SECTION 410    ASPHALT-RUBBER STRESS-ABSORBING MEMBRANE:

410-1    Description:

The work under this section shall consist of furnishing all materials including asphalt-rubber, tack coat and cover material and applying the materials in accordance with the details shown on the project plans and the requirements of these specifications.

410-2    Materials:

410-2.01    Tack Coat:

The existing roadway surface upon which the Asphalt Rubber Membrane is to be placed, shall be first cleaned of potentially detrimental material and tacked with a light coat of bituminous material, conforming to the requirements of Subsection 404-3.12 of the specifications. The cleaning of the surface, the tacking of the surface and the type and amount of bituminous material used shall be as directed by the Engineer.

410-2.02    Asphalt-Rubber:

Asphalt-Rubber shall conform to the requirements of Section 1009. The type of asphalt-rubber shall be as shown in the Special Provisions. The rubber gradation shall be Type A.

410-2.03    Cover Material:

Cover material shall conform to the requirements of Subsection 404-2.02(C). The bulk specific gravity shall be 2.30 to 2.85 as determined in accordance with the requirements of Arizona Test Method 210. The gradation shall meet the following requirements when tested in accordance with Arizona Test Method 201.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inch</td>
<td>100</td>
</tr>
<tr>
<td>1/4 inch</td>
<td>0 - 15</td>
</tr>
<tr>
<td>No. 8</td>
<td>0 - 5</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 - 2.0</td>
</tr>
</tbody>
</table>

410-3    Construction Requirements:

410-3.01    General:

All equipment used to mix and apply asphalt-rubber material shall meet the requirements specified under Subsection 404-3.02(A) of the specifications. The equipment shall also be capable of maintaining a uniform, homogeneous mixture throughout the operation.

410-3.02    Application of the Asphalt-Rubber Stress-Absorbing Membrane:
Asphalt-Rubber Stress-Absorbing Membranes shall be placed between the dates specified in the Special Provisions.

The existing pavement shall be cleaned in accordance with the requirements of Subsection 404-3.04.

After cleaning and prior to the application of the membrane, the existing pavement surface shall be treated with a tack coat as hereinbefore specified.

Placement of the asphalt-rubber membrane shall be made only when all of the following conditions are met:

1. The ambient air temperature and the pavement surface temperature are both above 65 degrees F.
2. The pavement is dry.
3. The wind conditions are such that a satisfactory membrane can be achieved.
4. All construction equipment such as asphalt rubber distributor, aggregate spreader, haul trucks with cover material, and rollers are in position and ready to commence placement operations.

The distributor shall be capable of spreading the asphalt-rubber mixture in accordance with the tolerances specified in Subsection 404-3.02(A) except that the maximum deviation from the specified rate shall not exceed 0.05 gallons per square yard.

The hot asphalt-rubber mixture shall be applied at the rate of approximately 0.55 ± 0.05 gallons per square yard (based on a unit weight of 7.75 pounds per gallon of hot asphalt-rubber); however, the Engineer will specify the exact rate based on existing surface conditions.

All transverse joints shall be made by placing building paper over the end of the previous application, and the joining application shall start on the building paper. Once the application process has progressed beyond the paper, the paper shall be disposed of as directed by the Engineer.

All longitudinal joints shall be lapped approximately four inches.

Traffic shall not be permitted on the asphalt-rubber membrane prior to the application of cover material.

**410-3.03 Application of Cover Material:**

Cover material shall be applied in accordance with the requirements of Subsection 404-3.06.
Cover material shall be immediately and uniformly spread over the freshly applied asphalt-rubber at the rate of approximately 0.014 cubic yards per square yard; however, the actual rate of application will be determined by the Engineer.

Cover material shall be precoated with 0.40 to 0.60 percent asphalt cement, by weight of the aggregate, and shall have a minimum temperature of 250 degrees F at the time of application. The asphalt cement shall meet the requirements of Section 1005. The end result shall be a thoroughly and uniformly coated, dust free material.

410-3.04 Rolling:

At least three pneumatic rollers shall be provided to accomplish the required rolling. The rollers shall conform to the requirements of Subsection 406-7.05(A)(2), except that the minimum air pressure in each tire shall be 100 pounds per square inch.

A sufficient number of rollers shall be furnished to cover the width of the spread on the first pass and complete the required number of passes within the time specified hereinafter. The first pass shall be made immediately behind the spreader and if the spreading is stopped for any reason, the spreader shall be moved ahead so that all cover material may be immediately rolled. The rolling shall continue until a minimum of four complete coverages have been made. Final rolling shall be completed in accordance with the following:

<table>
<thead>
<tr>
<th>Existing Pavement Temperature</th>
<th>Complete Rolling Within</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 °F and above</td>
<td>20 Minutes</td>
</tr>
<tr>
<td>Between 65 and 100 °F</td>
<td>10 Minutes</td>
</tr>
</tbody>
</table>

410-3.05 Traffic:

Traffic of all types shall be kept off the stress-absorbing membrane until it has had time to set properly. The minimum traffic free period shall be three hours. However, when it is absolutely necessary that hauling equipment or piloted traffic travel on the newly applied membrane and the use is approved in advance by the Engineer, the speed shall not exceed 15 miles per hour. Stress-absorbing membrane operations shall be scheduled so that the normal flow of traffic will be resumed before sunset.

410-3.06 Removing Loose Cover Material:

Loose cover material shall be removed in accordance with the requirements of Subsection 404-3.08. Sweeping shall be completed and all excess cover material removed prior to the placement of any subsequent layers of asphaltic concrete.

410-3.07 Placement of Asphaltic Concrete:

If the asphalt-rubber membrane has been subjected to traffic, a tack coat, as hereinbefore specified, shall be applied at the rate of approximately 0.06 gallons per square yard prior to placement of the asphaltic concrete.
410-4    **Method of Measurement:**

Asphalt-rubber material will be measured by the ton. Conversion from volume to weight will be calculated on the basis of 7.75 pounds per gallon of hot asphalt-rubber material.

Cover material will be measured by the cubic yard. Cover material will be weighed and the amount in tons of dry material will be converted to cubic yards. The weight of all moisture contained in the cover material will be deducted prior to the conversion of the weight in tons to the volume in cubic yards. The dry weight per cubic foot will be determined in accordance with the requirements of AASHTO T 19.

The quantities of bituminous tack coat and time to apply tack coat will be measured in accordance with the requirements of Section 404.

410-5    **Basis of Payment:**

The accepted quantity of asphalt-rubber, measured as provided above, will be paid for at the contract unit price for the asphalt-rubber mixture complete in place, including asphalt cement and crumb rubber.

The accepted quantity of cover material, measured as provided above, will be paid for at the contract unit price, complete in place, including precoating material, and rolling and removal of loose cover material.

The accepted quantities of bituminous tack coat and time to apply tack coat will be paid for in accordance with the requirements of Section 404.

The bidding schedule reflects a quantity of bituminous tack coat based on two applications of emulsified asphalt at the specified rate. No adjustment in the contract unit prices will be made because of a variation in the quantities actually required to complete the work.
SECTION 410  ASPHALT-RUBBER STRESS-ABSORBING MEMBRANE:

410-2.02  Asphalt-Rubber: of the Standard Specifications is revised to read:

Asphalt-Rubber shall conform to the requirements of Section 1009 of the specifications. The asphalt-rubber shall be Type XXXXX. The crumb rubber gradation shall be Type A conforming to the requirements of Section 1009.

410-2.03  Cover Material: of the Standard Specifications is revised to read:

Cover material shall conform to the requirements of Subsection 404-2.02(C).

410-3.02  Application of the Asphalt-Rubber Stress-Absorbing Membrane: the first paragraph of the Standard Specifications is revised to read:

Asphalt-rubber stress-absorbing membranes shall be placed between the dates shown below for the average elevation of the project.

<table>
<thead>
<tr>
<th>Average Elevation of Project, Feet</th>
<th>Beginning and Ending Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 3499</td>
<td>March 15 – May 31</td>
</tr>
<tr>
<td>0 – 3499</td>
<td>September 1 – October 31</td>
</tr>
<tr>
<td>3500 – 4999</td>
<td>April 15 – October 15</td>
</tr>
<tr>
<td>5000 and over</td>
<td>June 1 – September 15</td>
</tr>
</tbody>
</table>

410-3.02  Application of the Asphalt-Rubber Stress-Absorbing Membrane: item (1) of the fourth paragraph of the Standard Specifications is revised to read:

(1) The pavement surface temperature is above 75 degrees F.

410-3.03  Application of Cover Material: the third paragraph of the Standard Specifications is revised to read:

Cover material shall be precoated with 0.40 to 0.60 percent asphalt cement, by weight of the aggregate. The cover material shall have a minimum temperature of 250 degrees F at the time of precoating with asphalt cement. The asphalt cement shall meet the requirements of Section 1005. The end result shall be a dust-free material.