1.04B Prepaving Conference

Hold a prepaving conference with the Engineer at a mutually agreed time and place. Discuss methods of performing the production and paving work.

39-1.04C Asphalt Rubber Binder

Take asphalt rubber binder samples from the feed line connecting the asphalt rubber binder tank to the HMA plant. Sample and test asphalt rubber binder under Laboratory Procedure LP-11.

Test asphalt rubber binder for compliance with the viscosity specifications in section 39-1.02. During the asphalt rubber binder production and HMA production using asphalt rubber binder, measure the viscosity every hour with not less than 1 reading for each asphalt rubber binder batch. Log the measurements with the corresponding time and asphalt rubber binder temperature. Submit the log daily.

Submit a certificate of compliance and test results for CRM and asphalt modifier with each truckload delivered to the HMA plant. A certificate of compliance for asphalt modifier must not represent more than 5,000 lb. Use an AASHTO-certified laboratory for testing.

Sample and test gradation and wire and fabric content of CRM once per 10,000 lb of scrap tire crumb rubber and once per 3,400 lb of high natural rubber. Sample and test scrap tire crumb rubber and high natural rubber separately.

Submit certified weight slips for the furnished CRM and asphalt modifier.

39-1.04D Aggregate

Determine the aggregate moisture content and RAP moisture content in continuous mixing plants at least twice a day during production and adjust the plant controller. Determine the RAP moisture content in batch mixing plants at least twice a day during production and adjust the plant controller.

39-1.04E Reclaimed Asphalt Pavement

Perform RAP quality control testing each day.

Sample RAP once daily and determine the RAP aggregate gradation under California Test 367, appendix B, and submit the results with the combined aggregate gradation.

39-1.04F Density Cores

To determine density for Standard and QC/QA construction process projects, take 4- or 6-inch diameter density cores at least once every 5 business days. Take 1 density core for every 250 tons of HMA from random locations the Engineer designates. Take density cores in the Engineer's presence and backfill and compact holes with authorized material. Before submitting a density core, mark it with the density core's location and place it in a protective container.

If a density core is damaged, replace it with a density core taken within 1 foot longitudinally from the original density core. Relocate any density core located within 1 foot of a rumble strip to 1 foot transversely away from the rumble strip.

39-1.04G Briquettes

Prepare 3 briquettes for each stability and air void content determination. Report the average of 3 tests. Prepare new briquettes and test again when the range of stability for the 3 briquettes is more than 8 points.

You may use the same briquettes used for stability testing to determine bulk specific gravity under California Test 308. If you use these briquettes and tests using bulk specific gravity fail, you may prepare 3 new briquettes and determine a new bulk specific gravity.

39-1.05 ACCEPTANCE CRITERIA

HMA acceptance is specified in the sections for each HMA construction process.

The Department samples materials for testing under California Test 125 and the applicable test method, except samples may be taken:

1. At the plant from a truck or an automatic sampling device
2. From the mat behind the paver

Sampling must be independent of Contractor quality control, statistically based, and random.

If you request, the Department splits samples and provides you with a part.

HMA acceptance is based on:

1. Authorized JMF
2. Accepted QC plan for Standard and QC/QA construction process projects
3. Compliance with the HMA acceptance tables
4. Lot acceptance for QC/QA construction process projects
5. Visual inspection

The Department prepares 3 briquettes for each stability and air void content determination. The average of 3 tests is reported. If the range of stability for the 3 briquettes is more than 8 points, new briquettes are prepared and tested.

The Department may use the briquettes used for stability testing to determine bulk specific gravity under California Test 308. If the Engineer uses the same briquettes and the tests using that bulk specific gravity fail, the Engineer prepares 3 new briquettes and determines a new bulk specific gravity.

39-1.06 DISPUTE RESOLUTION

Work with the Engineer to avoid potential conflicts and to resolve disputes regarding test result discrepancies. Notify the Engineer within 5 days of receiving a test result if you dispute the test result.

If you or the Engineer dispute each other's test results, submit quality control test results and copies of paperwork including worksheets used to determine the disputed test results. An independent third party performs referee testing. Before the independent third party participates in a dispute resolution, the party must be accredited under the Department's Independent Assurance Program. The independent third party must be independent of the project. By mutual agreement, the independent third party is chosen from:

1. Department laboratory
2. Department laboratory in a district or region not in the district or region the project is located
3. Transportation Laboratory
4. Laboratory not currently employed by you or your HMA producer

If split quality control or acceptance samples are not available, the independent third party uses any available material representing the disputed HMA for evaluation.

39-1.07 PRODUCTION START-UP EVALUATION

The Engineer evaluates HMA production and placement at production start-up.

Within the first 750 tons produced on the 1st day of HMA production, in the Engineer's presence and from the same production run, take samples of:

1. Aggregate

2. Asphalt binder
3. RAP
4. HMA

Sample aggregate from cold feed belts or hot bins. Take RAP samples from the RAP system. Sample HMA under California Test 125, except if you request and if authorized, you may sample HMA from any of the following locations:

1. Plant
2. Truck
3. Windrow
4. Paver hopper
5. Mat behind the paver

For aggregate, RAP, and HMA, split the samples into at least 4 parts and label their containers. Submit 3 split parts and keep 1 part.

For Standard and QC/QA construction process projects, you and the Department must test the split samples and report test results within 3 business days of sampling. If you proceed before receipt of the test results, the Engineer may consider the HMA placed to be represented by these test results.

For Standard and QC/QA construction process projects, take 4- or 6-inch diameter density cores within the first 750 tons on the 1st day of HMA production. For each density core, the Department reports the bulk specific gravity determined under California Test 308, Method A, in addition to the percent of maximum theoretical density. You may test for in-place density at the density core locations and include them in your production tests for percent of maximum theoretical density.

39-1.08 PRODUCTION

39-1.08A General

Produce HMA in a batch mixing plant or a continuous mixing plant. Proportion aggregate by hot or cold feed control.

HMA plants must be Department qualified. Before production, the HMA plant must have current qualification under the Department's Materials Plant Quality Program.

During production, you may adjust:

1. Hot or cold feed proportion controls for virgin aggregate and RAP
2. Set point for asphalt binder content

39-1.08B Mixing

Mix HMA ingredients into a homogeneous mixture of coated aggregates.

Asphalt binder must be from 275 to 375 degrees F when mixed with aggregate.

Asphalt rubber binder must be from 350 to 425 degrees F when mixed with aggregate.

When mixed with asphalt binder, aggregate must not be more than 325 degrees F, except aggregate for OGFC must be not more than 275 degrees F. These aggregate temperature specifications do not apply if you use RAP.

HMA with or without RAP must not be more than 325 degrees F.

39-1.08C Asphalt Rubber Binder

Deliver scrap tire crumb rubber and high natural rubber in separate bags.

Either proportion and mix asphalt binder, asphalt modifier, and CRM simultaneously or premix the asphalt binder and asphalt modifier before adding CRM. If you premix the asphalt binder and asphalt modifier, the asphalt binder must be from 375 to 425 degrees F when you add the asphalt modifier. Mix for at least 20 minutes. When you add CRM, the asphalt binder and asphalt modifier must be from 375 to 425 degrees F.

Do not use asphalt rubber binder during the first 45 minutes of the reaction period. During this period, the asphalt rubber binder mixture must be from 375 to the lower of 425 degrees F or 25 degrees F below the asphalt binder's flash point described in the MSDS.

If any asphalt rubber binder is not used within 4 hours after the reaction period, discontinue heating. If the asphalt rubber binder drops below 375 degrees F, reheat before use. If you add more scrap tire crumb rubber to the reheated asphalt rubber binder, the binder must react for 45 minutes. The added scrap tire crumb rubber must not exceed 10 percent of the total asphalt rubber binder weight. Reheated and reacted asphalt rubber binder must comply with the viscosity specifications for asphalt rubber binder in section 39-1.02D. Do not reheat asphalt rubber binder more than twice.

39-1.09 SUBGRADE, TACK COAT, AND GEOSYNTHETIC PAVEMENT INTERLAYER

39-1.09A General

Prepare subgrade or apply tack coat to surfaces receiving HMA. If specified, place geosynthetic pavement interlayer over a coat of asphalt binder.

39-1.09B Subgrade

Subgrade to receive HMA must comply with the compaction and elevation tolerance specifications in the sections for the material involved. Subgrade must be free of loose and extraneous material. If HMA is paved on existing base or pavement, remove loose paving particles, dirt, and other extraneous material by any means including flushing and sweeping.

39-1.09C Tack Coat

Apply tack coat:

1. To existing pavement, including planed surfaces
2. Between HMA layers
3. To vertical surfaces of:
 - 3.1. Curbs
 - 3.2. Gutters
 - 3.3. Construction joints

Before placing HMA, apply tack coat in 1 application. The application rate must be the minimum residual rate specified for the underlying surface conditions shown in the following tables:

Tack Coat Application Rates for HMA Type A, Type B, and RHMA-G

HMA overlay over:	Minimum residual rates (gal/sq yd)		
	CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h asphaltic emulsion	CRS1/CRS2, RS1/RS2 and QS1/CQS1 asphaltic emulsion	Asphalt binder and PMRS2/PMCRS2 and PMRS2h/PMCRS2h asphaltic emulsion

New HMA (between layers)	0.02	0.03	0.02
PCC and existing HMA (AC) surfaces	0.03	0.04	0.03
Planed PCC and HMA (AC) surfaces	0.05	0.06	0.04

Tack Coat Application Rates for OGFC

OGFC over:	Minimum residual rates (gal/sq yd)		
	CSS1/CSS1h, SS1/SS1h and QS1h/CQS1h asphaltic emulsion	CRS1/CRS2, RS1/RS2 and QS1/CQS1 asphaltic emulsion	Asphalt binder and PMRS2/PMCRS2 and PMRS2h/PMCRS2h asphaltic emulsion
New HMA	0.03	0.04	0.03
PCC and existing HMA (AC) surfaces	0.05	0.06	0.04
Planed PCC and HMA (AC) surfaces	0.06	0.07	0.05

If you dilute asphaltic emulsion, mix until homogeneous before application.

For vertical surfaces, apply a residual tack coat rate that will thoroughly coat the vertical face without running off.

If you request and if authorized, you may:

1. Change tack coat rates
2. Omit tack coat between layers of new HMA during the same work shift if:
 - 2.1. No dust, dirt, or extraneous material is present
 - 2.2. Surface is at least 140 degrees F

Immediately in advance of placing HMA, apply additional tack coat to damaged areas or where loose or extraneous material is removed.

Close areas receiving tack coat to traffic. Do not track tack coat onto pavement surfaces beyond the job site.

Asphalt binder tack coat must be from 285 to 350 degrees F when applied.

39-1.09D Geosynthetic Pavement Interlayer

Place geosynthetic pavement interlayer under the manufacturer's instruction.

Before placing the geosynthetic pavement interlayer and asphalt binder:

1. Repair cracks 1/4 inch and wider, spalls, and holes in the pavement. These repairs are change order work.
2. Clean the pavement of loose and extraneous material.

Immediately before placing the interlayer, apply 0.25 ± 0.03 gal of asphalt binder per square yard of interlayer or until the fabric is saturated. Apply asphalt binder the width of the geosynthetic pavement

interlayer plus 3 inches on each side. At interlayer overlaps, apply asphalt binder on the lower interlayer the same overlap distance as the upper interlayer.

Asphalt binder must be from 285 to 350 degrees F and below the minimum melting point of the geosynthetic pavement interlayer when applied.

Align and place the interlayer with no folds that result in a triple thickness, except that triple thickness layers less than 1 inch in width may remain if less than 1/2 inch in height. Folds that result in a triple layer greater than a 1 inch width must be slit and overlapped in a double thickness at least 2 inches in width.

The minimum HMA thickness over the interlayer must be 0.12 foot thick, including conform tapers. Do not place the interlayer on a wet or frozen surface.

Overlap the interlayer borders from 2 to 4 inches. In the direction of paving, overlap the following roll with the preceding roll at any break.

You may use rolling equipment to correct distortions or wrinkles in the interlayer.

If asphalt binder tracked onto the interlayer or brought to the surface by construction equipment causes interlayer displacement, cover it with a small quantity of HMA.

Before placing HMA on the interlayer, do not expose the interlayer to:

1. Traffic, except for crossings under traffic control, and only after you place a small HMA quantity
2. Sharp turns from construction equipment
3. Damaging elements

Pave HMA on the interlayer during the same work shift.

39-1.10 SPREADING AND COMPACTING EQUIPMENT

Paving equipment for spreading must be:

1. Self-propelled
2. Mechanical
3. Equipped with a screed or strike-off assembly that can distribute HMA the full width of a traffic lane
4. Equipped with a full-width compacting device
5. Equipped with automatic screed controls and sensing devices that control the thickness, longitudinal grade, and transverse screed slope

Install and maintain grade and slope references.

The screed must produce a uniform HMA surface texture without tearing, shoving, or gouging.

The paver must not leave marks such as ridges and indentations, unless you can eliminate them by rolling.

Rollers must be equipped with a system that prevents HMA from sticking to the wheels. You may use a parting agent that does not damage the HMA or impede the bonding of layers.

In areas inaccessible to spreading and compacting equipment:

1. Spread the HMA by any means to obtain the specified lines, grades, and cross sections.
2. Use a pneumatic tamper, plate compactor, or equivalent to achieve thorough compaction.

39-1.11 TRANSPORTING, SPREADING, AND COMPACTING

Do not pave HMA on wet pavement or a frozen surface.

You may deposit HMA in a windrow and load it in the paver if:

1. Paver is equipped with a hopper that automatically feeds the screed
2. Loading equipment can pick up the windrowed material and deposit it in the paver hopper without damaging base material
3. Activities for deposit, pickup, loading, and paving are continuous
4. HMA temperature in the windrow does not fall below 260 degrees F

You may pave HMA in 1 or more layers on areas less than 5 feet wide and outside the traveled way, including shoulders. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture.

HMA handled, spread, or windrowed must not stain the finished surface of any improvement, including pavement.

Do not use petroleum products such as kerosene or diesel fuel to release HMA from trucks, spreaders, or compactors.

HMA must be free of:

1. Segregation
2. Coarse or fine aggregate pockets
3. Hardened lumps

Longitudinal joints in the top layer must match specified lane edges. Alternate the longitudinal joint offsets in the lower layers at least 0.5 foot from each side of the specified lane edges. You may request other longitudinal joint placement patterns.

Until the adjoining through lane's top layer has been paved, do not pave the top layer of:

1. Shoulders
2. Tapers
3. Transitions
4. Road connections
5. Driveways
6. Curve widenings
7. Chain control lanes
8. Turnouts
9. Turn pockets

If the number of lanes changes, pave each through lane's top layer before paving a tapering lane's top layer. Simultaneous to paving a through lane's top layer, you may pave an adjoining area's top layer, including shoulders. Do not operate spreading equipment on any area's top layer until completing final compaction.

If leveling with HMA is specified, fill and level irregularities and ruts with HMA before spreading HMA over the base, existing surfaces, or bridge decks. You may use mechanical equipment other than a paver for these areas. The equipment must produce uniform smoothness and texture. HMA used to change an existing surface's cross slope or profile is not paid for as HMA (leveling).

If placing HMA against the edge of existing pavement, sawcut or grind the pavement straight and vertical along the joint and remove extraneous material.

Rolling must leave the completed surface compacted and smooth without tearing, cracking, or shoving. Complete finish rolling activities before the pavement surface temperature is:

1. Below 150 degrees F for HMA with unmodified binder
2. Below 140 degrees F for HMA with modified binder
3. Below 200 degrees F for RHMA-G

If a vibratory roller is used as a finish roller, turn the vibrator off.

Do not use a pneumatic-tired roller to compact RHMA-G.

For Standard and QC/QA construction processes, if 3/4-inch aggregate grading is specified, you may use 1/2-inch aggregate grading if the total layer thickness is from 0.125 to 0.20 foot thick.

Spread and compact HMA under sections 39-3.03 and 39-3.04 if any of the following applies:

1. Specified paved thickness is less than 0.15 foot.
2. Specified paved thickness is less than 0.20 foot and 3/4-inch aggregate grading is specified and used.
3. You spread and compact at:
 - 3.1. Asphalt concrete surfacing replacement areas
 - 3.2. Leveling courses
 - 3.3. Areas for which the Engineer determines conventional compaction and compaction measurement methods are impeded

Do not allow traffic on new HMA pavement until its mid-depth temperature is below 160 degrees F.

If you request and if authorized, you may cool HMA Type A and Type B with water when rolling activities are complete. Apply water under section 17-3.

Spread sand at a rate from 1 to 2 lb/sq yd on new RHMA-G, RHMA-O, and RHMA-O-HB pavement when finish rolling is complete. Sand must be free of clay or organic matter. Sand must comply with section 90-1.02C(4)(c). Keep traffic off the pavement until spreading sand is complete.

39-1.12 SMOOTHNESS

39-1.12A General

Determine HMA smoothness with a profilograph and a straightedge.

Smoothness specifications do not apply to OGFC placed on existing pavement not constructed under the same project.

If concrete pavement is placed on HMA:

1. Cold plane the HMA finished surface to within specified tolerances if it is higher than the grade ordered.
2. Remove and replace HMA if the finished surface is lower than 0.05 foot below the grade ordered.

39-1.12B Straightedge

The top layer of HMA pavement must not vary from the lower edge of a 12-foot straightedge:

1. More than 0.01 foot when the straightedge is laid parallel with the centerline

2. More than 0.02 foot when the straightedge is laid perpendicular to the centerline and extends from edge to edge of a traffic lane
3. More than 0.02 foot when the straightedge is laid within 24 feet of a pavement conform

39-1.12C Profilograph

For the top layer of HMA Type A, Type B, and RHMA-G pavement, determine the PI_0 and must-grinds under California Test 526. Take 2 profiles within each traffic lane, 3 feet from and parallel with the edge of each lane.

A must-grind is a deviation of 0.3 inch or more in a length of 25 feet. You must correct must-grinds.

For OGFC, only determine must-grinds if placed over HMA constructed under the same project. The top layer of the underlying HMA must comply with the smoothness specifications before placing OGFC.

Profile the pavement in the Engineer's presence.

On tangents and horizontal curves with a centerline radius of curvature of 2,000 feet, the PI_0 must be at most 3 inches per 0.1-mile section.

On horizontal curves with a centerline radius of curvature from 1,000 to 2,000 feet, including pavement within the superelevation transitions, the PI_0 must be at most 6 inches per 0.1-mile section.

Before the Engineer accepts HMA pavement for smoothness, submit final profilograms.

Submit 1 copy of profile information in Microsoft Excel and 1 copy of longitudinal pavement profiles in ".erd" format or other ProVAL compatible format to the Engineer and to:

Smoothness@dot.ca.gov

The following HMA pavement areas do not require a PI_0 . You must measure these areas with a 12-foot straightedge and determine must-grinds with a profilograph:

1. New HMA with a total thickness less than 0.25 foot
2. HMA sections of city or county streets and roads, turn lanes, and collector lanes less than 1,500 feet in length

The following HMA pavement areas do not require a PI_0 and you must measure them with a 12-foot straightedge:

1. Horizontal curves with a centerline radius of curvature less than 1,000 feet, including pavement within the superelevation transitions of those curves
2. Within 12 feet of a transverse joint separating the pavement from:
 - 2.1. Existing pavement not constructed under the same project
 - 2.2. A bridge deck or approach slab
3. Exit ramp termini, truck weigh stations, and weigh-in-motion areas
4. If steep grades and superelevation rates greater than 6 percent are present:
 - 4.1. Ramps
 - 4.2. Connectors
5. Turn lanes
6. Areas within 15 feet of manholes or drainage transitions
7. Acceleration and deceleration lanes for at-grade intersections
8. Shoulders and miscellaneous areas
9. HMA pavement within 3 feet from and parallel to the construction joints formed between curbs, gutters, or existing pavement

39-1.12D Smoothness Correction

If the top layer of HMA Type A, Type B, or RHMA-G pavement does not comply with the smoothness specifications, grind the pavement to within specified tolerances, remove and replace it, or place an overlay of HMA. Do not start corrective work until your choice of methods is authorized.

Remove and replace areas of OGFC not in compliance with the must-grind and straightedge specifications, except you may grind OGFC for correcting smoothness:

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

Corrected HMA pavement areas must be uniform rectangles with edges:

1. Parallel to the nearest HMA pavement edge or lane line
2. Perpendicular to the pavement centerline

Measure the corrected HMA pavement surface with a profilograph and a 12-foot straightedge and correct the pavement to within specified tolerances. If a must-grind area or straightedged pavement cannot be corrected to within specified tolerances, remove and replace the pavement.

On areas ground but not overlaid with OGFC, apply fog seal coat under section 37-2.

39-1.13 HOT MIX ASPHALT ON BRIDGE DECKS

Produce and place HMA on bridge decks under the Method construction process.

Aggregate must comply with the 1/2-inch HMA Types A and B gradation.

If authorized, aggregate may comply with the no. 4 HMA Types A and B gradation for a section or taper at a bridge end that is less than 1 inch in total depth.

If a concrete expansion dam is to be placed at a bridge deck expansion joint, tape oil-resistant construction paper to the deck over the area to be covered by the dam before placing the tack coat and HMA across the joint.

Do not leave a vertical joint more than 0.15 foot high between adjacent lanes open to traffic.

The tack coat application rate must be the minimum residual rate specified in section 39-1.09C. For HMA placed on a deck seal, use the minimum residual rate specified for a PCC underlying surface.

HMA placed on a deck seal must be placed in at least 2 approximately equal layers. The 1st layer must be at least 1 inch thick after compaction. Protect the deck seal throughout all operations.

For placement of the 1st HMA layer on a deck seal:

1. Comply with the HMA application temperature recommended by the deck seal manufacturer.
2. Deliver and place HMA using equipment with pneumatic tires or rubber-faced wheels. Do not operate other vehicles or equipment on the bare deck seal.
3. Deposit HMA on the deck seal in such a way that the deck seal is not damaged. Do not windrow the HMA material on the bridge deck seal.
4. Place HMA in a downhill direction on bridge decks with grades over 2 percent.
5. Spreading equipment need not be self-propelled.

39-1.14 MISCELLANEOUS AREAS AND DIKES

The following specifications in section 39 do not apply to miscellaneous areas and dikes:

1. HMA construction process
2. HMA mix design requirements
3. Contractor quality control
4. Production start-up evaluation

Miscellaneous areas are outside the traveled way and include:

1. Median areas not including inside shoulders
2. Island areas
3. Sidewalks
4. Gutters
5. Gutter flares
6. Ditches
7. Overside drains
8. Aprons at the ends of drainage structures

Spread miscellaneous areas in 1 layer and compact to the specified lines and grades.

For miscellaneous areas and dikes:

1. Do not submit a JMF.
2. Choose the 3/8-inch or 1/2-inch HMA Type A and Type B aggregate gradations.
3. Minimum asphalt binder content must be 6.8 percent for 3/8-inch aggregate and 6.0 percent for 1/2-inch aggregate. If you request and if authorized, you may reduce the minimum asphalt binder content.
4. Choose asphalt binder Grade PG 70-10 or the same grade specified for HMA.

39-1.15 MINOR HOT MIX ASPHALT

39-1.15A GENERAL

39-1.15A(1) Summary

The following specifications in section 39 do not apply to minor HMA:

1. HMA construction process
2. HMA mix design requirements
3. Contractor quality control
4. Production start-up evaluation

39-1.15A(2) Definitions

Reserved

39-1.15A(3) Submittals

Reserved

39-1.15A(4) Quality Control and Assurance

Reserved

39-1.15B MATERIALS

The minimum asphalt binder content must be 6.8 percent for 3/8-inch aggregate gradation and 6.0 percent for 1/2-inch aggregate gradation.

Choose asphalt binder Grade PG 64-10, PG 64-16, or PG 70-10.

If you request and if authorized, you may reduce the minimum asphalt binder content.

Choose the 3/8-inch or 1/2-inch HMA Type A or Type B aggregate gradation.

39-1.15C CONSTRUCTION

Produce HMA at a central mixing plant.

Choose any method and equipment to spread and compact.

The surface must be:

1. Textured uniformly
2. Compacted firmly
3. Without depressions, humps, and irregularities

Smoothness specifications do not apply.

39-1.16 RUMBLE STRIPS

Reserved

39-1.17 DATA CORES

Reserved

39-1.18 HOT MIX ASPHALT AGGREGATE LIME TREATMENT—DRY LIME METHOD

Reserved

39-1.19 HOT MIX ASPHALT AGGREGATE LIME TREATMENT—SLURRY METHOD

Reserved

39-1.20 LIQUID ANTISTRIP TREATMENT

Reserved

39-1.21 REPLACE ASPHALT CONCRETE SURFACING

Reserved

39-1.22 LIQUID ASPHALT PRIME COAT

Reserved

39-1.23 HOT MIX ASPHALT TYPE C

Reserved

39-1.24 BONDED WEARING COURSE—GAP GRADED

Reserved

39-1.25 RUBBERIZED BONDED WEARING COURSE—GAP GRADED

Reserved

39-1.26 RUBBERIZED BONDED WEARING COURSE—OPEN GRADED

Reserved

39-1.27 BONDED WEARING COURSE—OPEN GRADED

Reserved

39-1.28 ROADSIDE PAVING

Reserved

39-1.29 SOIL TREATMENT

Reserved

39-1.30–39-1.40 RESERVED

39-2 STANDARD CONSTRUCTION PROCESS

39-2.01 GENERAL

Section 39-2 includes specifications for HMA produced and constructed under the Standard construction process.

39-2.02 CONTRACTOR QUALITY CONTROL

39-2.02A Quality Control Plan

Establish, implement, and maintain a QC plan for HMA. The QC plan must describe the organization and procedures you will use to:

1. Control the quality characteristics
2. Determine when corrective actions are needed (action limits)
3. Implement corrective actions

When you submit the proposed JMF, submit the proposed QC plan. You and the Engineer must discuss the QC plan during the prepaving conference.

The QC plan must address the elements affecting HMA quality including:

1. Aggregate
2. Asphalt binder
3. Additives
4. Production
5. Paving

The Engineer reviews each QC plan within 5 business days from the submittal. Do not produce HMA until the Engineer authorizes the QC plan.

39-2.02B Quality Control Testing

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

Minimum Quality Control—Standard Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA type			
			A	B	RHMA-G	OGFC

Aggregate gradation ^a	California Test 202		JMF ± Tolerance _b	JMF ± Tolerance _b	JMF ± Tolerance _b	JMF ± Tolerance _b
Sand equivalent (min) ^c	California Test 217	1 per 750 tons and any remaining part	47	42	47	--
Asphalt binder content (%)	California Test 379 or 382		JMF ± 0.45	JMF ± 0.45	JMF ± 0.50	JMF ± 0.50
HMA moisture content (% , max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	1.0
Percent of maximum theoretical density (%) ^{d, e}	QC plan	2 per business day (min.)	91–97	91–97	91–97	--
Stabilometer value (min) ^{c, f} No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	One per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--	--
			37	35	23	--
Air void content (%) ^{c, g}	California Test 367		4 ± 2	4 ± 2	TV ± 2	--
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^h	California Test 226 or 370	2 per day during production	--	--	--	--

Percent of crushed particles coarse aggregate (% min)	California Test 205	As designated in the QC plan. At least once per project	90	25	--	90
One fractured face			75	--	90	75
Two fractured faces						
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.)			70	20	70	90
One fractured face						
Los Angeles Rattler (% max) Loss at 100 rev.	California Test 211		12	--	12	12
Loss at 500 rev.			45	50	40	40
Flat and elongated particles (% max by weight @ 5:1)	California Test 235		Report only	Report only	Report only	Report only
Fine aggregate angularity (% min)	California Test 234	45	45	45	--	
Voids filled with asphalt (%) ⁱ	California Test 367					
No. 4 grading		76.0–80.0	76.0–80.0	Report only	--	
3/8" grading		73.0–76.0	73.0–76.0			
1/2" grading		65.0–75.0	65.0–75.0			
3/4" grading		65.0–75.0	65.0–75.0			
Voids in mineral aggregate (% min) ⁱ	California Test 367					
No. 4 grading		17.0	17.0	--	--	
3/8" grading		15.0	15.0	--		
1/2" grading		14.0	14.0	18.0–23.0 j		
3/4" grading		13.0	13.0	18.0–23.0 j		

Dust proportion ⁱ No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367		0.9–2.0 0.6–1.3	0.9–2.0 0.6–1.3	Report only	--
Smoothness	Section 39-1.12	--	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀	12-foot straight- edge, must grind, and PI ₀
Asphalt rubber binder viscosity @ 350 °F, centipoises	Section 39- 1.02D	Section 39-1.04C	--	--	1,500– 4,000	1,500– 4,000
Asphalt modifier	Section 39- 1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Section 39- 1.02D	Section 39-1.04C	--	--	Section 39-1.02D	Section 39-1.02D

- ^a Determine combined aggregate gradation containing RAP under California Test 367.
- ^b The tolerances must comply with the allowable tolerances in section 39-1.02E.
- ^c Report the average of 3 tests from a single split sample.
- ^d Required for HMA Type A, Type B, and RHMA-G if the specified paved thickness is at least 0.15 foot.
- ^e Determine maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.
- ^f California Test 304, Part 2.13.
- ^g Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ^h For adjusting the plant controller at the HMA plant.
- ⁱ Report only if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.
- ^j Voids in mineral aggregate for RHMA-G must be within this range.

For any single quality characteristic except smoothness, if 2 consecutive quality control test results do not comply with the action limits or specifications:

1. Stop production.
2. Notify the Engineer.
3. Take corrective action.
4. Demonstrate compliance with the specifications before resuming production and placement.

39-2.03 ACCEPTANCE CRITERIA

39-2.03A Testing

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Standard Construction Process

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC

Aggregate gradation ^a				California Test 202	JMF ± tolerance ^c	JMF ± tolerance ^c	JMF ± tolerance ^c	JMF ± tolerance ^c
Sieve	3/4"	1/2"	3/8"					
1/2"	X ^b							
3/8"		X						
No. 4			X					
No. 8	X	X	X					
No. 200	X	X	X					
Sand equivalent (min) ^d				California Test 217	47	42	47	--
Asphalt binder content (%)				California Test 379 or 382	JMF ± 0.45	JMF ± 0.45	JMF ± 0.50	JMF ± 0.50
HMA moisture content (%, max)				California Test 226 or 370	1.0	1.0	1.0	1.0
Percent of maximum theoretical density (%) ^{e, f}				California Test 375	91–97	91–97	91–97	--
Stabilometer value (min) ^{d,g} No. 4 and 3/8" gradings 1/2" and 3/4" gradings				California Test 366	30 37	30 35	-- 23	-- --
Air void content (%) ^{d, h}				California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Percent of crushed particles Coarse aggregate (%), min One fractured face Two fractured faces Fine aggregate (%), min (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face				California Test 205	90 75 70	25 -- 20	-- 90 70	90 75 90
Los Angeles Rattler (%), max) Loss at 100 rev. Loss at 500 rev.				California Test 211	12 45	-- 50	12 40	12 40
Fine aggregate angularity (%, min)				California Test 234	45	45	45	--
Flat and elongated particles (%), max by weight @ 5:1)				California Test 235	Report only	Report only	Report only	Report only
Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading				California Test 367	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	Report only	--

Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0–23.0 j 18.0–23.0 j	--
Dust proportion ⁱ No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367	0.9–2.0 0.6–1.3	0.9–2.0 0.6–1.3	Report only	--
Smoothness	Section 39-1.12	12-foot straight-edge, must grind, and PI ₀	12-foot straight-edge, must grind, and PI ₀	12-foot straight-edge, must grind, and PI ₀	12-foot straight-edge and must grind
Asphalt binder	Various	Section 92	Section 92	Section 92	Section 92
Asphalt rubber binder	Various	--	--	Section 92-1.01D(2) and section 39-1.02D	Section 92-1.01D(2) and section 39-1.02D
Asphalt modifier	Various	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Various	--	--	Section 39-1.02D	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

^c The tolerances must comply with the allowable tolerances in section 39-1.02E.

^d The Engineer reports the average of 3 tests from a single split sample.

^e The Engineer determines percent of maximum theoretical density if the specified paved thickness is at least 0.15 foot under California Test 375, except the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core instead of using the nuclear gauge in Part 4, "Determining In-Place Density By The Nuclear Density Device."
2. California Test 309 to determine maximum theoretical density instead of calculating test maximum density in Part 5, "Determining Test Maximum Density."

^f The Engineer determines maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

^g California Test 304, Part 2.13.

^h The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

ⁱ Report only if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.

^j Voids in mineral aggregate for RHMA-G must be within this range.

No single test result may represent more than 750 tons or 1 day's production, whichever is less.

For any single quality characteristic except smoothness, if 2 consecutive acceptance test results do not comply with the specifications:

1. Stop production.
2. Take corrective action.
3. Take samples and split each sample into 4 parts in the Engineer's presence. Test 1 part for compliance with the specifications and submit 3 parts to the Engineer. The Department tests 1 part for compliance with the specifications and reserves and stores 2 parts.
4. Demonstrate compliance with the specifications before resuming production and placement.

The Department tests the density core you take from each 250 tons of HMA production. The Department determines the percent of maximum theoretical density for each density core by determining the density core's density and dividing by the maximum theoretical density.

If the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot, the Department determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness.

For percent of maximum theoretical density, the Engineer determines a deduction for each test result outside the specifications using the reduced payment factors shown in the following table:

Reduced Payment Factors for Percent of Maximum Theoretical Density

HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor	HMA Type A and B and RHMA-G percent of maximum theoretical density	Reduced payment factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375
89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
< 89.0	Remove and replace	> 99.0	Remove and replace

39-2.04 TRANSPORTING, SPREADING, AND COMPACTING

Determine the number of rollers needed to obtain the specified density and surface finish.

39-3 METHOD CONSTRUCTION PROCESS

39-3.01 GENERAL

Section 39-3 includes specifications for HMA produced and constructed under the Method construction process.

39-3.02 ACCEPTANCE CRITERIA

39-3.02A Testing

The Department samples for acceptance testing and tests for the quality characteristics shown in the following table:

HMA Acceptance—Method Construction Process

Quality characteristic	Test method	HMA type			
		A	B	RHMA-G	OGFC

Aggregate gradation ^a	California Test 202	JMF ± tolerance ^b	JMF ± tolerance ^b	JMF ± tolerance ^b	JMF ± tolerance ^b
Sand equivalent (min) ^c	California Test 217	47	42	47	--
Asphalt binder content (%)	California Test 379 or 382	JMF ± 0.45	JMF ± 0.45	JMF ± 0.50	JMF ± 0.50
HMA moisture content (% max)	California Test 226 or 370	1.0	1.0	1.0	1.0
Stabilometer value (min) ^{c, d} No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 366	30 37	30 35	-- 23	-- --
Percent of crushed particles Coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.) One fractured face	California Test 205	90 75 70	25 -- 20	-- 90 70	90 75 90
Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.	California Test 211	12 45	-- 50	12 40	12 40
Air void content (%) ^{c, e}	California Test 367	4 ± 2	4 ± 2	TV ± 2	--
Fine aggregate angularity (% min)	California Test 234	45	45	45	--
Flat and elongated particles (% max by weight @ 5:1)	California Test 235	Report only	Report only	Report only	Report only
Voids filled with asphalt (%) ^f No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	Report only	--

Voids in mineral aggregate (% min) ^f	California Test 367				
No. 4 grading		17.0	17.0	--	
3/8" grading		15.0	15.0	--	
1/2" grading		14.0	14.0	18.0–23.0 ^g	--
3/4" grading		13.0	13.0	18.0–23.0 ^g	
Dust proportion ^f	California Test 367			Report only	--
No. 4 and 3/8" gradings		0.9–2.0	0.9–2.0		
1/2" and 3/4" gradings		0.6–1.3	0.6–1.3		
Smoothness	Section 39-1.12	12-foot straight-edge and must-grind	12-foot straight-edge and must-grind	12-foot straight-edge and must-grind	12-foot straight-edge and must-grind
Asphalt binder	Various	Section 92	Section 92	Section 92	Section 92
Asphalt rubber binder	Various	--	--	Section 92-1.01D(2) and section 39-1.02D	Section 92-1.01D(2) and section 39-1.02D
Asphalt modifier	Various	--	--	Section 39-1.02D	Section 39-1.02D
CRM	Various	--	--	Section 39-1.02D	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c The Engineer reports the average of 3 tests from a single split sample.

^d California Test 304, Part 2.13.

^e The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

^f Report only if the adjustment for the asphalt binder content TV is less than or equal to ±0.3 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.

^g Voids in mineral aggregate for RHMA-G must be within this range.

No single test result may represent more than 750 tons or 1 day's production, whichever is less.

For any single quality characteristic except smoothness, if 2 consecutive acceptance test results do not comply with the specifications:

1. Stop production.
2. Take corrective action.
3. Take samples and split each sample into 4 parts in the Engineer's presence. Test 1 part for compliance with the specifications and submit 3 parts to the Engineer. The Department tests 1 part for compliance with the specifications and reserves and stores 2 parts.
4. Demonstrate compliance with the specifications before resuming production and placement.

39-3.03 SPREADING AND COMPACTING EQUIPMENT

Each paver spreading HMA Type A and Type B must be followed by 3 rollers as follows:

1. One vibratory roller specifically designed to compact HMA. The roller must be capable of at least 2,500 vibrations per minute and must be equipped with amplitude and frequency controls. The roller's gross static weight must be at least 7.5 tons.
2. One oscillating type pneumatic-tired roller at least 4 feet wide. Pneumatic tires must be of equal size, diameter, type, and ply. The tires must be inflated to 60 psi minimum and maintained so that the air pressure does not vary more than 5 psi.
3. One steel-tired, 2-axle tandem roller. The roller's gross static weight must be at least 7.5 tons.

Each roller must have a separate operator. Rollers must be self-propelled and reversible.

Compact RHMA-G as specified for HMA Type A and Type B except do not use pneumatic-tired rollers.

Compact OGFC with steel-tired, 2-axle tandem rollers. If placing 300 tons or more of OGFC per hour, use at least 3 rollers for each paver. If placing less than 300 tons of OGFC per hour, use at least 2 rollers for each paver. Each roller must weigh from 126 to 172 lb per linear inch of drum width. Turn the vibrator off.

39-3.04 TRANSPORTING, SPREADING, AND COMPACTING

Pave HMA in maximum 0.25-foot thick compacted layers.

If the surface to be paved is both in sunlight and shade, pavement surface temperatures must be taken in the shade.

Spread HMA Type A and Type B at the atmospheric and surface temperatures shown in the following table:

Minimum Atmospheric and Surface Temperatures

Compacted layer thickness, feet	Minimum Atmospheric and Surface Temperatures			
	Atmospheric, °F		Surface, °F	
	Unmodified asphalt binder	Modified asphalt binder ^a	Unmodified asphalt binder	Modified asphalt binder ^a
< 0.15	55	50	60	55
0.15–0.25	45	45	50	50

^a Except asphalt rubber binder.

If the asphalt binder for HMA Type A and Type B is unmodified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 250 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 200 degrees F
3. Finish compaction before the surface temperature drops below 150 degrees F

If the asphalt binder for HMA Type A and Type B is modified asphalt binder, complete:

1. First coverage of breakdown compaction before the surface temperature drops below 240 degrees F
2. Breakdown and intermediate compaction before the surface temperature drops below 180 degrees F
3. Finish compaction before the surface temperature drops below 140 degrees F

For RHMA-G:

1. Only spread and compact if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.
2. Complete the 1st coverage of breakdown compaction before the surface temperature drops below 280 degrees F.
3. Complete breakdown and intermediate compaction before the surface temperature drops below 250 degrees F.
4. Complete finish compaction before the surface temperature drops below 200 degrees F.
5. Cover loads in trucks with tarpaulins, if the atmospheric temperature is below 70 degrees F. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface.

For HMA-O with unmodified asphalt binder:

1. Only spread and compact if the atmospheric temperature is at least 55 degrees F and the surface temperature is at least 60 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 200 degrees F.
4. Cover loads in trucks with tarpaulins, if the atmospheric temperature is below 70 degrees F. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface.

For HMA-O with modified asphalt binder, except asphalt rubber binder:

1. Only spread and compact if the atmospheric temperature is at least 50 degrees F and the surface temperature is at least 50 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 240 degrees F.
3. Complete all compaction before the surface temperature drops below 180 degrees F.
4. Cover loads in trucks with tarpaulins, if the atmospheric temperature is below 70 degrees F. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface.

For RHMA-O and RHMA-O-HB:

1. Only spread and compact if the atmospheric temperature is at least 55 degrees F and surface temperature is at least 60 degrees F.
2. Complete the 1st coverage using 2 rollers before the surface temperature drops below 280 degrees F.
3. Complete compaction before the surface temperature drops below 250 degrees F.
4. Cover loads in trucks with tarpaulins, if the atmospheric temperature is below 70 degrees F. The tarpaulins must completely cover the exposed load until you transfer the mixture to the paver's hopper or to the pavement surface.

For RHMA-G and OGFC, tarpaulins are not required if the time from discharging to the truck until transfer to the paver's hopper or the pavement surface is less than 30 minutes.

HMA compaction coverage is the number of passes needed to cover the paving width. A pass is 1 roller's movement parallel to the paving in either direction. Overlapping passes are part of the coverage

being made and are not a subsequent coverage. Do not start a coverage until completing the prior coverage.

Start rolling at the lower edge and progress toward the highest part.

Perform breakdown compaction of each layer of HMA Type A, Type B, and RHMA-G with 3 coverages using a vibratory roller. The speed of the vibratory roller in miles per hour must not exceed the vibrations per minute divided by 1,000. If the thickness of the HMA layer is less than 0.08 foot, turn the vibrator off. The Engineer may order fewer coverages if the thickness of the HMA layer is less than 0.15 foot.

Perform intermediate compaction of each layer of HMA Type A and Type B with 3 coverages using a pneumatic-tired roller at a speed not exceeding 5 mph.

Perform finish compaction of HMA Type A, Type B, and RHMA-G with 1 coverage using a steel-tired roller.

Compact OGFC with 2 coverages using steel-tired rollers.

39-4 QUALITY CONTROL/QUALITY ASSURANCE CONSTRUCTION PROCESS

39-4.01 GENERAL

Section 39-4 includes specifications for HMA produced and constructed under the Quality Control / Quality Assurance construction process.

The QC/QA construction process consists of:

1. Establishing, maintaining, and changing if needed a quality control system providing assurance the HMA complies with the specifications
2. Sampling and testing at specified intervals, or sublots, to demonstrate compliance and to control the process
3. Department sampling and testing at specified intervals to verify the testing process and HMA quality
4. Engineer using test results, statistical evaluation of verified quality control tests, and inspection to accept HMA for payment

A lot is a quantity of HMA. The Engineer designates a new lot when:

1. 20 sublots are complete
2. JMF changes
3. Production stops for more than 30 days

Each lot consists of no more than 20 sublots. A subplot is 750 tons, except a quantity of HMA paved at day's end greater than 250 tons is a subplot. If a quantity of HMA paved at day's end is less than 250 tons, you may either make this quantity a subplot or include it in the previous subplot's test results for statistical evaluation.

39-4.02 CONTRACTOR QUALITY CONTROL

39-4.02A General

Use a composite quality factor, QF_C , and individual quality factors, QF_{QCi} , to control your process and evaluate the quality control program. For quality characteristics without quality factors, use your QC plan's action limits to control your process.

Control HMA quality including:

1. Materials
2. Proportioning

3. Spreading and compacting
4. Finished roadway surface

Develop, implement, and maintain a quality control program that includes:

1. Inspection
2. Sampling
3. Testing

39-4.02B Quality Control Plan

With the JMF submittal, submit a QC plan. The QC plan must comply with the Department's *Quality Control Manual for Hot Mix Asphalt Production and Placement*. Discuss the QC plan with the Engineer during the pre-paving conference.

The Engineer reviews each QC plan within 5 business days from the submittal. Do not produce HMA until the Engineer authorizes the QC plan.

The QC plan must include the name and qualifications of a QC manager. The QC manager administers the QC plan and during paving must be at the job site within 3 hours of receiving notice. The QC manager must not be any of the following on the project:

1. Foreman
2. Production or paving crewmember
3. Inspector
4. Tester

The QC plan must include action limits and details of corrective action you will take if a test result for any quality characteristic falls outside an action limit.

As work progresses, you must submit a QC plan supplement to change quality control procedures, personnel, tester qualification status, or laboratory accreditation status.

39-4.02C Quality Control Inspection, Sampling, and Testing

Sample, test, inspect, and manage HMA quality control.

Provide a roadway inspector while HMA paving activities are in progress. Provide a plant inspector during HMA production.

Inspectors must comply with the Department's *Quality Control Manual for Hot Mix Asphalt Production and Placement*.

Provide a testing laboratory and personnel for quality control testing. Provide the Engineer unrestricted access to the quality control activities. Before providing services for the project, the Engineer reviews, accredits, and qualifies the testing laboratory and personnel under the Department's Independent Assurance Program.

For HMA at production start-up and every 5,000 tons, sample and test under California Test 371. Submit the test results to the Engineer and to:

Moisture_Tests@dot.ca.gov

For HMA at production start-up and once during production, submit samples split from your HMA production sample for California Test 371 to the Engineer and the Transportation Laboratory, Attention: Moisture Test.

The Department does not use results from California Test 371 to determine specification compliance.
 Comply with the values for the HMA quality characteristics and minimum random sampling and testing for quality control shown in the following table:

Minimum Quality Control—QC/QA Construction Process

Quality characteristic	Test method	Minimum sampling and testing frequency	HMA Type			Location of sampling	Maximum reporting time allowance
			A	B	RHMA-G		

Aggregate gradation ^a	California Test 202		JMF ± tolerance _b	JMF ± tolerance _b	JMF ± tolerance _b	California Test 125	
Asphalt binder content (%)	California Test 379 or 382	1 per 750 tons	JMF ±0.45	JMF ±0.45	JMF ±0.50	Loose mix behind paver See California Test 125	24 hours
Percent of maximum theoretical density (%) ^{c,d}	QC plan		92–96	92–96	91–96	QC plan	
Aggregate moisture content at continuous mixing plants and RAP moisture content at continuous mixing plants and batch mixing plants ^e	California Test 226 or 370	2 per day during production	--	--	--	Stockpiles or cold feed belts	--
Sand equivalent (min) ^f	California Test 217	1 per 750 tons	47	42	47	California Test 125	24 hours
HMA moisture content (% max)	California Test 226 or 370	1 per 2,500 tons but not less than 1 per paving day	1.0	1.0	1.0	Loose Mix Behind Paver See California Test 125	24 hours
Stabilometer value (min) ^{f,g}	California Test 366	1 per 4,000 tons or 2 per 5 business days, whichever is greater	30	30	--		48 hours
No. 4 and 3/8" gradings 1/2" and 3/4" gradings			37	35	23		
Air void content (%) ^{f,h}	California Test 367		4 ± 2	4 ± 2	TV ± 2		

Percent of crushed particles coarse aggregate (% min.): One fractured face Two fractured faces	California Test 205	As designated in QC plan. At least once per project.	90	25	--	California Test 125	48 hours
Fine aggregate (% min) (Passing no. 4 sieve and retained on no. 8 sieve.): One fractured face			75	--	90		
Los Angeles Rattler (% max): Loss at 100 rev. Loss at 500 rev.	California Test 211		70	20	70	California Test 125	
Fine aggregate angularity (% min)	California Test 234		45	50	40	California Test 125	
Flat and elongated particle (% max by weight @ 5:1)	California Test 235		45	45	45	California Test 125	
			Report only	Report only	Report only	California Test 125	

Voids filled with asphalt (%) ⁱ : No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	Report only	California Test 367	
Voids in mineral aggregate (% min.) ⁱ : No. 4 grading 3/8" grading 1/2" grading 3/4" grading	California Test 367		17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	-- -- 18.0–23.0 ^j 18.0–23.0 ^j	California Test 367	
Dust proportion ⁱ : No. 4 and 3/8" gradings 1/2" and 3/4" gradings	California Test 367		0.9–2.0 0.6–1.3	0.9–2.0 0.6–1.3	Report only	California Test 367	
Smoothness	Section 39-1.12	--	12-foot straight-edge, must-grind, and Pl ₀	12-foot straight-edge, must-grind, and Pl ₀	12-foot straight-edge, must-grind, and Pl ₀	--	
Asphalt rubber binder viscosity @ 350 °F, centipoises	Section 39-1.02D	--	--	--	1,500–4,000	Section 39-1.02D	24 hours
CRM	Section 39-1.02D	--	--	--	Section 39-1.02D	Section 39-1.02D	48 hours

^a Determine combined aggregate gradation containing RAP under California Test 367.

^b The tolerances must comply with the allowable tolerances in section 39-1.02E.

^c Required for HMA Type A, Type B, and RHMA-G if the specified paved thickness is at least 0.15 foot.

^d Determine maximum theoretical density (California Test 309) at the frequency specified for test maximum density under California Test 375, Part 5 D.

- ^e For adjusting the plant controller at the HMA plant.
- ^f Report the average of 3 tests from a single split sample.
- ^g California Test 304, Part 2.13.
- ^h Determine the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.
- ⁱ Report only if the adjustment for the asphalt binder content TV is less than or equal to ± 0.3 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.
- ^j Voids in mineral aggregate for RHMA-G must be within this range.

Within the specified reporting time, submit test results including:

1. Sampling location, quantity, and time
2. Testing results
3. Supporting data and calculations

If test results for any quality characteristic are beyond the action limits in the QC plan, take corrective actions. Document the corrective actions taken in the inspection records under section 39-4.02E.

Stop production, notify the Engineer, take corrective action, and demonstrate compliance with the specifications before resuming production and placement if:

1. A lot's composite quality factor, QF_C , or an individual quality factor, QF_{QC_i} for $i = 3, 4, \text{ or } 5$, is below 0.90 determined under section 39-4.02F using quality control data
2. An individual quality factor, QF_{QC_i} for $i = 1 \text{ or } 2$, is below 0.75 using quality control data
3. Quality characteristics for which a quality factor, QF_{QC_i} , is not determined has 2 consecutive quality control tests not in compliance with the specifications

39-4.02D Charts and Records

Record sampling and testing results for quality control on forms provided in the *Quality Control Manual for Hot Mix Asphalt Production and Placement*, or on forms you submit with the QC plan. The QC plan must also include posting locations and submittal times for forms.

Submit quality control test results using the Department's statistical evaluation program, HMAPay. For HMAPay, go to the Department's Construction Web site.

39-4.02E Records of Inspection and Testing

During HMA production, submit a daily:

1. *HMA Construction Daily Record of Inspection*. Also make this record available at the HMA plant and job site each day.
2. *HMA Inspection and Testing Summary*. Include in the summary:
 - 2.1. QC worksheet with updated test results from the HMAPay program
 - 2.2. Test forms with the testers' signatures and QC manager's initials
 - 2.3. Inspection forms with the inspectors' signatures and QC manager's initials
 - 2.4. List and explanation of deviations from the specifications or regular practices
 - 2.5. Signed statement by the QC manager that says:

"It is hereby certified that the information contained in this record is accurate, and that information, tests, or calculations documented herein comply with the specifications of the Contract and the standards set forth in the testing procedures. Exceptions to this certification are documented as part of this record."

Retain for inspection the records generated as part of quality control, including inspection, sampling, and testing for at least 3 years after final acceptance.

39-4.02F Statistical Evaluation

39-4.02F(1) General

Determine a lot's composite quality factor, QF_C , and the individual quality factors, QF_{QCi} . Perform statistical evaluation calculations to determine these quality factors based on quality control test results for:

1. Aggregate gradation
2. Asphalt binder content
3. Percent of maximum theoretical density

The Engineer grants a waiver and you must use 1.0 as the individual quality factor for percent of maximum theoretical density, QF_{QC5} , for HMA paved in:

1. Areas where the total paved thickness is less than 0.15 foot
2. Areas where the total paved thickness is less than 0.20 foot and 3/4-inch grading is specified and used
3. Dig outs
4. Leveling courses
5. Areas where compaction or compaction measurement by conventional methods is impeded

39-4.02F(2) Statistical Evaluation Calculations

Use the Variability-Unknown / Standard Deviation Method to determine the percentage of a lot not in compliance with the specifications.

Determine the percentage of work not in compliance with the specification limits for each quality characteristic as follows:

1. Calculate the arithmetic mean (\bar{X}) of the test values

$$\bar{X} = \frac{\sum x}{n}$$

where:

x = individual test values
 n = number of test values

2. Calculate the standard deviation

$$s = \sqrt{\frac{n(\sum x^2) - (\sum x)^2}{n(n-1)}}$$

where:

$\sum(x^2)$ = sum of the squares of individual test values
 $(\sum x)^2$ = sum of the individual test values squared
 n = number of test values

3. Calculate the upper quality index (Q_u)

$$Q_U = \frac{USL - \bar{X}}{s}$$

where:

- USL = TV plus the production tolerance or upper specification limit
- s = standard deviation
- \bar{X} = arithmetic mean

4. Calculate the lower quality index (QL);

$$Q_L = \frac{\bar{X} - LSL}{s}$$

where:

- LSL = TV minus production tolerance or lower specification limit
- s = standard deviation
- \bar{X} = arithmetic mean

5. From the table, Upper Quality Index Q_U or Lower Quality Index Q_L , determine P_U ;

where:

- P_U = estimated percentage of work outside the USL
- $P_U = 0$, if USL is not specified

6. From the table, Upper Quality Index Q_U or Lower Quality Index Q_L , determine P_L ;

where:

- P_L = estimated percentage of work outside the LSL
- $P_L = 0$, if LSL is not specified

7. Calculate the total estimated percentage of work outside the USL and LSL, percent defective

$$\text{Percent defective} = P_U + P_L$$

The P_U and P_L are determined from the following:

P _U or P _L	Upper Quality Index Q _U or Lower Quality Index Q _L												
	Sample Size (n)												
	5	6	7	8	9	10-11	12-14	15-17	18-22	23-29	30-42	43-66	>66
0	1.72	1.88	1.99	2.07	2.13	2.20	2.28	2.34	2.39	2.44	2.48	2.51	2.56
1	1.64	1.75	1.82	1.88	1.91	1.96	2.01	2.04	2.07	2.09	2.12	2.14	2.16
2	1.58	1.66	1.72	1.75	1.78	1.81	1.84	1.87	1.89	1.91	1.93	1.94	1.95
3	1.52	1.59	1.63	1.66	1.68	1.71	1.73	1.75	1.76	1.78	1.79	1.80	1.81
4	1.47	1.52	1.56	1.58	1.60	1.62	1.64	1.65	1.66	1.67	1.68	1.69	1.70
5	1.42	1.47	1.49	1.51	1.52	1.54	1.55	1.56	1.57	1.58	1.59	1.59	1.60
6	1.38	1.41	1.43	1.45	1.46	1.47	1.48	1.49	1.50	1.50	1.51	1.51	1.52
7	1.33	1.36	1.38	1.39	1.40	1.41	1.41	1.42	1.43	1.43	1.44	1.44	1.44
8	1.29	1.31	1.33	1.33	1.34	1.35	1.35	1.36	1.36	1.37	1.37	1.37	1.38
9	1.25	1.27	1.28	1.28	1.29	1.29	1.30	1.30	1.30	1.31	1.31	1.31	1.31
10	1.21	1.23	1.23	1.24	1.24	1.24	1.25	1.25	1.25	1.25	1.25	1.26	1.26
11	1.18	1.18	1.19	1.19	1.19	1.19	1.20	1.20	1.20	1.20	1.20	1.20	1.20
12	1.14	1.14	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
13	1.10	1.10	1.10	1.10	1.10	1.10	1.11	1.11	1.11	1.11	1.11	1.11	1.11
14	1.07	1.07	1.07	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
15	1.03	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
16	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
17	0.97	0.96	0.95	0.95	0.95	0.95	0.94	0.94	0.94	0.94	0.94	0.94	0.94
18	0.93	0.92	0.92	0.92	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.90	0.90
19	0.90	0.89	0.88	0.88	0.88	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
20	0.87	0.86	0.85	0.85	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.83	0.83
21	0.84	0.82	0.82	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.80	0.80	0.79
22	0.81	0.79	0.79	0.78	0.78	0.77	0.77	0.77	0.76	0.76	0.76	0.76	0.76
23	0.77	0.76	0.75	0.75	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73	0.73
24	0.74	0.73	0.72	0.72	0.71	0.71	0.70	0.70	0.70	0.70	0.70	0.70	0.70
25	0.71	0.70	0.69	0.69	0.68	0.68	0.67	0.67	0.67	0.67	0.67	0.67	0.66
26	0.68	0.67	0.67	0.65	0.65	0.65	0.64	0.64	0.64	0.64	0.64	0.64	0.63
27	0.65	0.64	0.63	0.62	0.62	0.62	0.61	0.61	0.61	0.61	0.61	0.61	0.60
28	0.62	0.61	0.60	0.59	0.59	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.57
29	0.59	0.58	0.57	0.57	0.56	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.54
30	0.56	0.55	0.54	0.54	0.53	0.53	0.52	0.52	0.52	0.52	0.52	0.52	0.52
31	0.53	0.52	0.51	0.51	0.50	0.50	0.50	0.49	0.49	0.49	0.49	0.49	0.49
32	0.50	0.49	0.48	0.48	0.48	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46
33	0.47	0.48	0.45	0.45	0.45	0.44	0.44	0.44	0.44	0.43	0.43	0.43	0.43
34	0.45	0.43	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.41	0.41	0.40
35	0.42	0.40	0.40	0.39	0.39	0.39	0.38	0.38	0.38	0.38	0.38	0.38	0.38
36	0.39	0.38	0.37	0.37	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36
37	0.36	0.35	0.34	0.34	0.34	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.32
38	0.33	0.32	0.32	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.30	0.30	0.30
39	0.30	0.30	0.29	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
40	0.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
41	0.25	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
42	0.23	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
43	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
44	0.16	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
45	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13

46	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
47	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
48	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
49	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOTES:

1. If the value of Q_U or Q_L does not correspond to a value in the table, use the next lower value.
2. If Q_U or Q_L are negative values, P_U or P_L is equal to 100 minus the table value for P_U or P_L .

39-4.02F(3) Quality Factor Determination

Determine individual quality factors, QF_{QCi} , using percent defective = $P_U + P_L$ and the following:

Quality Factors

Quality factor	Maximum allowable percent defective ($P_U + P_L$)												
	Sample size (n)												
	5	6	7	8	9	10-11	12-14	15-17	18-22	23-29	30-42	43-66	>66
1.05				0	0	0	0	0	0	0	0	0	0
1.04			0	1	3	5	4	4	4	3	3	3	3
1.03		0	2	4	6	8	7	7	6	5	5	4	4
1.02		1	3	6	9	11	10	9	8	7	7	6	6
1.01	0	2	5	8	11	13	12	11	10	9	8	8	7
1.00	22	20	18	17	16	15	14	13	12	11	10	9	8
0.99	24	22	20	19	18	17	16	15	14	13	11	10	9
0.98	26	24	22	21	20	19	18	16	15	14	13	12	10
0.97	28	26	24	23	22	21	19	18	17	16	14	13	12
0.96	30	28	26	25	24	22	21	19	18	17	16	14	13
0.95	32	29	28	26	25	24	22	21	20	18	17	16	14
0.94	33	31	29	28	27	25	24	22	21	20	18	17	15
0.93	35	33	31	29	28	27	25	24	22	21	20	18	16
0.92	37	34	32	31	30	28	27	25	24	22	21	19	18
0.91	38	36	34	32	31	30	28	26	25	24	22	21	19
0.90	39	37	35	34	33	31	29	28	26	25	23	22	20
0.89	41	38	37	35	34	32	31	29	28	26	25	23	21
0.88	42	40	38	36	35	34	32	30	29	27	26	24	22
0.87	43	41	39	38	37	35	33	32	30	29	27	25	23
0.86	45	42	41	39	38	36	34	33	31	30	28	26	24
0.85	46	44	42	40	39	38	36	34	33	31	29	28	25
0.84	47	45	43	42	40	39	37	35	34	32	30	29	27
0.83	49	46	44	43	42	40	38	36	35	33	31	30	28
0.82	50	47	46	44	43	41	39	38	36	34	33	31	29
0.81	51	49	47	45	44	42	41	39	37	36	34	32	30
0.80	52	50	48	46	45	44	42	40	38	37	35	33	31
0.79	54	51	49	48	46	45	43	41	39	38	36	34	32
0.78	55	52	50	49	48	46	44	42	41	39	37	35	33
0.77	56	54	52	50	49	47	45	43	42	40	38	36	34
0.76	57	55	53	51	50	48	46	44	43	41	39	37	35
0.75	58	56	54	52	51	49	47	46	44	42	40	38	36
Reject	60	57	55	53	52	51	48	47	45	43	41	40	37
	61	58	56	55	53	52	50	48	46	44	43	41	38
	62	59	57	56	54	53	51	49	47	45	44	42	39
	63	61	58	57	55	54	52	50	48	47	45	43	40
	64	62	60	58	57	55	53	51	49	48	46	44	41

Reject values greater than those shown above

NOTE: To obtain a quality factor if the estimated percent outside specification limits from table titled, "Upper Quality Index Q_U or Lower Quality Index Q_L ," does not correspond to a value in the table, use the next larger value.

Compute the composite of single quality factors, QF_C , for a lot using:

$$QF_C = \sum_{i=1}^5 w_i QF_{QC_i}$$

where:

- QF_C = the composite quality factor for the lot rounded to 2 decimal places
- QF_{QCi} = the quality factor for the individual quality characteristic
- w = the weighting factor listed in the table titled "HMA Acceptance – QC/QA Construction Process"
- i = the quality characteristic index number in the table titled "HMA Acceptance – QC/QA Construction Process"

39-4.03 QUALITY ASSURANCE

39-4.03A General

The Department assures quality by:

1. Reviewing mix designs and proposed JMF
2. Inspecting procedures
3. Conducting oversight of quality control inspection and records
4. Verification sampling and testing during production and paving

39-4.03B Verification Sampling and Testing

39-4.03B(1) General

The Department samples:

1. Aggregate to verify gradation
2. HMA to verify asphalt binder content

39-4.03B(2) Verification

For aggregate gradation and asphalt binder content, the ratio of verification testing frequency to the minimum quality control testing frequency is 1:5. The Department performs at least 3 verification tests per lot.

Using the t-test, the Engineer compares quality control tests results for aggregate gradation and asphalt binder content with corresponding verification test results. The Engineer uses the average and standard deviation of up to 20 sequential sublots for the comparison. The Engineer uses production start-up evaluation tests to represent the 1st sublot. If there are less than 20 sequential sublots, the Engineer uses the maximum number of sequential sublots available. The 21st sublot becomes the 1st sublot (n = 1) in the next lot.

The t-value for a group of test data is computed as follows:

$$t = \frac{|\bar{X}_c - \bar{X}_v|}{S_p \sqrt{\frac{1}{n_c} + \frac{1}{n_v}}} \quad \text{and} \quad S_p^2 = \frac{S_c^2(n_c - 1) + S_v^2(n_v - 1)}{n_c + n_v - 2}$$

where:

- n_c = Number of quality control tests (2 min, 20 max).
- n_v = Number of verification tests (min of 1 required).
- \bar{X}_c = Mean of quality control tests.
- \bar{X}_v = Mean of verification tests.
- S_p = Pooled standard deviation (when $n_v = 1$, $S_p = S_c$).
- S_c = Standard deviation of quality control tests.
- S_v = Standard deviation of verification tests (when $n_v > 1$).

The comparison of quality control test results and the verification test results is at a level of significance of $\alpha = 0.025$. The Engineer computes t and compares it to the following critical t-values, t_{crit} :

Degrees of freedom (n_c+n_v-2)	t_{crit} (for $\alpha = 0.025$)	Degrees of freedom (n_c+n_v-2)	t_{crit} (for $\alpha = 0.025$)
1	24.452	18	2.445
2	6.205	19	2.433
3	4.177	20	2.423
4	3.495	21	2.414
5	3.163	22	2.405
6	2.969	23	2.398
7	2.841	24	2.391
8	2.752	25	2.385
9	2.685	26	2.379
10	2.634	27	2.373
11	2.593	28	2.368
12	2.560	29	2.364
13	2.533	30	2.360
14	2.510	40	2.329
15	2.490	60	2.299
16	2.473	120	2.270
17	2.458	∞	2.241

If the t-value computed is less than or equal to t_{crit} , quality control test results are verified.

If the t-value computed is greater than t_{crit} and both \bar{X}_v and \bar{X}_c comply with acceptance specifications, the quality control tests are verified. You may continue to produce and place HMA with the following allowable differences:

1. $|\bar{X}_v - \bar{X}_c| \leq 1.0$ percent for any grading
2. $|\bar{X}_v - \bar{X}_c| \leq 0.1$ percent for asphalt binder content

If the t-value computed is greater than t_{crit} and the $|\bar{X}_v - \bar{X}_c|$ for grading and asphalt binder content are greater than the allowable differences, quality control test results are not verified and:

1. Engineer notifies you.
2. You and the Engineer must investigate why the difference exists.

- If the reason for the difference cannot be found and corrected, the Department's test results are used for acceptance and pay.

39-4.04 ACCEPTANCE CRITERIA

39-4.04A Testing

The Engineer samples for acceptance testing and tests for the following quality characteristics:

HMA Acceptance—QC/QA Construction Process

Index (i)	Quality characteristic				Weighting factor (w)	Test method	HMA type		
							A	B	RHMA-G
	Aggregate gradation ^a					California Test 202	JMF ± Tolerance ^c		
	Sieve	3/4"	1/2"	3/8"					

1	1/2"	X ^b	--	--	0.05				
1	3/8"	--	X	--	0.05				
1	No. 4	--	--	X	0.05				
2	No. 8	X	X	X	0.10				
3	No. 200	X	X	X	0.15				
4	Asphalt binder content (%)				0.30	California Test 379 or 382	JMF ± 0.45	JMF ± 0.45	JMF ± 0.5
5	Percent of maximum theoretical density (%) ^{d, e}				0.40	California Test 375	92–96	92–96	91–96
	Sand equivalent (min) ^f					California Test 217	47	42	47
	Stabilometer value (min) ^{f, g} No. 4 and 3/8" gradings 1/2" and 3/4" gradings					California Test 366	30 37	30 35	-- 23
	Air void content (%) ^{f, h}					California Test 367	4 ± 2	4 ± 2	TV ± 2
	Percent of crushed particles coarse aggregate (% min) One fractured face Two fractured faces Fine aggregate (% min) (Passing No. 4 sieve and retained on No. 8 sieve.) One fractured face					California Test 205	90 75	25 --	-- 90
	HMA moisture content (% max)					California Test 226 or 370	1.0	1.0	1.0
	Los Angeles Rattler (% max) Loss at 100 rev. Loss at 500 rev.					California Test 211	12 45	-- 50	12 40
	Fine aggregate angularity (% min)					California Test 234	45	45	45
	Flat and elongated particle (% max by weight @ 5:1)					California Test 235	Report only	Report only	Report only

	Voids in mineral aggregate (% min) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading		California Test 367	17.0 15.0 14.0 13.0	17.0 15.0 14.0 13.0	(Note j) -- -- 18.0–23.0 18.0–23.0
	Voids filled with asphalt (%) ⁱ No. 4 grading 3/8" grading 1/2" grading 3/4" grading		California Test 367	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	76.0–80.0 73.0–76.0 65.0–75.0 65.0–75.0	Report only
	Dust proportion ⁱ No. 4 and 3/8" gradings 1/2" and 3/4" gradings		California Test 367	0.9–2.0 0.6–1.3	0.9–2.0 0.6–1.3	Report only
	Smoothness		Section 39-1.12	12-foot straight-edge, must grind, and Pl ₀	12-foot straight-edge, must grind, and Pl ₀	12-foot straight-edge, must grind, and Pl ₀
	Asphalt binder		Various	Section 92	Section 92	Section 92
	Asphalt rubber binder		Various	--	--	Section 92-1.01D(2) and section 39-1.02D
	Asphalt modifier		Various	--	--	Section 39-1.02D
	CRM		Various	--	--	Section 39-1.02D

^a The Engineer determines combined aggregate gradations containing RAP under California Test 367.

^b "X" denotes the sieves the Engineer tests for the specified aggregate gradation.

^c The tolerances must comply with the allowable tolerances in section 39-1.02E.

^d The Engineer determines percent of maximum theoretical density if the specified total paved thickness is at least 0.15 foot under California Test 375 except the Engineer uses:

1. California Test 308, Method A, to determine in-place density of each density core instead of using the nuclear gauge in Part 4, "Determining In-Place Density By The Nuclear Density Device."
2. California Test 309 to determine maximum theoretical density instead of calculating test maximum density in Part 5, "Determining Test Maximum Density."

^e The Engineer determines maximum theoretical density (California Test 309) at the frequency specified for Test Maximum Density under California Test 375, Part 5.D.

^f The Engineer reports the average of 3 tests from a single split sample.

^g California Test 304, Part 2.13.

^h The Engineer determines the bulk specific gravity of each lab-compacted briquette under California Test 308, Method A, and theoretical maximum specific gravity under California Test 309.

ⁱ Report only if the adjustment for the asphalt binder content TV is less than or equal to ± 0.3 percent from the OBC value submitted on a *Contractor Hot Mix Asphalt Design Data* form.

^j Voids in mineral aggregate for RHMA-G must be within this range.

The Department determines the percent of maximum theoretical density from the average density of 3 density cores you take from every 750 tons of production or part thereof divided by the maximum theoretical density.

If the specified total paved thickness is at least 0.15 foot and any layer is less than 0.15 foot, the Department determines the percent of maximum theoretical density from density cores taken from the final layer measured the full depth of the total paved HMA thickness.

The Engineer calculates QF_{QCi} for $i = 1, 2, 3,$ and 4 using quality control data and QF_{QCi} for $i = 5$ using quality assurance data,

The Engineer stops production and terminates a lot if:

1. A lot's composite quality factor, QF_C , or an individual quality factor, QF_{QCi} for $i = 3, 4,$ or $5,$ is below 0.90 determined under section 39-4.02F
2. An individual quality factor, QF_{QCi} for $i = 1$ or $2,$ is below 0.75
3. Quality characteristics for which a quality factor, QF_{QCi} , is not determined has 2 consecutive acceptance or quality control test results not in compliance with the specifications

For any single quality characteristic for which a quality factor, QF_{QCi} , is not determined, except smoothness, if 2 consecutive acceptance test results do not comply with specifications:

1. Stop production.
2. Take corrective action.
3. Take samples and split each sample into 4 parts in the Engineer's presence. Test 1 part for compliance with the specifications and submit 3 parts to the Engineer. The Department tests 1 part for compliance with the specifications and reserves and stores 2 parts.
4. Demonstrate compliance with the specifications before resuming production and placement.

39-4.04B Statistical Evaluation, Determination of Quality Factors, and Acceptance

39-4.04B(1) Statistical Evaluation and Determination of Quality Factors

To determine the individual quality factor, QF_{QCi} , for any quality factor $i = 1$ through 5 or a lot's composite quality factor, QF_C , for acceptance and payment adjustment, the Engineer uses the evaluation specifications under section 39-4.02F and the following:

1. Verified quality control test results for aggregate gradation
2. Verified quality control test results for asphalt binder content
3. Department's test results for percent of maximum theoretical density

39-4.04B(2) Lot Acceptance Based on Quality Factors

The Engineer accepts a lot based on the quality factors determined for aggregate gradation and asphalt binder content, QF_{QCi} for $i = 1$ through $4,$ using the total number of verified quality control test result values and the total percent defective ($P_U + P_L$).

The Engineer accepts a lot based on the quality factor determined for maximum theoretical density, QF_{QC5} , using the total number of test result values from cores and the total percent defective ($P_U + P_L$).

The Engineer calculates the quality factor for the lot, QF_C , which is a composite of weighted individual quality factors, QF_{QCi} , determined for each quality characteristic in the HMA Acceptance – QC/QA table in section 39-4.04A.

The Engineer accepts a lot based on quality factors if:

1. Current composite quality factor, QF_C , is 0.90 or greater
2. Each individual quality factor, QF_{QCi} for $i = 3, 4,$ and 5 , is 0.90 or greater
3. Each individual quality factor, QF_{QCi} for $i = 1$ and 2 , is 0.75 or greater

No single quality characteristic test may represent more than 750 tons or 1 day's production, whichever is less.

39-4.04B(3) Payment Adjustment

If a lot is accepted, the Engineer adjusts payment with the following formula:

$$PA = \sum_{i=1}^n HMA CP * w_i * [QF_{QCi} * (HMATT - WHMATT_i) + WHMATT_i] - (HMA CP * HMATT)$$

where:

- PA = payment adjustment rounded to 2 decimal places
 - HMA CP = HMA Contract price
 - HMATT = HMA total tons represented in the lot
 - WHMATT_i = total tons of waived quality characteristic HMA
 - QF_{QCi} = running quality factor for the individual quality characteristic
- QF_{QCi} for $i = 1$ through 4 must be from verified Contractor's QC results. QF_{QC5} must be determined from the Engineer's results on density cores taken for percent of maximum theoretical density determination.
- w = weighting factor listed in the HMA acceptance table
 - i = quality characteristic index number in the HMA acceptance table

If the payment adjustment is a negative value, the Engineer deducts this amount from payment. If the payment adjustment is a positive value, the Engineer adds this amount to payment.

The 21st subplot becomes the 1st subplot ($n = 1$) in the next lot. If the 21st sequential subplot becomes the 1st subplot, the previous 20 sequential sublots become a lot for which the Engineer determines a quality factor. The Engineer uses this quality factor to pay for the HMA in the lot. If the next lot consists of less than 8 sublots, these sublots must be added to the previous lot for quality factor determination using 21 to 27 sublots.

39-4.04C Dispute Resolution

For a lot, if you or the Engineer dispute any quality factor, QF_{QCi} , or verification test result, every subplot in that lot must be retested.

Referee tests must be performed under the specifications for acceptance testing.

Any quality factor, QF_{QCi} , must be determined using the referee tests.

For any quality factor, QF_{QC_i} , for $i = 1$ through 5, dispute resolution:

1. If the difference between the quality factors for QF_{QC_i} using the referee test result and the disputed test result is less than or equal to 0.01, the original test result is correct
2. If the difference between the quality factor for QF_{QC_i} using the referee test result and the disputed test result is more than 0.01, the quality factor determined from the referee tests supersedes the previously determined quality factor

39-5 RESERVED

39-6 PAYMENT

Section 39-6 includes specifications for HMA payment. The weight of each HMA mixture designated in the Bid Item List must be the combined mixture weight.

If the QC/QA construction process is specified, the Engineer adjusts payment under section 39-4.

If recorded batch weights are printed automatically, the bid item for HMA is measured by using the printed batch weights, provided:

1. Total aggregate and supplemental fine aggregate weight per batch is printed. If supplemental fine aggregate is weighed cumulatively with the aggregate, the total aggregate batch weight must include the supplemental fine aggregate weight.
2. Total asphalt binder weight per batch is printed.
3. Each truckload's zero tolerance weight is printed before weighing the 1st batch and after weighing the last batch.
4. Time, date, mix number, load number, and truck identification is correlated with a load slip.
5. Copy of the recorded batch weights is certified by a licensed weighmaster and submitted to the Engineer.

If tack coat, asphalt binder, and asphaltic emulsion are paid with separate contract items, their contract items are measured under section 92 or section 94.

The Department does not adjust the unit price for an increase or decrease in the tack coat quantity. Section 9-1.06 does not apply to tack coat.

Place hot mix asphalt dike of the type specified is measured along the completed length.

Place hot mix asphalt (miscellaneous areas) is measured as the in-place compacted area.

HMA dike is paid for as place hot mix asphalt dike of the type specified in the Bid Item List and by weight for hot mix asphalt.

HMA specified to be placed in miscellaneous areas is paid for as place hot mix asphalt (miscellaneous area) and by weight for hot mix asphalt.

If the QC/QA construction process is specified, HMA placed in dikes and miscellaneous areas is paid for as hot mix asphalt as specified in section 39-4 except section 39-4.04B does not apply.

If minor hot mix asphalt is paid by area, it is measured from the dimensions shown.

Payment for tack coat for minor HMA is included in payment for minor hot mix asphalt or the bid item that requires minor HMA.

Geosynthetic pavement interlayer is measured for the actual pavement area covered.

If the dispute resolution independent third party determines the Department's test results are correct, the Engineer deducts the independent third party's testing costs from payments. If the independent

third party determines your test results are correct, the Department pays the independent third party's testing costs.