

# CITY OF IMPERIAL

## ADDENDUM NO. 1

### TO THE CONTRACT DOCUMENTS AND SPECIFICATIONS FOR THE CITY OF IMPERIAL BID NO. 2014-04

#### STREET IMPROVEMENT PROJECT ASPHALT RUBBER COMPOSITE LAYER OVERLAY ON DESIGNATED STREETS

Bidders are advised that the contract documents and specifications for the above referenced contract are hereby amended in the following manner and the following manner only:

Add the specifications and special provision as shown on Exhibit A (Attached).

**Bidder shall sign this addendum and fax a copy of this addendum back to the office of the City Clerk as proof of receipt (Fax Number 760-355-4718). Bidder shall also include a signed copy of this Addendum No. 1 with their bid proposal.**

Dated: August 05, 2014  
Faxed/Emailed to  
Plan Holders list

By:  \_\_\_\_\_  
Debra Jackson, City Clerk

By: \_\_\_\_\_  
(Bidder's Company Name)

Date Received by Bidder: \_\_\_\_\_  
(Bidder's Signature)

\_\_\_\_\_  
(Type or Print Name)

# EXHIBIT "A"

## **SPECIFICATIONS**

### **1.01 STANDARD SPECIFICATIONS**

The work embraced herein shall be done in accordance with the appropriate provisions of construction details as shown in the specifications entitled “State of California, Department of Transportation Standard Specifications 2010” insofar as the same may apply. Also portions of the work shall be done in accordance with the “GREENBOOK” Standard Specifications for Public Works Construction 2012 Edition. These specifications are hereinafter referred to as the Standard Specifications and in accordance with the following provisions:

Whenever in the Standard Specifications the following terms are used, they shall be understood to mean to refer the following:

Department of Public Works or Division of Highways – City of Imperial, California

Director of Public Works – The Director of Public Works of the City of Imperial, California.

Engineer – The City Engineer, acting directly or through properly authorized agents, such agents acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties entrusted to them.

Laboratory – The designated laboratory authorized by the City of Imperial to test materials and work involved in the contract.

State – The City of Imperial, California.

Other terms appearing in the Standard Specifications, the General Conditions and these Special Provisions, shall have the intent and meaning specified in the Sections 1, “Definitions of Terms”, Standard Specifications. In case of conflict between the Standard Specifications and these General Conditions and Specifications, the General Conditions and Specifications shall take precedence over and be used in lieu of such conflicting portions.

### **1.02 SCOPE OF WORK**

The work shall include grinding of existing asphalt concrete pavement, installation of conventional-asphalt concrete leveling course, asphalt-rubber aggregate membrane, gap graded asphalt-rubber hot mix, slurry seal, traffic striping, loop detectors, utility adjustments and traffic control.

**END OF SPECIFICATIONS**

## **SPECIAL PROVISIONS**

### **1. ORDER OF WORK**

Prior to commencement of any work on the project, a preconstruction conference will be held for the purpose of review and discussion of progress schedule and construction procedures. At the discretion of the Director of Public Works, periodic meetings involving project personnel (Contractor, utility and others) will be held for the purpose of coordinating project activities.

### **2. STARTING AND COMPLETION OF WORK**

The work called for in these contract documents shall commence within (10) calendar days after that date set out in the **Notice-to-Proceed** issued by the City, and shall be diligently pursued to completion within \_\_\_\_\_ (\_\_\_\_) calendar days of said date.

### **3. FAILURE TO COMPLETE ON TIME AND LIQUIDATED DAMAGES**

It is agreed by the parties of the contract that in case of all work called for under the contract is not completed before or upon the expiration of the time limits set forth in these Special Provisions, damages will be sustained by the City of Imperial and that it will be impracticable to determine the actual damage by which the City will sustain in the event of and by reason of such delay and it is therefore agreed that the contractor will pay to the City of Imperial the sum of two hundred dollars (\$200.00) per day for each and everyday's delay beyond the time prescribed to complete the work.

### **4. MAINTAINING TRAFFIC**

The Contractor shall maintain two way traffic in the work area in accordance with the "Manual of Uniform Traffic Control Devices" (MUTCD), 2010 Edition or as modified, available through the State of California, Department of Transportation, 1900 Royal Oaks Drive, Sacramento, California 95815.

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

The contractor shall make every effort to keep driveways open during working hours. After work hours, all driveways shall be accessible and safe. The payment for item shall be included in the bid price for the applicable item of work for which traffic control is performed.

### **5. NOTICE AND POSTING REQUIREMENTS**

The Contractor shall post and remove temporary "No Parking" signs as needed. Signs shall be in place for at least 48 hours in advance of commencing of work. Signs may be attached to existing poles, parkway trees, or any available support that may exist in the public right-of-way or the contractor may furnish sign supports as may be necessary.

Multiple notices shall be delivered and hung on door handles of each residence and to each business affected by the construction. The format and content of the notices shall be submitted to the Engineer for approval at least 2 weeks prior to use. Notices will be required as follows:

- 1) A general notice in all cases will be required 2 weeks in advance of work, describing the sequence of activities that will affect parking and access to properties, to be delivered 2 weeks prior to construction. This notice will generally address parking and access for street resurfacing with further details to follow on subsequent notices, except detailed information will be required in this first notice to explain the leveling course portion of the work.
- 2) A notice prior to ARAM, with specifics about parking and access, to be delivered 48 hours prior to construction.
- 3) A notice prior to Slurry, with specifics about parking and access to be delivered 48 hours prior to construction.
- 4) A combined notice about System III, that includes specifics about both ARAM and ARHM-GG overlay to be delivered 48 hours prior to construction.

Notice numbers 1), 2) and 3) shall be delivered for System I and System II. Notice numbers 1) and 4) shall be delivered for System III.

## **6. CONSTRUCTION AREA SIGNS**

The Contractor shall furnish, install, maintain, and remove all construction area signs in conformance with the plans and Sections 12-3.06 of the Standard Specifications.

## **7. REPAIR EXISTING ROADBED**

Where directed by the Director of Public Works, broken or failed, or other unsatisfactory portions of the existing roadbed shall be removed and disposed of and the resulting excavation shall be filled with asphalt concrete pavement in conformance with specifications and to be compensated by applicable bid item.

## **8. REMOVE PAVEMENT MARKINGS**

Existing pavement markers, when no longer required for traffic lane delineation as directed by the Director of Public Works, shall be removed and disposed of.

Full compensation for removing and disposing of pavement markers shall be considered as included in the contract price for the applicable bid item for roadway surfacing and no separate payment will be made therefore.

## **9. ASPHALT CONCRETE LEVELING COURSE**

The work shall consist of installing asphalt concrete Type A ½-inch Hot Mix Asphalt conforming to Section 39 of Caltrans Standard Specifications 2010. The Contractor shall submit for approval to the City Engineer a Caltrans signed and verified Job Mix Formula (JMF) on Caltrans Form CEM 3513, 15 days prior to the beginning of the work.

## 9.01 Placing

All holes and cracks exceeding 2 inches deep by 5 inches wide by 7 inches long in all 3 dimensions shall be filled with asphalt concrete approved for skin patch compacted level with the top of the existing pavement. All cracks and joints 1/4 inch or greater in width shall be blown thoroughly clear with high pressure air or power broomed clean to a depth of 3/4-inch min. prior to final sweeping just ahead of leveling course.

Tack coat on all feathered areas and cold milled areas shall be SS-1h applied at .48 liters per square meter (.12 gal/sy).

The Contractor shall place asphalt concrete with a self-propelled asphalt paving machine. Contractor shall provide a 20 foot long automatic screed control on both sides of the paving machine for all paving with paving machine, as directed by Engineer.

Each paving machine used will require a paving foreman for each machine along with a full set of rollers as specified and two rakers and one shoveler laborer as a minimum.

Asphalt concrete shall be placed at a minimum thickness of 3/4-inch. Non-uniform surface voids or scraped rock surfaces on the surface of the mat behind the screed will be considered indication of aggregate particle conflicts between screed and existing grade, resulting in cessation of paving until adjustment of thickness to provide for a smooth surface is provided to the satisfaction of the Engineer.

Rolling along a joint shall be such that the widest part of the roller is on the hot side of the joint.

Rubber tire rollers shall be used on any leveling course.

Join lines between successive runs shall be within 150 mm (6 inches) of lane lines or a minimum of 3.6 m (12 feet) outside of the outer most lane line.

## 9.02 Compaction

The Contractor shall use the following equipment as a minimum:

One pass with a steel wheeled 2-axle tandem vibratory breakdown roller weighing between 10 tons and 12 tons with wheels whose diameter shall measure a minimum of 40 inches.

Two passes with a pneumatic-tired roller weighing **not less than 12 tons**.

An 8 to 10 ton roller shall perform finish rolling.

## 9.03 Payment

Payment of this item complete shall be by the square yard for leveling course, and shall be considered to include compensation for all holes and crack preparation as specified in this Section 9 of Special Provisions.

### 302-9.1 General.

ARHM-GG construction on System III streets shall be performed on a different day than on intersections that are not contiguous with a System III street, without written authorization from the Engineer. Non-conformance with this requirement will be cause to pay for tonnage of pavement in all areas on that day at the lowest of the two tonnage prices.

## **10. ASPHALT CONCRETE REPAIRS**

### **10.01 Remove and replace Asphalt Pavement**

The work under this item shall include removal and replacement of existing asphalt concrete pavement. Repair locations will be as marked by the Engineer on the existing pavement. The perimeter of all repairs shall be sawcut minimum 3-inches deep.

Asphalt replacement shall be performed the same day as removals.

Asphalt concrete used for remove and replace asphalt pavement shall be 3/4" Maximum, Coarse.

Tack coat for vertical joints on repairs in AC shall be uniformly applied as two coats SS-1h applied uniformly at .64 liter per square meter (.20 gal/SY) each coat.

Compensation for Remove and Replace Asphalt Pavement will be made at the unit price bid per ton of asphalt concrete used for the repairs. The price per ton shall include sawcut, excavation and removal, subgrade preparation, tack coat, and placement and compaction of AC and all incidentals.

### **10.02 Skin Patch**

Areas marked with an "S" shall receive a layer of a fine AC mix on existing pavement. The AC mix design shall be submitted to the Engineer for review and approval at least 5 working days prior to use on the project. Pavement shall be allowed to dry prior to placement of any material and a torch shall be used to evaporate and thoroughly dry out any residual dampness prior to application of tack coat. Tack coat shall be applied in all areas to be paved, but no more than 10 minutes ahead of paving in wet areas. AC skin patch material shall be placed in the depressed area slightly below flush with surrounding pavement. Thorough compaction shall be provided by a walk behind roller or other small roller.

Tack coat on all feathered areas around the perimeter of skin patches shall be .13 gal/SY. It is considered extremely important that material used for feathers be rolled above minimum temperature. Contractor shall provide a heated compartment to maintain temperature of material or bring enough material to maintain temperature of the mass of AC until placement is complete.

The unit price bid per square foot for Skin Patch will be considered full compensation for all preparation, tack coat, materials, placement and compaction of skin patch, including all incidentals.

## 11. SLURRY SEAL

Construction and materials for Emulsion-Aggregate Slurry shall conform to Subsection 203-5 and 302-4 of the GREENBOOK, except as modified herein.

### SECTION 203-5 - EMULSION-AGGREGATE SLURRY

#### 203-5.1 General

Emulsion-aggregate slurry shall be polymer modified.

#### 203-5.2 Materials

Emulsion - aggregate slurry shall be Type II, unless otherwise indicated on the plans, bid schedule or in these specifications. The amount and type of accelerator or retardant used shall be approved by the Engineer, and shall provide for curing sufficiently to support traffic within 2 hours.

Emulsified asphalt shall be CQS-1h.

Prior to the time of delivery of each shipment of asphalt emulsion, the Contractor shall deliver to the City certified copies of the test report for that emulsion. The test report shall indicate the name of the vendor, type and grade of asphalt emulsion, date and point of proposed delivery, quantity, purchase order number, and results of the specified tests. The test report shall be signed by an authorized representative of the vendor, shall certify that the product delivered conforms to the standard specifications and is compatible with the proposed aggregate. Testing shall be accomplished by an accredited materials testing laboratory approved by the Engineer.

Prior to a change of emulsion, Contractor shall thoroughly clean all emulsion tanks and mixing units to prevent any chemical reaction between the two emulsions.

Contractor shall schedule and coordinate the delivery of aggregate to the stockpile(s) such that: (1) deliveries originate at the plant and arrive at the stockpile site within normal work hours on the same calendar day, (2) delivery site and project name are explicitly stated on each delivery ticket, (3) successive deliveries on the same calendar day show the cumulative total for that day, (4) copies of all delivery tickets are delivered to the Engineer before the end of the working day, whereas any delivery tickets not so delivered may be rejected by the Engineer. Any deviation from this process must have the prior approval of the Engineer.

203-5.2.1 Polymer Modified Emulsion. Polymer modified emulsion-aggregate slurry shall conform to Table 203-5.2.1(A).

Asphalt emulsions shall be composed of a paving asphalt base uniformly emulsified with water and an emulsifying or stabilizing agent. Polymer modified asphalt emulsions shall also contain a polymer.

The asphalt emulsion shall be homogeneous. Within 30 days after delivery and provided separation has not been caused by freezing, the asphalt

emulsion shall be homogeneous after thorough mixing. The polymer used in the manufacture of polymer modified asphaltic emulsion shall be, at the option of the Contractor, either neoprene, ethylene vinyl acetate, or a blend of butadiene and styrene.

The emulsion supplier shall certify that the asphalt residue contains at least 2.5 percent polymer (dry weight) and that the polymer has either been added as a solid polymer to the base asphalt, or has been added in the form of a latex at the time of emulsion manufacture.

Polymer modified emulsified asphalt shall be kept in a suspended state by an agitating mixer operated every 3 days.

**TABLE 203-5.2.1(A)**

Requirements for Polymer Modified Cationic Quick Setting Emulsions (PMCQS1h)		
<u>Properties</u>	<u>Min.</u>	<u>Max.</u>
Tests on Emulsions		
Viscosity SSF, @ 77°F	15.0	90.0
Sieve Test, %		0.3
Storage Stability, 1 day, %		1.0
Residue by Evaporation	57.0	
Particle Charge	Positive	
Tests on Residue from Evaporation Test		
Penetration, 77°F	40.0	90.0
Ductility, 77°F, cm	40.0	
Absolute Viscosity @ 140°F, poise	2,250.0	
Solubility in Trichloroethylene	97.0	
Quantitative Test for Polymer Content		
Either;		
Torsional Recovery, %	18.0	
or		
Polymer Content in Residue, wt %	2.5	3.0

203-5.6 Test Reports and Certification. A certification of compliance shall be provided at least 48 hours prior to delivery of emulsion to the project.

Testing shall be accomplished by an accredited materials testing laboratory approved by the Engineer. Tests performed shall provide values corresponding to all parameters set forth in the table of requirements for the materials specified.

## 302-4 EMULSION-AGGREGATE SLURRY

302-4.1 General. After application, slurry shall be rubber tire rolled in all areas. The work to be done consists of furnishing all plant, labor, materials, tools, equipment and services necessary for the application of emulsion-aggregate slurry upon designated ARAM street surface areas.

### 302-4.2 Mixing

302-4.2.1 General. Transit mix trucks shall not be used.

Contractor shall arrange with the City for appropriate areas for stockpiling and batching. The stockpile areas shall be thoroughly cleaned, removing all excess material and all material contaminated by spilled oil, and left with a neat, orderly appearance upon completion of slurry operations in that area. Stockpiles shall be covered as necessary to prevent contamination by all materials including excessive moisture. No equipment or materials shall be stored in the public right-of-way.

All trucks which the Contractor proposes to use that exceed the legal load limit will be required to have overweight permits from the Agency.

Loaders used to load spreader trucks shall be equipped with functioning weighing devices with weight read-outs. The weight of each loader bucket added to a spreader truck shall be logged in writing by Contractor's personnel after each bucket load.

Prior to the beginning of slurry operations, Contractor shall furnish, at no cost to the Agency, a current licensed weigh master's certificate indicating the net weight capacity of the aggregate bin.

Contractor shall supply the Engineer with licensed weigh master's certificates of weights for all aggregate delivered to the job during the course of each day. Aggregate so certified as being delivered for use in the contract shall be used only in the slurry mixture for this contract. Contractor shall also present weigh master's certificates for the amount of such aggregate remaining unused at the completion of the contract at no cost to the Agency. Payment shall be determined by deducting the amount of unused aggregate from the total amount of aggregate delivered, all as shown on the licensed weigh master's certificates. The certificates shall be presented to the Engineer on the same day the aggregate is delivered.

Water (excluding that water in the emulsified asphalt) shall be added at a rate of from 5 to 10 percent by weight of dry aggregate to ensure proper dispersion of the emulsified asphalt and proper workability, while (1) avoiding excess water which would allow separation and settlement of the

aggregate, (2) avoiding insufficient water which would result in balling and coagulation in the mixer, and (3) permitting uncontrolled vehicular traffic as specified herein. The exact rate will be determined by the Contractor based upon field conditions subject to approval of the Engineer.

302-4.2.2 Continuous-Flow Mixers. The mixing unit shall be equipped with a fines feeder for addition of accelerator.

The spreader box shall be equipped with a suitable drag to erase ridges. A minimum 2-foot length of burlap material shall be attached to the entire width of the drag. The spreader box shall be equipped with a steering device.

The slurry spreader box shall be maintained in a good state of repair at all times. The spreader box main strike off squeegee (rubber) shall be new at the beginning of the contract and shall be maintained in a good state of repair throughout the contract.

Equipment shall be available for inspection before the beginning of the contract and again before work is to be accomplished.

### 302-4.3 Application

302-4.3.1 General. The first paragraph of Subsection 302-4.3.1 of the Standard Specifications is hereby deleted and replaced with the following:

The work shall consist of preparation, mixing asphaltic emulsion, aggregate, accelerator and water, and spreading the mixture on the pavement where shown on the plans. Type II slurry shall be applied at a rate yielding a minimum 1,200 square feet per extra long ton.

Actual spread rates shall be approved by the Engineer.

#### 302-4.3.1.1 Preparation.

Slurry shall not be applied over any manhole, valve, survey monument, or miscellaneous frames and covers. Any material used to protect such devices shall be removed and disposed of lawfully by the Contractor.

302-4.3.2 Spreading. The first sentence of Subsection 302-4.3.2 is hereby deleted and replaced with the following:

Slurry seal shall be placed only when the ambient temperature is above 50 degrees and rising. No slurry will be placed during inclement weather or the threat of. Contractor will bear the responsibility of that may arise from non-cancellation.

Each slurry crew shall be composed of a coordinator at the project site at all times, a competent quick-set mixing man, a competent driver, and sufficient laborers for any handwork and cleanup.

Prior to commencement of work, Contractor shall perform test sections for review and approval by the Engineer. The area of the test sections shall be at least 5,000 square feet. The section locations shall be in the area of the work, to be specified prior to construction. In no case will the Contractor begin operations until the test sections have adequately cured and he has received written approval by the Engineer. The approved mix design and test section shall be considered the standard for the operation.

No slurry seal shall be placed on a wet street or crossing without the Engineer's consent.

Intersections and commercial driveways shall be completed in two parts to allow ingress and egress to traffic. Sand may be spread over the fresh slurry only with the permission of the Engineer.

All slurried streets shall be fully swept 5 to 8 days after slurry is complete, with residual material removed to a legal disposal site.

The cost of cleanup and/or damage caused by vehicles tracking through the slurry seal will be born solely by the Contractor.

302-4.3.2.1 Rubber Tire Rolling. Rolling shall be performed with two complete coverages by a 12-ton nine-wheel rubber tired roller with a tire pressure of 50 psi. Rolling shall be performed after slurry and as soon as it sets up enough to support the roller and not pick up on the tires.

Areas of shade on the pavement that set up more than 10 minutes later than other areas shall be rolled separately, but as soon as they set up sufficiently to meet the requirements herein. Insufficient rubber-tire rollers to meet these requirements shall be cause for termination of slurry operations until rolling can keep pace with slurry spread.

302-4.4 Public Convenience and Traffic Control. The spreading schedule shall list the streets in order of proposed application and denote which streets are to be completed each day.

Traffic control with ample barricades, flaggers, standard regulatory and warning signs, no parking signs, etc., shall be provided to protect the uncured slurry surface from all types of traffic. Any damage to the uncured slurry is the responsibility of the Contractor. Traffic control plan shall be submitted to and approved by the City Director of Public Works prior to commencing work. The Contractor's work will be done on successive adjacent streets during the same day of the operation. Adequate means shall be provided to protect the slurry seal from damage by traffic for a

minimum of four (4) hours of application or until such time that the mixture has cured sufficiently so that the slurry seal will not adhere to and be picked up by tires of vehicles.

Temporary "No Parking" signs shall be posted at least 48 hours in advance of the work. The signs shall be placed no more than 100 feet apart on each side of the street and at shorter intervals if conditions warrant. The Contractor shall provide the signs and will be responsible for adding the dates and hours of closure to the signs, removal of the signs, and furnishing and placing of barricades, if necessary, for posting of the signs. All signs shall be removed within 48 hours after the effective date.

Contractor shall provide barricades and other traffic control devices as necessary to eliminate traffic on areas of fresh slurry that might sustain damage from such traffic. Any tracking of slurry seal on private property will be the responsibility of the Contractor to correct. Contractor shall sweep the streets for five (5) consecutive days after application of the slurry.

Slurry seal shall not be spread on the trash pickup day of each respective street.

Temporary striping devices shall be provided on all lane lines covered by slurry.

302-4.5 Measurement and Payment. The second paragraph of Subsection 302-4.5 of the Standard Specifications is hereby deleted and replaced with the following:

The contract unit price per square yard shall be considered to include full compensation for furnishing emulsion, polymer as specified, accelerator or retardant and water, and all preparation, traffic control, rubber tire rolling where specified, and other incidentals described in the work and no additional compensation will be provide therefor.

## **12. ASPHALT-RUBBER HOT MIX – GAP GRADED (ARHM-GG)**

ARHM Material shall conform to 203-11 of the GREENBOOK as modified herein and Section 39 of Caltrans Standard Specifications 2010. The Contractor shall submit for approval to the City Engineer a Caltrans signed and verified Job Mix Formula (JMF) on Caltrans Form CEM 3513, 15 days prior to the beginning of the work.

ARHM Construction shall conform to 302-9 of the GREENBOOK as modified herein.

### **203-11 ASPHALT-RUBBER HOT MIX (ARHM) WET PROCESS.**

#### **203-11.2 Materials.**

##### **203-11.2.3 Crumb Rubber Modifier (CRM).**

The third and the last sentence of the first paragraph of Subsection 203-11.2.3 are hereby deleted and replaced with the following:

The high natural rubber shall be a single source material and not a blend of more than one source. The high natural CRM shall not be tire rubber. A minimum 2-ounce unground and ungranulated sample of the base stock shall be provided, along with a minimum 4-ounce ground or granulated sample. Contractor shall pay for any failed chemical analysis tests.

The fifth paragraph of Subsection 203-11.2.3 is hereby deleted and replaced with the following:

The percentage of high natural CRM shall be equal to 1000 divided by the percentage of natural rubber in the high natural CRM (using whole number percentages), e.g., 1000/40 percent equals 25 percent. The remainder of CRM shall be scrap tires.

The maximum value for Natural Rubber Content in Table 203-11.2.3(B) is hereby deleted.

The sixth (last) paragraph of Subsection 203-11.2.3 is hereby deleted.

203-11.2.4 Aggregate. The text of Subsection 203-11.2.4 is hereby deleted and replaced with the following:

The aggregate for ARHM shall conform to the “quality requirements” for asphalt concrete Type A as specified in Caltrans Standard Specifications, except for the following:

Maximum LA Rattler value at 500 revolutions shall be 35.

Eighty-five percent of coarse aggregate shapes shall be “proportioned particles”, a proportioned particle being defined as a particle having a minimum dimension greater than  $\frac{1}{2}$  the maximum dimension as measured with a caliper. The percentage of proportioned particles shall be tested by California Test 205 with the words “proportioned particles” substituted for “crushed particles”.

California Test 205, Section D, definition of a crushed particle hereby revised as follows: "A particle having 2 or more fresh mechanically fractured faces shall be considered a crushed particle".

### 203-11.3 Composition and Grading.

The aggregate for Asphalt-Rubber Hot Mix (ARHM-GG) shall conform to following gradations, which shall be considered included as additional columns in Table 203-11.3(A):

**½-inch RHMA-G**

<b><u>Sieve Sizes</u></b>	<b><u>TV limits</u></b>	<b><u>Allowable tolerance</u></b>
¾"	100	--
½"	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

No mineral filler or material from sand or rock dust bins shall be included in the mix.

The gradation ranges shown in Table 203-11.3(A) shall be considered the Contract Compliance Range. The Operating Range for the ½" sieve shall be the full contract compliance range. The Operating Range for all other sieves, except the 200 sieve, shall be 2 percentage points inside both limits of the Contract Compliance Range. If gradation-testing results do not meet the Operating Range requirements but meet the Contract Compliance Range, placement of ARHM may be continued for the remainder of the day. However, another day's work shall not be started until tests, or other information, indicate to the satisfaction of the Engineer that the next material to be used in the work will comply with the requirements specified for Operating Range.

Except for the No. 200 sieve, it is the intent of the Specifications that the target percentage be the central value in the Contract Compliance Range.

The asterisk noted under Table 203-11.3(A) is hereby deleted and replaced with the following:

Once the percent asphalt-rubber binder is determined by the mix design, the tolerance shall be +/-0.5% as determined by California Test Method 382, and this tolerance shall be considered to include all sampling and testing tolerances. Variations of binder content on this basis at or exceeding +/- 0.5% from the mix design will be cause to terminate paving operations until changes to provide specified tolerances are verified and approved by the Engineer.

Any change in source of aggregate supply requires 2 weeks advance notice in writing to the Engineer, and submittals and testing in conformance with specifications for a new mix design. No single bin shall receive aggregate from more than one source. Contractor shall provide a copy of aggregate delivery tickets for aggregate delivered for use on the project.

The amount of asphalt-rubber binder to be mixed with the aggregate for Asphalt-Rubber Hot Mix Type GG will be determined by the Engineer using the samples of aggregates furnished by the Contractor in conformance with the provisions in Section 39-3.03, "Proportioning," of the Standard Specifications. The Engineer will determine the exact amount of asphalt-rubber binder to be mixed with the aggregate in conformance with the provisions in California Test 368 with the following

exceptions. The aggregate shall be mixed with PG 64-16 paving asphalt and the optimum bitumen content shall be determined in conformance with the test procedure. The optimum binder content for Asphalt-Rubber Hot Mix Type GG shall then be determined using the following formula:

A.  $OBC_2 = (OBC_1) \times 1.20$

B.  $OBC_1$  = Optimum bitumen content using PG 64-16 paving asphalt

C.  $OBC_2$  = Optimum bitumen content using asphalt-rubber binder

The asphalt-rubber binder content of the Asphalt-Rubber Hot Mix Type GG will be determined by California Test Method 382.

#### 203-11.4 Mixing.

The third paragraph of Subsection 203-11.4 is hereby deleted and replaced with the following:

The proportions of the materials, by total weight of asphalt-rubber binder, shall be 80 percent combined paving asphalt and asphalt modifier, and 20 percent CRM. The temperature of the blended asphalt and modifier shall be between 190 degrees C (375 Fahrenheit) minimum and 226 degrees C (440 Fahrenheit) maximum when the CRM is added. The temperature shall not exceed 6 degrees C (10 Fahrenheit) below the actual flash point of the mixture. The CRM shall be combined and mixed together in an asphalt-rubber mechanical blender meeting the requirements of 203-11.5. The combined asphalt and CRM shall be pumped into a reaction tank or distributor truck meeting the requirements of 203-11.5, Item 3A). The required mixing/reaction time shall be **90** minutes minimum. The temperature of the asphalt-rubber mixture shall be between 194 degrees C (**380** Fahrenheit) minimum to 218 degrees C (425 Fahrenheit) maximum during the reaction period.

After reacting, the asphalt-rubber binder shall conform to the requirements in Table 203-11.4(A). The minimum reaction period shall be the time from complete incorporation of materials into the mix to the time that the asphalt-rubber meets all specifications for reacted material, but no less than 90 minutes. Once established, the minimum reaction period shall remain unchanged, unless there are changes in materials or equipment that may affect rubber digestion, in which case a new reaction period shall be established per specifications. The Engineer's decision shall be final for determination of the minimum reaction period.

All material shall be tested for viscosity and verified as to complete reaction prior to transfer to any storage tank or use of the reaction tank for feed to the hot mix plant. Material reacted lower than specified temperature, but above 185 degrees C (365 F), or transferred to a storage tank prior to completion of reaction as specified, shall be reacted for total period of 3 hours prior to use. Any such transfer shall be described in the comments column of the Asphalt-Rubber Batch Log.

Inability to maintain reaction temperatures above specified minimums will be cause to terminate paving operations. Contractor is reminded that if the reaction tank does not have a gas retort heating system capable of raising the temperature of its contents at least 20 degrees per hour, there exists the inherent potential for such below

minimum temperatures to become an irreversible condition. **Certification was previously provided at time of bid opening in the bid that the asphalt-rubber hot mix plant owner, the paving subcontractor, and asphalt-rubber supplier have been made fully aware of these provisions.**

Contractor shall test viscosity and record the following information for every tank of asphalt-rubber prior to being transferred to storage or directed to feed to the hot mix plant:

- 1) Temperature of stored asphalt cement material at time of loading
- 2) Time at which the reaction tank is fully loaded
- 3) Tons of asphalt-rubber added to the tank for the batch
- 4) Total asphalt-rubber in the tank after loading
- 5) The beginning time of reaction (Fully loaded and above 380° F)
- 6) Binder temperature at time of sampling
- 7) Temperature of tested material
- 8) Viscosity reading
- 9) Time of viscosity test (All test results must be prior to use.)

If more than 20% of a batch is holdover material, the reaction time may be reduced, but a line item must be provided on the Asphalt-Rubber Batch Log showing items 6), 7) and 8) for a test just prior to loading new material. Reaction shall be considered to begin after all material is added. If more than 20% is holdover material, reaction time can be reduced to the fraction of total material that is holdover material, times 90 minutes, but shall be no less than 20 minutes.

A copy of the Asphalt-Rubber Batch Log shall be provided to the Engineer upon request. A copy of the batch log sheet and all circle charts for the day shall be faxed to the City within 1 1/2 hours of ending production of ARHM for the day. To fit 8 1/2 x 11-inch sheets, the circle chart may be faxed in 2 parts with an overlap. See Subsection 203-11.5 for circle chart requirements.

The Maximum value for Haake Field Viscosity @191 degrees C (375 degrees Fahrenheit) in Table 203-11.4(A) is hereby changed to 2400 Centipoise.

The first fully reacted passing sample on each batch, prior to transfer to storage or converting to feed to the ARHM mix plant shall be poured into a clean gallon can that has been pre-certified by the Engineer. It shall be the responsibility of the contractor to ensure that sufficient sample cans with lids are at the plant, such that the can be pre-certified at least three days prior to use. If the Engineer is not at the plant at start up, the Engineer will provide certified labels, which are pre-numbered and signed by Engineer to be affixed to the cans as they are consecutively used by number.

The Contractor shall conduct sampling such that the pre-certified sample can numbers correspond to the batch numbers beginning with one at the start of the project, increasing consecutively with each batch, without restarting the count at any point. After testing and recording the information for the batch, the corresponding pre-certified sample can shall be filled and stored for the duration of the project or until the Engineer takes possession of the can.

203-11.4.1 The second and third sentences of Item Number 3 under Test Procedure is hereby deleted and replaced with the following:

In one continuous operation, turn off the spindle rotation, remove the spindle vertically from the binder (after heating), discontinue stirring the binder and immediately insert the spindle back into the center of the binder to full immersion and wait 5 seconds. While holding the viscometer level, turn the spindle on and watch the needle on the viscometer dial and record the maximum value obtained on the dial.

203-11.5 Equipment for production of Asphalt-Rubber.

Add the following to Item 3) of 203-11.5:

- A) Reaction Tank. The asphalt-rubber material shall be held in a reaction tank separate from the storage tank feeding the ARHM plant, until the reaction is complete. The reaction tank shall have agitation sufficient to increase the viscosity of the mixture to a peak viscosity reading at least 20 percent higher than the viscosity reading of the material measured at a time that the material otherwise meets specifications for reacted material. The time of reaction may be extended as needed to produce this result. It shall be the responsibility of the Contractor to demonstrate to the Engineer through viscosity readings at appropriate times that the equipment conforms to these requirements. If this cannot be demonstrated, the reaction time shall be 3 hours. Once established, the reaction time shall be the minimum time for reaction unless there are changes in materials or equipment, in which case a new reaction time shall be established per specifications. The Engineer's decision shall be final.

The reaction tank shall have a functioning paper circle chart thermometer device, which shall record tank temperatures whenever asphalt-rubber is in any stage of production. Seven days before production of asphalt-rubber starts, the Contractor shall provide the Engineer approximately double the number of charts estimated to be needed to produce the necessary binder quantity. These charts will be numbered and signed by the Engineer and returned to the Contractor prior to start of production. These signed and numbered charts shall be used throughout production of the asphalt-rubber binder. Charts shall be used in the consecutive order as numbered by the Engineer beginning with number one, and shall be returned weekly after use to the Engineer. Charts will be identified with the date they were used by the Contractor at time of installing on the equipment, and shall be identified as to the tank to which they were attached. Production of asphalt-rubber shall be terminated if this procedure is not followed and will not be restarted until

Contractor demonstrates to the Engineer that it is capable of complying with this requirement.

At the start of each production day, the paper chart shall be replaced with a new signed, dated and numbered sheet, the lead scribe shall be sharpened or ink well filled, and the circle chart shall be calibrated against a sample of material drawn early from the first batch of the day. Any calibration adjustments shall be recorded in the appropriate space provided on the batch log sheet. A spare functional circle chart device shall be at the plant at all times for immediate installation should failure occur on a circle chart device being used. Calibration shall be performed as part of such installation. The lack of a functional circle chart device on the reaction tank shall be cause to terminate production of asphalt-rubber binder. A blunt lead scribe or low ink, or a paper chart used on a prior day will be considered to render the device non-functional.

- B) Storage Tank. After a complete reaction is verified by viscosity readings acceptable to the Engineer, the material shall be held in a storage tank that is fully isolated from material that is not fully reacted. This tank shall be the only tank feeding the ARHM plant. No material shall be transferred to the storage tank feeding the plant until reaction is complete in the reaction tank.

### 302-9 Asphalt-Rubber Hot Mix (ARHM).

#### 302-9.1 General.

ARHM-GG construction on system III streets shall be performed on a different day than on intersections that are not contiguous with a system III street, without written authorization from the Engineer. Non-conformance with this requirement will be cause to pay for tonnage of pavement in all areas on that day at the lowest of the two tonnage prices.

ARHM-GG shall be complete in all areas prior to slurry.

Tack coat material for overlay shall be SS-lh applied at a rate of 0.32 liter per square meter (0.08 gal/SY) on all areas except on ARAM, where tack coat shall be at a rate of 0.24 liter per square meter (0.05 gal/SY).

All PCC surfaces, to be crossed by trucks used to haul ARHM, that are within 500 feet of the work limits shall be covered with sand or other durable covering prior to applying tack coat.

Contractor shall have sufficient power brooms on site during all periods of distribution and spreading to provide for cleanup of haul routes and work areas. Power broom shall provide miscellaneous cleanup of ARHM spoils as directed by the Engineer.

### 302-9.2 Mixing Binder with Aggregate.

For drum plants, the system shall run fully automatic with the only input to the AC plant computer being information transmitted automatically from a Corealis mass flow meter on the line of the asphalt-rubber feed to the AC plant. All automatic shutdown features of the AC plant shall be fully functional.

### 302-9.4 Distribution and Spreading.

The ambient temperature shall not exceed 105F at time of placing ARHM.

The temperature of ARHM shall be minimum 290 degrees Fahrenheit directly behind the paving machine and high enough upon delivery that pavement temperature after two passes with the breakdown roller exceeds 240 degrees Fahrenheit.

To avoid picking up loose rock in the overlay area, the tires of all trucks must be lightly oiled with linseed oil or soy bean oil or approved equal. Diesel fuel will not be allowed on the project at all for oil down of any equipment.

Raking of ARHM shall be eliminated as much as possible. ARHM material shall not be cast across the mat under any circumstance. Raking shall be just enough to set up edges for uniform joints without casting material. Screed controls shall be the predominant means of controlling material at joints. In areas where paving machines can not be used due to space constraints, material shall not be thrown by shovels. Material shall be removed directly from the paving machine hopper and shall be placed directly in its final location, to be distributed with minimal raking. Material may be dumped directly from a truck, but further material distribution shall be by shovel directly to its final location with minimal raking. A small rubber tire tractor with a screed type attachment may be used to spread a pile dumped from a truck, but raking shall be minimized after spreading.

The paving machine screed shall not be pulled across an area already paved with ARHM, even adjacent to narrow areas to be paved. Such narrow areas shall have ARHM distributed by methods specified by shovel or rubber tire tractor, unless the adjacent area has hardened enough and will not be significantly marred by passing the screed over it. Even if hardened adequately, Contractor shall spread rock dust by hand tools to avoid cohesion of the ARHM in the screed to the existing surface of such areas of freshly cured ARHM.

Contractor shall maintain a functioning infrared heat measurement device in close proximity to each paving machine at all times. Contractor shall provide a pavement temperature reading, with an infrared heat measurement instrument, when requested by the Engineer. Inaccessibility of a heat measurement shall be cause for termination of paving operations.

Transverse cold joints shall be provided such that longitudinal joints are not left exposed at the end of the workday.

Contractor shall provide 20 foot long automatic screed control on both sides of the paving machine for all paving with paving machine, as directed by Engineer.

#### 302-9.5 Rolling.

Rolling along a joint shall be such that the widest part of the roller is on the hot side of the joint.

Join lines between successive runs shall be within 150 mm (6 inches) of lane lines or a minimum of 3.6 m (12 feet) outside of the outer most lane line.

Initial breakdown rolling shall be static. Breakdown roller shall make two passes over all areas. A pass shall mean one passage of the roller over an area.

An intermediate roller of the same or greater width than the breakdown roller shall be rolling directly behind the breakdown roller at all times, and paving shall cease if intermediate rolling is terminated for any reason. Additional intermediate rollers may be necessary depending on production rates. Intermediate roller shall make 2 passes unless otherwise directed or approved by the Engineer.

The rolling pattern shall be approved by the Engineer and once established, the rolling pattern shall remain consistent, unless conditions change and a modified rolling pattern is needed to conform to specification. Engineer shall be notified immediately on change of rolling pattern.

All finish rolling shall be performed by a separate finish roller.

To ensure optimum quality control, the use of more than one paver must be approved in advance by the Engineer, and will generally require one foreman, one sweeper, and a full complement of rollers per Subsection 302-5 of the Standard Specifications and this Subsection 302-9.5 for each paving machine.

An extra breakdown roller shall be on site at all times, free of defects.

A finish roller shall be provided in addition to intermediate rolling to perform all finish rolling, such that the intermediate roller can stay immediately behind the breakdown roller at all times.

302-9.6 Rock Dust Blotter. The second sentence of Subsection 302-9.6 is hereby deleted and replaced with the following:

Rock dust blotter shall be washed concrete sand per Fine Aggregate in Section 90, spread at rate of 2 to 3 pounds per square yard as necessary to maintain traffic at the direction of the Engineer. Excess sand spread on adjoining areas to receive ARHM-GG shall be thoroughly swept before spreading any binder.

## **12.01 Warranty**

The Contractor shall warranty the materials and workmanship of the Asphalt-Rubber Hot Mix (Type GG), for a period of 365 days, and shall repair defects identified during the warranty period, in conformance with these special provisions. The warranty period shall start upon acceptance of the pavement.

During the warranty period, should an area of ARHM (TypeGG) be found to be defective, the Engineer will notify the Contractor in writing of the areas to be repaired. The Contractor shall complete the repairs within 60 days from the date of the notification letter, unless the Engineer determines that weather conditions are unsuitable, in conformance with the provisions in Section 8-1.06, "Time of Completion," of the Standard Specifications, for completing the repair work, in which case the Engineer will allow additional time for completion of the repairs.

The Engineer shall decide all questions which arise as to the performance of the Asphalt-Rubber Hot Mix (Type GG) during the warranty period and as to the acceptable fulfillment of the warranty, in conformance with the provisions in Section 5-1.01, "Authority of the Engineer," of the Standard Specifications.

Construction area signs, shown on the plans, shall be removed upon completion of the contract item work, except for work required by the warranty. During the warranty period, the Contractor shall place and maintain signs in conformance with Section 12-3, "Traffic-Handling Equipment and Devices," of the Standard Specifications and these special provisions. Signs shall be, at the Contractor's option, either stationary mounted or portable signs conforming to the provisions in "Construction Area Signs" of these special provisions.

At least 7 days prior to beginning placement of the leveling course under the Asphalt-Rubber Hot Mix (Type GG), the Contractor shall submit to the Engineer a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway post locations and defect type. Within 7 working days of receiving the list of existing defective areas, the Engineer will review the list and provide the Contractor written approval or revisions of the areas, as being excluded from the warranty.

Alligator pavement shall mean areas of pavement surrounded by cracks on the full perimeter where the maximum dimension of the area within the perimeter is less than 10 inches, and such areas are multiple and clustered together contiguous to each other. Defects in the existing surfacing which may qualify areas for exclusion from the warranty include: Rutting greater than 9mm in combination with flushing of surface pavement as flushing as defined herein in more than 10% of the rutted area; rutting greater than 9 mm in combination with alligator cracking in more that 15% of the rutted area; patches of cold mixed asphalt concrete placed within the last 12 months. Rutting that shall be excluded from the warranty is defined as a longitudinal depression in the wheel path that, when measured by placing a straightedge 3.6± 0.06-m long on the finished surface and perpendicular with the center line, varies more than 9 mm from the lower edge of the straightedge, in combination with alligator cracking or flushing in the percentages described above. Segments of the project excluded from warranty for rutting or cracking shall be warranted for the other criteria. Segments repaired by the Contractor shall be warranted for all criteria. Placement of the Asphalt-Rubber Hot

Mix (Type GG) shall not begin until the Engineer has approved the list of existing defective areas, and repairs included in the contract have been made. The Asphalt-Rubber Hot Mix (Type GG) placed over areas shown on the plans or designated by the Engineer to be repaired shall be warranted.

When it is anticipated that there will be a suspension of work of more than 120 days, the Contractor may request in writing that a separate warranty period be established for the portion of Asphalt-Rubber Hot Mix (Type GG) already completed. If the Engineer determines that the designated portion of Asphalt-Rubber Hot Mix (Type GG) work has been completed in conformance with the requirements of the contract, the Engineer will recommend that the Director relieve the Contractor of the duty of maintaining and protecting the designated portion of Asphalt-Rubber Hot Mix (Type GG) work in conformance with the provisions in Section 7-1.15, "Relief from Maintenance and Responsibility," of the Standard Specifications, except for work required by the warranty, and the Engineer will notify the Contractor in writing of the date of the start of the separate warranty period and the date on which the separate warranty period will be complete. The relief from maintenance and responsibility shall apply to the designated portion of Asphalt-Rubber Hot Mix (Type GG) only, and does not constitute completion of a contract item of work. Upon completion of the separate warranty period, no further work will be required on the designated portion of Asphalt-Rubber Hot Mix (Type GG). No separate interim estimate will be prepared for the designated portion of Asphalt-Rubber Hot Mix (Type GG). No more than one separate warranty period will be allowed during the contract.

The following criteria for identifying defective material placed by the Contractor shall apply to the Asphalt-Rubber Hot Mix (Type GG) during the warranty period:

- A. Rutting consists of a longitudinal surface depression in the wheel path which is, when measured by placing a straightedge,  $3.6 \pm 0.06$ -m long on the finished surface and perpendicular with the center line varies more than 9 mm from the lower edge of the straightedge for a 20-m length.
- B. Raveling consists of the separation of the aggregate from the binder.
- C. Flushing consists of the occurrence of a film of bituminous material on the surface of the rubberized asphalt concrete (Type GG) which results in a coefficient of friction of less than 0.30, determined in conformance with the requirements in California Test 342.
- D. Delamination consists of the loss of the bond between the layers of pavement.
- E. Pot holes consist of the loss of Asphalt-Rubber Hot Mix (Type GG) material, between  $0.008\text{-m}^2$  and  $0.5\text{-m}^2$ .

Lengths of each lane with rutting in the Asphalt-Rubber Hot Mix (Type GG) shall have the 20-m length area repaired. Areas in the Asphalt-Rubber Hot Mix (Type GG), of raveling, flushing or delamination that are greater than  $0.5\text{-m}^2$ , and pot holes shall be considered defective and shall be repaired.

Areas of rutting, raveling, flushing and delamination to be repaired shall be removed to 25 mm depth of the Asphalt-Rubber Hot Mix (Type GG), by cold milling in conformance with these special provisions, for the full lane width and the length of the area determined to be defective, plus 2 m on each end measured along the lane line. The area planed shall then be repaired by placing Asphalt-Rubber Hot Mix (Type GG) in conformance with the provisions in "Asphalt-

Rubber Hot Mix (Type GG)" of these special provisions, produced by the same plant and aggregate source as original ARHM-GG.

If the area between 2 consecutive repairs, except repairs of pot holes is less than 6 m in length, measured along the lane line, that area shall also be repaired.

If the total length of repairs, measured along the lane line, exceeds 60-m of any 300 meter length of a lane or shoulder, an additional layer of Asphalt-Rubber Hot Mix (Type GG) in conformance with the provisions in ASPHALT-RUBBER HOT MIX – GAP GRADED (ARHM-GG) of these special provisions, 30 mm in thickness, shall be placed on that 300 meter length on lanes and shoulders. If a continuous area of 60 m or more in length, within that 300 meter length, has not been repaired and does not contain defective areas, the additional layer of Asphalt-Rubber Hot Mix (Type GG) will not be required on that area. If placement of the additional layer will interfere with the location, clearances or function of highway facilities, areas requiring the additional layer shall be removed to the full depth of the Asphalt-Rubber Hot Mix (Type GG), by cold milling and Asphalt-Rubber Hot Mix (Type GG) shall be placed in conformance with the provisions in ASPHALT-RUBBER HOT MIX – GAP GRADED (ARHM-GG) of these special provisions and as shown on the plans.

Areas of rutting, raveling, flushing, delamination, or pot holes which create a condition hazardous to traffic shall be temporarily patched by placing a layer of commercial quality paving grade asphalt concrete over the defective area, or filling pot holes with that material, to provide a temporary traveling surface, or shall be repaired as specified above.

The Contractor shall begin placing temporary patches within 2 days after notification of the condition by the Engineer and shall complete the work within 3 days of that notification.

Upon 3 days after notification of the Contractor, the Engineer may make or cause to be made the needed temporary patches and provide a detailed billing to the Contractor for the work.

The Contractor shall reimburse the City for the work within 60 days of receipt of the billing, or the costs may be deducted from any moneys due or to become due the Contractor under the contract. If the total area of temporary patching placed or to be placed exceeds 5 percent of any 100-m length of a lane or shoulder, the entire lane or shoulder for that 60-m length shall be repaired as specified above, and the temporary patches previously placed in that 100-m length shall be removed prior to placing the repair.

Temporary patches greater than 0.5-m<sup>2</sup> in area shall be removed and a repair placed within 20 days after expiration of the warranty period. If the Engineer determines that a temporary patch provides an acceptable traveling surface, the patch may remain in place.

As an alternative to the materials and methods specified above for repairs and temporary patches, the Contractor may use other materials or methods which will provide performance equal to or better than the Asphalt-Rubber Hot Mix (Type GG) placed in conformance with the provisions in "Asphalt-Rubber Hot Mix (Type GG)" of these special provisions, if the alternative materials and methods are approved in writing by the Engineer, except no alternative to removing the full depth of the Asphalt-Rubber Hot Mix (Type GG) specified herein will be allowed for areas of flushing.

Should the Contractor fail or refuse to comply with the requirements of the warranty, the Engineer may make or cause to be made the needed repair work and provide a detailed billing to the Contractor for the work. The Contractor will be charged the cost for the work. This charge will be deducted from any payments due or to become due the Contractor.

Temporary patches and repairs made or caused to be made by the State, due to the Contractor's failure to comply with the requirements of the warranty, shall not void the warranty of the Asphalt-Rubber Hot Mix (Type GG). The Contractor shall continue to warranty the Asphalt-Rubber Hot Mix (Type GG), including areas patched or repaired by the Contractor or by the State, for the remainder of the warranty period.

Warranty will be paid for on a lump sum basis. The contract lump sum price paid for warranty shall include full compensation for providing a warranty for Asphalt-Rubber Hot Mix (Type GG) and for furnishing labor, materials, tools, equipment, and incidentals, and doing the work involved in repairing defective areas in the Asphalt-Rubber Hot Mix (Type GG), including job site inspection, placement and removal of temporary patches, cold planing, repair of defective areas, sealing cracks and replacement of traffic stripes, pavement markings and pavement markers obliterated by patches and repairs, as shown on the plans or described in the specifications, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer. Payment for the warranty item will be made in 10 equal payments. The first payment will be made on the third progress payment date after the warranty period begins, and subsequent payments will be made monthly thereafter. Retention payment for the remainder of the work will be made under normal procedures and within normal timeframes; the payment for Warranty will be independent of other payments including retention. Ten percent retention for any Warranty work actually performed based on estimate of cost by the Engineer will be withheld until 35 days after the Warranty period has expired.

Full compensation for furnishing construction area signs required for the direction of public traffic through or around the work during the warranty period and for erecting or placing, maintaining (including covering and uncovering as needed) and, when no longer required, removing construction area signs at locations shown on the plans, during the warranty period, shall be considered as included in the cost for warranty and no separate payment will be made therefor.

**13. ASPHALT-RUBBER AGGREGATE MEMBRANE (ARAM) SURFACING AND INTERLAYER**

ARAM shall conform to Subsection 302-10 of the GREENBOOK, except as modified herein and Caltrans "Material Plant Quality Program" (MPQP) dated July, 2008 with Errata dated October 3, 2011.

**302-10 Asphalt-Rubber Aggregate Membrane (ARAM)**

Where ARAM is to be placed directly on existing pavement, pavement preparation shall include the following preparation.

Areas as directed by the Engineer shall be skin patched in conformance with Subsection 10.02 of these Special Provisions.

Cracks shall be treated as follows:

A singular crack shall be considered to be a crack on the perimeter of an otherwise uncracked asphalt pavement area exceeding 4 feet in minimum dimension. Cracks not fully interconnected in forming a complete perimeter shall be considered singular cracks, unless the maximum dimension across the partial perimeter between cracks can be measured as less than 4-feet. Such pavement area is defined by the cracks forming its perimeter. 1) Contractor shall spray all weeds in cracks with Monsanto brand Roundup, a minimum of 2 weeks prior to paving. All weeds shall be resprayed if rain occurs within 48 hours after application; 2) all holes and cracks exceeding 1.5 inches wide shall be filled with asphalt concrete approved for skin patch compacted level with the top of the existing pavement; 3) all cracks and joints 1/4 inch or greater in width shall be blown thoroughly clear with high pressure air or power broomed clean to a depth of 3/4-inch minimum immediately ahead of the crack filling operation; and 4) all joints and singular cracks between 1/4 inch and 1.5 inches in width shall be filled with Crafcro Polyflex III or equal. Filler shall be within 1/8 inch below and flush with existing pavement surface and **shall be thoroughly squeegeed**, as necessary, to attain this result.

All crack preparation shall be performed after cold milling.

Payment for crack filling will be compensated by the lump sum bid item for crack filling. All other preparation work related to crack preparation, including weed killing and power brooming or blowing out cracks will considered included in the unit price bid for ARAM per square yard.

### 302-10.1 Application

The maximum viscosity of asphalt-rubber material in Table 203-11.4(A) shall be 2400 Centipoise.

The maximum ambient temperature for placement of ARAM shall be 105F.

Temperature of asphalt-rubber spread for ARAM shall be between 395F and 425F.

Asphalt-Rubber shall conform to Subsection 203-11 of GREENBOOK including modification of that section included in these Special Provisions.

Contractor shall provide a pavement temperature reading, with an infrared heat measurement instrument, when requested by the Engineer.

Item 4. of the second paragraph of Subsection 302-10.1 is hereby deleted and replaced with the following:

Material shall be applied at a rate between 2.5 and 3.0 Liters per square meter (.60 to .70 gallons per square yard) as directed by the Engineer.

The first sentence of the third paragraph of Subsection 302-10.1 is hereby deleted and replaced with the following:

The asphalt-rubber mixture may be applied to the roadway immediately after mixing and reacting at a temperature between 201 C (395 F) minimum to 218C (425 F) maximum.

Reference is made to Subsection 7-1.01F Air Pollution Control whereby Contractor shall comply with all air pollution rules and regulations.

302-10.2 Screenings The first sentence of the first paragraph of Subsection 302-10.2 is hereby deleted and replaced with the following:

Following application of asphalt-rubber, screenings shall be placed over all areas receiving asphalt-rubber. Screenings shall conform to quality requirements of Class A aggregate with the following modifications:

Maximum LA Rattler value at 500 revolutions shall be 35.

Eighty-five percent of coarse aggregate shapes shall be “proportioned particles”, a proportioned particle being defined as a particle having a minimum dimension greater than ½ the maximum dimension as measured by caliper. Percentage of proportioned particles shall be determined by California Test 205 with the words “proportioned particles” substituted for “crushed particles”.

California Test 205, Section D, definition of a crushed particle is revised as follows: "A particle having 2 or more fresh mechanically fractured faces shall be considered a crushed particle".

The aggregate for screenings shall conform to following gradations:

<u>Sieve Size</u>	<u>Percent Passing</u>
¾”	100
½”	95-100
3/8”	70 -85
No. 4	0-10
No. 8	0-3
No. 200	0-1

No mineral filler or material from sand or rock dust bins shall be included in the mix.

The gradation ranges shown for screenings shall be considered the Contract Compliance Range. The Operating Range for the ½” sieve shall be the full contract compliance range. The Operating Range for all other sieves, except the 200 sieve, shall be 2 percentage points inside both limits of the Contract Compliance Range. If gradation-testing results do not meet the Operating Range requirements but meet the Contract Compliance Range, placement of ARAM may be continued for the remainder of the day. However, another

day's work shall not be started until tests, or other information, indicate to the satisfaction of the Engineer that the next material to be used in the work will comply with the requirements specified for Operating Range.

Except for the No. 200 sieve, it is the intent of the Specifications that the target percentage be the central value in the Contract Compliance Range.

Any change in source of aggregate supply requires 2 weeks advance notice in writing to the Engineer, and submittals and testing in conformance with specifications for a new mix design. No single bin shall receive aggregate from more than one source. Contractor shall provide a copy of aggregate delivery tickets for aggregate delivered for use on the project.

Trucks for hauling cover material shall be tailgate discharged and shall be equipped with a device to lock onto the hitch at the rear of the aggregate spreader. Haul trucks shall also be compatible with the aggregate spreader so that the dump bed will not push down on the spreader when fully raised or have too short an apron resulting in aggregate spillage while dumping into the receiving hopper.

Screenings shall be coated completely black on the full particle surface with PG 64-16 asphalt at a central mixing plant to prevent free dust, and shall be preheated 127C (260F) to 163C (325F).

Screenings shall be placed at a rate between 32 and 40 pounds per square yard.

All rollers shall be operational at all time unless full roller coverage is complete and cessation of rolling is authorized by the Engineer. The spreader shall not stop over an area of rocks that are spread but not rolled. The spreader shall clear all areas to allow rollers to complete roller coverage without any delay.

A layer of washed concrete sand per Fine Aggregate in Section 90 spread at rate of 2 to 3 pounds per square yard shall be applied as necessary to maintain traffic at the direction of the Engineer. Excess sand spread on adjoining areas to receive ARAM shall be thoroughly swept before spreading any binder.

#### **14. CUL-DE-SAC ASPHALT CONCRETE OVERLAY**

Cul-de-sac AC paving shall be paved prior to slurry. The cul-de-sac bulbs shall be paved with ½-inch Maximum Medium PG 70-10 asphalt concrete in conformance with the Cul-de-sac Bulb typical section. The rolling pattern in the Standard Specifications may be modified at Contractor's discretion to achieve the minimum level of compaction hereby specified as 95 percent of relative maximum density. Payment shall be by the unit price bid for Cul-de-sac AC Overlay including materials, tack coat, placement, compaction, traffic control and all incidentals.

## 15. STONE MATRIX PAVEMENT.

### 15.01 Materials.

Asphalt-concrete for stone matrix pavement shall be Type A 1-1/2 inch maximum and shall conform to the provisions in Section 39, "Asphalt Concrete", of the Standard Specifications and these special provisions.

The amount of asphalt binder to be mixed with the aggregate for Type A 1-1/2 inch asphalt concrete will be determined by the Engineer in accordance with California Test 367 using the samples of aggregate furnished by the contractor in conformance with Section 39-3.03, Proportioning, of the Standard Specifications.

The grade of asphalt binder to be mixed with aggregate for asphalt concrete shall be PG 70-10 and shall conform to the requirements specified under "Asphalt" elsewhere in these special provisions.

The aggregate for Type A 1-1/2 inch asphalt concrete shall conform to the following grading as determined by the California test 202:

Sieve Size	Limits of Proposed Grading	Operating Range	Contract Compliance
1-1/2 inch		100	100
1 inch		82-94	79-97
3/4 inch		70-85	65-90
3/8 inch		45-60	40-65
No. 4	25-35	$x \pm 5$	$x \pm 8$
No. 8	22-30	$x \pm 5$	$x \pm 8$
No. 30	10-13	$x \pm 5$	$x \pm 8$
No. 200		1-5	1-6

Aggregate for Type A 1-1/2 inch asphalt concrete shall conform to the quality requirements in Section 39-2.02 of the Standard Specifications with the following modifications:

### California Test 205 (% Crushed)

Coarse Aggregate (1-1/2 inch x 3/4 inch)	
Contract compliance	90 percent minimum
Coarse aggregate (3/4 inch x #4)	
Contract compliance	90 percent minimum
Fine Aggregate (#4 x #8)	
Contract compliance	70 percent minimum
Los Angeles Rattler Loss at 500 Rev. (max)	35

Eighty-five percent of coarse aggregate shapes shall be “proportioned particles”, a proportioned particle being defined as a particle having a minimum dimension greater than ½ the maximum dimension as measured with a caliper. The percentage of proportioned particles shall be tested by California Test 205 with the words “proportioned particles” substituted for “crushed particles”.

California Test 205, Section D, definition of a crushed particle hereby revised as follows: "A particle having 2 or more fresh mechanically fractured faces shall be considered a crushed particle".

Coarse aggregate crushed particle count percentage shall be computed separately and all sieve size fractions of the AS RECEIVED sample shall be included in the weighed average percentage. The weighed average percentage of crushed particles retained on the No. 4 sieve shall be 90 percent minimum and each particle shall have two or more fractured faces.

Paragraph 1 of Section 39-3.01A(1) and Section 39-3.01A(2), “Cold Storage” of the Standard Specifications, are amended to read:

Aggregate for Type A 1-1/2 inch asphalt concrete shall be separated into four or more sizes.

Paragraph 2 of Section 39-3.01B, “Hot Storage” of the Standard Specifications, is amended to read:

Aggregate for Type A 1-1/2 inch asphalt concrete shall be separated into four or more sizes.

## **15.02 Construction**

All stone matrix pavement shall be placed by end dump trucks.

Stone matrix construction shall be performed on the full width of both legs of Wake Avenue leading away from Highway 86 (4<sup>th</sup> Street) to a distance as marked by the Engineer on each leg. The pavement will end at the edge of gutter line on Highway 86. Only lanes in one direction shall be constructed on the same day, including the surface course pavement. Surface course shall not commence until base course is complete in all areas. There shall be no breaks in construction of stone matrix pavement, such that the new finish surface is complete in place in 6 working days.

Areas of stone matrix pavement shall be cold milled to a depth of 12 inches to remove existing pavement and subgrade to proposed subgrade. A base course of stone matrix asphalt concrete 8 inches thick shall be installed in one lift the same day as removals in all areas of removal. Temporary AC ramps shall be installed 10 feet wide to transition from existing grade to grade of top of base pavement.

Paragraph 12 of Section 39-6.01, “General Requirements” of the Standard Specification, is amended to read:

Longitudinal joints in the base course of Stone Matrix asphalt concrete shall be placed not less than 0.5 foot nor more than 1.0 foot of the proposed traffic lane lines. Longitudinal joints in surface course Stone Matrix asphalt concrete shall be within .5 foot of the proposed lane lines and shall be offset a minimum 2 inches from base course joints.

Stone matrix asphalt concrete shall be compacted to minimum 95% of relative maximum density.

### **15.03 Payment**

Construction of stone matrix asphalt concrete pavement will be compensated at the bid item unit prices for Cold Milling 12-Inch Existing Pavement and Subgrade for excavation and removal, and by the bid item for Stone Matrix Asphalt Concrete for materials and installation of the pavement. All equipment, materials and labor, including temporary pavement installation and removal and traffic control and all incidentals will be considered included in the unit prices bid.

### **16. EXISTING LOOP DETECTORS**

The Contractor or representative will meet with the City Director of Public Works and will clearly mark existing loops not to be damaged or removed.

If any part of the loop conductor, including the portion leading to the adjacent pull box, is damaged by the Contractor's operations, the entire detector loop shall be replaced. If any adjacent loop(s) are/is damaged during such replacement, that loop shall also be replaced.

### **17. TRAFFIC STRIPING, PAVEMENT MARKINGS, AND PAVEMENT MARKERS**

Traffic striping, pavement markings and pavement markers shall be replaced in kind and on the same pattern as existing in conformance with these Special Provisions.

All details and dimensions for traffic striping and marking shall conform to the Caltrans Traffic Manual and Maintenance Manual.

**17.01 Layout, Alignment, and Spotting.** The Contractor shall furnish the necessary control points for all striping, markers and markings, and shall be responsible for the completeness and accuracy thereof to the satisfaction of the Engineer.

Contractor shall supply the Engineer with a copy of a complete inventory of striping, markers and marking prior to any cold milling or installation of any material. For each stripe, marker and marking, the inventory shall include sufficient definition about type of marker, stripe or marking, and dimensions for control points to allow for accurate reestablishment.

In no case shall any section of street be left without the proper striping for more than 48 hours, or over weekends or holidays.

**17.02 Application of Paint.** All paint shall be applied in two coats. The second coat shall be applied no less than 24 hours from application of the first coat and the first coat applied within 48 hours paving.

Paint for traffic striping shall be rapid dry type per Subsection 84-3.02 of the Standard Specifications. Reflective material, as specified in Subsection 84-3.02 of the Standard Specifications and these Special Provisions, shall be dropped on during application.

Paint for crosswalks, stop bars, arrows, other pavement legends and reflectorized curb markings shall be rapid dry type per Subsection 84-3.02 of the Standards Specifications, with reflective material added directly to the paint during manufacture.

**17.03 Payment for traffic striping, markings and markers** will be considered included in the lump-sum price bid for signing and striping and no additional compensation will be allowed therefor.

## **18. UTILITY COVER ADJUSTMENTS TO GRADE**

Manholes shall be adjusted to grade in accordance with Section 302-5.8, "Manholes," of the GREENBOOK and as supplemented herein.

### **18.01 Reference Setting.**

Contractor shall note and reference the locations of the manholes and water valves and vaults prior to placing pavement in order to locate and raise them following the work. Manhole, water valve and of vault locations and distance from reference points to the center of each such facility shall be marked on either a curb face or other reference point indicators (stakes) by contractor prior to be getting any paving.

### **18.02 Adjustment to Grade**

Contractor shall lower manhole and water valves within areas designated for cold milling prior to cold milling operations. Each such manhole water valve or utility box shall be lowered to a depth below the required milling depth. Frames and covers and utility boxes shall be removed to the city yard facility and a ½" thick steel plate shall be provided to cover the hole where the utility facility exists. Temporary AC shall be provided to fill any voids in the roadway surface which remain after the cover is in its final lowered position.

After completion of paving, the facility shall be raised to grade. The finish grade of raised facilities shall be ¼-inch below the finish grade of the asphalt concrete pavement.

Contractor shall exercise care such that rocks, dirt and debris do not enter sewer lines.

The water valves shall be raised as follows: the asphalt pavement immediately adjacent to the water valve shall be removed, the existing frame and cover removed, the existing sleeve extended or replaced with matching material to extend from the valve to the new valve frame elevation, the water valve frame and cover placed to match the respective water district's standards, the water valve and cover and adjusted to proper grade, and the pavement replaced with a minimum of two inches of asphalt concrete.

Contractor shall notify the respective utility owners at least five working days in advance of the paving operations and again after completion of paving operations. Such notifications of utilities to be adjusted to grade by others shall be made in writing. Contractor shall mark locations of utilities for those locations of facilities to be adjusted to grade by others.

The Contractor shall take care to insure no intrusion of gravel or pulverized material into the manholes or valve stem areas.

### **18.03 Payment.**

Compensation for raising utility facilities to grade based on the applicable bid item for each type of facility and type of adjustment, and whether single or double. Single shall mean leaving the facility in place until paving is complete and raising the grade thereafter. Double shall mean removing the facility prior to paving and reestablishing the facility at finish grade per specifications after paving. The unit price bid shall be considered full compensation for removing the facility, and storing and replacing it as applicable, protecting the facility at all times during the procedure and as specified, and resetting the facility at finish grade, including all materials, equipment and labor and incidentals.

## **19. COOPERATION**

Attention is directed to Sections 7-1.14, "Cooperation" and 8-1.10, "Utility and Non-Highway Facilities" of the Standards Specifications.

## **20. SANITARY ARRANGEMENTS**

The Contractor shall make provisions for and maintain in a sanitary manner at the work site all necessary and sanitary conveniences for the workmen, in accordance with the rules and regulations of the State Board of Health.

## **21. ACCESS**

The Contractor's attention is directed to the existing pedestrian and vehicular access ways crossing the lines of work. These access ways shall not be closed unless an alternate access way is provided. The Contractor shall assume full responsibility for providing alternate access. The compensation for the work in this item shall be considered as included in the cost of the various contract items of work and additional compensation will be made therefore.

## **22. INSURANCE**

The Contractor's attention is directed to the amount of insurance as shown in the General Provisions.

## **23. CONSTRUCTION CONFERENCE**

The Contractor's attention is directed to the preconstruction conference as stated in Section 6 of the General Provisions.

END OF SPECIAL PROVISIONS