CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS

SPECIFICATIONS

FOR

2013 ASPHALT OVERLAY
(PKG 2)

Prepared by

DEPARTMENT OF PUBLIC WORKS
PLANNING AND ENGINEERING DIVISION
SAN ANTONIO, TEXAS

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10-1-12

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CITY OF SAN ANTONIO, TEXAS

GOVERNING SPECIFICATIONS, SPECIAL SPECIFICATIONS AND SPECIAL PROVISIONS FOR

2013 ASPHALT OVERLAY (PKG 2)

All Standard Specifications, Special Specifications and Special Provisions applicable to this project are identified as follows:

CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR CONSTRUCTION JUNE, 2008

ITEM	DESCRIPTION
100	Mobilization
101	Preparing Right-of-Way
103	Remove Concrete
203	Tack Coat
205	Hot Mix Asphaltic Concrete Pavement
208	Salvaging, Hauling, and Stockpiling Reclaimable Asphaltic Pavement
209	Concrete Pavement
210	Rolling
230	Base and Pavement Replacement
300	Concrete
301	Reinforcing Steel
303	Welded Wire Flat Sheets
311	Concrete Surface Finish
500	Concrete Curb, Gutter, and Concrete Curb and Gutter
502	Concrete Sidewalks
503	Asphaltic Concrete, Portland Cement Concrete, and Gravel Driveways
512	Adjusting Existing Manholes and Valve Boxes
515	Top Soil
516	Sodding
530	Barricades, Signs and Traffic Handling
535	Hot Applied Thermoplastic Pavement Markings
537	Raised Pavement Markings
556	Cast in Place Detectable Warning Surface Tiles
700	Cost Loaded Project Schedules
1000	Web Portal

SPECIAL SPECIFICATIONS FOR CONSTRUCTION:

241	Emulsion Aggregate Slurry Seal Mix
250	Seal Coat
799	Speed Humps, Type II, Modular Rubber Cushions

SP 100 Door Hangers
SP 2000 Railroad Insurance and Permit

SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR CONSTRUCTION MARCH, 2008

826 Valve Box Adjustment

SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR CONSTRUCTION REV. JUNE, 2009

851 Adjusting Existing Manhole

SPECIAL SPECIFICATIONS FOR SAN ANTONIO WATER SYSTEM CONSTRUCTION:

826A Valve Box Locate and Adjustments
851a Locating and Adjusting Existing Manholes

TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2004:

315 Fog Seal

SPECIAL PROVISIONS TO TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES 2004:

315 Fog Seal

ITEM 241
Special Specification

EMULSION AGGREGATE SLURRY SEAL MIX

241.1 DESCRIPTION: This item shall govern for the asphalt emulsion aggregate slurry seal mix that will be used for pavement preservation. This item shall consist of a mixture of modified emulsified asphalt, ground tire rubber, mineral aggregate, and water. The slurry seal mix shall be produced in an approved centrally located facility and the mix shall be tested and certified by the producer to meet specifications prior to shipment to distribution location(s). The Slurry Seal mix shall be uniform and stable for placement the day of loading when proper agitation is maintained. The aggregates, emulsion, and water should form a creamy-textured slurry that, when spread, will flow ahead of the strike-off squeegee. When cured, the surface shall have a uniform appearance, fill cracks, and adhere to the existing pavement surface. Proportions shall be based on the mix design specifications herein.

241.2 MATERIALS:

A. AGGREGATE: The aggregate shall consist of sound and durable Trap Rock 100% crushed in accordance with these specifications. The aggregate shall be clean and free from vegetable matter, dirt, and other deleterious substances. The aggregate shall have a sand equivalent of not less than 45 percent when tested in accordance with ASTM D 2419. The aggregate shall show a loss of not more than 35 percent when tested in accordance with ASTM C 131. The sodium sulfate soundness loss shall not exceed 12 percent, or the magnesium soundness loss shall not exceed 20 percent after 5 cycles when tested in accordance with ASTM C 88.

The combined aggregate shall conform to the gradation shown in Table 1 when tested in accordance with ASTM C 136 and ASTM C 117.

TABLE 1

GRADATION OF AGGREGATES

Sieve Size	**Precent by Weight Passing Sieve**
No.4 (4.75 mm)	100
No.8 (2.36 mm)	75 – 85
No.16 (1.18 mm)	30 – 40
No.30 (600 micro m)	10 – 20
No.50 (300 micro m)	3 – 8
No.100 (150 micro m)	0 – 2
No.200 (75 micro m)	0 – 1
Emulsion content by dry weight of aggregate	14% - 17%
Ground tire rubber by dry weight of aggregate	5% Minimum

The mix formula (mix design) shall be run using aggregate within the gradation band shown in Table 1. Once the mix design has been submitted and approved, the aggregate used on the project shall be within the gradation bands in Table 1.

B. MINERAL FILLER: If mineral filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D 242 and shall be used in the amounts required by the mix design. The mineral filler shall be considered as part of the aggregate.

C. GROUND TIRE RUBBER: The material shall be granulated tire rubber specifically designed for use with the Slurry Seal mixes. The rubber shall have a specific gravity between 1.15 and 1.20. One hundred percent of the granulated tire rubber shall pass a No. 16 sieve, 95% shall pass a No. 20 sieve, and a maximum of 2 percent shall pass a No. 200 sieve.

D. POLYMER MODIFIER: Polymer modifier shall be latex and shall be added at a minimum of 2 percent polymer solids by weight of the emulsion.

E. WATER: All water used in making the slurry shall be potable and free from harmful soluble salts and chemicals.

F. EMULSION: The emulsion shall be a slow-set or a quick-set type of emulsion as approved by the Engineer. The emulsion shall contain ground tire rubber and polymer modifiers and shall conform to the following quality requirements as shown in Table 2:

TABLE 2

TESTS ON EMULSION

Emulsion Property	Test Procedure	Min	Max
Rotational viscosity at 77°F, cP	ASTM D 7226	200	2000
Uniformity	ASTM D 2939	Pass[1]	
Resistance to heat	ASTM D 2939	Pass[2]	
Resistance to water	ASTM D 2939	Pass[3]	
Wet flow, mm	ASTM D 2939	--	0
Residue by evaporation, % by weight	ASTM D 2939	33	--
Tests on residue from evaporation:			
Penetration, 77°F, 100 g, 5 sec.	ASTM D5	15	30
Flash point, Cleveland open cup, °F	ASTM D92	500	
Softening Point, °F [4]	ASTM D36	230	--

1. Product shall be homogenous and show no separation or coagulation that cannot be overcome by moderate stirring.
2. No sagging or slippage of film beyond the initial reference line.
3. No blistering or re-emulsification.
4. Cure the emulsion in the softening point ring in a 200°F ± 5°F oven for 2 hr.

241.3 COMPOSITION AND APPLICATION:

A. COMPOSITION: The slurry shall consist of a mixture of polymer emulsified asphalt, mineral aggregate, ground tire rubber, and water.

B. JOB MIX FORMULA: The Vendor shall submit to the Engineer for approval a complete mix design on the materials proposed for use, prepared and certified by an approved laboratory.

Compatibility of the aggregate, emulsion, mineral filler, and other additives shall be verified by the mix design. The mix design shall be made with the same aggregate and emulsion that the Vendor will supply. The slurry seal mix shall be produced in an approved centrally located facility and the mix shall be pretested and certified to meet specifications by the producer prior to shipment to distribution location.

C. APPLICATION RATE: Unless otherwise specified, the slurry seal shall be applied to at the application rates of 10-15 pounds of mixture per square yard. The rate of application shall not vary more than +/- 2 pounds per square yard.

D. CERTIFICATE OF ANALYSIS: The producer of the Slurry Seal Mix shall make available a certificate of analysis (C of A) for the slurry seal mix supplied under the contract. The C of A shall indicate the proportions of aggregates, mineral filler, ground tire rubber, water and emulsion based on the dry aggregate weight. The main items of design in the Emulsion Slurry Seal are aggregate gradation, emulsion content and consistency of the mixture.

The Vendor shall submit to the Engineer for approval a complete mix design on the materials proposed for use, prepared and certified by an approved laboratory. Compatibility of the aggregate, emulsion, mineral filler, and other additives shall be verified by the mix design. The mix design shall be made with the same aggregate and emulsion that the Vendor will supply.

241.4 MEASUREMENT: The Item will be measured by the square yard of Emulsion Aggregate Slurry Seal Mix installed and accepted.

241.5 Payment: The work performed and materials furnished in accordance this Item and measured as provided under "Measurement" will be paid for at the unit price bid for Emulsion Aggregate Slurry Seal Mix. This price shall be full compensation for furnishing and placing materials, surface preparation, and for all labor, tools, equipment and incidentals necessary to complete the work.

241.6 BID ITEM:

Item 241 - Emulsion Aggregate Slurry Seal Mix – per square yard

ITEM 250
Special Specification

SEAL COAT

250.1 DESCRIPTION:
This item shall consist of a single asphalt surface treatment composed of asphalt surface treatment composed of asphalt material covered with aggregate for the purposed of sealing existing pavements in accordance with these specifications.

250.2 MATERIALS:

A. AGGREGATE:
Aggregates shall be of the type as shown on the plans and shall meet all the requirements of the Texas Department of Transportation (TxDOT) Item No. 302, "Aggregate for Surface Treatments" and subsequent revisions thereto. Gradation requirements when tested by TxDOT Test Method Tex-200F, Part I, shall be as shown on the plans.

B. ASPHALTIC MATERIALS:
Asphalt cement, emulsified asphalts, other miscellaneous asphaltic materials, and latex additives shall conform to TxDOT Item No. 300, "Asphalt, Oils, and Emulsions" and subsequent revisions thereto.

250.3 EQUIPMENT

A. DISTRIBUTOR:
The distributor shall be a self-propelled pressure type, equipped with an asphaltic material heater and a distributing pump capable of pumping the material at the specified rate through the distributor spray bar. The distributor spray bar shall be capable of fully circulating the asphaltic material. The distributor spray bar shall contain nipples and valves so constructed that the nipples will not become partially plugged with congealing asphaltic material, in order to prevent streaking or irregular distribution of asphaltic material. Distributor equipment shall include a tachometer, pressure gauges, volume measuring devices, and thermometer for reading the temperature of tank contents.

The distributor tank shall have been calibrated within three (3) years from the date it is first used on this project. The tank calibration procedure shall be in accordance with Test Method Tex-922-K, Part 1, and shall be signed and sealed by a registered professional engineer. Unless otherwise shown on the plans, the Contractor shall provide the tank calibration and shall furnish the Engineer an accurate and satisfactory calibration record prior to beginning the work. The Engineer may at any time verify calibration accuracy in accordance with Test Method Tex-922-K, Part II, and may perform the recalibration if the calibration is found to be in error.

B. AGGREGATE SPREADER:
A self-propelled continuous-feed aggregate spreader shall be used which will uniformly spread aggregate at the rate specified by the Engineer.

C. ROLLERS:
Approved rolling equipment shall be of the self-propelled type and shall be so designed such that a 12 ton load may be obtained by ballast loading. The roller shall be equipped with tires that will afford ground contact pressures to 90 psi or more. Individual tire inflation pressures shall be within 5 psi of each other. The operation load and tire air pressure shall be within the range of the manufacture's chart.

D. SWEEPERS:
A rotary, self-propelled power broom shall be acceptable for sweeping existing pavement surfaces.
Vacuum sweepers or other approved equally capable equipment shall be suitable for removing loose aggregate form compacted Seal Coat.

250.4 CONSTRUCTION METHOD:

Prior to Seal Coating, all dirt and other objectionable material shall be removed from the existing pavement by sweeping or other approved methods. All existing raised pavement markings shall be removed daily, as the work progresses, and as approved by the Engineer. All vegetation found in the existing pavement shall be destroyed by an approved chemical killer.
Building paper shall be place over all manholes, valve boxes, grates, etc., so as to protect the surfaces from Asphaltic materials. Asphaltic materials shall not be placed, lapped, or splashed onto adjacent structures.

Seal Coat shall not be applied when the air temperature is below 60^0F and is falling, but it may be applied when the air temperature is 50^0F and is rising, the air temperature being taken in the shade and away from artificial heat. Seal Coat shall not be applied when the roadway surface temperature is below 60^0F or when in the opinion of the Engineer, general weather conditions are not suitable. When latex modified asphalt cement is specified, Seal Coat shall not be applied when the air temperature is below 80^0F and is falling, but may be applied when the air temperature is above 70^0F and is rising and shall not be applied when the temperature of the surface on which the Seal Coat is to be applied is below 70^0F.

Asphalt and aggregate rates as shown on the plans are for estimate purposes only an may be varied as directed by the Engineer.

The width of each application of Asphaltic material shall be such to allow uniform application and immediate covering with aggregate. The contractor shall be responsible for uniform application of asphaltic material at the junction of distributor loads. Paper or other suitable material shall be used to prevent overlapping of transverse joints. Longitudinal joints shall match lane lines unless otherwise authorized by the Engineer. Application of asphaltic material will be measured as necessary to determine the rate of application. In those areas where the asphalt distributor is not accessible, hand spraying may be permitted as directed by the Engineer.

Aggregate shall be immediately and uniformly applied and spread in the same width as the application of asphaltic material. The entire surface shall then be broomed or raked as required by the Engineer.

The aggregate shall be rolled for its width with a minimum of two (2) pneumatic tires rollers which shall be maintained in good repair and operating condition. Rolling shall begin as soon as sufficient aggregate is spread to prevent pick-up and shall begin longitudinally at the outside edge of the mat and progress toward the center of the mat, uniformly lapping each preceding pass by at least 2 the width of the roller. Rolling shall continue until no more aggregate can be worked into the surface.

After all rolling, the finished surface shall be cleared of any surplus aggregate by the Contractor by sweeping. Until the work has been accepted, additional sweeping shall be required as often as necessary so that loose aggregate does not present a hazard to traffic.

The Contractor shall be responsible for the maintenance of the Seal Coat until the work is accepted by the Engineer. All holes or failures in the surface shall be repaired by use of additional asphalt and aggregate. All fat or bleeding surfaces shall covered with approved cover material in such a manner that the asphaltic material will not adhere to or be picked up by the wheels of vehicles.
All parkways, private property, and driveways adjacent to the work shall be cleaned of loose aggregate and other debris as produced from Seal Coat operations.

250.5 MEASUREMENT:

Seal Coat: will be measured by the square yard of completed and accepted work

250.6 PAYMENT:

The work performed as prescribed by this item will be paid for at the contract unit price bid per square yard for "Seal Coat", which price shall be full compensation for furnishing and placing all materials, sweeping, rolling, manipulations, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

PAY ITEM NO. 250: SEAL COAT - per square yard.

ITEM 799
SPECIAL SPECIFICATION

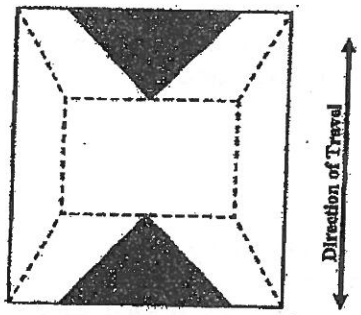
SPEED HUMPS, TYPE II
MODULAR RUBBER CUSHIONS

GENERAL:

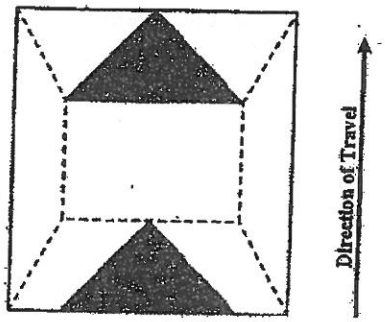
This specification sets forth the minimum acceptable requirements for modular rubber cushions for use at approved speed hump locations.

GENERAL REQUIREMENTS:

1. Pre-formed components manufactured from rubber
   All pre-formed rubber components shall be compatible and interchangeable with existing speed hump material in use by the City.
   - 1.1. Each component unit shall be 3" high
   - 1.2. The side gradient shall be between 1:4 and 1:8
   - 1.3. The ramp gradient shall be between 1:8 and 1:10
   - 1.4. The transition from the street shall not exceed ½ inch
   - 1.5. The cushion length shall be a minimum 78 inches
   - 1.6. The cushion width shall be 74 to 75 inches
   - 1.7. The cushions shall be black in color
   - 1.8. The markings shall be white in color, triangular in shape, and integral to the pre-formed rubber components
     - 1.8.1. Type A markings (not to scale)



     - 1.8.2. Type B markings (not to scale)



1.9. Cushion components including but not limited to the rubber cushions, hardware, angle iron, etc., shall be interchangeable with existing material currently in use on City of San Antonio streets.

1.10. Shore hardness shall be a minimum of 65. The manufacturer shall provide test data from an independent test lab confirming the product meets the minimum criteria with the bid submittal. Test data shall be provided for each shipment. An outline of the testing procedures shall be provided for review and approval with the bid submittal.

1.11. Tensile strength shall be a minimum of 500 psi. The manufacturer shall provide test data from an independent test lab confirming the product meets the minimum criteria with the bid submittal. Test data shall be provided for each shipment. An outline of the testing procedures shall be provided for review and approval with the bid submittal.

1.12. Deformation rate under compression shall be zero with 100% recovery.

1.13. The riding surface shall be smooth in texture for the duration of the warranty period, at a minimum, as determined by the City Inspector.

2. Rigid reinforcement perpendicular to the flow of traffic

3. Sufficient stainless/galvanized steel mounting bolts or hex head screws/fasteners per cushion
   3.1. Minimum 10mm x 100mm or equivalent

4. Plastic or nylon screw anchors
   4.1. Minimum 14mm x 75mm or equivalent

5. Metal washers
   5.1. Minimum 10mm or equivalent

6. Quick-set, two component epoxy/adhesive. Contractor shall submit manufacturer's material specifications for review and approval with the bid submittal.

7. Heavy duty rubber/nylon caps/plugs

WARRANTY:

The speed cushion and all associated equipment shall be fully warranted against defects and/or failure in design, material and workmanship in accordance with the manufacturer's standard warranty, or for a minimum of two (2) years from the date of final acceptance, whichever is greater. All material supplied shall have no less than one hundred percent (100%) of the manufacturer's standard warranty remaining on the date that the material invoices are submitted for payment. Any material with less than 100 percent (100%) of its warranty remaining will not be accepted by the City.

ITEM NO. SP 100
Special Specification

DOOR HANGERS

DESCRIPTION: Contractor shall place Hangers with every business and resident within each segment of a project limit and at Inspector specified locations. The City of San Antonio is to provide template/verbage for the Door Hangers.

BID ITEM:
Item SP 100 – Door Hangers – lump sum

ITEM NO. SP 2000
Special Specification

RAILROAD INSURANCE AND PERMIT

DESCRIPTION: Each Contractor is to include a $5,000 allowance for the SP RAILROAD INSURANCE AND PERMIT bid item. Contractor to secure all required railroad permits. All fees associated with such permits shall be included in this item.

BID ITEM:
Item SP 2000 – Railroad Insurance and Permit - lump sum

ITEM NO. 826 A
Valve Box Locate and Adjustments

826A.1 Description:
This item shall consist of locating covered valve boxes, cutting asphalt, replacing asphalt, and adjusting existing valve boxes in accordance with these applications and as directed by the Engineer.

826A.2 Materials:
The materials for valve boxes shall conform to the specifications contained within the latest revision of SAWS Material Specifications, Item 10-20 "Valve Boxes".

1. Construction Methods: Locate valve box using maps and metal detectors. Cut and replace asphalt as necessary. The valve box shall be placed in such a manner to prevent shock or stress from being transmitted to the valve. It shall be centered and plumb over the operating nut of the valve with the box cover flush with the surface of the finished pavement or at such other level as may be directed by the Engineer.

   Valve boxes located in streets or other area subject to vehicular traffic shall be provided with concrete collars as shown in the Standard Drawings DD-828 Series. Collars around such valve boxes shall be formed and finished off neatly and to a workmanlike manner. Valve box shall be located so that the valve operating nut is readily accessible for operation through the opening to the valve box. The valve box shall be set flush with the surface of the finished pavement or at such other elevations as may be specified. Pits shall be constructed to permit trainer valve repairs and to afford protection to the valve and pipe from impact where they pass through the pit walls.

2. Existing Valve Box: Existing covered valve boxes shall be defined as those boxes which are located within the right-of-way of the specified area of construction operations which are covered by asphalt. These boxes shall be adjusted to match proposed finished grades.

   Valve boxes installed as part of a new valve and mainline construction project are considered "new valves". Adjustments to "new valves" are incidental to the installation of the valve and are paid for as part of items 828, 830 or 832 of these Specifications. Separate pay shall not be given to adjust "new valves" to finished grade.

826A.3 Measurement:
Locating and adjusting of valve boxes will be measured by the unit of valve boxes located and adjusted to the finished grades.

826A.4 Payment:
Payment for "valve box locate and adjustment" shall be made at the contract unit price.

ITEM NO. 851-a

LOCATING AND ADJUSTING EXISTING MANHOLES

851a.1 DESCRIPTION: This item shall consist of the locating covered manholes, cutting asphalt, replacing asphalt, and adjustment of all existing manholes, to include the replacing of existing manhole covers and rings regardless of type shown on the plans and in conformity with the provisions of these specifications.

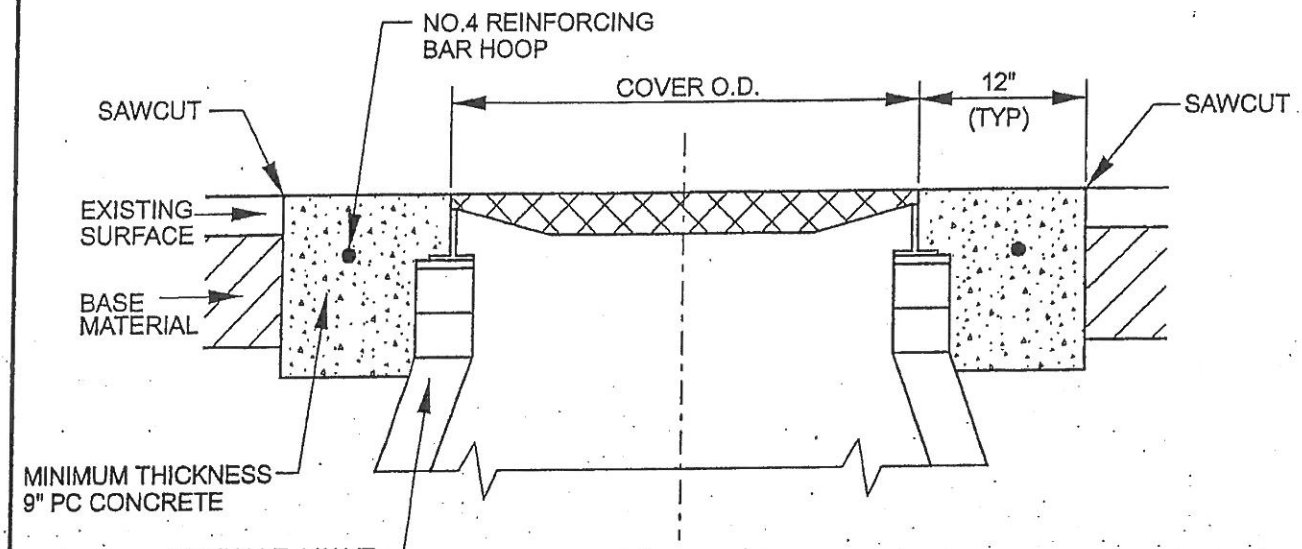
851a.2 CONSTRUCTION: Locate manholes using maps and metal detectors. Cut and replace asphalt as necessary. Manholes shall be lowered below subgrade before placing base materials and openings shall be protected by hatch covers. Existing manhole rings and covers which are determined by the SAWS Inspector to be in an unacceptable condition, will be removed and replaced with new rings and cover. Contractor shall take all necessary measures to prevent damage to existing or new rings, cover, or cone from equipment and materials used in or taken through the work area. If an existing or new manhole cover, ring, or cone is damaged by the Contractor, it shall be replaced (as directed by SAWS inspector) by the Contractor at his expense. Manholes shall be adjusted after the base material has been laid and before placing of the surface course. Manhole that are going to be adjusted on an existing surface course not being replaced will be in accordance to the City of San Antonio Utility Excavation Criteria Manual Standard Drawing No. 8.8. All manholes shall then be raised, or lowered a sufficient height so as to be level with the finished surface course. Adjustment in height will be made by addition or removal of "throat rings" above the manhole "cone" where feasible. A minimum of two and a maximum ofsix throat rings shall be used at each manhole. Material excavation from around the manholes shall be replaced with concrete in accordance with Standard Drawings, and select materials from the excavation (as shown on the plans or specified by the SAWS). All excess materials shall be disposed of by the Contractor at his own expense an in an approved location.

851a.3 MEASUREMENT: Manholes located and completely adjusted, as prescribed above, will be measured by the unit of each manhole located and adjusted. The excavation and the amount of asphalt, concrete or reinforced concrete as necessary to fill the area excavated will not be measured for payment.

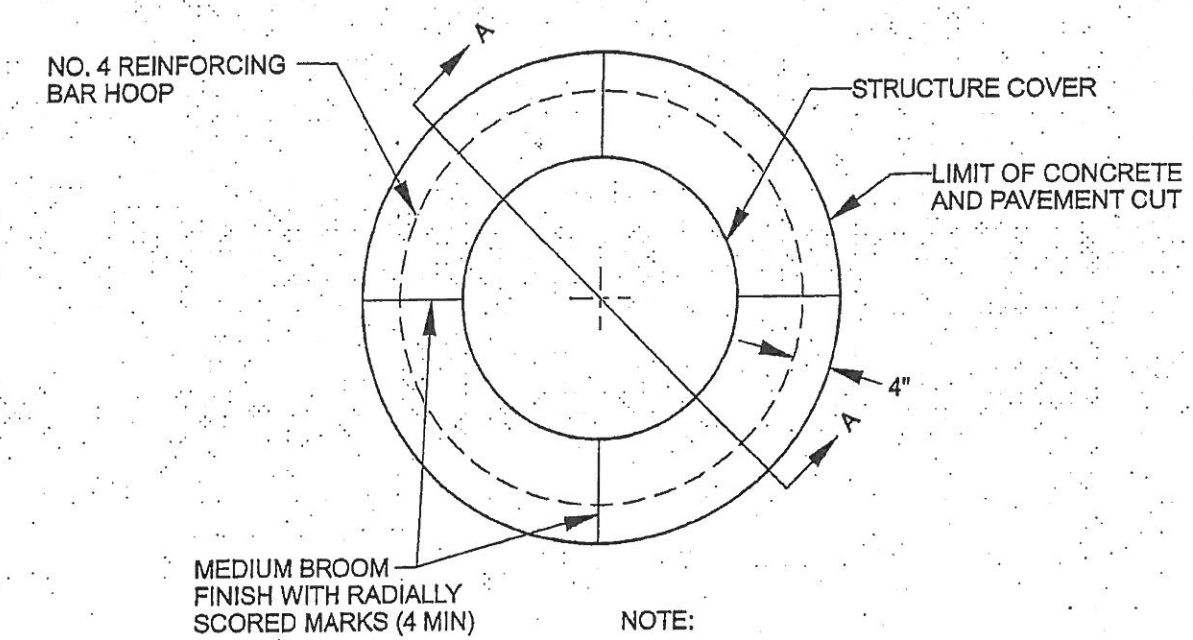
851a.4 PAYMENT: The work performed as prescribed by this item will be paid for at the contract unit price bid per manhole for "Locating and Adjusting Existing Manholes" which price shall be full compensation for all excavation, including saw cutting of surfaces as required, reinforced concrete and disposal of material excavated; for furnishing and placing all materials and for all labor, tools, equipment and incidentals necessary to complete the work.

furnishing and placing all materials and for all labor, tools, equipment and incidentals necessary to complete the work.

CONCRETE COLLAR FOR MANHOLE AND VALVE ADJUSTMENTS



SECTION A-A



NOTE:
THE CONCRETE SHALL BE 3000 PSI, MIN, AND REINFORCED WITH NO. 4 BARS, AS SHOWN

THE CONCRETE SHALL EXTEND TO EDGE OF SAW CUT PAVEMENT EDGE

ITEM 315
Special Provision

FOG SEAL

For this project, Item 315 "Fog Seal", of the TxDOT Standard Specifications, is hereby amended as follows:

1) Delete in its entirety Article 315.5, Measurement.

2) Add Article 315.5 Measurement:

   This Item will be measured by the square yard (SY) of accepted emulsified asphalt used in the emulsified asphalt and water mixture.

3) When referenced in the Item 315, "Fog Seal" specification, Item 300, "Asphalts, Oils and Emulsions," of the TxDOT Standard Specifications is hereby amended with respect to the clauses cited below.

Article 300.2. Materials D. Emulsified Asphalt., is supplemented by the following:

D. Emulsified Asphalt. Emulsified asphalt must be homogeneous, not separate after thorough mixing, and meet the requirements for the specified type and grade in the Table 11A for TRMSS.

Table 11A

Hazardous Materials Identification System (HMIS) ratings:

HMIS	Rating
Health	1
Flammability	0
Reactivity	0
Protective Equipment	E

American Society for Testing and Materials (ASTM):

TEST METHOD	PROPERTY	REQUIREMENT
ASTM D 562	Viscosity, Kreb Unit (KU)	35 to 65
ASTM D 2939.07	Weight/Gallon	8.3 – 8.6
ASTM D 2939.08	Residue by Evaporation %	>33.0
ASTM244 (sec. 44-47)	Sieve Analysis	0.1 max
ASTM D 93	Flash Point (of residue)	>500
ASTM D 2939.05	Emulsion Uniformity	Pass
ASTM D 2939.14	Resistance to Heat	Pass
ASTM D 2939.15	Resistance to Water	Pass
ASTM D 2939.19	Wet Flow	Pass
Performance Criteria Testing*		
ASTM G 154	Accelerated Weathering Test **	Pass

Asphalt Cement Certificate of Compliance ***		
Certificate of compliance	Ground Whole Tire Rubber %	10 min
ASTM D 5	Penetration 77˚F, 100g, 5sec, dmm	15-55
ASTM D 36	Softening Point, ˚F	> 140
ASTM D 2042	Solubility % (3 set average)	>98.0

* TRMSS, ready to use.
** 1,000 hours. UVA-340 lamp, 0.77 W/m^2(V1.0 calibration), 8 hours UV light @ 50˚C, 5min. Spray, 3.55 hours condensation @ 50˚C.
*** Ground whole tire rubber modified asphalt cement.

International Slurry Surfacing Association (ISSA):

TEST METHOD	**PROPERTY**	**REQUIREMENT**
Performance Criteria Testing*		
ISSA TB-100	Wet track Abrasion, %****	<5.0%

* TRMSS, ready to use.
**** Calculated weight loss, percentage of original Volume, 1 hour soak.