CUPERTINO

PUBLIC WORKS DEPARTMENT
Ralph A. Qualls, Jr., Director

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Date: June 3, 2008
File: 98,493.83
Project: 2008-03, Local Streets Pavement Management 1

ADDENDUM NO.4
To
CITY OF CUPERTINO's LOCAL STREETS PAVEMENT MANAGEMENT 1 PROJECT
City Project Number: 2008-03

Please note that the following revisions and clarifications are made to the above referenced project:

1. Bid Proposal Page 2 of 8 is revised as shown on the attached Bid Proposal Page 2 of 8. Attention is called to Bid Item No. 8, which has been changed to "Cape Seal."

2. Special Provisions Page 6 of 20 is revised as shown on the attached Special Provisions Page 6 of 20. Attention is called to Estimated Quantity Item No. 8, which has been changed to "Cape Seal."

3. Technical Provisions Pages 29 through 34 of 34 have been replaced with the attached Section 110 Pages 1 through 12 of 12 and PASS Scrub Broom Diagram Exhibit "A". Please note that the original Section 110 of the Technical Provisions concerning Asphalt Cape Seal and Slurry Seal is replaced in its entirety.

This Addendum No.4 is hereby incorporated and made part of the Bid Proposal requirements for the **Local Streets Pavement Management 1 Project**. All other provisions of the Contract Documents shall remain in full force and effect.

APPROVED BY:

FOR Ralph A. Qualls, Jr.
Director of Public Works

Attachments

ITEM NO.	ITEM DESCRIPTION	APPROX. QTY	UNIT	PAYMENT REFERENCE	UNIT PRICE	*TOTAL ITEM PRICE
1	Traffic Control	***	LS	101-4		
2	Asphalt Concrete, 1/2" Max. Medium	4,237	TN	102-4		
3	Asphalt Concrete, 3/8" Max.	1,605	TN	102-4		
4	Pavement Reinforcing Fabric	40,589	SY	107-4		
5	Keycut Type A	16,185	LF	104-4		
6	Keycut Type B	1,563	LF	104-4		
7	Type II Slurry Seal	190,551	SF	110-4		
8	Cape Seal	94,613	SF	110-4		
9	4" Digout	11,685	SF	105-4		
10	Cold Plane 0.25' (3") AC and Replace w/H.S. AC Mix	960	SF	105-4		
11	Crack Sealing	8,314	LF	109-4		
12	Adjust Manhole Cover to Finish Grade	76	EA	106-3		
13	Adjust Water Valve/Sewer Cleanout/Survey Monument/ Gas Valve Covers to Finish Grade	49	EA	106-3		
14	Install Box & Cover @ Existing Survey Monument	1	EA	106-3		
15	Blue Reflective Marker @ Hydrant	27	EA	108-4		
16	"STOP" Legend (Thermo)	27	EA	108-4		
17	"AHEAD" Legend (Thermo)	2	EA	108-4		
18	"SLOW" Legend (Thermo)	2	EA	108-4		
19	"SCHOOL" Legend (Thermo)	2	EA	108-4		
20	"KEEP" Legend (Thermo)	10	EA	108-4		
21	"CLEAR" Legend (Thermo)	10	EA	108-4		
22	"XING" Legend (Thermo)	2	EA	108-4		
23	"25" Legend (Thermo)	1	EA	108-4		
24	"30" Legend (Thermo)	1	EA	108-4		
25	"Bike Lane" Legend (Paint)	21	EA	108-4		
26	12" White Crosswalk/Limit Line (Thermo)	1,257	LF	108-4		
27	12" Yellow Crosswalk (Thermo)	368	LF	108-4		
28	Type IV - Turn Arrow (Thermo)	3	EA	108-4		
29	TypeVII - Turn Arrow (Thermo)	5	EA	108-4		
30	Striping Detail #23C (Markers)	3,190	LF	108-4		
31	Striping Detail #37B (Markers)	204	LF	108-4		
32	Striping Detail #38C (Markers)	101	LF	108-4		
33	Striping Detail #39 (Thermo)	3,477	LF	108-4		
34	Striping Detail #39AC (Thermo)	2,658	LF	108-4		

TOTAL BASE BID: _____

ADD ALTERNATE NO. 1

35	Warm-Mix Asphalt	5,842	TN	102-4		

ADD ALTERNATE NO. 2

36	Black Aggregate for Cape Seal/Slurry Seal	285,164	SF	110-4		

NOTE: In case of error in extension of price into total price column, the unit price will govern.

Estimated Quantities (Continued)

7.	Type II Slurry Seal	190,551	S.F.
8.	Cape Seal	94,613	S.F.
9.	4" Digout	11,685	S.F.
10.	Cold Plane 0.25' (3) AC, and Replace w/H.S. AC Mix	960	S.F.
11.	Crack Sealing	8,314	L.F.
12.	Adjust Manhole Cover to Finish Grade	76	EA.
13.	Adjust Water Valve/Sewer Cleanout/Survey Monument Gas Valve Covers to Finish Grade	49	EA.
14.	Install Box & Cover at Existing Survey Monument	1	EA.
15.	Blue Reflective Marker @ Hydrant	27	EA.
16.	"STOP" Legend (Thermo)	27	EA.
17.	"AHEAD" Legend (Thermo)	2	EA.
18.	"SLOW" Legend (Thermo)	2	EA.
19.	"SCHOOL" Legend (Thermo)	2	EA.
20.	"KEEP" Legend (Thermo)	10	EA.
21.	"CLEAR" Legend (Thermo)	10	EA.
22.	"XING" Legend (Thermo)	2	EA.
23.	"25" Legend (Thermo)	1	EA.
24.	"30" Legend (Thermo)	1	EA.
25.	"Bike Lane" Legend (Paint)	21	EA.
26.	12" White Crosswalk/Limit Line (Thermo)	1,257	L.F.
27.	12" Yellow Crosswalk (Thermo)	368	L.F.
28.	Type IV – Turn Arrow (Thermo)	3	L.F.
29.	Type VII – Turn Arrow (Thermo)	5	L.F.
30.	Striping Detail #23C (Thermo)	3,190	L.F.
31.	Striping Detail #37B (Thermo)	204	L.F.
32.	Striping Detail #38C (Thermo & Markers)	101	L.F.
33.	Striping Detail #39 (Thermo)	3,477	L.F.
34.	Striping Detail #39AC (Thermo)	2,658	L.F.

SECTION 110

POLYMER MODIFIED (PASS® CR) ASPHALT CAPE SEAL AND SLURRY SEAL

110-1 GENERAL

The work consists of constructing a Type II Slurry Seal or a Cape Seal consisting of a Type II Slurry Seal over a Polymer Modified Asphalt (PASS® CR) Scrub Seal.

The slurry seal shall consist of mixing asphaltic emulsion, aggregate, set-control additives, and water and spreading the mixture on a surfacing or pavement where shown on the plans, in accordance with the requirements in Section 37-2, "Slurry Seal", of the Standard Specifications, and as specified in these Special Provisions.

The Polymer Modified Asphalt (PASS® CR) Scrub Seal shall comply with the requirements indicated herein.

The Contractor shall: **a)** have had a minimum of three (3) years experience in the application of the Polymer Modified Asphalt Surface Sealer as applied to scrub-seal; and **b)** have successfully completed at least three (3) scrub Seal projects utilizing the scrub-broom to the satisfaction of their clients.

The contractor shall supply a scrub broom as described for the purpose of scrubbing the Polymer Modified Asphalt Surface Sealer. If the Contractor fails to supply the scrub broom specified, the project shall be shut down until the contractor supplies the required equipment in full operation. Shut downs resulting from the failure to provide this specified scrub broom shall not excuse the Contractor from the provisions of contract working days.

110-2 MATERIALS

110-2A Slurry Seal Materials

The materials for slurry seal immediately prior to mixing shall conform to the following requirements:

Aggregate – Aggregate shall conform to Type II conforming to Section 37-2 of the Caltrans Standard Specifications.

For the **Black Aggregate Alternative Bid Item**, the Aggregate shall be 100% crushed with no rounded particles, volcanic in origin and black in color, as supplied by George Reed, Table Mountain, Sonora, CA or Equal.

Asphalt Emulsion - Polymer modified asphaltic emulsion shall be composed of a bituminous material uniformly emulsified with water and an emulsifying or stabilization agent and shall contain a polymer. The polymer used in the manufacture of polymer modified asphaltic emulsions shall be at the option of the Contractor, either neoprene, or a copolymer of butadiene and styrene. The polymer used in the polymer modified asphaltic emulsion shall be homogenous and shall be milled into the product at the

colloid mill. The percentage of Polymer within the asphaltic emulsion shall be between 2 and 3% and must be Butonal NX1138 manufactured by BASF Corporation or approved equal.

The polymer modified asphalt emulsion shall be grade PMCQS-1h and shall conform to the following requirements:

Type	Cationic	
Grade	PMCQS1h	
Properties	Min.	Max
Tests on Emulsion:		
Viscosity SSF @ 25°C, sec AASHTO Designation T-59	15	90
Sieve Test, % AASHTO Designation T-539	—	0.30
Storage Stability, 1 day, % AASHTO Designation T-59	—	1
Residue by Evaporation, % California Test 331	57	—
Particle Charge AASHTO Designation T-59	Positive	
Tests on Residue from Evaporation Test		
Penetration, 25°C AASHTO Designation: T 49	40	90
Ductility, 25°C, mm AASHTO Designation: T 51	400	—
Torsional Recovery, % California Test 332	18	—
or		
Polymer Content, % California Test 401	2.5	—

Note:

When the test for polymer content of polymer modified asphaltic emulsion is used, see sampling requirements in Section 94-1.03, "Sampling" of the Standard Specifications.

At the time of delivery of each shipment of asphalt, the vendor supplying the material will deliver to the purchaser certified copies of the test report. The test report shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, purchase number, and results of the specified tests. The test report signed by an authorized representative of the vendor shall certify that the product delivered conforms to the specifications of the type and grade indicated. The certified test reports and the testing required in connection with the reports shall be at no cost to the City. Until the certified test reports and samples of the materials have been checked by the Engineer to determine conformity with the prescribed requirements, the material to which the report related and any work in which it may have been incorporated as an integral component will be only tentatively accepted by the City. Final acceptance will be dependent upon the determination of the City Inspector that the material involved fulfills the prescribed requirements.

The retardant shall be of a type that will prevent slurry mix from setting up prematurely in the spreader box and to ensure the applied slurry mix can support vehicular traffic within 60 minutes after the last application. A retardant, when used, shall be in liquid form when added to the slurry mix in the mixing chamber of the continuous mixer. Any proposed retardant and proportioning system shall be subject to evaluation and approval by the Street Maintenance Superintendent at the pre-construction meeting.

Sufficient water must be used to obtain a mix consistency that is smooth and homogeneous and does not segregate on standing.

The applied slurry shall break and set on the aggregate within 5 minutes and shall be ready for cross-traffic within 15 (15) to forty-five (45) minutes.

At least 7 working days before slurry seal placement commences, the Contractor shall submit to the Engineer for approval a laboratory report of tests and proposed mix design covering the specific materials to be used on the project. The percentage of asphalt emulsion proposed in the mix design shall be between 14 to 18% by weight of dry aggregate. The theoretical asphalt content based on weight of dry aggregate shall be between 7.5 and 13.5 percent. The tests and mix design shall be performed by a laboratory capable of performing the applicable International Slurry Seal Association (ISSA) tests. The proposed slurry seal mixture shall conform to the requirements specified when tested in accordance with the following tests:

Test	ISSA Test Method	Requirement
Slurry Seal Consistency, cm	T106	3 max.
Wet Stripping	T114	Pass
Compatibility	T115	
Pass(a)		
Cohesion Test (b), kg-cm within 1 hour min.	T139	20
Wet Track Abrasion, g/sq.ft. max	T100	50

a. Mixing test must pass at the maximum expected air temperature at the project site during application.
b. Using project source aggregate asphalt emulsion and set-control agents if used.

The laboratory report shall be signed by the laboratory that performed the tests and mix design and shall show the results of the tests on individual materials, comparing the test results to those required by the specifications. The report shall clearly show the proportions of aggregate, filler (as determined from the tests, minimum and maximum), water (minimum and maximum), asphalt solids content based on the dry weight of aggregate and set-control agent usage. Previous laboratory reports covering the same materials may be accepted provided they are made during the same calendar year.

110-2B Polymer Modified Asphalt (PASS® CR) Scrub Seal.

110-2B-1 Polymer Modified Asphalt Rejuvenating Emulsion

The asphalt emulsion shall be a polymer modified rejuvenating Emulsion with a latex polymer, rejuvenating agent and asphalt and shall meet the following specifications.

Test on Emulsion	Method	Specification
Viscosity @77 (SFS)	ASTM D244	50 - 350
Residue, w%, minimum.	ASTM D244	67
pH	ASTM E70	2.0-5.0
Sieve, w%, max.	ASTM D244	0.1
Oil distillate, w%, max.	ASTM D244	0.5
Test on Residue [1]		
Viscosity @ 140°F, P, maximum.	ASTM D2170	2000
Penetration @ 39.2°F, minimum.	ASTM D5	40
Elastic Recovery on residue by distillation, %, minimum.	AASHTO T59, T301 [1,2]	60
Test on Latex:		
Tensile strength, die C dumbbell, psi, minimum	ASTM D412 [3]	500
Swelling in rejuvenating agent, % maximum; 48 hours exposure @ 104°F	ASTM D471[4] Modified	40% intact film
Test on rejuvenating agent:		
Flash point, COC , °F	ASTM D92	> 380
Hot Mix Recycling Agent Classification	ASTM D4552	See Section II

[1] Exception to AASHTO T59: Bring the temperature on the lower thermometer slowly to 350° F plus or minus 10° F. Maintain at this temperature for 20 minutes. Complete total distillation in 60 plus or minus 5 minutes from first application of heat.

[2] Elastic Recovery @ 10° C (50° F): Hour glass sides, pull 20 cm, hold 5 minutes then cut, let sit 1 hour.

[3] Tensile Strength Determination: Samples for testing for tensile strength in accordance with ASTM D412 shall be cut using a die dumbbell at a crosshead speed of 20 in/min.

[4] Latex Testing: Suitable substrate for film formation shall be polyethylene boards, silicone rubber sheeting, glass, or any substrate which produces a cured film of uniform cross-section. Polymer film shall be prepared from latex as follows:

Resistance to Swelling: Polymer films shall be formed by using a 50 mil drawdown bar and drawing down 50 mils of the latex on polyethylene boards. Films shall be cured for 14 days at 75°F and 50% humidity. Samples for resistance to swelling in rejuvenating agent shall be 1" by 2" rectangles cut from the cured film. Cut at least 3 specimens for each sample to be tested for swelling. Fill 3- 8 oz ointment tins with at least a ½" deep of rejuvenating agent. Swelling samples shall be weighed and then placed in the ointment tins on top of the rejuvenating agent. Then, add at least another ½" deep of

rejuvenating agent over each of the latex samples. The ointment tins shall be covered and placed in an oven at 104°F for the specified 48 hours +/- 15 minutes. The ointment tins are allowed to cool to 75°F and then the latex films are removed from the tins. Unabsorbed rejuvenating agent is removed from the intact latex film by scraping with a rubber policeman and blotting with paper towels. If the latex film does not remain intact during removal from the tins or while removing the unabsorbed rejuvenating agent the sample shall be rejected. After the rejuvenating agent is removed from the samples they are then weighed. Percent swelling is reported as weight increase of the polymer film; report mass increase as a percent by weight of the original latex film mass upon exposure of films to the recycling agent.

110-2B-2 – Recycling Agent

The recycling agent shall meet the following specification:

Test	Specification
Viscosity, 140F, CST	50-175
Flash Point, F, COC	380 Min.
Saturate, % by wt.	30 Max
Asphaltenes	1.0 Max.
Test on Residue	
Weight Change, %	6.5 Max.
Viscosity Ratio	3 Max

110-2B-3 – Material Certifications and Testing

The emulsion manufacturer, through the contractor, shall submit to the agency certification that the emulsion meets the specification. The latex manufacturer, through the emulsion supplier and the contractor, shall submit to the agency test results from an approved laboratory and certification that the latex is cationic and meets the required specifications. **The agency will not accept test results dated more than 90 days from the date of bid opening.**

The manufacturer of the recycling agent, through emulsion supplier and the contractor, shall submit to the agency test results on the recycling agent and certification that the recycling agent meets the required specifications.

Polymer film's required for testing must be prepared by the same laboratory testing the latex performance requirements as outlined in the specification. The manufacturer of the recycling agent shall submit to the laboratory testing the latex a one quart sample of the recycling agent for use in the swell test.

For the latex, certification must be from a laboratory with **an ISO 17025 certification and accredited by IAS.** Laboratories must be accredited in the test procedures specified above for the latex and the rejuvenating agent.

Certifications and test results on the emulsion must be submitted to the agency and approved by the agency 5 days prior to supplying material.

Prior to and during the project the agency may require one quart samples of both the finished emulsion and the latex used in the emulsion to be submitted to the agency designated laboratory for testing. All testing shall be at the Agency's expense.

110-2C-1 Aggregate:

The Aggregate Screenings shall conform to the following requirements prior to placing on the roadway.

Sieve		3/8 X #6
1/2	(12.5 mm)	100
3/8	(9.5 mm)	90 - 100
#4	(4.75mm)	5 - 20
#8	(2.36mm)	0 - 7
#16	(1.18mm)	0 - 5
#30	(600 um)	0 - 4
#200	(75 um)	0 - 3

* Grading Type shall be that specified in the Bid Schedule

Screenings shall also conform to the following quality requirements:

Test	California Test	Requirements
Los Angles Rattler Loss at 500 rev. (max.)	211	40%
Cleanness Value (min.)	227	80
Percentage of Crushed Particles	205	100%

110-3 CONSTRUCTION

110-3A Scheduling

The Contractor shall prepare the roadway and place the Scrub Seal and Slurry Seal within a 5 working day period. The scrub seal shall be placed a minimum of 24 hours prior to the placement of the Slurry Seal.

Some of the streets require either leveling courses or digouts. This work shall be accomplished no more than 2 weeks or 10 working days prior to the placement of the cape seal. Utility adjustments shall be accomplished within 7 working days of the slurry seal placement. Failure to comply with these provisions shall incur a liquidated damage of $250 per calendar day per street segment.

The Contractor shall comply with the applicable Sections for MAINTAINING TRAFFIC and TRAFFIC CONTROL SYSTEM including all notice requirements.

110-3B Polymer Modified Asphalt Rejuvenating Emulsion

110-3B-1 General

The work shall consist of but not be limited to furnishing all labor, materials, equipment and transportation for the application of the Polymer Modified Asphalt Surface Sealer. Application of aggregate to conform with Section 37-1 of the California Department of Transportation Standard Specifications and these Special Provisions unless otherwise specified herein. The work shall be done in the following order: Preparing the pavement surface; applying the Polymer Modified Asphalt Surface Sealer and scrubbing the applied emulsion sealer with a scrub broom as specified herein; applying aggregate, brooming the aggregate with a secondary broom when specified, rolling the aggregate; and sweeping up and disposing of excess aggregate off of the job site.

110-3B-2 Preparation

Prior to the Scrub Seal operation on city streets the Contractor shall remove any and all vegetation within the limits of the scrub seal by applying an approved herbicide. The herbicide shall be applied at least 10 days prior to the scrub seal operation, or as directed by the manufacturer of the approved herbicide. Reward and Round Up are pre-approved herbicides. All other herbicides shall be submitted by the contractor for approval by the Agency, and shall be certified for use in the State of California for the specific use intended. The application of the herbicide shall be performed in accordance with all applicable regulations. Any and all fines or clean-up costs for unlawful misuse or discarding of herbicides shall be the sole responsibility of the Contractor. Mixtures and spread rates for the herbicides shall be determined by the manufacturer's specifications. Wash down of equipment or discarding of herbicides shall not enter the catch basins or positive drainage facilities.

Prior to the Scrub Seal operation, the Contractor shall remove all existing thermoplastic striping, thermoplastic legends and raised pavement markers within the scrub seal limits. When removing the raised pavement markers the Contractor shall remove excessive adhesive left on pavement caused from the removal of raised pavement markers. Removal shall be done to the satisfaction of the Engineer.

Prior to the Scrub Seal operation, all manhole covers, drain inlet covers, monument covers, and all other utility covers shall be protected from the Contractor's scrub seal operations by applying a sheet of plastic, cut to fit, or placing a plastic bag over the exposed facilities or other methods approved by the Engineer. All traces of plastic, residual emulsion and chips shall be removed from all personnel covers, drain inlet covers, monument covers, and all other utility covers as quickly as possible, after the application of the scrub seal and/or prior to final acceptance of the project.

Immediately prior to the scrub sealing operations, the Contractor shall sweep the entire surface with vacuum assisted power brooms. Areas that have been patched shall receive a fog seal at the discretion of the engineer.

110-3B-3 Equipment

The scrub broom frame shall be constructed of metal. The scrub broom shall be attached to and pulled by the distributor truck. The scrub broom must be equipped with the means to mechanically raise and lower the scrub broom off and onto the road surface at designated points of completion and start up. It shall be towable in the elevated position to the next area of construction. The weight of the broom assembly shall be such that it does not squeegee the emulsion sealer off the roadway surface.

The main body of the scrub broom shall be a frame minimum 6'-9" wide, 10' (ft) deep. The maximum transverse rigid frame width at any point shall not exceed 6'-9". The nearest and furthest members, paralleling the back of the spreader truck, and diagonal members shall be equipped with street brooms. **The leading member and the trailing member shall have broom heads angled at 15 degrees off the centerline of the supporting member.** The diagonal members shall have broom heads attached in line with the centerline of the supporting member. Each individual street broom attached to the scrub broom assembly shall be 3 ½" w x 61/2" h x 16" L and have stiff nylon bristles. Bristle height is to be maintained at a minimum of 5". The scrub broom shall be equipped with hinged wing assemblies attached to the main body not to exceed 4'-6" (ft) per side, with diagonals and equipped with street brooms. The purpose of the maximum rigid frame width and the hinged wing extensions is not only for maximum width of 16' (ft) but to maintain the scrubbing process evenly as contours and cross-sections change across the existing road surface.

110-3B-4 Equipment

The following equipment to be used for the scrub-seal shall be as follows

A. An asphalt distributor for application of the emulsion sealer shall have a full circulation spray bar that is adjustable to at least sixteen (16) feet wide in two (2) feet increments and capable of heating and circulating the emulsion simultaneously. It must have computerized rate control for adjusting and controlling the application from the cab that is adjusting by .01 gallons per square yard increments. The distributor shall also be equipped with a volume measuring devise and a thermometer for measuring the emulsion temperature in the tank.

B. A SCRUB BROOM as described herein shall be used to scrub the emulsion sealer after application.

C. A self-propelled aggregate spreader with front discharge that can evenly distribute aggregate.

D. A minimum of two (2) pneumatic rollers weighing at least five (5) and a maximum of twelve (12) tons each.

E. Two (2) vacuum type brooms.

F. A back pack blower for removing excess chips during the sweeping operation.

110-3B-5 Application

All incidental work such as surfacing of driveway aprons and returns shall be done concurrently with the surfacing of the street proper. The scrub seal shall be applied 0"-4" from the lip of the gutter. Where a curb exists without gutter, the scrub seal shall be applied 0"-4" from the face of curb when receiving a cape. If a cape is not specified then the scrub seal shall be placed from edge of pavement to edge of pavement. Where no curb or gutter exists, the scrub seal shall be applied from edge of pavement to edge of pavement. The edges of the limits of the scrub seal application on both sides of the street shall be maintained in a neat and uniform line. Scrub seal shall not be applied on concrete gutters or pads unless directed by the Engineer.

The application of Polymer Modified Asphalt Surface Sealer shall be applied when ambient temperature is above sixty (60) degrees Fahrenheit and rising. The polymer modified asphaltic rejuvenating emulsion shall not be placed if the ambient temperature during the twenty four curing period (24) hours is expected to be below fifty (50) degrees Fahrenheit. The termination time of application shall be determined by the Engineer.

The areas to be scrub sealed shall have the Polymer Modified Asphalt Surface Sealer applied with a distributor truck to the pavement surface at a rate of 0.25 to 0.40 gallons per square yard. For cul-de-sacs, turnout pockets, elbows and curve returns the use of the scrub broom will not be required. The actual emulsion sealer application rate required will be determined by the pavement surface condition and the aggregate used. Recommended application rate ranges for both aggregate and emulsion are shown in **Table I** below. The actual application of the emulsion sealer shall be determined by the manufacturer's representative and/or the Engineer.

The Polymer Modified Asphalt Surface Sealer temperature when applied shall be at a minimum of 110 degrees Fahrenheit. For smaller areas the emulsion sealer may be applied with a wand. The emulsion sealer shall be immediately broomed to fill cracks and voids. Immediately following the application of the emulsion sealer to the road surface, the material shall be scrubbed with a scrub broom for the purpose of forcing the emulsion sealer into the existing surface and distributing the emulsion sealer evenly over variable road surface contours.

The contractor shall supply a scrub broom as described for the purpose of scrubbing the Polymer Modified Asphalt Surface Sealer. If the Contractor fails to supply the scrub broom specified, the project shall be shut down until the contractor supplies the required equipment in full operation. Shut downs resulting from the failure to provide this specified scrub broom shall not excuse the Contractor from the provisions of contract working days.

The application of the Polymer Modified Asphalt Surface Sealer and the scrub broom operation shall cease 40' (ft) prior to the end of the street section or intersection. The remaining emulsion sealer shall be drug out by the scrub broom, and the remaining emulsion sealer required to complete the pass shall be applied only by the spread truck (boot truck), at the specified rate.

Immediately following the scrubbing of emulsion sealer, aggregate shall be applied at the rate specified. The rate shall be adjusted up or down so that no "bleed through" occurs during rolling.

The aggregate shall be spread evenly by a mechanical spreader. Aggregate ¼"X #10 or less shall be broomed with a SECONDARY AGGREGATE BROOM to fill all cracks and voids, unless otherwise directed by the Engineer. The SECONDARY AGGREGATE BROOM when used must be equipped with the means to mechanically raise and lower the broom off and onto the road surface at designated points of completion and start up. The design shall be similar in design to that of the emulsion broom. The exception would be that the internal diagonal members shall be used for stiffness and shall not have broom heads attached to the cross members. It shall be pulled by a vehicle following the aggregate spreader to ensure even distribution of the aggregate, and penetration of the aggregate into the cracks. The weight of the broom assembly shall be such that it does not roll or turn the aggregate that is set in the emulsion sealer. The use of the SECONDARY AGGREGATE BROOM can be used immediately after the application of the chips or after rolling. The sequence of operation will be determined by the Engineer.

The aggregates screenings rate of application and corresponding emulsion spread rates shall conform to the following as shown in Table I below.

Table I

Aggregate Application Rate	**Emulsion Spread Rate**
22 – 31 lbs / sy	.29 gals / sy - .40 gals / sy

A minimum of two self-propelled pneumatic-tired rollers shall be used for the required rolling of the aggregate. The pneumatic-tired rollers shall be in good working condition and actively rolling at all times during the scrub seal operation. The pneumatic-tired rollers shall be a minimum 5 tons and a maximum of 12 tons. The pneumatic-tired rollers shall be operated in such a manner to prevent the dislodging of newly applied aggregate.

Power sweeping shall be done before the end of the day after scrub seal operation to remove any excess loose aggregate. During the sweeping process the Contractor shall use a backpack blower to clear driveways, gutters and sidewalks of excess aggregate at the end of each day until the street is micro surfaced. **The Contractor shall wait a minimum of one day after the scrub seal application before applying other surface treatments as specified.**

The Contractor shall exercise care to prevent oil from being deposited on concrete surfaces. Each day the Contractor shall remove oil from the surfaces not designated to caped. No additional streets shall be scrub sealed until this clean up has been performed. The method of the oil removal shall be approved by the Engineer.

Contractor shall install temporary raised pavement markers once the scrub seal is cured until the roadway surface is ready for permanent raised pavement markers.

110-3C **Slurry Seal Construction**

Each machine shall have a spray bar attached to enable the fogging of the pavement surface with water.

The Contractor shall apply the slurry using a minimum of two continuous mixers of 12 cubic yard or greater capacity, one mixer to be applying slurry, while the other machine is in transit to and from the batch site. The Contractor shall provide a coordinator, at least one competent quickset mixing man, one driver for the mixer applying the slurry, and one shuttle driver for the machine en route to reload. The Contractor shall also provide sufficient laborers for any handwork and cleanup required to ensure proper progress of work.

The slurry seal retention time in the pug mill shall be less than three seconds. No retention of mixed slurry seal shall be allowed within the pug mill by gate shut-off or other mechanical means. Transit mix trucks shall not be used.

Prior to placement, all existing utility lids and covers shall be located and referenced so they can be exposed after the slurry seal placement.

Prior to applying slurry seal, the surface to be sealed shall be cleaned by the Contractor, to the approval of the City Inspector, of all loose material, silt, vegetation, and other objectionable material by a method approved by the City Inspector. The surface may be pre-wetted by fogging ahead of the slurry box if required by local conditions. Water used in pre-wetting the surface shall be applied at such a rate that the entire surface is damp with no ponding of water.

Protection and maintenance of the street surface to the condition required for proper slurry application shall be the sole responsibility of the Contractor and no additional expense will be allowed. The Contractor shall, at the direction of the City Inspector and Street Maintenance Superintendent, repair and reseal all areas of the streets which have not been sealed properly and completely or have been damaged by traffic.

The Contractor shall exercise care to prevent slurry from being deposited on concrete surfaces. The Contractor shall remove slurry from surfaces not designated to be sealed each day. No additional streets shall be slurry sealed until this clean-up has been performed. The method of slurry removal shall be approved by the City Inspector.

All streets to be slurry sealed shall be sealed from edge of pavement to edge of pavement. The slurry shall fully extend up to the lip of gutter but shall not overlap the gutter. Any overlay shall be removed by methods that shall not damage the remaining slurry seal. Spreaders to be used for this operation shall meet the approval of the Street Maintenance Superintendent.

The sites for stockpiling and batching materials shall be clean and free from objectionable materials and shall be located outside the road right-of-way. Arrangements for these sites shall be the responsibility of the Contractor. If on private property, a written agreement shall be approved by the Planning Department prior to commencing operations.

Requests for changes in the schedule must be submitted to the City Inspector for approval at least 48 hours prior to sealing the streets affected.

Contractor shall tie off survey monuments, manholes, water valves, etc. prior to application of the slurry seal. The Contractor shall take precautions to remove any slurry that may cover these appurtenances.

Immediately before commencing the slurry seal operation, all surface metal utility covers (including survey monuments) shall be protected by thoroughly covering the surface with an appropriate adhesive and oiled or plastic paper. No adhesive material shall be permitted to cover, seal or fill the joint between the frame and cover of the structure. Covers are to be uncovered and cleaned of slurry material by the end of the same workday.

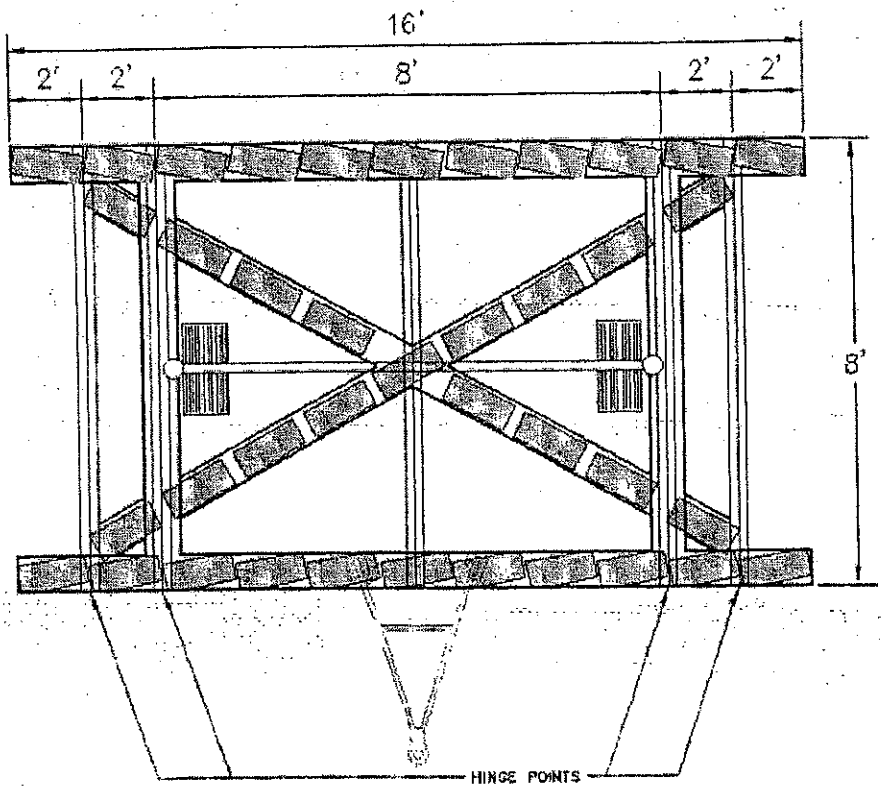
Raised pavement markers shall be covered or cleaned after the application of the seal coat as approved by the Engineer.

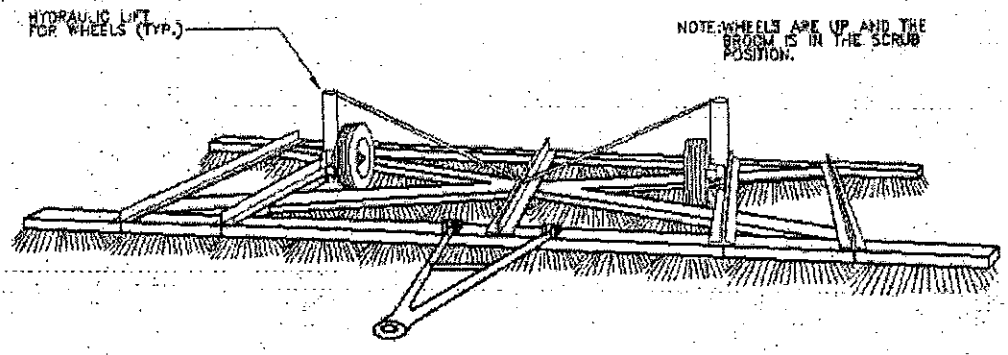
Hand tools shall be available to remove spillage. Ridges or bumps in the finished surface will not be permitted. The mixture shall be uniform and homogeneous after spreading on the existing surface and shall not show separation of the emulsion and aggregate after setting.

110-4 MEASUREMENT & PAYMENT

Type II Slurry Seal and Cape Seal will be measured and paid for at the contract unit price per square foot. The unit price paid per square foot includes all costs for labor, materials, tools, and equipment and incidentals necessary for doing all work involved in performing slurry seal surfacing or cape seal including mobilization, notifying the adjacent homeowners, cleaning surfaces to receive slurry seal/scrub seal, application, cleanup, maintenance and cleaning completed sites.

The **Black Aggregate Alternative Bid Item** shall include only the additional cost of supplying the Black Aggregate over the cost of the standard specified aggregate. Anticipated additional costs include additional material cost, trucking and Contractor's markup. If the **Black Aggregate Alternative Bid Item** is awarded, this item shall be paid ***in addition to*** the bid item for Type II Slurry Seal or Cape Seal depending on the surface treatment for each individual street.





PASS Scrub Broom
Exhibit "A"
(Not for fabrication – Use as schematic only)