[06/24/2026]

TO: PLAN HOLDERS LIST

SUBJECT: PROCUREMENT NO. 062026-1036
ON-CALL PAVEMENT REPAIRS (2026)

ADDENDUM NUMBER 02

This addendum is issued to amend the following:

32 12 16 – Asphalt Paving

- Removed references to ¾-inch and 1-inch HMA aggregate sizes.

PART 1 - GENERAL

1.01 SCOPE

A. The work covered by this Section includes the furnishing of all labor, materials, equipment and necessary services to construct asphalt pavements to the sections and at the locations as specified in this Section and as indicated on the Contract Drawings.

B. This specification covers the requirements for general asphalt paving at the Port of Tacoma and includes mix design criteria for ~~various~~ 1/2-inch aggregate gradations ~~(½ “, ¾” and 1”)~~. [2]

1. ~~Specific Task Orders issued under this Contract may use one or more aggregate gradations. Each g~~ Gradation shall meet the respective sieve criteria, gyration levels (N), target air voids (V_a), voids filled with asphalt (VFA), and voids in mineral aggregate (VMA) as specified. The Contractor shall provide mix designs and quality control testing for ~~EACH~~ the 1/2-inch gradation specified herein.

1.02 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

B. Unless otherwise indicated, the most recent edition of the publication, including any revisions, shall be used.

C. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M 17 - Mineral Filler for Bituminous Paving Mixtures
2. AASHTO M 323 - Superpave Volumetric Mix Design
3. AASHTO M 332 - Performance-Graded Asphalt Binder Using Multiple Stress Creep Recovery (MSR) Test
4. AASHTO T 11 - Materials Finer Than 75 □m (No. 200) Sieve in Mineral Aggregates by Washing
5. AASHTO T 27 - Sieve Analysis of Fine and Coarse Aggregates
6. AASHTO T 89 - Determining the Liquid Limit of Soils
7. AASHTO T 90 - Determining the Plastic Limit and Plasticity Index of Soils
8. AASHTO T 96 - Resistance to Degradation of Small-Size Coarse Aggregate and Impact in the Los Angeles Machine
9. AASHTO T 112 - Clay Lumps and Friable Particles in Aggregate
10. AASHTO T164 - Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA)
11. AASHTO T168 - Sampling Hot Mix Asphalt Paving Mixtures
12. AASHTO T 176 - Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
13. AASHTO T 304 - Uncompacted Void Content of Fine Aggregate
14. AASHTO T308 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Method

15. AASHTO T 312 - Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
16. AASHTO T 324 - Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
17. AASHTO T 329 - Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
18. AASHTO T 335 - Determining the Percentage of Fracture in Coarse Aggregate

D. American Society for Testing and Materials (ASTM)

1. ASTM D75 - Sampling Aggregates
2. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
3. ASTM D2726 - Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures
4. ASTM D4791 - Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

E. Washington State Department of Transportation (WSDOT)

1. Construction Manual, M 41-01
2. Standard Specifications for Road, Bridge and Municipal Construction, M 41-10
3. Materials Manual, M 46-01

1.03 SUBMITTALS

A. A separate job mix formula for each proposed mix design shall be submitted in writing by the Contractor upon execution of the task order. Submittals shall represent all submittal elements specified herein and shall include as a minimum:

1. Mix designation/identification number and certificate of manufacturer’s rated production rate.
2. Plant where mix will be produced.
3. Performance Graded Binder Certified Test Reports
    a. Source location and type of binder.
    b. Certificate of Compliance, including date and signature of the supplier, regarding conformance with AASHTO M 332, Table 1.
    c. Recovery requirements in accordance with WSDOT Section 9-02.1(4)
    d. Temperature-viscosity relationship of the asphalt cement.
    e. Minimum mixing temperature (degrees F).
    f. Minimum compaction temperature (degrees F).
4. Coarse Aggregate Certified Test Reports:
    a. Source location and type of aggregate.
    b. Angularity.
    c. Bulk specific gravity.

d. Flat and elongated particles.

e. Soundness.

f. LA Abrasion.

5. Fine Aggregate Certified Test Reports:
   a. Source location and type of aggregate.
   b. Bulk specific gravity.
   c. Percent natural sand (if used).
   d. Sand equivalent.
   e. Uncompacted void content.
6. Recycled Asphalt Pavement Test Reports (if used)
7. Anti-strip agent:
   a. Certification.
   b. Amount used.
8. Optimum Asphalt Determination (in accordance with ASTM D5581 or ASTM D6927, as appropriate).
   a. Compactive effort (75 or 112 blows applied to specimen, each face, as appropriate).
   b. Actual specific gravity and unit weight of each specimen.
   c. Percentage of asphalt in each specimen.
   d. Theoretical specific gravity of each specimen calculated.
9. Percentage and grade of performance graded asphalt binder.
10. Proportions and percentage of each aggregate stockpile.
11. Temperature of mix when discharged from the mixer.
12. Compaction temperature
13. Plot of the blended aggregate gradation and gradation control points on the Federal Highway Administration (FHWA) 0.45 power gradation curve.
14. Maximum specific gravity at the target binder content.
15. Gyratory compaction curve for N_{max}.
16. Bulk specific gravity at N_{design} gyrations.
17. Percent theoretical maximum density at $N_{initial}$, N_{design}, and N_{max} gyrations.
18. Voids in mineral aggregate at N_{design} gyrations.
19. Voids filled with asphalt at N_{design} gyrations.
20. Dust to binder ratio
21. Flow value
22. Stability

23. Actual unit weight of laboratory compacted mixture.
24. Graphical plots of air voids, voids in the mineral aggregate, voids filled with asphalt, fines to effective binder content ratio, and unit weight verses asphalt content. Plots shall indicate values at –0.5 percent design asphalt content, design asphalt content, and +0.5 percent design asphalt content.
25. Tensile strength ratio (TSR), strength of conditioned samples, and worksheets.
26. A Hamburg Wheel-Track test, ASSHTO T 324. The mix design shall be evaluated and shall have a minimum of 15,000 passes before a rut depth of 10mm is achieved, with no stripping inflection point.

B. The certification(s) shall show the appropriate AASHTO/ASTM test(s) for each material, test results, and a statement that the material meets the specification requirement.

C. If requested by the Engineer, submit samples for each type of aggregate to be used and from each source with proper identification as to source, type of aggregate and contract number. Take all samples in accordance with requirements of ASTM D75 and D242. Submit in clean, sturdy bags and in the following amounts for each sample when requested:

MATERIAL	SAMPLE SIZE
Coarse Aggregate	25 lbs.
Fine Aggregate	25 lbs.
Reclaimed Asphalt Pavement	25 lbs.
Mineral Filler	5 lbs.

D. The job mix formula for each mixture shall be in effect until modified in writing by the Engineer. Should a change in mix or sources of materials be made, a new job mix formula must be tested and resubmitted for approved by the Engineer before the new mix is used.

E. Working Drawings: For each paving area, provide working drawings to show the following information:

1. Direction of paving.
2. Lane widths.
3. Thickness of each lift.

F. Submit smoothness measurements and surface grade survey results to the Engineer prior to application for payment.

G. Equipment List: The Contractor shall submit a list of equipment to be used for placing asphalt concrete to the Engineer prior to utilization on the job.

H. Moisture content of asphalt

1.04 CONTRACTOR QUALITY CONTROL

A. The Contractor shall be responsible for developing the asphalt mix designs specified herein. The mix designs shall be developed and/or certified by a laboratory accredited by AASHTO under the AASHTO resource program. Mixtures on WSDOT’s QPL are considered to be certified.

B. Quality Control Testing: The Contractor shall conduct any and all quality control (QC) testing that he deems necessary to properly control the quality, consistency, and uniformity of the asphalt concrete mix being produced. The minimum number of quality control tests is required for this Contract are defined in the following sections.

1. Asphalt Content. A minimum of one test shall be performed per lot in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. If ASTM D6307 is used, mix specific calibration factors shall be determined at the beginning of plant production and furnished to the Engineer. If ASTM D2172 is used, the weight of ash portion of the test, as described in ASTM D2172, shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter, for the duration of planned production. The last weight of ash value obtained shall be used in the calculation of the asphalt content for the mixture. The asphalt content for the lot will be determined by averaging the test results.

2. Gradation. Aggregate gradations shall be determined at a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

3. Aggregate Specific Gravities. The effective specific gravity of the aggregates in the mixture shall be determined in accordance with ASTM D6995 during construction of the test section and after every 2000 tons of mix production. If the effective specific gravity differs from the approved mix design by more than 1 percent, notify the Engineer. On the next lot after notification, in addition to the normal acceptance tests, the Contractor shall measure the bulk specific gravity of the aggregates in accordance with ASTM C127 and ASTM C128 and the asphalt content of each sublot in accordance with ASTM D6307 or ASTM D2171 and compute the VMA of the mixture for each sublot. If the VMA deviates by more than 1.0% from the mix design, then the contractor shall stop production and produce a revised mix design.

4. A Hamburg Wheel-Track test, ASSHTO T 324. One sample shall be evaluated for each LOT and shall have a minimum of 15,000 passes before a rut depth of 10mm is achieved, with no stripping inflection point.

5. Additional Testing. Any additional testing that the Contractor deems necessary to control the process may be performed at the Contractor's option.

C. For all Quality Control testing performed by Contractor, information and data determined through that testing shall be made available for inspection by Engineer upon request. In no case, however, will Contractor's Quality Control test data be used by Engineer for acceptance or payment purposes.

D. Surface Grades: Grades shall conform to the tolerance requirements specified herein, except where closer tolerance is required for the proper functioning of appurtenant structures and drainage as determined by the Engineer.

1.05 QUALITY ASSURANCE

A. The Engineer will provide inspection services. Sampling and testing for compliance shall be in accordance with the applicable reference standards using certified technicians and accredited independent testing laboratories.

B. Sampling and testing for compliance with the Contract provisions shall be in accordance with Section 01 33 00 - Submittal Procedures and Section 01 45 00 - Quality Control.

C. The Contractor may obtain copies of results of tests performed by the Engineer, at no cost. Tests conducted for the sole benefit of the Contractor, shall be at the Contractor's expense.

D. Unless otherwise referenced or modified herein, quality control and quality standards for this section shall be as specified in the WSDOT Standard Specifications.

1.06 JOB CONDITIONS

A. Environmental Requirements:

1. Do not place asphalt beginning October 1st through March 31st of the following year, without written concurrence from the Engineer.

2. In case of sudden rain, the Engineer may permit placing of mixture then in transport from the plant provided that the surface upon which the mix being placed is dry. In addition, the laydown temperatures must conform to the above requirements. Such permission, however, shall not be interpreted as a waiver of any of the quality requirements.

B. New and existing manholes, catch basins, and utility vault covers shall be adjusted to conform to the new pavement grades. All lids, vaults, frames, grates, and other appurtenances shall be set to final grade and accepted by the Engineer paving. Paving shall be finished 1/4-inch to 1/2-inch higher than adjacent structures, unless otherwise shown or specified.

C. Existing Underground Utilities: The Contractor shall locate existing underground utilities in the area of the work. Those utilities which are to remain shall be adequately protected from damage.

D. All permanent utilities shall be installed prior to final paving. All utility trenches shall be patched with asphalt pavement as shown on the Contract Drawings.

E. Dust Control: The Contractor shall be responsible for dust control at the site. As a minimum, a water truck and vacuum truck shall be used on site for dust control when required by the Engineer.

PART 2 - PRODUCTS

2.01 PERFORMANCE GRADED ASPHALT BINDER (PGAB)

A. Asphalt shall conform to the requirements of AASHTO M 332, Table 1, and the recovery requirements of WSDOT Standard Specification Section 9-02.1(4) for the Performance Grade specified herein. The RTFO J_{nrdiff} and PAV direct tension specifications of AASHTO M 332 are not required.

2.02 AGGREGATE

A. Coarse Aggregate – Coarse aggregate shall conform to WSDOT Standard Specification Section 9-03.8 and AASHTO M 323, as modified below:

Test	Specification
Flat and Elongated Particles (ASTM D 4791, using a ratio of 5:1, maximum to minimum dimension)	8%, maximum
Coarse Aggregate Angularity (AASHTO T 335)	95% with 2 or more fractured faces 100% with 1 or more fractured faces
LA Abrasion Wear (AASHTO T 96, 500 revolutions)	40%, maximum

B. Fine Aggregate - Fine aggregate shall consist of clean, sound, durable, angular shaped particles produced by crushing stone or gravel that meets the requirements for wear and soundness specified for coarse aggregate. Natural (non-manufactured) siliceous sand may be used to obtain the gradation of the aggregate blend or to improve the workability of the mix. The amount of sand to be added will be adjusted to produce mixtures conforming to requirements of this Specification. The aggregate particles shall be free from coatings of clay, silt, or other objectionable matter and shall contain no clay balls. Fine aggregate shall conform to WSDOT Standard Specification Section 9-03.8 and AASHTO M 323, as modified below:

Test	Specification
Sand Equivalent (AASHTO T 176)	45%, minimum
Uncompacted Void Content (AASHTO T 304, Method A)	45%, minimum
Deleterious Materials (AASHTO T 112)	2%, maximum

C. Mineral filler, when used, shall conform to the requirements of AASHTO M 17.

D. Crushed slag aggregates shall not be used.

E. Recycled Asphalt Pavement (RAP)

1. RAP, if used, shall conform to the requirements of WSDOT Standard Specification Section 9-03.8(3)B, 9-03.21(1), and 9-03.21(1)A, as modified herein.

2. The maximum proportion of RAP permitted within each mix shall not exceed 20 percent measured by total weight of HMA.
3. RAP shall have 100 percent passing the 2-inch sieve, 95 percent passing the 1 inch sieve, and shall be a mixture of only coarse aggregate, fine aggregate, and asphalt cement, free of solvents and other contaminating materials.
4. When RAP is used in a mixture, the RAP aggregate shall be extracted from the RAP using a solvent extraction (AASHTO T164) or ignition oven (AASHTO T308). The RAP aggregate shall be included in determinations of gradation, coarse aggregate angularity, fine aggregate angularity, and flat-and-elongated requirements. The sand equivalent requirements shall be waived for the RAP aggregates but shall apply to the remainder of the aggregate blend.
5. Documentation of RAP stockpile quality and traceability shall be submitted to the Engineer for approval prior to use.

F. Aggregate Gradation

1. Each gradation contains maximum and minimum control points. Job mix formula gradations must fall within control points for the specified nominal aggregate size. The combined aggregate shall conform to the gradation requirements shown below when tested in accordance with AASHTO T11 and T27. Design gradation requirements are as follows:

[2]

Sieve Size	1/2-inch NMAS (Percent Passing)	~~3/4 inch NMAS (Percent Passing)~~	~~1 inch NMAS (Percent Passing)~~
1-1/2”	-	~~–~~	~~100~~
1”	-	~~100~~	~~90-100~~
3/4"	100	~~90-100~~	~~67-86~~
1/2"	90-100	~~60-90~~	~~60-80~~
3/8”	75-90	~~50-82~~	~~51-69~~
No. 4	46-66	~~35-65~~	~~34-56~~
No. 8	33-45	~~23-49~~	~~27-43~~
No. 30	13-29	~~10-30~~	~~12-28~~
No. 200	3.0-7.0	~~3.0-7.0~~	~~3.0-7.0~~

2. Aggregates shall be provided in sufficient sizes to produce a uniform mixture. The Contractor shall indicate on the proposed job-mix formula the separate size designations of aggregate to be used.
3. It is recommended that the Bailey Method of gradation evaluation be used to evaluate the packing of aggregate particles and constructability of the blended aggregate mix. If segregation or non-uniformity is evident in the finished pavement, the Engineer reserves the right to require the Contractor to discontinue the use of crusher run or aggregate blends and to furnish separate sizes of open graded aggregate material.
4. Blended Aggregates:
   a. Fine aggregates and coarse aggregates when blended shall not contain more than 2 percent by mass, clay and other friable particles as determined by AASHTO T 112.

b. Each gradation contains maximum and minimum control points. Job mix formula gradations must fall within control points for the specified mix. The combined aggregate shall conform to the gradation requirements shown here when tested in accordance with AASHTO C117 and C136.

2.03 HOT MIX ASPHALT (HMA) MIX DESIGN

A. Mix design shall be prepared by the Contractor in accordance with WSDOT SOP 732 as modified herein.

B. Asphalt Binder: PG 58V-22.

[2] C. Aggregate Gradation: [1/2-inch; ~~3/4-inch; 1-inch~~]

D. Gyration levels for mix preparation shall conform to the following:

Mix Designation	$N_{initial}$	N_{design}	N_{max}
1/2 inch	8	100	160
[2] ~~3/4 inch~~	~~7~~	~~75~~	~~115~~
~~1 inch~~	~~7~~	~~75~~	~~115~~

E. The target air voids (V_a) of the mix design at the design number of gyrations shall be as follows:

Mix Designation	Air Voids (Percent)
1/2 inch	4.0
[2] ~~3/4 inch~~	~~4.0~~
~~1 inch~~	~~4.0~~

F. The voids filled with asphalt (VFA) at the target air void level shall be as follows:

Mix Designation	Voids Filled with Asphalt (Percent)
1/2 inch	65 – 75
[2] ~~3/4 inch~~	~~65 – 75~~
~~1 inch~~	~~65 – 75~~

G. The voids in mineral aggregate (VMA) of the HMA design shall be as follows:

Mix Designation	Voids in Mineral Aggregate (Percent) Minimum[1]
1/2 inch	14.0
[2] ~~3/4 inch~~	~~13.0~~
~~1 inch~~	~~12.0~~

[1]Note: VMA is not allowed to drop below minimum in production.

H. The HMA design when compacted in accordance with AASHTO T 312, shall meet the density specified below at the initial, design, and maximum compaction levels.

Compaction Level (Number of Gyrations)	Required Density (% of Theoretical Maximum Specific Gravity)
N_{ini}	$\%G_{mm}$ =< 89
N_{des}	$\%G_{mm}$ = 96
N_{max}	$\%G_{mm}$ =< 98

I. The dust to binder ratio (by weight ratio between the minus 200 sieve material and effective asphalt content) of the blended mix shall be between **[0.6 and 1.4 for 1/2-inch ~~and 3/4-inch mixes, and 0.6 to 1.6 for 1-inch mix~~]**. [2]

J. Compacted mix design shall have a maximum rut depth after 15,000 passes of 10 mm and no stripping inflection point when tested accordance with WSDOT FOP for AASHTO T324. If a stripping inflection point is observed, the Contractor shall increase the approved anti-stripping agent dosage or take other corrective action to satisfy the specification.

K. The mixture shall have a maximum indirect tensile strength of 175 psi per WSDOT Bituminous Materials FOP for ASTM D6931.

2.04 HEAT-STABLE ANTI-STRIPPING ADDITIVE

A. Mix designs shall include a minimum of 0.05 percent by weight of binder of an approved non-amine based anti-stripping additive, ZycoTherm SP2 or equivalent.

2.05 TACK COAT

A. Unless otherwise approved by the Engineer, the tack coat shall be CSS-1, CSS-1h, or STE-1 emulsified asphalt conforming to WSDOT Standard Specification Section 9-02.1(6). The CSS-1 and CSS-1h emulsified asphalt may be diluted with water at a rate not to exceed one part water to one part emulsified asphalt. The tack coat shall not exceed the maximum temperature recommended by the emulsified asphalt manufacturer.

2.06 JOINT AND CRACK SEALANT

A. Sealant material shall conform to the requirements of WSDOT Standard Specification Section 9-04.2(1)A2.

PART 3 - EXECUTION

3.01 CONSTRUCTION METHODS

A. Asphalt Mixing Plant – Asphalt shall be produced at a plant approved by the WSDOT. Plants shall conform to WSDOT Standard Specifications Section 5-04.3(3)A.

B. Hauling Equipment:

1. Hauling equipment shall conform to WSDOT Standard Specifications Section 5-04.3(3)B, as modified herein.

2. Trucks shall be equipped with tarps, in good condition without holes, which can be tied down over the sides and ends of the truck beds during periods of inclement weather to prevent rain from entering the truck bed and coming in contact with the asphalt concrete mix.

3. Trucks shall be loaded using a multiple-drop method (front then back the middle) to minimize truck to truck segregation.

C. Paving Equipment – Asphalt pavers shall conform to WSDOT Standard Specifications Section 5-04.3(3)C.

NOTE: The requirement for using a material transfer vehicle may be removed as determined appropriate by the specifier.

D. Materials Transfer Vehicle – For lots greater than 300 tons, the Contractor shall use a Materials Transfer Vehicle (MTV) to deliver the HMA from the hauling equipment to the paving equipment for any lift in or partially in the top 0.3 feet of the pavement section. MTVs shall conform to WSDOT Standard Specifications Section 5-04.3(3)D. **[All 1 inch NMAS mix must be placed with an MTV, regardless of depth from surface.]**

E. Compaction Equipment – Rollers shall conform to WSDOT Standard Specifications Section 5-04.3(3)E.

F. Preparation of the Asphalt Binder Material (asphalt cement):

1. The binder shall be stored within the temperature range specified by the supplier of the binder for the grade of asphalt cement being used. Different grades of asphalt binder shall be stored separately and not mixed together at any time.

2. The binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature.

3. The temperature of the binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 350 degrees F unless otherwise required by the asphalt binder manufacturer.

G. Preparation of the Aggregates:

1. The aggregate for the mixture shall be heated and dried prior to introduction into the mixer. Aggregate shall be dry with no moisture content prior to introduction into the mixer. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates.

2. The aggregate temperature shall not be lower than is required to obtain complete coating and uniform distribution of the aggregate particles and to provide a mixture of satisfactory workability.

H. Preparation of Bituminous Mixture:

1. Asphalt plant shall not exceed production rate certified by manufacturer.

2. Mixing shall conform to WSDOT Standard Specifications Section 5-04.3(6), as modified herein.

3. The aggregates and the bituminous material shall be properly proportioned and introduced into the mixer in the amount specified by the job mix formula.

4. Job mix formula production tolerances shall conform to WSDOT Standard Specifications Section 9-03.8(7), except the tolerance limits for aggregate shall not exceed the limits of the control points specified herein.

5. The moisture content of all bituminous mix upon discharge shall not exceed one (1) percent. Asphalt sampling shall be performed in accordance with AASHTO T 168 and moisture content testing shall be performed in accordance with AASHTO T 329. Results of the moisture content testing shall be submitted to the Engineer.

I. Preparation of the Underlying Surface:

1. Preparation shall conform to WSDOT Standard Specifications Sections 5-04.3(4), and, 5-04.3(4)C as modified herein.

2. Asphalt materials shall not be placed until the underlying course has been tested and accepted by the Engineer.

3. The underlying surface shall be free of water, foreign material, and dust when the hot mix asphalt mixture is applied. Immediately before placing asphalt materials, clean all underlying surfaces and previous courses of all loose and foreign material by sweeping with hand brooms, power sweepers or blowers as directed by the Engineer.

4. Tack Coat:

a. Tack coat shall be applied in accordance with WSDOT Standard Specifications Section 5-04.3(4), as modified herein. The Engineer shall verify that the tack coat has been properly placed prior to constructing subsequent pavement lifts. Refer to the applicable sections in Chapter 5 of the WSDOT Construction Manual for guidance on tack coat application and inspection.

b. Apply tack coat only when the underlying surface is free of water, foreign material, dust, and the ambient temperature meets the requirements for the pavement course being placed.

c. Residual asphalt coating shall be 0.03 to 0.05 gallons per square yard on newly placed asphalt surfaces

d. Residual asphalt coating shall be 0.06 to 0.08 gallons per square yard on existing or milled asphalt surfaces.

e. Residual asphalt coating shall be 0.06 to 0.08 gallons per square yard on compacted subgrade.

f. Tack coat shall be applied to all vertical surfaces of existing pavement, curbs, gutters, utility structures, concrete edge of the wharf, and construction joints in the asphalt against which additional material is to be placed.

g. Exposed surfaces of utility vault lids, frames, grates, valve boxes, inlets and other appurtenances within the area to be paved shall be protected from tack coating.

5. Manholes, valve boxes, inlets, frames, grates, lids, and other appurtenances within the area to be paved shall be adjusted to final grade as shown on the Contract Drawings, shall be in place during paving operations, and shall not be paved over as part of the paving operation. Permanent curbs, gutters, and other supports shall be constructed and backfilled prior to placing asphalt. All contact surfaces shall be coated with tack coat.

J. Transporting, Placing, and Finishing:

1. The asphalt concrete mixture shall be transported from the mixing plant to the site in vehicles conforming to the requirements specified herein.

2. Hauling over freshly placed material shall be not permitted until the material has been compacted, as specified, and allowed to cool to atmospheric temperature.
3. Placing and finishing of the asphalt mixture shall be in accordance with WSDOT Standard Specifications Section 5-04.3(7), as modified herein.
4. The nominal compacted depth of any layer of any course shall be within the depth range shown below.

[2]

HMA Class	Minimum Thickness, in.	Maximum Thickness, in.
1/2 inch	2.0	3.0
~~3/4 inch~~	~~3.0~~	~~4.0~~
~~1 inch~~	~~3.0~~	~~4.0~~

5. The hot mix asphalt mixture shall not be placed during unsuitable weather or when the surface temperature of the underlying course is less than that specified below. Asphalt shall not be placed unless the atmospheric temperature is at least 50 degrees F and rising. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Lift Thickness, T (inches)	Minimum Base Temperature (degrees F)
T > 3	40
2 < T < 3	45
T < 2	55

6. The initial placement of the asphalt concrete mixture shall occur at a temperature suitable for obtaining density, surface smoothness, and other specified requirements but not less than 250 degrees F, unless approved by the Engineer.
7. Upon arrival, the mixture shall be placed to the full width of the paving lane. It shall be struck off in a uniform layer of such depth that, when the mix is properly compacted, shall have the required thickness and conform to the grade and contour indicated. The speed of the paver shall be regulated to eliminate pulling and tearing of the bituminous mat. Unless otherwise permitted, placement of the mixtures shall begin along the centerline of a crowned section or on the high side or areas with a one-way slope. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10-feet except where edge lanes require less width to complete the area.
8. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture may be spread and raked by hand tools.
9. Formation of all joints shall be made to ensure a continuous bond between courses and obtain required density. Joints shall have same texture as other sections of course and meet requirements for smoothness and grade.
10. Roller shall not pass over unprotected transverse end of freshly laid mixture except when necessary to form a temporary stop. After a temporary stop, and prior to continuation of paving, the tapered edge shall be cut back to its full depth and width on a straight line, to expose a vertical face, before placing the adjacent lane.

11. Longitudinal joints which are irregular, damaged, uncompacted, or otherwise defective shall be cut back to expose a clean, vertical, sound, surface for the full depth of the course. Apply tack coat on all newly exposed contact surfaces before placing any fresh mixture against the joint.

3.02 COMPACTION OF MIXTURE

A. After placing, the mixture shall be thoroughly and uniformly compacted by rolling. Surface shall be compacted as soon as possible when the mixture has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. Sequence of rolling operations and the type of rollers shall be at the discretion of the Contractor.

B. Compaction shall be completed before the mixture cools below 175 degrees F, unless otherwise approved by the Engineer. Temperature shall be determined using an infrared thermometer by the Engineer.

C. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any displacement occurring as a result of reversing the direction of the roller, or from any other cause, shall be corrected at once.

D. In areas not accessible to the roller, the mixture shall be thoroughly compacted with mechanical tampers.

E. Any mixture that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at Contractor's expense. Skin patching will not be allowed.

F. Compaction of the asphalt mixture shall be in accordance with WSDOT Standard Specifications Section 5-04.3(10), as modified herein.

1. For density determination, each day’s production will be treated as a lot. A minimum of ten sublots will be tested each day; 15 if production tonnage is expected to exceed 600 tons for that day. In no case shall the sublot size for density determination exceed 40 tons. Random test locations will be determined according to WSDOT Test Method T 716.

2. In-place density shall be a minimum of 93% of the reference theoretical maximum density as determined by WSDOT FOP for AASHTO T209.

3. If nuclear density testing is the basis for acceptance, then the nuclear density testing equipment shall be calibrated in accordance with WSDOT SOP 730. Calibration cores may be omitted at the Engineer’s discretion.

4. Determine reference theoretical maximum density as the moving average of the most recent five determinations for the lot of asphalt concrete being placed according to WSDOT Materials Manual Standard Operating Procedure 729.

5. Engineer may evaluate cyclic density as described in WSDOT Standard Specifications Section 5-04.3(10)B to assess segregation.

G. Joints:

1. The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least 6-inches; however, the joint in the surface course shall be at the centerline of the pavement if that pavement is to be used by normal car or truck traffic.

2. Longitudinal joint density shall be assessed once per sublot in accordance with WSDOT SOP 735. Low density is defined as less than 91 percent of reference maximum density. When placing a single paver width patch, consecutive density tests will be taken on alternating sides of the patch.

3. Transverse joints in one course shall be offset by at least 10-feet longitudinally from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10-feet.

3.03 JOINT SEALANT

A. Apply joint sealant to the edges of new paving joints, catch basins, manholes, at the meet lines to concrete structures and as directed by the Engineer.

3.04 SURFACE SMOOTHNESS

A. The completed surface of the wearing course shall conform to the smoothness tolerance requirements of WSDOT Standard Specifications Section 5-04.3(13).

3.05 FIELD QUALITY CONTROL

A. Contractor shall backfill core holes with compacted asphalt or quickset concrete with a minimum compressive strength of 3,000 psi at the Engineer's discretion.

B. Surface Grades: Grades shall conform to tolerance requirements specified herein, except where a closer tolerance is required for the proper functioning of appurtenant structures and drainage as determined by Engineer.

C. After the curing, Contractor shall perform a flood test to check if there are any local depressions on the pavement. All asphalt pavement work where water ponds and does not run off within a reasonable amount of time, as determined by the Engineer, shall be fixed to provide proper drainage. Test shall be performed in the Engineer's presence.

D. Quality Assurance Testing By Engineer:

1. Contractor shall arrange for Engineer to have access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphalt concrete mix.

2. Contractor shall provide reasonably safe and convenient access, acceptable to Engineer, for inspection and sampling of the AC, and shall cooperate in the inspection and sampling process when requested to do so.

3.06 ADJUSTING AND CLEANING

A. The Contractor shall adjust manholes, utility vaults and boxes, and valve boxes to final grades.

B. At the conclusion of the work and before final payment is made, Contractor shall remove all debris of every kind from the premises and leave the area broom clean.

3.07 PROTECTION

A. After final rolling, the Contractor shall not permit vehicular traffic on pavement for a minimum of 24 hours until it has cooled and hardened.

B. The Contractor shall erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

END OF SECTION

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