Annual Street Sealing 2009-10
PROJECT NO. 09-144-38-307

ADDENDUM NO. 1 – EXHIBIT A

SECTION 200 – ROCK MATERIALS

GENERAL

200-1 ROCK PRODUCTS Rock products shall conform to the provisions of Section 200-1 "Rock Products," of the Standard Specifications and these Special Provisions.

200-1.1 General. The following is added to section 200-1.1 "General" of the Standard Specifications:

A Certificate of Compliance shall be furnished by the Contractor for all aggregate used under these specifications.

The contractor shall furnish all labor, materials, equipment, and incidentals required to perform all operations in connection with the Street Maintenance Project, in accordance with the lines, grades, design and dimensions shown on the plans, the Standard Specifications and these Special Provisions. "Surface seal application" or "surface treatment" refers to either Chip Seal or Slurry Seal as appropriate. A "Cape Seal" is defined as a Chip Seal followed by the application of a slurry seal coat. A "Slurry Seal" is defined as Emulsion-Aggregate Slurry.

200-1.2 Crushed Rock and Rock Dust The following is added to Section 200-1.2 "Crushed Rock and Rock Dust" of the Standard Specifications: Percentage of material with fractured faces shall be determined by California Test 205.

200-1.4 COURSE AGGREGATE FOR CEMENT CONCRETE. Concrete aggregate shall be No. 3 of Table200-1.4 (B)

Sieve Sizes	Percent Passing Sieve
6"	100%
4"	25 – 100%
1"	5 – 25%
¾"	0 – 5%

200-2 UNTREATED BASE MATERIALS Untreated base materials shall conform to the provisions of Section 200-2 "Untreated Base Materials," of the Standard Specifications and these Special Provisions.

200-2.2 Crushed Aggregate Base Crushed aggregate base (CAB) shall conform to the provisions of Section 200-2.2 of the Standard Specifications and these Special Provisions.

200-2.2.1 General The following is added to section 200-2.2 of the Standard Specifications:

Material shall conform with this section or with Section 26-1.02A, Class 2 Aggregate Base, of the Caltrans Standard Specifications.

200-2.2.3 Quality Requirements The following modifications are made to Section 200-2.2.3 of the Standard Specifications:

The percentage wear test shall be waived. R-value shall be 78 minimum. Sand Equivalent shall be 30 minimum.

200-2.4 Crushed Miscellaneous Base Crushed miscellaneous base (CMB) shall conform to the provisions of Section 200-2.4 of the Standard Specifications and these Special Provisions.

200-2.4.1 General The following is added to Section 200-2.4.1 of the Standard Specifications:

Material shall conform with this section or with Section 25-1.02A, of the Caltrans Standard Specifications; material defined as coarse shall conform with class 1, material defined as fine shall conform with class 2.

200-2.4.3 Quality Requirements The following modifications are made to Section 200-2.4.3 of the Standard Specifications:

The percentage wear test shall be waived. R-value shall be 60 minimum. Sand Equivalent shall be 25 minimum.

200-2.5 Processed Miscellaneous Base Processed miscellaneous base shall conform to the provisions of Section 200-2.5, "Processed Miscellaneous Base," of the Standard Specifications and these Special Provisions.

200-2.5.3 Quality Requirements The following modifications are made to Section 200-2.5.3 of the Standard Specifications:

The percentage wear test and R-value shall be waived. Sand equivalent shall be 25 minimum.

200-2.6 Select Subbase Work shall be done per the Standard Specifications.

SECTION 201 – CONCRETE, MORTAR AND RELATED MATERIALS

201-1 PORTLAND CEMENT CONCRETE. Portland cement concrete shall conform to the provisions of Section 201-1, "Portland Cement Concrete," of the Standard Specifications, these Special Provisions and the Standard Plans.

201-2 REINFORCEMENT FOR CONCRETE. Work shall be done per the Standard Specifications.

201-3 EXPANSION JOINT FILLER AND JOINT SEALANTS Expansion Joint Filler and Joint Sealants shall conform to the provisions of Section 201-3, "Expansion Joint Filler and Joint Sealants," of the Standard Specifications and these Special Provisions.

201-3.2 PREMOLDED JOINT FILLER The following is added to Section 210-3 of the Standard Specifications:

EXPANSION JOINT FILLER for Portland cement concrete "Concrete Curbs , Walks, Gutters, and Driveways," shall be 6mm (1/4") Nonextruding and Resilient Filler (Bituminous) ASTM 1751.

EXPANSION JOINTS shall be installed in accordance with Section 303-5.4.2 of the Standard Specifications and these Special Provisions.

201-4 CONCRETE CURING COMPOUND. Work shall be done per the Standard Specifications.

201-5 CEMENT MORTAR Cement Mortar shall conform to the provisions of Section 201-5, "Cement Mortar," of the Standard Specifications and these Special Provisions.

203-15 ASPHALT RUBBER DOUBLE CHIP SEAL The following Section 203-15 is added to the Standard Specifications.

203-15.1 General This item shall consist of a bituminous surface Stress Absorbing Membrane Interlayer (SAMI) composed of a single application of Polymer Modified Asphalt-Rubber (PMAR) material and pre-coated aggregate followed by a second bituminous surface Stress Absorbing Membrane (SAM) composed of a single application of Rubberized Asphalt Binder (RAB or PG 76-22TR "field blend") and pre-coated aggregate in accordance with these specifications.

203-15.1.1 Bonded Extended Warranty This project will include an extended warranty, and must be bonded for the entire warranty period. The bond will cover 10% of the total dollar value of the contract. This warranty is directly associated with the asphalt rubber double chip seal and will be required as follows:

General Conditions

The asphalt rubber double chip seal application shall be covered by a warranty by the Contractor for materials and workmanship for a period of five (5) years and shall be a guideline for repair of defects during the warranty period, in conformance with this agencies warranty language. Work must be completed in accordance with the project plans and specifications and must be completed in accordance with the acceptance requirements of the project special provisions. Work and materials, not performed or supplied by the Contractor, which do not meet the requirements of the approved plans and specifications are not covered under this warranty. Other conditions that are not covered include but are not limited to: unanticipated traffic loadings, acts of God, or failure of underlying layers.

During the warranty period, should an area of the asphalt rubber double chip seal be found to be defective, the Engineer will notify the Contractor in writing regarding the areas that require potential repair. The Contractor shall complete the specified repair work within 30 days from receipt of written notice to proceed from the Engineer, unless the Contractor and the Engineer determine that weather conditions are unsuitable. Required repair work will then be rescheduled and the timing will be agreed upon by the Contractor and the Engineer.

Specific Conditions

This warranty shall not apply to excluded areas designated on the plans and specifications or to other identified areas where the existing surface prior to the application of the asphalt rubber double chip seal contain defective areas as determined by the Contractor and the Engineer. At least 21 (twenty-one) days prior to the beginning of the placement of the asphalt rubber double chip seal, the Contractor shall submit to the Engineer a written list of existing defective areas, identifying the lane direction, lane number, starting and ending highway mile post locations, street name, location address, curb marking or other method of location, along with defect type. Within 14 (fourteen) days of receiving the list of defective areas, the Engineer will review the list and provide the Contractor written notice and approval, with revisions if appropriate, concerning each defective area on the original list. Defects in the existing pavement surface which may qualify as areas of exclusion from this warranty include: a) rutting greater than 0.35 inches. This type of rutting shall be defined as a longitudinal depression in the wheel path that, when measured by placing a straightedge 12 feet ± 1 foot on the existing surface, perpendicular with the centerline showing an average rut measurement of 0.35 inches, b) thermal, block and alligator cracks greater than 3/8 of an inch in width that have not been filled with the proper rubberized sealant material and c) base failed areas that have not been removed and replaced with the proper hot mix patching material. All materials utilized for the required repairs shall have had a minimum cure time of 1 (one) month prior to the application of the asphalt rubber double chip seal.

Placement of the asphalt rubber double chip seal shall not begin until the Contractor and the Engineer have approved the list of defective areas and the correct repairs have been completed and have had the proper cure time. The asphalt rubber double chip seal that is placed over these areas and areas shown on the plans and specifications, previously agreed to and approved by the Contractor and the Engineer, shall be warranted.

Performance Criteria
Work shall be evaluated and accepted based on a pavement segment of roadway which will be defined as a 200 foot section length and one lane or one shoulder in width. The following definitions of defect and recommended criteria for correction concerning materials manufactured and placed by the Contractor or workmanship regarding application or construction management shall apply to the asphalt rubber double chip seal during the warranty period.

Cracking: If no deficiency is reported during the warranty period, the cracking will be evaluated and measured at the end of the warranty period regarding cracks that form longitudinally and transversely. The percentage and lineal footage shall be calculated per pavement segment of roadway.

Acceptance: The work shall be accepted at the end of the warranty period if the average crack width for the pavement segment is less than 0.125 (1/8) inch in width and/or the total percentage of cracking is 5 percent or less.

Correction: All longitudinal and transverse cracks greater than 0.125 (1/8) inch in width and/or greater than 5 percent shall be blown clean and sealed with a crack sealant approved by the Contractor and the Engineer.

Flushing or Bleeding: Will be considered a distress when the result is unacceptable skid resistance (< 0.30 coefficient of friction) and/or results in "pick-up" of the asphalt rubber double chip seal on vehicular tires.

Acceptance: The work will be accepted at the end of the warranty period if the measured skid resistance does not fall below 0.30 coefficient of friction, skid testing (British pendulum).

Correction: Flushing or bleeding that remains below a 0.30 coefficient of friction, at the end of the warranty period, shall be corrected by removal and replacement of the affected asphalt rubber double chip seal for the full width of the pavement segment.

Raveling or Streaking: Is defined as the wearing away of the placement surface caused by the dislodging of aggregate particles and/or stripping of binder material.

Acceptance: The work will be accepted at the end of the warranty period if 10 (ten) percent or less of the pavement segment has experienced raveling.

Correction: Raveling or streaking shall be repaired by placement of an additional layer of asphalt rubber double chip seal over the affected areas of the pavement segment.

203-15.2 Materials

Asphalt Cement

The type and grade of PG asphalt cement utilized to manufacture the PMAR binder and RAB shall be PG 64-16. The exact grade of PG asphalt cement, if different than PG 64-16, shall be determined by the PMAR or RAB supplier dependant on the specific project requirements and conditions (climate and traffic) and approved by the Engineer.

Granulated Reclaimed Tire Rubber

The CRM shall be produced primarily from the processing of whole automobile and truck tires. The rubber shall be produced by ambient temperature grinding processes only. The SBS (styrene-block-butadiene-block-styrene) polymer shall be a linear or radial type of polymer with a molecular weight sufficient enough to meet the end result physical binder requirements. The gradation of the CRM and SBS Polymer when tested in accordance with ASTM C-136 (dry sieve only) and using a 100 gram sample, shall meet the requirements in Table 203-15.2 (A).

Table 203-15.2 (A) - CRM and SBS Polymer Grading Requirements

	For PMAR Binder	For RAB Binder	For PMAR & RAB Binder
Sieve Size	**Reclaimed Tire CRM Percent Passing**	**Reclaimed Tire (CRM) Percent Passing**	**SBS Polymer Percent Passing**
#8 (2.36 mm)	100	---	Per Binder Manufacturer
#10 (2 mm)	95 - 100	---	Per Binder Manufacturer
#16 (1.18 mm)	45 - 75	---	Per Binder Manufacturer
#20 (mm)	---	100	Per Binder Manufacturer
#30 (600 m)	2 - 20	95 – 100	Per Binder Manufacturer
#50 (300 m)	0 - 10	Open	Per Binder Manufacturer
#200 (75 m)	---	Open	Per Binder Manufacturer

The use of CRM from multiple sources is acceptable provided that the overall blend of rubber meets the gradation requirements.

The individual CRM particles, irrespective of diameter, shall not be greater in length than 3/16 of an inch (5mm).

The CRM shall have a specific gravity of 1.15± 0.05 as determined by, and shall be free of loose fabric, wire and other contaminants except that up to 4 percent (by weight of rubber) calcium carbonate or talc may be added to prevent the rubber particles from sticking together. The rubber shall be sufficiently dry so as to be free flowing and not produce a foaming problem when blended with the hot asphalt cement. The CRM and SBS Polymer shall be accepted by certification from the approved supplier. The Reclaimed Tire CRM material shall conform to the chemical analysis in Table 203-15.2 (B).

Table 203-15.2 (B) - Reclaimed Tire CRM Chemical Requirements

Test	ASTM Test Method	Minimum	Maximum
Acetone Extract	D 297	6.0 %	16.0 %
Ash Content	D 297	----	8.0 %
Carbon Black Content	D 297	28.0 %	38.0 %
Rubber Hydrocarbon	D 297	42.0 %	65.0 %
Natural Rubber Content	D 297	22.0 %	39.0 %

Note: All reclaimed tire rubber CRM shall be certified to have originated in California, and the CRM material will also be certified to have been processed in California, through invoice and bill of lading.

PMAR Binder and RAB

The temperature of the blended PG asphalt cement shall not be less that 375° F nor more than 450° F when the CRM and the SBS Polymer are homogenously blended and/or milled with either binder, in the field. The combined materials shall be reacted for a minimum of 120 minutes after the incorporation of all the CRM and SBS Polymer. The PMAR binder and RAB shall meet the requirements in Table 203-15.2 (C) and Table 203-15.2 (D) **for moderate climate**, when the reaction/interaction is complete.

Table 203-15.2 (C) - Specification Limits for PMAR (Polymer Modified Asphalt-Rubber Binder)

		Hot Climate	Moderate Climate	Cold Climate
Apparent viscosity, 347 F (175 C) Spindle 3 @ 12 RPM: cps (ASTM D2669)	Min Max	1500 3500	**1500** **3500**	1500 3500
Cone Penetration, 77 F (25 C), 150g, 5 sec; 1/10 dm (ASTM D217)	Min Max	15 40	**20** **70**	25 100
Softening Point, F (C) (ASTM D36)	Min	150 F (66 C)	**140 F (60 C)**	130 F (54 C)
Resilience, 77 F (25 C), % (ASTM D3407)	Min	40	**30**	20

Table 203-15.2 (D) - Specifications Limits for RAB (Rubberized Asphalt Binder) or (PG 76-22TR "field blend")

		Hot Climate	Moderate Climate	Cold Climate
Rotational Viscosity, 400º F (205º C) Spindle 1 @ 12 RPM: cps (ASTM D2669)	Min Max	200 900	**200** **900**	200 900
Penetration, 77º F (25º C) 100g / 5 sec., dmm (ASTM D5)	Min Max	35 65	**40** **80**	45 95
Softening Point, ºF (ºC) (ASTM D36)	Min	150 º F (66 º C)	**140 º F (60 º C)**	130 º F (54 º C)
Elastic Recovery @ 77 º F (25 º C), 20 cm elongation, 5 cm / min., % recovery @ 2 hrs.	Min	60	**55**	50
Resilience, % rebound (ASTM D5329)	Min	20	**20**	20
Dynamic Shear (AASHTO T315)	Min	76	**76**	76

Climate Definitions

Hot Climate	Average July Max @ 110 F Average January Low @ 30 F or above
Moderate Climate	Average July Max @ 100 F Average January Low @ 15º F – 30 F
Cold Climate	Average July Max @ 80 F Average January Low @ 15 F or lower

Note: Certain climates may overlap the above, defined areas. When in doubt of the type of PG asphalt cement to utilize, always look to the lower penetration materials in the hot temperature range and the higher penetration materials in the low temperature range.

The viscosity shall be conducted by using a hand held HAAKE VISCOMETER, with rotor 1, 24mm in depth x 53mm in height, or equivalent. **Viscosity for PMAR binder and RAB binder shall be tested by the Contractor every hour with not less than one (1) reading for each binder batch.** The reacted PMAR binder and RAB binder shall be maintained at a temperature of not less than 375° F nor more than 425° F.

If material in a batch of PMAR binder or RAB is not used with-in six hours after the reaction period is complete, heating of the material shall be discontinued. When the PMAR binder or RAB temperature cools below 375° F and is then reheated, it shall be considered a reheat cycle. The total number of reheat cycles shall not exceed two (2). The binder materials shall be uniformly reheated to a temperature of not less than 375° F. Additional scrap tire CRM may be added to the reheated PMAR binder and reacted for a minimum of 30 minutes and shall not exceed 10 percent of the total binder weight. Reheated PMAR binder shall conform to the requirements for blended PMAR binder.

PMAR Binder and RAB Formulation

The PMAR binder and RAB supplier, shall furnish to the Engineer within 15 days of the notice to proceed, the PMAR binder and RAB formulations which shall contain the following information:

PG Asphalt Cement
- Source of PG Asphalt
- Grade of PG Asphalt
- Percentage of PG Asphalt by total weight of the PMAR and RAB mixture

Reclaimed Tire Rubber (CRM)
- Source of CRM
- Grade of CRM
- Percentage of CRM by total weight of the PMAR and RAB mixture

SBS Polymer
- Source of SBS Polymer
- Grade of SBS Polymer
- Percentage of SBS Polymer by total weight of the PMAR and RAB mixture

If CRM or SBS Polymer from more than one source is to be utilized, then the above information will be required from each source.

Aggregate Cover Material

Aggregate shall be composed of clean and durable crushed rock or crushed gravel conforming to the following requirements:

Proposed aggregate samples shall be submitted to the PMAR/RAB supplier prior to the preparation of the binder design to test the aggregate for compatibility and stripping characteristics (vialit testing). All results shall be submitted to the project engineer.

If the aggregate is to be crushed stone, it shall be manufactured from sound, hard, durable material of accepted quality and crushed to specification size. All strata, streaks and pockets of clay, dirt, sandstone, soft rock or other unsuitable material accompanying the sound rock shall be discarded and not allowed to enter the crusher.

If the aggregate material is to be crushed gravel, it shall consist of hard, durable fragments of stone or gravel of accepted quality and crushed to specification size. All strata, streaks, pockets of sand, excessively fine gravel, clay or other unsuitable material including all stones, rocks and boulders of inferior quality shall be discarded and not allowed to enter the crusher. The crushing of the gravel shall separate the #4, 3/8 and 1/2 inch sieves and shall have a minimum 95% of the particles with a minimum of one mechanically fractured face and 90% of the particles shall have a minimum of two mechanically fractured faces.

The crushed aggregate or crushed gravel shall not contain more that **8% by weight** of flat or elongated pieces and shall be free from wood, roots and vegetable or other organic extraneous matter. The 3/8 inch crushed aggregate or crushed gravel shall have a **minimum Cleanness Value (CV) of 80,** the 1/8 inch crushed aggregate or crushed gravel shall have a **minimum Cleanness Value (CV) of 88,** and shall have a percentage of wear not more than **7 percent at 100 revolutions** and not more than **30 percent at 500 revolutions**, as determined by ASTM C131 or California Test Method 211. Note: When performing the percentage of wear testing for the 1/8 inch aggregate **Schedule "D" Sizing** will be required as indicated in California Test Method 211. **Modified Fine Durability** testing shall also be required for the 1/8 inch aggregate, with a **minimum acceptable value at 76**, as required by California Test Method 229.

The aggregate shall show no evidence of disintegration nor show a total loss greater than 12% when subjected to 5 cycles of the sodium sulfate accelerated soundness test specified in ASTM C88.

The crushed aggregate for PMAR binder applications shall meet the requirements for gradation given in Table 203-15.2 (E). The crushed aggregate for RAB shall meet the requirements for gradation given in Table 203-15.2 (F), when tested in accordance with ASTM C136. This aggregate shall be a porphyritic olivine basalt with a specific gravity (coarse bulk SSD) ranging from 2.6 – 2.8, California Test Method 206; as supplied by George Reed, Table Mountain Plant, Sonora California, or equal. **The use of gray or light colored aggregate as part of the RAB chip seal surface course shall not be allowed.**

Table 203-15.2 (E) - Aggregate Gradation Requirements - PMAR
3/8 inch PMAR Aggregate Gradation

Sieve Size	Percent Passing
1/2 inch (12 mm)	100
3/8 inch (9 mm)	70 - 85
1/4 inch (4.75 mm)	0 - 15
#8 (2.36 mm)	0 - 5
#200 (75 m)	0 - 1
---	---

Table 203-15.2 (F) – 1/8th Inch Aggregate Gradation Requirements – RAB

Sieve Size	Percent Passing
3/8 inch (9 mm)	100
1/4 inch (4.75 mm)	95 - 100
#8 (2.36 mm)	20 - 40
#16 (1.18 mm)	0 - 5
#30 (600 µm)	0 - 2
#200 (75 µm)	0 - 1

The aggregate to be utilized for both binder materials shall be hot pre-coated with 0.5 0.25 PG asphalt cement. The Engineer shall determine the appropriate amount of pre-coat. The pre-coated aggregate shall have a "salt and pepper" appearance and shall be supplied to the project site at 225 F to 325 F.

203-15.3 PMAR Binder and RAB – Mixing and Reaction

Concerning the PMAR binder, the percentage of Reclaimed Tire Rubber CRM shall be 15 – 18 percent by weight of the total PMAR mixture; the exact CRM content shall be determined by the binder design submitted by the PMAR supplier. During PMAR binder manufacture the CRM percentage shall not fluctuate by more than 1 (one) percent by weight of total PMAR mixture, as determined by the original laboratory binder design. The SBS Polymer shall be 2 percent by weight of the PMAR mixture. Concerning the RAB, the percentage of Reclaimed Tire Rubber CRM shall be 7 – 12 percent by weight of the total RAB mixture, the exact CRM content shall be determined by the binder design submitted by the RAB supplier. The SBS Polymer shall be 2 – 4 percent by weight of the total RAB mixture. During RAB binder manufacture the CRM percentage shall not fluctuate by more than 1 (one) percent by weight of total RAB mixture, as determined by the original laboratory binder design.

The temperature of the PG asphalt cement shall be between 375 F and 450 F at the addition of the CRM and SBS Polymer. The PG asphalt cement, CRM and SBS Polymer shall be combined and mixed together in the PMAR binder or RAB blending unit and/or field Supraton Mill, and reacted in the distributor truck or a reaction vessel for a minimum period of 120 minutes from the time the CRM and SBS Polymer are blended with the PG asphalt cement. The temperature of the PMAR binder and RAB mixture shall be above 375 F during the reaction period, but shall not exceed 425 F at <u>any</u> time.

When a job delay occurs after full reaction, the PMAR binder and RAB may be allowed to cool. The PMAR binder or RAB shall be re-heated slowly just prior to application to a temperature between 375 F and 400 F. An additional quantity of PG asphalt cement and/or CRM may be added to only to the PMAR binder as required to produce a material with the appropriate viscosity. See re-heat cycle in Section 203-15.2, Materials.

203-15.4 Equipment

General

The equipment used by the contractor for pavement cleaning and excess aggregate removal shall include a self-propelled rotary power broom, mobile pick-up broom or top dumping mobile pick-up broom.

PMAR and RAB Equipment

All equipment utilized in the production and application of PMAR binder and RAB materials shall be described as follows:

a) A PG asphalt cement heating tank with a hot oil heat transfer system or a retort heating system capable of heating the PG asphalt cement to the proper temperature for blending/milling with the CRM and SBS Polymer.

b) A PMAR/RAB mechanical blender and a Supraton 549-5.03 mill shall have a two stage continuous mixing process capable of producing a homogenous blend of PG asphalt cement CRM and SBS Polymer, at the mix design specified ratios, as directed by the engineer. The mechanical blender shall be equipped with a <u>dual hopper</u> granulated rubber feed system capable of supplying the PG asphalt cement feed system, as not to interrupt the continuity of the blending process. The maximum capacity of the primary

blending vessel shall be 500 gallons. Both the primary and secondary blenders shall be equipped with an agitation device orientated horizontally in the blending vessel. The mechanical blender and Supraton 549-5.03 mill shall be capable of fully blending or milling the individual modifier particles (CRM and SBS Polymer) with the PG asphalt cement. A separate PG asphalt cement feed pump and finished product pump are required. This unit shall have a PG asphalt cement totalizing meter in gallons and a flow rate meter in gallons per minute.

c) A distributor truck equipped with a heating unit, and an internal mixing device capable of maintaining a uniform mixture of PG asphalt cement, CRM and SBS Polymer. It shall be equipped with a full circulating spreader bar and pumping system capable of applying the PMAR binder and RAB material within a 1% tolerance of the specified application rate, and must achieve a uniform covering of the surface to be treated. The distributor shall have a boot board on the rear of the vehicle and a bootman shall accompany the distributor. The bootman shall ride in a position so that all the spray bar tips are in full view and readily assessable for unplugging, if a plugged tip should occur. The distributor truck shall also require a thermometer and a computer rate control (CRC) interlinked with a Coriolis Flow Measuring System to ensure and confirm binder application rate accuracy.

Aggregate Cover Material Spreader

The cover material (chip) spreader shall be a self-propelled machine with an aggregate receiving hopper in the rear, belt conveyors to carry the pre-coated aggregate to the front, and a full width spreading hopper. The spreader shall be in good mechanical condition and shall be capable of applying the cover aggregate uniformly across the spread width and at the specified application rate, and heat-treated belts should be installed on the chip spreader.

Rolling Equipment

A minimum of three continually operated self-propelled pneumatic-tired rollers (and one steel wheel roller) shall be used for the required rolling of the cover material. The pneumatic-tired rollers' shall carry a minimum loading of 3,000 pounds on each wheel and a minimum pressure of 90 pounds per square inch in each tire. Foam filled tires can be utilized.

Hauling Equipment

Trucks for hauling the pre-coated cover aggregate shall be tailgate discharge and shall be equipped with a device to lock onto the hitch of the cover material spreader. Haul trucks shall also be compatible with the cover aggregate spreader so that the dump bed will not push down on the spreader when fully raised, or have too short of a bed which results in aggregate spillage while dumping into the receiving hopper.

203-16 MICROSURFACING The following Section 203-16 is added to the Standard Specifications.

203-16.1 General Microsurfacing shall consist of mixing a polymer modified, cationic microsurfacing emulsion (MSE), aggregate, mineral filler, set-control additives, and water and spreading the mixture on a pavement surface where shown on the plans, in conformance with the provisions in these special provisions, and as directed by the Engineer.

203-16.2 Materials

Microsurfacing Emulsion (MSE)

Microsurfacing Emulsion (MSE) shall be homogenous and shall conform to the provisions of these special provisions. The polymer shall be milled or blended into the asphalt or blended into the emulsifier solution prior to the emulsification process.

The MSE shall conform to the following requirements when tested in conformance with the following test methods:

Polymer Modified, Cationic Microsurfacing Emulsion (MSE)

Specification Designation	Test Method	Requirement
Viscosity SSF @ 77 °F (25° C)	AASHTO T 59	15-90 Seconds
Sieve, max.	AASHTO T 59	0.30 Percent
Settlement, 5 days, max.	ASTM D244	5 Percent
Storage Stability, 1 day, max.	AASHTO T 59	1 Percent
Residue by Evaporation, min.	California Test 331	62 Percent

Specification Designation for Residue

Specification Designation	Test Method	Requirement
Penetration@ 77 °F (25°C), 100g, 5s ,0.1mm	AASHTO T 51	40-90
Softening Point °F (°C) Min.	AASHTO T53	135 (57)

Water and Additives

Water shall be of such quality that the asphalt will not separate from the MSE before the microsurfacing is placed on the pavement. If necessary for workability, a set-control agent that will not adversely affect the microsurfacing product may be used.

Mineral Filler

Mineral filler shall be Portland cement or hydrated lime that is free of lumps. Portland cement shall be either Type I, Type II, Type III or combination thereof. The type of mineral filler shall be determined by the Contractor based on laboratory mix designs. The mineral filler will be considered part of the aggregate gradation requirement.

Aggregate

The mineral aggregate used shall be of the type and grade specified for the particular use of the microsurfacing. Aggregate shall consist of sound, durable, crushed stone or crushed gravel and approved mineral filler. The material shall be free from vegetable matter and other deleterious substances. Aggregates shall be 100% crushed material with no rounded particles and shall be volcanic in origin and black in color, as supplied by George Reed, Table Mountain Plant, Sonora, CA., or approved equal. **The use of gray or light-colored aggregate will not be allowed**. All aggregate shall be free of caked lumps and oversize particles.

The aggregate, prior to the addition of emulsion shall conform to the requirements of this section. If aggregates are blended each component aggregate shall meet the sand equivalency and abrasion resistance and shall be 100% crushed as tested in accordance with California Test 205. The definition of a crushed particle in California Test 205 Section D, is amended to read: "Any particle having 2 or more fresh mechanically fractured faces shall be considered a crushed particle."

The percentage composition by mass of the aggregate (including mineral filler) shall conform to the following grading requirements when tested in conformance with California Test 202:

TYPE II

Sieve Sizes	Percentage Passing
3/8" (9.5-mm)	100
No. 4 (4.75-mm)	94 - 100
No. 8 (2.36-mm)	65 - 90
No. 16 (1.18-mm)	40 - 70
No. 30(600-μm)	25 - 50
No. 200 (75-μm)	5 – 15

TYPE III

Sieve Sizes	Percentage Passing
3/8" (9.5-mm)	100
No. 4 (4.75-mm)	70 – 90
No. 8 (2.36-mm)	45 – 70
No. 16 (1.18-mm)	28 – 50
No. 30(600-μm)	19 – 34
No. 200 (75-μm)	5 – 15

Aggregate for the subject project shall be Type II.

The aggregate (excluding mineral filler) shall conform to the following quality requirements:

Test	California Test	Requirement
Sand Equivalent (Min.)	217	70
Durability Index (Min.)	229	75
Percentage of Crushed Particles (Min.) [1]	205	100%
Los Angeles Rattler Loss at 500 Rev. (Max.) [2]	211	35%

Notes: 1. CT205, Section D, is amended to read: "Any particle having 2 or more freshly, mechanically fractured faces shall be considered a crushed particle"

2. Los Angeles Rattler shall be performed on the parent aggregate before crushing.

If the results of the aggregate grading do not meet the specified gradation, the microsurfacing represented by the test shall be removed. However, if requested in writing by the Contractor and approved by the Engineer, the microsurfacing may remain in place and the Contractor shall pay to the City $2.00 per ton for the aggregate represented by the tests and left in place.

If the results of the Sand Equivalent test for aggregate do not meet the specified requirement, the microsurfacing represented by the test shall be removed. However, if requested in writing by the Contractor and approved by the Engineer, the microsurfacing may remain in place and the Contractor shall pay to the City $2.00 per ton for the aggregate represented by the tests and left in place.

When the results of both the aggregate grading and the Sand Equivalent tests do not conform to the specified requirements, both payments to the City shall apply. The City may deduct these amounts from any moneys due or to become due the Contractor.

No single aggregate grading or Sand Equivalent test shall represent more than 300 tons or one day's production, whichever is smaller.

203-16.3 Mix Design

At least 7 working days before the microsurfacing placement commences, the Contractor shall submit for approval of the Engineer a laboratory report of tests and a proposed mix design covering the specific materials proposed for use on the project.

The percentages of each individual material proposed in the mix design shall be shown in the laboratory report. Individual materials shall be within the following limits:

Residual Asphalt	5.5% to 9.5% by dry mass of aggregate
Mineral Filler	0% to 3% by dry mass of aggregate
Additive	As needed
Water	As needed

Adjustments may be required during construction based on field conditions.

The mix design and aggregate tests shall be performed by a laboratory capable of performing the applicable International Slurry Surfacing Association (ISSA) tests. The proposed microsurfacing mixture shall conform to the specified requirements when tested in conformance with the following tests:

Test	ISSA Test Method	Requirements
Wet Cohesion @ 30 Minute (Set) (Min.) @ 60 Minute (Traffic) (Min.)	TB* 139	 12 kg-cm 20 kg-cm
Excess Asphalt	TB* 109	540 g/m^2
Wet Stripping (Min.)	TB* 114	90%
Wet Track Abrasion 6-day Soak Loss (Max.)	TB* 100	 810 g/m^2
Displacement Lateral (Max.) Specific Gravity After 1000 Cycles of 125 lbs. (56.8 kg)(Max.)	TB* 147A	 5%. 2.10
Classification Compatibility	TB* 144	(AAA, BAA) 11 Grade Points
Mix Time @ 77°F (25°C)	TB* 113	Controllable to 120 Seconds

TB* = Technical Bulletin

The laboratory that performed the tests and designed the mixture shall sign the laboratory report. The report shall show the results of the tests on individual materials and shall compare their values to those required by these special provisions. The report shall clearly show the proportions of aggregate, filler (minimum and maximum), water (minimum and maximum), set control additive, and MSE solids content (minimum and maximum) based on the dry mass of aggregate. The laboratory shall report the quantitative effects of moisture content on the unit mass of the aggregate (bulking effect) in conformance with the requirements of ASTM Designation C 29M. Previous laboratory reports covering the same materials may be accepted provided the material test reports were completed within the previous 12 months. The mix design shall further show the recommended changes in mineral filler, water, and additive proportions for high temperature weather conditions by reporting proportions of materials required for 60 seconds of mix time with materials heated to 100 °F (38°C). This 100 °F (38°C) mixing report will not be required for projects requiring nighttime application.

The component materials used in the mix design shall be representative of the microsurfacing materials proposed by the Contractor for use on the project.

Once the mix design is approved by the Engineer, no substitution of other material will be permitted unless the materials proposed for substitution are first tested and a laboratory report is submitted for the substituted design in conformance with the provisions of these special provisions. Substituted materials shall not be used until the mix design for those materials has been approved by the Engineer.

The completed mixture, after addition of water and set control agent, if used, shall be such that the microsurfacing mixture has proper workability. At the expiration of the road closure hours, the microsurfacing mixture shall be sufficiently cured to support unrestricted traffic.

<u>203-16.4 Proportioning</u>

Aggregate, mineral filler, MSE, water, and additives, including the set-control agent, if used, shall be proportioned by volume utilizing the mix design approved by the Engineer. If more than one kind of aggregate is used, the correct amount of each kind of aggregate to produce the required grading shall be

proportioned separately, prior to adding the other materials of the mixture, in a manner that will result in a uniform and homogeneous blend.

The aggregate shall be proportioned using a belt feeder operated with an adjustable cutoff gate. The height of the gate opening shall be determinable. The MSE shall be proportioned by a positive displacement pump. Variable rate emulsion pumps, if used, shall be calibrated and sealed in the pump's calibrated condition in conformance with California Test 109 prior to usage.

The delivery rate of aggregate and MSE per revolution of the aggregate feeder shall be calibrated at the appropriate gate settings for each mixer-spreader truck used on the project in conformance with California Test 109 and in conformance with the provisions of these special provisions.

The aggregate belt feeder shall deliver aggregate to the pugmill with such volumetric consistency that the deviation for any individual aggregate delivery rate check-run shall not exceed 2.0 percent of the mathematical average of three runs of at least 3 tons each. The emulsion pump shall deliver MSE to the pugmill with such volumetric consistency that the deviation for any individual delivery rate check-run shall be within 2.0 percent of the mathematical average of 3 runs of at least 300 gallons (1135 L) each. The water pump shall deliver water to the pugmill with such volumetric consistency that the deviation for any individual delivery rate check-run shall be within 2.0 percent of the mathematical average of 3 runs of at least 300 gallons (1135 L) each.

The MSE storage tank shall be located immediately before the emulsion pump and shall be equipped with a device which will automatically shut down the power to the emulsion pump and aggregate belt feeder when the MSE level is lowered to a point where the pump suction line is exposed.

A temperature-indicating device shall be installed in the emulsion storage tank at the pump suction level. The device shall indicate the temperature of the MSE and shall be accurate to within 10°F (5°C).

The belt delivering the aggregate to the pugmill shall be equipped with a device to monitor the depth of aggregate being delivered to the pugmill. The device for monitoring the depth of aggregate shall automatically shut down the power to the aggregate belt feeder whenever the depth of aggregate is less than the target depth of flow. A second device shall be located where the device will monitor the movement of the aggregate belt by detecting revolutions of the belt feeder. The devices for monitoring no flow or belt movement shall automatically shut down the power to the aggregate belt when the aggregate belt movement is interrupted. The device to detect revolutions of the belt feeder will not be required where the aggregate delivery belt is an integral part of the drive chain. To avoid erroneous shutdown by normal fluctuation, a delay of 3 seconds will be permitted between sensing and shutdown of the operation.

203-16.5 Mixing and Spreading Equipment

The microsurfacing shall be mixed in continuous pugmill mixers of adequate size and power for the type of microsurfacing to be placed. All indicators shall be in conformance with the provisions of these special provisions and shall be in working order prior to commencing mixing and spreading operations.

Mixer-spreader trucks shall be equipped to proportion the MSE, water, aggregate, mineral filler, and set-control additives by volume. Rotating and reciprocating equipment on mixer-spreader trucks shall be covered with metal guards.

The mixer-spreader truck shall not be operated unless low-flow and no-flow devices and revolution counters are in good working condition and functioning and metal guards are in place. Indicators required by these special provisions shall be visible while walking alongside the mixer-spreader truck.

Aggregate feeders shall be connected directly to the drive on the emulsion pump. The drive shaft of the aggregate feeder shall be equipped with a revolution counter reading to the nearest one-tenth of a revolution.

The identifying number of mixer-spreader trucks shall be at least three inches (75 mm) in height, located on the front and rear of the vehicle.

The microsurfacing mixture shall be spread by means of a spreader box conforming to the following requirements:

Spreader Box

The spreader box shall be capable of placing the microsurfacing a minimum of 12 feet (3.6 m) wide and shall have strips of flexible rubber belting or similar material on each side of the spreader box and in contact with the pavement to prevent the loss of microsurfacing from the box. Spreader boxes over eight feet (2.38 m) in application width shall have baffles, reversible motor driven augers or other suitable means to insure uniform application on superelevated sections and shoulder slopes. Spreader box skids shall be maintained in such manner as to prevent chatter (wash boarding) in the finished mat. The spreader box in use shall be clean and free of microsurfacing and MSE at the start of each work shift.

The spreader box shall have a series of strike-off devices at the rear of the box. The leading strike-off device shall be fabricated of steel, stiff rubber or other suitable material. The number of strike-off devices shall be determined by the Contractor. The first strike-off device shall be designed to maintain close contact with the pavement during the spreading operations, shall obtain the thickness required, and shall be capable of being adjusted to the various pavement cross sections for application of a uniform microsurfacing finished surface. The final strike-off device shall be fabricated of flexible material suitable for the intended use and shall be designed and operated to ensure a uniform texture is achieved in the finished surface of the microsurfacing. The final strike-off device shall be cleaned or changed daily if problems with longitudinal scouring occur.

Flexible fabric drags attached to the rear of the spreader box shall not be used.

Wheel Path Depression (Rut) Box

The wheel path depression (rut) box shall be designed to have adjustable strike-off devices to regulate the depth and shall have a width of between five feet (1.52 m) and six feet (1.81 m). Hydraulic augers, or similar devices, shall be installed and shall be capable of moving the mixed material from the rear to the front of the filling chamber. These devices shall also be capable of guiding the larger aggregate into the center, deeper section of the wheel path depression, and forcing the finer material toward the outer edges of the spreader box.

The microsurfacing mixture, to be spread in areas inaccessible to the controlled spreader box, may be spread by other methods upon approval of the Engineer.

302-13 – ASPHALT RUBBER DOUBLE CHIP SEAL The following Section 302-13 is added to the Standard Specifications.

302-13.1 General Immediately prior to the application of the PMAR binder and RAB chip seal applications, the surface shall be clean in order to insure adequate adhesion of the PMAR to the existing pavement surface and the RAB chip seal to the PMAR chip seal.

PMAR binder and RAB material shall be applied only when the existing surface is dry and the atmospheric temperature is above 60 F and rising. No material shall be applied when predicted chance of rain is higher than 75 % or when the wind is in excess of 20 mph, as directed by the Engineer.

302-13.2 Application of PMAR Binder and RAB

Placement of the PMAR and RAB shall proceed only under the following conditions:

a) The pavement surface temperature shall be 60 F and rising.
b) The pavement surface is clean and dry.
c) The wind conditions do not exceed 20 mph.
d) All of the construction equipment such as the Polymer Modified Asphalt-Rubber distributor, aggregate spreader, haul trucks loaded with cover material, rollers and brooms are in position and ready to commence placement operations.
e) Chance of rain does not exceed 75%.

The PMAR binder shall be applied to the existing roadway immediately following mixing and reaction, at a temperature of 375 F to 400 F at a rate of 0.60 to 0.65 gallons per square yard, with a maximum of 1% application rate variance allowed. The RAB shall be applied to the PMAR chip seal surface immediately following mixing and reaction, at a temperature of 375º F to 400º F at a rate of 0.20 to 0.23 gallons per square yard, with a maximum of 1% application rate variance allowed. Transverse joints (including those at the work limits) shall be constructed by placing building paper across and over the end of the previous PMAR binder or RAB chip seal application. Once the application has progressed beyond the paper, the paper shall be removed immediately and disposed of as directed by the Engineer. The use of paper may be discontinued if the contractor chooses to squeegee the excess PMAR binder material at the transverse joints prior to the placement of the cover aggregate. All longitudinal joints shall not exceed a 12-inches (30 cm) overlap and shall be staggered from initial PMAR and RAB application. At no time shall the contractor be allowed to place longitudinal joints (one on top of the other).

Distributor bar height, tip size, distribution, speed and shielding materials shall be utilized to reduce the effects of excess wind upon the spray distribution (fan), of each binder. The Engineer shall delay or reschedule work when high gusting or dusty winds in excess of 20 mph prevent or adversely affect binder or aggregate application.

The application of PMAR binder and RAB to areas not accessible with the distributor bar on the distributor truck shall be accomplished by using a squeegee or other means approved by the Engineer.

The contractor shall comply with all Federal, State and Local environmental laws, regulations and ordinances.

Application at Speed Humps

The application of PMAR binder and 3/8" aggregate shall terminate six (6) inches from the edge of speed humps. The application of the subsequent RAB and 1/8" aggregate shall overlap the edge of the speed humps by six (6) inches.

302-13.3 Application of Aggregate Cover Material

The 3/8 inch cover material shall be applied immediately onto the PMAR membrane at a rate of 26 to 34 pounds per square yard and the 1/8 inch cover material shall be applied immediately to the RAB membrane, at a rate of 8 to 12 pounds per square yard. The actual rate selected within this range will be determined in the field based on the appearance of the PMAR chip seal and the RAB chip seal after initial rolling. At all times the application rate of the cover aggregate shall be kept to a minimum.

At the time of application the temperature of the aggregate shall range from 225 F to 325 F.

302-13.4 Rolling

At least three operational pneumatic-tired rollers (and one steel wheel roller) shall be provided to accomplish the required embedment of the aggregate cover material. At some project locations, or when production rates dictate, additional or fewer rollers may be utilized as directed by the Engineer. The pneumatic tire rollers shall be operated in front of the steel wheel roller. At no time shall there be less than 3 (three) operational pneumatic-tired rollers and 1 (one) 12 to 14 ton operational steel wheel roller on a project.

Sufficient rollers shall be used for the initial rolling to cover the width of the aggregate spread with one pass. The first pass shall be made immediately behind the cover material spreader (chip-box) as the aggregate is being placed. If the spreading is stopped for an extended period, the cover material spreader (chip-box) shall be moved ahead or off the chip seal surface so that all cover material may be immediately rolled. Three complete passes with rollers shall be made with the pneumatic rollers and one pass with the steel wheel roller.

302-13.5 Traffic Control

Except when it is necessary the hauling equipment must avoid travel on the newly applied PMAR – SAMI or RAB – SAM. Traffic of all types shall be kept off both of these chip seal applications until they have had time to set properly. The speed of the hauling equipment shall not exceed 15 miles per hour when traveling over either chip seal that has not had sufficient time to properly set.

302-13.6 Measurement and Payment.

The Asphalt rubber double chip seal shall be measured by the square yard at the specified application rate for the PMAR and RAB chip seal applications, and approved by the Engineer. Payment shall be made at the contract unit price per square yard for Asphalt rubber double chip seal, Bid Item 6. These prices shall be full compensation for mobilization, furnishing all materials and for all preparation, hauling and application of the materials, including labor, equipment, tools and incidentals necessary to complete each item contained in the asphalt rubber double chip seal application.

302-14 – MICROSURFACING The following Section 302-14 is added to the Standard Specifications.

302-14.1 General Before placing the microsurfacing, the pavement surface shall be cleaned by sweeping, flushing or by other means necessary to remove loose particles of paving, dirt, and other extraneous material. When required, the roadway surface may be fogged with water ahead of the spreader box. The application of the fog spray may be adjusted to suit temperatures, surface texture, humidity and dryness of pavement.

302-14.2 Application of Microsurfacing

The microsurfacing mixture shall be uniformly spread on the existing surfacing within the rate specified without spotting, rehandling or otherwise shifting of the mixture.

The microsurfacing mixture shall not be placed when the ambient temperature is below 50 °F (10°C) or during unsuitable weather. Microsurfacing shall not be placed if rain is imminent or if there is the possibility that there will be freezing temperatures within 24 hours.

When wheel path depressions have a cross section that is deformed 1/2 inch (12.5 mm) or more, the individual wheel paths shall first be filled utilizing a wheel path depression (rut) box in conformance with the provisions of the special provisions. The depth of the wheel path depression shall be determined after the adjacent ridges have been removed, when applicable. The maximum single application for wheel path depressions shall be one inch (25 mm). Wheel path depressions of depths greater than one inch (25 mm) shall require multiple applications in each depression.

Wheel path depression repair shall be constructed with a slight crown to allow for initial compaction by traffic on the microsurfacing.

Freshly filled wheel path depressions shall be compacted by traffic for a minimum of 12 hours before additional lifts of microsurfacing material are placed for rut filling purposes or as surface courses.

Microsurfacing shall be spread at a rate within the following ranges of pound of dry aggregate per square yard. Type II aggregate shall be utilized for this project.

Microsurfacing Type	Location	Spread Rate
Type II	Full Traffic Width	10 – 20 (5.5 – 11.0)
Type III[1]	Full Traffic Width	20 - 32 (11.0 – 17.5)
Type III[2]	Full Traffic Width	30 – 32 (16. 0 – 17.5)

Notes: 1. For microsurfacing over asphalt concrete pavement.

2. For microsurfacing over Portland cement concrete pavement and concrete bridge decks.

Longitudinal joints shall correspond with the edges of the traffic lanes. The Engineer may permit other patterns of longitudinal joints if the patterns will not adversely affect the quality of the finished product.

Through traffic lanes shall be spread in full lane widths only. Longitudinal joints common to 2 traffic lanes shall be butt joints with overlaps not to exceed 3 inches (76 mm). Building paper shall be placed at the transverse joints to avoid double placement of the microsurfacing. Other suitable methods to avoid double placement of the microsurfacing will be allowed. Hand tools shall be available to remove spillage.

The mixture shall be uniform and homogeneous after placing on the surfacing and shall not show separation of the MSE and aggregate after setting. The completed surface shall be of uniform texture and free from ruts, humps, depressions, or irregularities.

Adequate means shall be provided to protect the microsurfacing from damage by traffic until such time that the mixture has cured sufficiently so that the microsurfacing will not adhere to or be picked up by the tires of vehicles.

Placement of the microsurfacing shall cease a minimum of one hour before the expiration of the road closure hours, unless the Contractor proves to the satisfaction of the Engineer that the surface will be ready for unrestricted traffic at the expiration of the road closure hours.

302-14.3 Test Strip

At the option of the Engineer, the Contractor shall construct a test strip for evaluation by the Engineer. The test strip shall be 300 feet to 500 feet long and shall consist of the application courses specified. The test strip shall be constructed at the same time of day or night that the full production of microsurfacing will be placed and may be constructed in 2 days or nights when multiple course applications are specified.

The Engineer will evaluate the completed test strip after 12 hours of traffic on the completed test strip to determine if the mix design and placement procedure are acceptable. If the mix design or the placement procedure is determined by the Engineer to be unacceptable, the test strip will be rejected, the Contractor shall make modifications, and a new test strip shall be constructed and evaluated by the Engineer. The cost of materials and placement of the test strips, which have been rejected, shall be borne by the Contractor and will not be considered as part of the contract work. If ordered by the Engineer, rejected test strips shall be removed at the Contractors expense.

302-14.4 Repair of Early Distress

If bleeding, raveling, delamination, rutting, or washboarding occurs within 60 days after placing the microsurfacing, the Contractor shall diligently pursue repairs by any method approved by the Engineer. The Contractor shall not be relieved from maintenance until repairs have been completed.

302-14.5 Measurement and Payment

Microsurfacing will be measured by the square yard. The quantity of microsurfacing to be paid for will be the square yards of actual area covered by the microsurfacing.

The contract price paid per square yard for microsurfacing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in placing microsurfacing, complete in place, including testing for and furnishing mix design, cleaning the surface, furnishing added water and set-control additives, and protecting the microsurfacing until it has set, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

SECTION 303 CONCRETE AND MASONARY CONSTRUCTION

303-1 CONCRETE STRUCTURES Concrete structures shall conform to the provisions of Section 303-1 "Concrete Structures" of the Standard Specifications and these Special Provisions.

303-1.7 Placing Reinforcement The following is added to section 303-1.7 of the Standard Specifications:

Reinforcing steel shall be placed center to center as shown on the Plans. Placement tolerances shall comply with ACI 301 Chapter 5, ACI 318 Chapter 7 and CRSI Manual of Standard Practice Chapter 8.

Reinforcing steel shall be installed in place, spaced, and rigidly and securely tied with wire at all splices, at crossing points, and intersections in the position indicated. Rebending of reinforcing steel on the job site to fit site conditions will not be allowed without approval from the Engineer. Point end of wire ties away from forms.

303-1.7.2 SPLICING The following is added to Section 303-1.7.2 of the Standard Specifications.

Splice length not shown on the Plans shall be 1.2 times longer than standard splice length.

303-4 MASONRY CONSTRUCTION Work shall be done per the Standard Specifications.

303-5 CONCRETE CURBS, WALKS, GUTTERS, CROSS GUTTERS, ALLEY INTERSECTIONS, ACCESS RAMPS, AND DRIVEWAYS Concrete curbs, walks, gutters, cross gutters, alley intersections, access ramps, and driveways shall conform to the provisions of Section 303-1 "Concrete curbs, walks, gutters, cross gutters, alley intersections, access ramps, and driveways" of the Standard Specifications and these Special Provisions.

303-5.1.1 General The following is added to section 303-5.1.1 of the Standard Specifications:

All PCC improvements shall be doweled to adjacent PCC improvements using 12" long #3 or #4 reinforcing steel dowels at 3' spacing. Drill for drive tight fit or epoxy in place.

303-5.4.2 Expansion Joints The following is added to Section 303-5.4.2 of the Standard Specifications:

Expansion joints in longitudinal sections of curb, gutter and sidewalk shall be at intervals of 16 to 20 feet, where directed by the Engineer, or where designated on the plans.

303-5.4.3 WEAKENED PLANE JOINTS The following is added to Section 303-5.4.3 of the Standard Specifications:

Weakened plane joints shall be constructed according to the details shown on the City of San Leandro Standard Plan for "General Concrete Notes," (Dwg. 104, Case 3101).

303-5.5.2 Concrete Curb and Gutter The following is added to Section 303-5.5.2 of the Standard Specifications:

Concrete curb and gutter shall be constructed according to the details shown on the City of San Leandro Standard Plans "Concrete Curb, Gutter and Sidewalk", (Dwg. 100, Case 3101) and "General Concrete Notes" (Dwg. 104, Case 3101).

Mortar shall not be applied to any part of the curb.

303-5.5.3 Sidewalk The following is added to Section 303-5.5.3 of the Standard Specifications:

Concrete sidewalk shall be constructed according to the details shown on the City of San Leandro Standard Plans "Concrete, Curb, Gutter, Sidewalk", (Dwg. 100, Case 3101) and "General Concrete Notes", (Dwg. 104, Case 3101).

303-5.5.4 Concrete Valley Gutter The following is added to Section 303-5.5.4 of the Standard Specifications:

Concrete Valley Gutter shall be constructed according to the details shown on the City of San Leandro Standard Plans "Valley Gutter", (Dwg. 114, Case 3101) and "General Concrete Notes", (Dwg. 104, Case 3101).

303-5.5.5 Concrete Curb Ramps The following is added to Section 303-5.5.5 of the Standard Specifications:

Concrete Curb Ramps of the type shown on the plans shall be constructed according to the details shown on the City of San Leandro Plans "Standard Curb Ramps", (Dwg. 106A, 106B, 106C & 106D, Case 3101) and "General Concrete Notes" (Dwg. 104, Case 3101).

Concrete curb ramps shall be of the types shown on the plans.

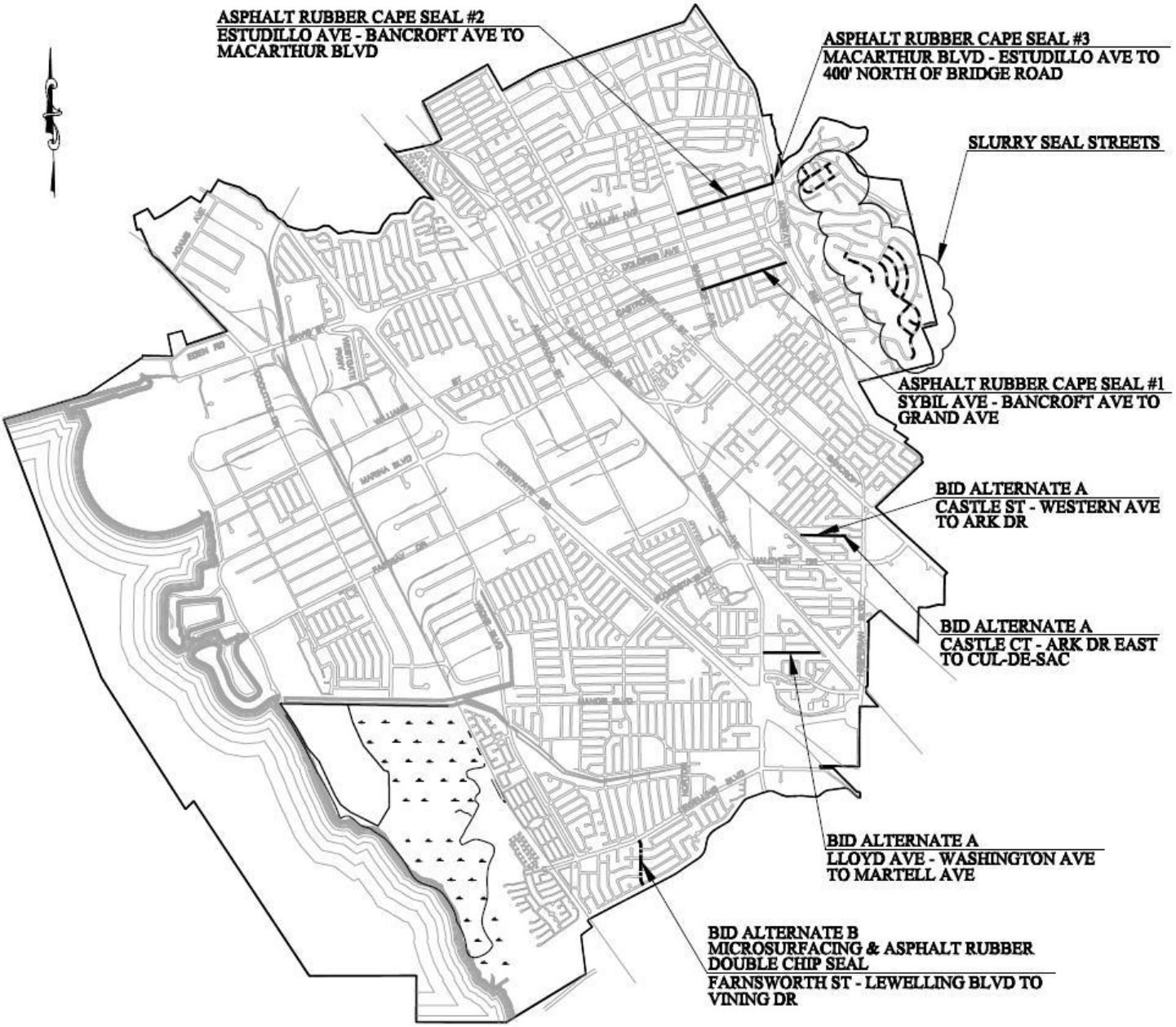
303-5.9 Measurement and Payment. The following is added to section 303-5.9, "Measurement and Payment", of the standard specifications:

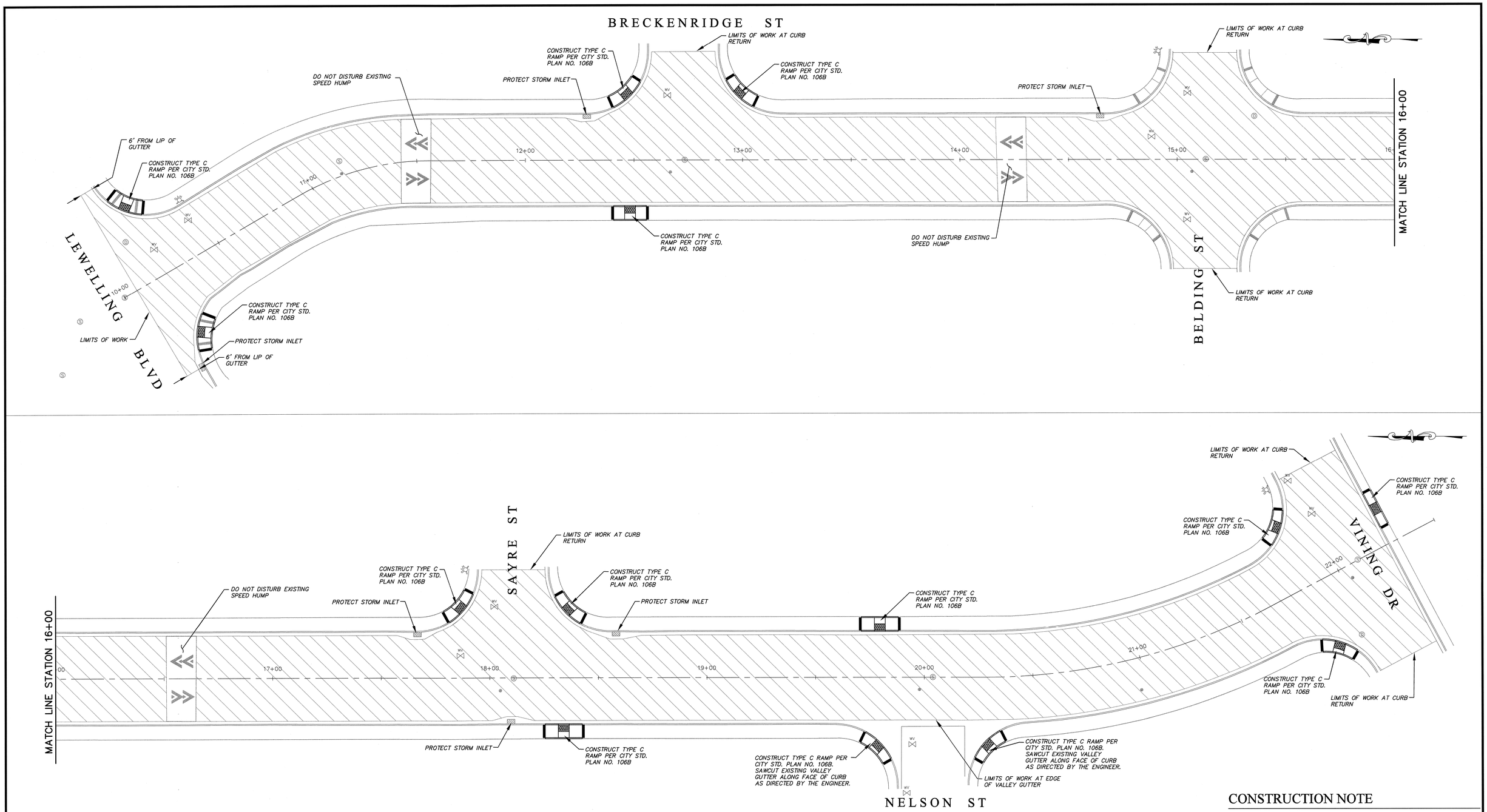
Curb ramps shall be measured per each ramp installed, which includes the curb, gutter, sidewalk, and truncated domes included with the construction of each ramp.

Payment for all work described in section 303-5 "Concrete curbs, walks, gutters, cross gutters, alley intersections, access ramps, and driveway" is included in the contract price paid for the bid item(s) that contain concrete improvements and no separate payment will be made therefore. Bid Item B6, "Construct Type C Curb Ramp w/Truncated Domes, Curb & Gutter", includes truncated dome panels.

Annual Street Sealing 2009-10
PROJECT NO. 09-144-38-307

ADDENDUM NO. 1 – EXHIBIT B





CONSTRUCTION NOTE

THE CONTRACTOR SHALL INVENTORY AND REFERENCE ALL EXISTING STRIPING, PAVEMENT MARKINGS, DELINEATORS, ETC. PRIOR TO THEIR REMOVAL AND PROVIDE A COPY TO THE PROJECT ENGINEER.

LEGEND

- AREA FOR MICROSURFACING AND SUBSEQUENT APPLICATION OF ASPHALT RUBBER DOUBLE CHIP SEAL
- SANITARY SEWER MANHOLE
- STORM DRAIN MANHOLE
- WATER VALVE
- FIRE HYDRANT

REGISTERED PROFESSIONAL ENGINEER KENNETH C. JOSEPH No. 34870 Exp. 2-30-11 CIVIL STATE OF CALIFORNIA

Measure B Improvements
Your half-cent sales tax at work
ACTIA
www.actia2022.com
(510) 893-3347
ALAMEDA COUNTY TRANSPORTATION IMPROVEMENT AUTHORITY

811 Know what's below. Call before you dig.
One free, easy call gets your utility lines marked AND helps protect you from injury and expense.
Call 811 or visit call811.com for more information.

CITY OF SAN LEANDRO INCORPORATED 1872

BEFORE YOU DIG, CALL UNDERGROUND SERVICE ALERT 811

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES. THOSE SHOWN REPRESENT THE BEST INFORMATION AVAILABLE TO THE CITY OF SAN LEANDRO AT THE TIME OF PREPARATION OF THESE PLANS. NO GUARANTEE IS MADE AS TO THE ACCURACY OF THIS INFORMATION.

NO.	DATE	REVISION

CITY OF SAN LEANDRO

DESIGNED BY	KKL	DATE	6/22/10
DRAWN BY	KKL	DATE	6/22/10
PROJECT MGR.	KKL	DATE	6/22/10
TRANS ADMIN.	DH	DATE	6/24/10
SENIOR ENGR.	AEO	DATE	6/24/10
APPROVED BY		DATE	6/24/10

CITY ENGINEER, R.C.E. No. 34870

ANNUAL STREET SEALING 2009-10

ASPHALT RUBBER DOUBLE CHIP SEAL - FARNSWORTH ST

SHEET 5 OF 5
JOB NO. 09-144-38-307
SCALE 1" = 20'
DWG 3549.01 CASE 202

G:□_PD□Annual Street Sealing 09-10□3. Design Study□3.1.1 Drawings□Farnsworth.dwg 6-24-10 01:43:33 PM klei

Annual Street Sealing 2009-10
PROJECT NO. 09-144-38-307

EXHIBIT D

CONTRACT PRICE SCHEDULE (ADDENDUM 1)

Item No.	**Description**	**Estimated Quantity** (A)	**Unit of Measure**	**Item UNIT Price** (in Words)	**Item UNIT Price** (in Figures) (B)	**TOTAL PRICE** (in Figures) (AxB)
1.	Traffic Control & Construction Area Signs, Lane Closures, and Detours	1	LS	_____ _____		
2.	Remove and Replace Existing Thermoplastic Stripes, Pavement Markings and Markers	1	LS	_____ _____		
3.	Staging/Stockpile Location	1	LS	_____ _____		
4.	Emulsion Aggregate Slurry	68,760	SY	_____ _____		
5.	Asphalt Rubber Chip Seal	26,189	SY	_____ _____		

TOTAL BASE BID: _____
(In Words)

TOTAL BASE BID: _____
(In Figures)

ALTERNATE A – Lloyd Ave from Washington Ave to Martell Ave; Castle St from Western Ave to Ark Dr; and Castle Ct from Ark Dr east to cul-de-sac

Item No.	**Description**	**Estimated Quantity** (A)	**Unit of Measure**	**Item UNIT Price** (in Words)	**Item UNIT Price** (in Figures) (B)	**TOTAL PRICE** (in Figures) (AxB)
A1.	Traffic Control & Construction Area Signs, Lane Closures, and Detours	1	LS	_____ _____		
A2.	Remove and Replace Existing Thermoplastic Stripes, Pavement Markings and Markers	1	LS	_____ _____		
A3.	Staging/Stockpile Location	1	LS	_____ _____		
A4.	Emulsion Aggregate Slurry	9,112	SY	_____ _____		
A5.	Asphalt Rubber Chip Seal	9,112	SY	_____ _____		

TOTAL ALTERNATE A BID: _____
(In Words)

TOTAL ALTERNATE A BID: _____
(In Figures)

TOTAL BASE BID + ALT A BID: _____
(In Words)

TOTAL BASE BID + ALT A BID: _____
(In Figures)

ALTERNATE B – Farnsworth St from Lewelling Blvd to Vining Dr

Item No.	Description	Estimated Quantity (A)	Unit of Measure	Item UNIT Price (in Words)	Item UNIT Price (in Figures) (B)	TOTAL PRICE (in Figures) (AxB)
B1.	Traffic Control & Construction Area Signs, Lane Closures, and Detours	1	LS	_____ _____		
B2.	Remove and Replace Existing Thermoplastic Stripes, Pavement Markings and Markers	1	LS	_____ _____		
B3.	Staging/Stockpile Location	1	LS	_____ _____		
B4.	Asphalt Rubber Double Chip Seal	6,003	SY	_____ _____		
B5.	Microsurfacing	6,003	SY	_____ _____		
B6.	Construct Type C Curb Ramp w/Truncated Domes, Curb & Gutter	14	EA	_____ _____		

TOTAL ALTERNATE B BID: _____
(In Words)

TOTAL ALTERNATE B BID: _____
(In Figures)

TOTAL BASE BID + ALT A + ALT B BID: _____
(In Words)

TOTAL BASE BID + ALT A + ALT B BID: _____
(In Figures)

UNITS OF MEASURE:

Abbreviation	Word or Words
LF	Linear Feet
SF	Square Feet
SY	Square Yards
CY	Cubic Yards
TN	Tons (2,000 lbs./907.2 kgs.)
LS	Lump Sum
EA	Each
MO	Months

NOTE: The estimate of construction quantities set forth herein is approximate only, being given as a basis for the comparison of bids. The City does not expressly nor by implication agree that the actual amount of work will correspond therewith, and reserves the right to change the amount of any class or portion of the work or to omit portions of the work as may be deemed necessary or expedient by the Engineer in accordance with section 3-2.1.1 of the Special Provisions. All bids will be compared on the basis of the Engineer's Estimate of the quantities of the work to be done. The undersigned declares, by signing this proposal, that the bidder has carefully checked all of the above figures and understands that the City shall not be responsible for any errors or omissions on the part of the undersigned in making up this bid.