## PART 1 GENERAL

1.1 SCOPE:

A. This item shall consist of constructing repairs to strengthen existing surfaces in preparation for weatherization and/or resurfacing The work includes surface course repairs (SCR), full depth repairs (FDR), milling or cold planing, surface cleaning, and crack sealing.

## PART 2 PRODUCTS

2.1 HOT MIX ASPHALTIC (HMA) CEMENT SURFACE COURSE:

A. Bituminous surface course for use in dig out and surface course repairs shall conform to Section 2400 of these Specifications.

2.2 TACK COAT:

A. Tack coat is an application of emulsified asphalt or asphalt cement to an existing pavement and curbs before placing an overlay course of AC pavement.

B. Tack coat shall conform to RS-1, SS-1, SS-1h, CRS-1, CSS-1, or CSS-1h.

2.3 BASE COURSE:

A. Base course for backfilling full depth repairs shall be 1-inch minus, crushed quarry stone or crushed gravel, well graded, and otherwise conforming to Section 4215 of these specifications.

2.4 CRACK SEALANT:

A. Crack sealant shall be a premixed, prepackaged material of 100-percent vulcanized granulated crumb rubberized-asphalt mixture, as produced by Crafco, Inc. Asphalt Rubber Type-2, Asphalt Rubber Plus of Chandler, AZ (800.528.8242) or equal.

B. Applicator unit shall conform to manufacturer=s specifications for use of crack sealant material. Unit shall be capable of heating and agitate material to specified limits.

2.5 GEOTEXTILE AND PAVING FABRIC:

A. GEOTEXTILE - for use between sub-base and base rock on surface repairs shall be as specified in Section 2200 of these Specifications.

B. PAVING FABRIC - for use in AC surface course overlays shall be as specified in **S**ection 2200 of these Specifications.

2.6 PAVEMENT MILLING (or COLD PLANING):

A. Planing machines or grinders shall be specially built for milling of bituminous pavements without use of heat. The cutting drum shall be a minimum of 6-feet wide, totally enclosed, and shall be equipped with replaceable cutting teeth placed in a pattern to produce a uniformly rough grooved or ridged surface without the use of heat and approved by the engineer.

B. The machine shall have a positive means for controlling cross slope, depth and grade.

C. The machine shall be capable of a deep cut of 3-inches in one pass without producing fumes or smoke.

D. The machine shall be self-propelled and have an effective means for removing loosened material from the surface and for preventing dust from escaping into the air.

E. The machine shall be capable of removing the pavement next to the gutter and be designed so that the operator can observe the milling operation at all times without leaving the controls.

F. The contractor shall provide a smaller machine if necessary with a 12-inch minimum width-cutting drum to trim areas inaccessible to the larger machine such as around manholes, valve boxes, curb returns, intersections, and etc.

## PART 3 EXECUTION

3.1 PAVEMENT REMOVAL:

A. Drawings depict general areas of existing asphalt concrete pavement removal for pavement transition. The Engineer will supervise the establishment of the exact boundaries. The Contractor shall cut the pavement to the depth of removal around the perimeter of the area to be removed. Cuts in unexposed areas may be made with a saw, cutting wheel, jackhammer, or other approved method that leaves a straight and vertical face. Cuts in areas where existing pavement is to be matched or in areas that will be left exposed shall be made with a power saw.

B. After cutting, existing pavement shall be excavated as required. Any damage to adjoining pavement or the underlying base course, as a result of either the cutting or removal operation, will be repaired by the Contractor at no extra cost to the Owner.

C. Apply tack coat to vertical face of existing AC along edges of cut and allow to cure.

D. Place new, approved, AC mix to line and grade as specified to make a smooth transition from new surface course to existing.

E. AC mix shall be compacted to 92-percent of the theoretical maximum density (Rice Value).

F. Sand seal exposed joint with approved hot asphalt or emulsion and sand.

3.2 SURFACE COURSE REPAIR:

A. Drawings depict areas of existing asphalt to be removed and replaced not included in pavement transition areas. The Engineer will supervise the establishment of exact boundaries of the work. Methods of removal shall be as stated in subsection 3.1 PAVEMENT REMOVAL.

B. Any damage to the adjoining pavement or underlying base course, as a result of either cutting or removal of the existing pavement, will be repaired by the Contractor at no additional cost to the Owner.

C. Before replacement of the bituminous surface course, apply tack coat to all vertical surfaces of the existing pavement and allow the tack coat to cure. Compact the existing aggregate base course to a tight level surface to pave on.

D. Place hot-mix AC uniformly using the proper approved tools and ensure a well-graded patch compacted to 92-percent of the theoretical maximum density (Rice Value).

E. See Standard Detail 4220-3.

3.3 FULL DEPTH REPAIRS:

A. Drawings depict general areas of pavement dig out repair. The Engineer will supervise the establishment of exact boundaries of the work. Methods of removal shall be as stated in subsection 3.1 PAVEMENT REMOVAL.

B. The Contractor at no extra cost to the Owner will repair any damage to adjoining pavement or underlying base course, as a result of either the cutting or removal operation.

C. Remove defective subgrade to an acceptable native material, place geotextile before placing imported aggregate backfill.

D. Place 1-inch minus aggregate base from fabric to top of repair minus AC pavement thickness and compact to 95 percent of AASHTO T-180 and in 8-inch lifts maximum.

E. Apply tack coat to vertical face of existing AC along edges of cut and allow to cure.

F. Place hot-mix AC uniformly using the proper approved tools and ensure a well-graded patch compacted to 92-percent of the theoretical maximum density (Rice Value).

G. See Standard Detail 4220-1.

3.4 DISPOSAL:

A. Dispose of all existing asphalt, base course, and defective subgrade in a permitted landfill /waste disposal site as defined in these specifications.

## 3.5 SLURRY SEAL AND PAVEMENT MARKING REMOVAL:

A. Existing paint marking in area to be overlaid shall be completely removed unless otherwise directed by the Engineer. Sandblasting, or other approved method, shall remove the markings. Removal by heating or by chemical means will not be allowed.

B. Before removal of traffic markers the Contractor shall record the type and location of each marker for replacement after overlay.

C. Poorly bonded slurry seal on the existing surface shall be removed by hydro flushing. The area to be hydro-flushed shall be worked in two directions. The second direction shall be perpendicular to the first to adequately cover the slurry seal and remove any remaining loose fragments.

D. Equipment used for slurry seal removal shall include a high-pressure sprayer with a nozzle capable of applying a minimum pressure of 3,000 psi.

E. Contractor shall make adequate observations and inspections as necessary before the work to determine the extent of the removal of the existing slurry seal and pavement markings. The Engineer will supervise the limits of existing pavement markings and slurry seal to be removed.

## 3.6 PAVEMENT CRACK REPAIR:

A. Cracks shall be routed to a minimum width of 3/8-inch and a minimum depth of 2-inch. Reservoir depth shall be constructed for a 2:1 depth-to-width ratio.

B. For use in concrete joints install a Backer Rod in accordance with ASTM D5249, Type I.

C. Cracks or joint shall be cleaned using routing, brushing, or blowing to provide an intact bonding surface, which is free from all dust, moisture or other contaminants. Typical equipment types used include routers, power brush devices, air compressors, water blasters, heat lances, diamond saws, and sand blasters. Equipment use shall be chosen and approved with due consideration for results, location, traffic, and impact to residents.

D. Sealant shall be applied when the existing pavement surface temperature exceeds $40^0$F.

E. Application of sealant shall be by pressure feed wand system from a sealant smelter application unit.

F. When crack sealing is performed for maintenance purposes and not in conjunction with an overlay, sealant shall be applied to depth of not more than 1/8-inch above the existing surface and a band 2 to 4-inches wide as produced with a squeegee or a sealing shoe. When crack sealing is accomplished as part of an overlay project the sealant shall be placed to the top of the reservoir level with the existing surface and have no band beyond the width of the routed reservoir.

G. A light dusting of fine sand shall be applied to new sealant prior to overlay and the first pass (break down) by compactive roller shall be static to prevent mushrooming of new sealant

though the mix. If in the opinion of the Engineer it is necessary, Contractor shall apply DETACK prior to overlay. Sealant placed the prior season or earlier need not be dusted.

3.7 PREPARATION OF EXISTING PAVEMENT SURFACE FOR BITUMINOUS SURFACE COURSE OVERLAY:

A. Prior to the application of tack coat, asphalt binder, or paving fabric to the existing pavement receiving the bituminous surface course overlay, the existing surface shall be thoroughly cleaned of all rock, debris, accumulations of rubber and paint and all other foreign material. Excess crack sealant material shall be removed by hand or by tight blading with a motor patrol grader. Vegetation on the edges of pavement shall be removed by hand or by tight grinding with a motor patrol grader.

3.8 PAVEMENT MILLING (or COLD PLANING):

A. Planing of existing surface shall produce the required milled grade tolerance of 0.02-feet by reference from either the existing pavement or from an independent grade control as measured with a 12-foot straight edge. Also any variation of the top of ridges from a 12-foot straight edge between two ridge contact points shall not exceed 0.02-feet.

B. Milling shall remove all loose, poorly bonded material from the surface. When the machine is unable to remove loose material it shall be done by hand methods along edges until old overlay or slurry seal is with-in grade tolerance and firmly bonded.

C. Contractor shall sweep the street of loosened material at the end of the milling process prior to traffic being allowed back on the street.

D. Milled areas greater than or equal to 1-inch difference in elevation and to be left for traffic use prior to paving shall receive a feathered skin patch of hot-mix AC to accommodate transition between milled and existing areas at ends of the work and all cross street intersections. This ramp shall be maintained and remain until overlay operations commence.

3.9 TACK COAT:

A. Surface upon which the tack coat is applied shall be dry and shall be cleaned of dirt, dust, and all other debris detrimental to the adherence of the new AC pavement.

B. Tack coat shall be spread with pressure spray equipment, which will provide for a uniform coverage at the prescribed rate of 0.02 to 0.06 gallons of RETAINED asphalt per square yard.

C. Tack coat shall not be applied during wet or cold weather or during darkness. The existing surface temperature shall be not less than $55^0$F.

D. Tack coat shall be applied only so far in advance as is appropriate to insure a tacky condition at the time of placement of the next course of AC pavement. Tack coat shall be covered the same day as applied.

E. Application shall be scheduled so as to offer the least interference to traffic and to permit one-way traffic without pickup of tack.

3.10 MEASUREMENT AND PAYMENT:

A. PAVEMENT REMOVAL - Payment shall be made at the Contract unit price to the nearest 0.1 square yard for Pavement Removal. This unit price shall be full compensation for furnishing all material; for all preparation, hauling, and removal of materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

B. SURFACE COURSE REPAIR - Payment shall be made at the Contract unit price to the nearest 0.1 square yard for Surface Course Repair. This unit price shall be full compensation for furnishing all material; for all preparation, hauling, and removal of materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

C. FULL DEPTH REPAIR - Payment shall be made at the Contract unit price to the nearest 0.1 square yard for Full Depth Repair. This unit price shall be full compensation for furnishing all material; for all preparation, hauling, and removal of materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

D. SURFACE CLEANING - Payment for surface cleaning shall be made at the Contract unit price to the nearest 0.1 square yard for Surface Cleaning. This price shall be full compensation for removal of existing slurry seal and pavement markings; all cleaning and preparation of the existing pavement surfaces for bituminous surface course overlay, for furnishing all materials; for all preparation, hauling, removal of materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

E. CRACK SEALING - Payment shall be made at the Contract unit price to the nearest 0.1 linear foot of crack repair. This price shall be full compensation for furnishing all materials; for all preparation, delivering, and application of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

F. PAVEMENT MILLING - Payment shall be made at the Contract unit price per inch of depth per yard to the nearest 0.1 square yard for AC Milling. This price shall be full compensation for furnishing all materials, equipment, and labor for preparation and work to complete this task. Measurement shall be conducted at the mid point of the milled surface in order to calculate the overall milled area.

G. TACK COAT - Payment for this item shall be incidental to the work of PAVEMENT REMOVAL, SURFACE COURSE REPAIR, FULL DEPTH REPAIR, PAVING FABRIC, and OVERLAY unless specifically stated as a separate item in the Bid Proposal.

## PART 4 TESTING

4.1 GENERAL:

A. All materials shall be certified to conform to these specifications. Samples may be taken and sent, or in-place, to a certified laboratory for conformance testing at any time and at the discretion of the Engineer. Materials found not to meet specification shall be removed or a negotiated price reduction shall be imposed, whichever is in the best interest of the Owner.

END OF SECTION