PART 1 GENERAL

1.1 SCOPE:

A. This Section establishes the work to place hot-mix bituminous pavement Class B, C, and/or D as specified on the plans.

1.2 DEFINITIONS:

A. HOT MIX ASPHALT CONCRETE (HMAC) - Asphalt concrete is a hot mixture of asphalt cement; well graded, high-quality aggregate; and mineral filler and additives as required; plant mixed into a uniformly coated mass, hot laid on a prepared base, and compacted.

B. RECYCLED ASPHALT PAVEMENT (RAP) - RAP is processed recycled asphalt pavement materials used in the production of new asphalt concrete pavement. The RAP materials proposed for use in the recycled mix shall contain hard, sound, durable aggregates and asphalt cement.

PART 2 PRODUCTS

2.1 GENERAL:

A. HMA product shall conform to Section 2400 of these Specifications and be a mix design submitted by the Contractor and approved by the Engineer for use on this specific project.

PART 3 EXECUTION

3.1 PRE-PAVING CONFERENCE:

A. The Contractor and subcontractors who are to be involved in the paving work shall meet with the Engineer for a pre-paving conference at a time mutually agreed upon. At this conference, the Contractor shall discuss the proposed methods of accomplishing all phases of the paving work.

3.2 WEATHER LIMITATIONS:

A. Asphalt concrete shall be placed on a dry prepared surface when the surface temperature is not less than 55^{O}F and the ambient temperature is above 54^{O}F - and rising.

B. Asphalt concrete shall not be placed during rain or other adverse weather conditions, except that mix in transit at the time these adverse conditions occur may be laid if the mix has been covered during transit and is at the specified temperature, if the foundation is free from pools or flow of water, and if all other requirements of these specifications are met. Asphalt concrete mixtures shall not be placed when the foundation is frozen or when, in the opinion of the Engineer, existing or expected whether conditions will prevent the proper handling, finishing, or compaction of the mixtures.

3.3 TRUCK SCALES:

A. Each payload of asphalt concrete mixture shall be weighed on vehicle scales licensed by the Oregon Department of Agriculture. The Contractor shall be responsible for maintaining the scales in an accurate condition at all times.

B. If the accuracy tests reveal scales have been indicating less than the true weight, no additional payment will be allowed for previously weighed materials. If the tests reveal that scales have been indicating more than the true weight, all materials received since the last passing accuracy test, or the time at which the Engineer determines the problem occurred, will be reduced by the amount of error in excess of the tolerance allowed by state law.

C. Each load of mixture shall have a weigh memo provided by the Contractor.

3.4 HAULING EQUIPMENT:

A. Vehicles used for hauling asphalt concrete mixtures shall have tight, clean, and smooth beds which have been thinly coated with paraffin oil, lime solution, soapy water, or other approved material to prevent mixture from adhering to the beds. Diesel oil may be used when requested by the Contractor and approved by the Engineer. During each application of approved coating material, and prior to loading the vehicle bed shall be drained of all excess coating material.

B. Hauling vehicles shall be equipped with covers to protect against intrusion and heat loss.

C. Vehicles that cause segregation, leak badly, or delay normal operation shall not be used.

3.5 ASPHALT CONCRETE PAVERS:

A. Pavers shall self-contained, power-propelled units with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing layers of asphalt concrete material to the widths, thickness, lines, grades, and cross sections required.

B. The paver shall be equipped with receiving and distribution system of sufficient capacity for a uniform spreading operation and capable of placing the mixture uniformly in front of the screed without segregation of materials. Extensions added to the paver when used on travel lanes shall have the same auguring and screeding equipment as the rest of the paver.

C. The screed or strike-off assembly shall produce a finished surface of the required smoothness and texture without tearing, shoving, or gouging the mixture. The paver shall be equipped with either a manual (string) or electronic line grade control.

3.6 COMPACTORS:

A. Rollers shall be steel wheel, pneumatic tire, vibratory or a combination of these types. They shall be in good condition and capable of reversing without backlash.

1. STEEL WHEEL ROLLERS - Steel wheeled rollers shall have a minimum gross static weight of 8-tons and a minimum static weight on the drive wheel of 250-pounds per inch of width. For finish rolling a 6-ton minimum gross static weight is acceptable and the 250-pounds per inch of width will not be required.

2. VIBRATORY ROLLERS - Vibratory rollers shall be equipped with amplitude and frequency controls and shall be specifically designed for compaction of asphalt concrete mixture. The rollers shall be capable of frequencies of not less than 2,000 vibrations per minute.

3. PNEUMATIC ROLLERS - The pneumatic-tired rollers shall be self propelled, tandem, or multiple axle, multiple wheeled with smooth tread pneumatic tires. The tires shall be of equal size and staggered on the axles at spacings and overlaps that will provide uniform compacting pressure for the full compacting width of the roller. Ground pressures shall be at least 80 psi of tire contact area. Pneumatic-tired rollers shall be fully skirted to insulate the tires from significant heat loss during compaction.

3.7 PREPARATION OF FOUNDATION:

A. All bases and foundations on which the pavement is to be constructed, shall meet applicable specifications and be approved prior to the start of paving. Existing bases and foundations shall be reconditioned as specified or directed.

B. Broken or ragged edges of existing paved surfaces underlying or abutting the new pavement shall be trimmed back to firm material.

C. Depressed areas in existing pavement shall be tacked and leveled with an approved asphalt concrete mixture and compacted. This leveling work shall be a separate operation and performed as specified.

3.8 ASPHALT CONCRETE STORAGE:

A. Storing or holding of hot asphalt concrete mixture in open stockpiles shall not be permitted.

3.9 DELIVERY, STORAGE, AND HANDLING OF AGGREGATES:

A. During production, hauling and storage, aggregates shall be handled in a manner that will prevent segregation of materials or intermingling of separate grades or kinds of aggregates. Covers shall be used to protect the mixture when adverse weather or cold air temperature is encountered during hauling.

3.10 CONTROL OF LINE AND GRADE:

A. The Contractor shall furnish, place, and maintain supports, wires, devices, and materials as necessary to provide continuous line and grade reference control to the automatic paver control system on either or both sides of the paving machine.

3.11 TEMPERATURE OF MIXTURE:

A. The temperature of the mixture at the time it is placed in final position shall be within 10-degrees of 280^0 F. The Engineer may adjust the lay-down temperature in 10-degree increments to attain maximum workability and compaction. In no case shall the lay-down temperature of mixture be less than 240^0 F.

3.12 FINISHING AND DETAILS

A. Segregation of materials, non-uniform texture, fouled surface preventing full bonding between lifts of mixture, and other defects determined by the Engineer as detrimental, shall be corrected by the Contractor at no expense to the Owner.

3.13 TRANSVERSE JOINTS:

A. On wearing courses, pavement depth, line, and grade shall be maintained at least 4 feet beyond the selected transverse joint location. On all courses, a sloped end section shall be constructed. If subject to traffic, the end section shall be sloped at not less than 50:1. If not subject to traffic, the end section shall be sloped at a minimum of 10:1.

B. When paving is not expected to continue from the transverse joint until the following day or later, paper, squared 2x4 or other suitable material shall be placed under the material ahead of the transverse joint location to ensure a vertical face to pave against.

C. Prior to continuing the permanent paving lift, the Contractor shall remove the material beyond the joint to a vertical face against which paving will resume. The base shall be cleaned of all debris. A tack coat shall be applied to the vertical edge and surface of the exposed area before paving is continued.

D. After placement and finishing of the new asphalt concrete, both sides of the joint shall be compacted to the specified density. The joint surface shall conform to the requirements of subsection 3.16.

3.14 THICKNESS AND NUMBER OF LAYERS:

A. The mixture shall be placed in the number of lifts and to the compacted thickness of each lift as shown on the Plans. If the compacted thickness of each lift is not shown on the Plans, the maximum compacted thickness for any lift shall be 3-inches.

3.15 COMPACTION:

A. Immediately after the asphalt concrete mixture has been spread, struck off and surface irregularities and other defects remedied, it shall be thoroughly and uniformly rolled until the mixture is compacted.

B. The type, number, and weight of rollers shall be sufficient to compact the mixture while it is still within the specified temperature range.

C. Steel roller wheels shall be moistened with water to the least extent necessary to prevent pickup of mixture and not cause spotting or defacement of the surface of the mixture.

D. Rollers shall be operated at speeds recommended by the roller manufacturer and slow enough to avoid displacement of the mixture. The maximum speeds shall be 3-miles per hour for vibratory rollers, 4-miles per hour for steel-wheeled rollers, and 5-miles per hour for pneumatic-tired rollers.

E. Care shall be exercised not to displace the line and grade of edges. Displacement of any course occurring as a result of the reversing of the direction of a roller, or from other causes, shall be corrected at once by the use of approved rakes and addition of fresh mixture when required. Any mixture that becomes loose and broken, contaminated, segregated, or is in any way defective, shall be removed and replaced with new mixture at no expense to the owner.

F. Finish rolling shall continue until all roller marks are eliminated.

G. Along curbs and walls, on walks, irregular areas, due care shall be exercised to not damage adjoining structures such as sidewalks, curbs, gutters, catch basins, and/or but not limited to vaults.

H. DENSITY REQUIREMENTS

1. For a specified lift thickness less than 1-1/2-inches, the mixture shall be compacted to the maximum limits established with thin lift correction factor method.

2. For a specified lift thickness of 1-1/2-inches or greater, the mixture shall be compacted to at least 92-percent of the theoretical maximum density as determined by ODOT TM 306.

3.16 PAVEMENT SMOOTHNESS:

A. The top surface of the asphalt concrete pavement shall not vary by more than 0.02-foot when tested with a 12-foot straightedge either parallel with or perpendicular to the centerline. The straightedge shall be furnished and operated by the Contractor. The Engineer will observe this testing and may require additional testing.

B. The joint between the pavement and the top surface of utility structures, such as manhole covers and valve boxes located in the traveled way, shall meet the pavement surface tolerances.

C. The surface of the finished pavement shall be within 0.02-foot of the specified line, grade and cross section.

D. The Contractor shall correct any surface tolerance deficiency by a method that has been approved by the Engineer. All corrective work shall be completed within 10 workdays following notification from the Engineer. All corrective work, including furnishing of materials, shall be performed at the Contractor's expense and no adjustment in Contract time will be made.

3.17 SPECIAL PROTECTION UNDER TRAFFIC:

A. No traffic or equipment shall come in contact with the compacted mixture until it has cooled and set sufficiently to prevent marking. Edges shall be protected from being broken down, and edge DROP-OFFS 1-inch or more in height shall be marked with warning devices visible by day and night to the traveling public and spaced as specified or as directed by the Engineer.

B. When it is necessary to put traffic back on fresh hot-mix sooner then is optimum place a dusting of masonry sand over the surface to eliminate/reduce tearing of fresh surface.

3.18 TEMPORARY PAVEMENT MARKINGS:

A. During paving operations, lane markings shall be maintained throughout the project by applying temporary lane stripes to the roadway each day. Temporary striping shall consist of strips of pavement marking tape a minimum of 1-foot in length on the lane separation line to delineate the path of travel for vehicles. Intervals between marking strips shall be a maximum of 25-feet.

B. The pavement marking tape shall be 4-inches wide, pressure sensitive, reflective tape of a form suitable for marking asphalt or concrete pavement surfaces. Biodegradable tape with paper backing will not be allowed. Surface preparation and application shall be in conformance with the Manufacturer's recommendations.

C. The pavement marking shall be maintained in serviceable condition by the Contractor during the interval of time it is in use. All preliminary layout and marking in preparation for application of the temporary striping shall be the Contractor's responsibility. If specified, the Contractor shall remove the temporary striping prior to placement of subsequent paving materials or permanent lane markings.

3.19 MEASUREMENT AND PAYMENT:

A. HMAC: Shall be measured, in the field from weigh tickets, and paid to the nearest 0.1-Ton per Class of mix placed. If the HMAC placed is found to be out of the JMF tolerances, see Section 2400(2.9)(A)(Table A-7), the mat shall be either removed or be required an extended guarantee period.

Length of time to be determined by the Engineer based upon consideration of the overall deviation of the mix placed.

B. DENSITY: If the completed project does not meet compaction requirements, final pay may be adjusted by Table C-1. Use maximum density when working with Rice value and target when working with test strip or thin-mix overlay correction factor.

TABLE C-1		
PRICE REDUCTION SCHEDULE		
% MAXIMUM DENSITY	**% PAY**	**%TARGET DENSITY**
92.0 >	100	98.0 >
91.5 – 91.9	98	97.5 – 97.9
91.0 – 91.4	97	97.0 – 97.4
90.5 – 90.9	95	96.5 – 96.9
89.5 – 89.9	90	96.0 – 96.4
89.0 – 89.4	85	95.5 – 95.9
< 89.0	0 - 50	< 95.0

C. THICKNESS: If the completed project does not meet thickness requirements, final pay may be adjusted as follows.

TABLE C-2		
% Reduction in Pay (Payment by Ton)	% Deficiency (Thickness)	% Reduction in Pay (Payment by Area)
0	0.0 – 5.0	0
0.5 x Deficiency	5.1 – 10.0	1.0 x Deficiency
0.75 x Deficiency	10.1 – 20.0	1.5 x Deficiency
1.0 x Deficiency	20.1 – 30.0	2.0 x Deficiency

E. LOT: A paving lot will be determined by 500-tons of HMAC placed or one days completed paving work.

3.20 INLET PROTECTION:

A. Place filter fabric over all catch basin inlets to ensure HMAC is restrained from entering the public drainage system. In the event HMAC is passed to inlet(s) the Contractor shall clean it to the satisfaction of the Engineer.

PART 4 TESTING

4.1 SAMPLING AND TESTING:

A. The Contractor is responsible for process control and shall conduct sampling, testing, measurement and inspection as necessary to insure the finished pavement meets specifications.

B. The Engineer will determine the suitability of the final product through final acceptance testing. Results of these tests will be used to determine payment deductions, if any, to be assessed against the Contract.

C. The Engineer shall be permitted to cut samples or to take cores from the compacted mixture for testing purposes. Where samples have been taken, the Contractor shall furnish new material and fill the holes as directed with no compensation beyond the unit price for asphalt concrete in place.

4.2 AGGREGATE GRADATION AND ASPHALT CONTENT:

A. The Contractor shall take samples from the grade on a random basis in the presence of the inspector for testing by the engineer. A minimum of three (3) samples may be taken for each lot of HMAC.

4.3 COMPACTION:

A. For final acceptance of the pavement, the density of each section of pavement will be determined by random tests using a nuclear gauge or laboratory analysis of pavement core samples. Density tests will be taken at three (3), or more, randomly selected sites for each section of pavement. The average of the three (3) density tests will constitute the density of the pavement.

B. Acceptance tests will not be made within one 1-foot of the edges of the panel or from areas where the specified compaction thickness is less than ½-inch.

C. When using a nuclear gauge, two readings will be obtained at each site, the second at right angles to the first. The two readings will be averaged to obtain the test density. For any section of pavement, if the Contractor requests in writing within two work days after nuclear gauge test results are furnished to the Contractor, pavement cores will be obtained at the same randomly selected sites used for the nuclear gauge tests. The density of the core samples will be determined by and independent testing laboratory. The average density of the core samples will constitute the in-place density of the lot of pavement and will prevail over nuclear results. If the density as determined by the core samples does not meet density requirements, the Contractor shall bear the cost of coring and testing.

D. The Engineer shall have the right to conduct any testing deemed necessary to verify compaction results. Pavement found to be out of specification shall be subject to replacement or to payment adjusted prices in accordance with (3.19)(B)(Table C-1).

4.4 PAVEMENT THICKNESS:

A. The Engineer will select locations for non-destructive measurement or core samples to determine pavement thickness.

B. If non-destructive measurement indicates a pavement section is less than the thickness shown on the Plans, or is otherwise out of specification, the Contractor may take cores at the same location to verify the Engineer's measurements. If the pavement section is found to comply with specifications, the coring and restoration will be paid for as extra work. Pavement found to be out of specification shall be subject to replacement or to payment adjusted prices in accordance with (3.19)(C)(Table C-2).

C. In determining deficient or excessive thickness in asphalt concrete overlays, the Engineer shall adjust the cross section measurement sequence, average series of measurements, or take other appropriate steps to allow for the desirable leveling of low or high areas on the existing pavement.

D. Where a deficiency is found and the Engineer determines the deficiency serious enough to impair the traffic service expected from the pavement, the area of such deficiency shall be removed by the Contractor and shall be replaced with pavement meeting the specifications. The cost of the deficient pavement and of the removal shall be borne by the Contractor.

END OF SECTION