

Town of Mead Design Standards and Construction Specifications

SECTION 32 12 00 FLEXIBLE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Full depth and/or composite hot bituminous pavement (asphalt) over prepared subgrade.
- B. Overlay, patch and/or pavement rehabilitation applications for streets, parking lots and other miscellaneous asphalt pavement.

1.2 REFERENCES

- A. AASHTO T 230: Standard Method of Test of Determining Degree of Pavement Compaction of Bituminous Aggregate Mixtures
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C29 – Unit Weight and Voids in Aggregate
 - 2. ASTM C88 – Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
 - 3. ASTM C117 - Materials Finer than No. 200 Sieve in Mineral Aggregates by Washing
 - 4. ASTM C128 – Specific Gravity Test and Absorption of Fine Aggregate
 - 5. ASTM C131 – Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - 6. ASTM C136 – Sieve or Screen Analysis of Fine and Coarse Aggregates
 - 7. ASTM D70 – Specific Gravity of Semi-Solid Bituminous Materials
 - 8. ASTM D2726 – Bulk Specific Gravity of Compacted Bituminous Mixtures
 - 9. ASTM D2041 – Theoretical Maximum Specific Gravity of Bituminous Paving Mixtures
 - 10. ASTM D4462 – Viscosity of Asphalts (Bitumens)
 - 11. ASTM D2172 – Quantities Extraction of Bitumens from Bituminous Paving Mixtures
 - 12. ASTM D2419 – Sand Equivalent Value of Soils and Fine Aggregate
 - 13. ASTM D290 – Bituminous Mixing Plant Inspection
 - 14. ASTM D6373 – Performance Graded Asphalt Binder
 - 15. ASTM D692 – Course Aggregate for Bituminous Paving
 - 16. ASTM D1073 – Fine Aggregate for Bituminous Paving Mixtures
 - 17. ASTM D1241 – Materials for Soil-Aggregate Subbase, Base and Surface Courses
 - 18. ASTM D2026 – Cutback Asphalt (Slow-Curing Type)
 - 19. ASTM D2027 – Cutback Asphalt (Medium-Curing Type)
 - 20. ASTM D2028 – Cutback Asphalt (Rapid-Curing Type)
 - 21. ASTM D2950 – Density of Bituminous Concrete in Place by Nuclear Methods
- C. Surface Preparation Standards (SSPC)
 - 1. SP-2: Superior Performing Asphalt Pavement System (Superpave) Level 1 Mix Design
- D. Colorado Department of Transportation
- E. Colorado Asphalt Pavement Association

Town of Mead Design Standards and Construction Specifications

1.3 SUBMITTALS

- A. Record of Work: Maintain record of time and date of placement, temperature, and weather conditions. Retain until completion and furnish a final copy to Town of Mead.
- B. Proposed Design Job Mix Formula for each mixture required by the work: the mixture design shall be determined using AASHTO T-312 or Colorado Procedure CP-L 5115 for the Superpave Method of Mixture Design.
- C. Test Reports: Proposed Design Job Mix testing shall be performed in a materials laboratory under the direct supervision of, and shall be stamped and signed by, a Professional Engineer licensed in the State of Colorado practicing in this field. In addition, the General Contractor shall submit as part of the Proposed Design Job Mix, documents to verify the following:
 - 1. Source of materials
 - 2. Gradation, specific gravity, source and description of individual aggregates and the final blend
 - 3. Aggregate physical properties
 - 4. Source and Grade of the Performance Graded Binder (PG Binder)
 - 5. Proposed Design Job Mix - aggregate and additive blending, final gradation shown on 0.45 power graph, optimum asphalt content
 - 6. Required mixing and compaction temperatures
 - 7. Mixture properties determined at a minimum of four asphalt contents and interpolated at optimum and graphs showing mixture properties versus asphalt content.
 - 8. Sampling and testing of asphalt concrete mixtures for quality control during paving operations
 - a. Uncompacted asphalt concrete mix
 - i. Asphalt cement content: ASTM D2172 (AASHTO T164)
 - ii. Maximum Specific Gravity: ASTM D2041 (AASHTO T209)
 - b. Compacted asphalt concrete mix
 - i. Bulk density: ASTM D1188 (AASHTO T166)
 - c. Perform at least one test for each day's paving, but not less than one test per each 4,000 sf of each lift.

1.4 QUALITY ASSURANCE

- A. Materials and installation shall conform to applicable portions of Colorado Department of Transportation (CDOT) and Town of Mead construction specifications, standards and details.

1.5 REGULATORY REQUIREMENTS

- A. For work on public streets or rights-of-way, conform to the requirements of **Town of Mead Design Standards and Construction Specifications** and details.
- B. Comply with applicable requirements of CABO/ANSI A117.1 for accessibility requirements related to walks, ramps, parking areas, drives, curb ramps, etc.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Transport mixture from mix plant in trucks with tight, clean, smooth, non-sticking compartments. Thinly coat hauling compartments with lime-water mixture, paraffin oil or other approved release agent to prevent sticking. Petroleum distillates such as kerosene or fuel oil are not approved release agents. Elevate and drain compartment of excess solution before loading mix.
- B. Cover loads to protect from weather and prevent loss of heat.

Town of Mead Design Standards and Construction Specifications

- C. Provide insulated truck beds during temperature below 50 degrees F on long distance deliveries.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when underlying surface is muddy, frozen or wet.
- B. Place material only when weather conditions permit pavement to be properly placed and compacted.

The hot mix asphalt will be placed only when both the air and surface temperatures are equal to or exceed the temperatures specified in the table below:

CDOT Table 401-3: Placement Temperature Limitations in F

Compacted Layer Thickness (Inches)	Minimum Air and Surface Temp. (Degrees F and rising)	
	Top Layer	Other Layers
1½ or less	60	50
>1½ to 3	50	40
3 to 4	45	35

- C. Air temperature shall be taken in the shade. Surface is defined as the existing base on which the new pavement is to be placed.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General: Pavement shall be asphalt of the plant hot mix type. Materials and construction shall comply with Section 403 and 702 of the CDOT Standards and Specifications for Road and Bridge Construction.
- B. Tack Coat:
 - 1. SS-1 or CSS-1h
 - 2. AASHTO M208 or M140
- C. Asphaltic Cement
 - 1. Superpave Performance Graded (PG) binder of PG64-22 or PG58-28 Table 702-1 of CDOT standard section 702
 - 2. Will not be acidic modified or alkaline modified
 - 3. Will not contain any used oils that have not been refined
 - 4. Modifiers will not be carcinogenic
- D. Aggregate for Asphaltic Concrete
 - 1. Sound, angular crushed stone, crushed gravel, or crushed slag: ASTM D692
 - 2. Sand, stone, or slag screening: ASTM D1073
 - 3. Percent wear: ASTM C131, less than 45 for aggregates retained in #10 sieve
- E. Base Course Aggregates for Asphaltic Concrete
 - 1. Uncrushed gravel may be used in mixture if it meets design criteria specified.
 - 2. Provide uniform quality combined aggregates with a minimum sand equivalent value of 40.

Town of Mead Design Standards and Construction Specifications

3. Provide aggregate in gradations for courses to comply with Class S and SX, Colorado Department of Transportation, ASTM C136
 4. A maximum of 20% Reclaimed Asphalt Pavement (RAP) will be allowed in (non-polymer or non-rubberized) mixes, provided that all the requirements for hot bituminous pavement are met.
- F. Surface Course Aggregates for Asphaltic Concrete
1. Provide natural sand, unless sand prepared from stone, slag, or gravel or combinations are required to suit local conditions.
 2. Provide uniform quality combined aggregate with a minimum sand equivalent value of 50.
 3. Provide aggregate in gradations for courses to comply with Class S or SX, Colorado Department of Transportation, ASTM C136. Wearing surface course shall be Grading S or SX for residential roadway classification and Grading S for collectors, arterials, and all industrial/commercial roadways.
- G. Hydrated Lime for Aggregate:
1. May be added at the rate of 1% by dry weight of the aggregate and shall be included in the amount of material passing the No. 200 sieve. Hydrated lime for aggregate pretreatment will conform to ASTM C207, Type N. Residue retained on a No. 200 sieve will not exceed 10% when determined in accordance with ASTM C110. Drying of the residue in an atmosphere free from carbon dioxide will not be required.
- H. Weed Control:
1. First application: "Roundup," or accepted substitute.
 2. Second application: Casoron "W-50" or "G-10" with colored marker dye, manufactured by Pacific Coast Borax Company or an accepted substitute of non-flammable type.

2.2 ACCESSORIES

A. Traffic Control Devices

1. Signs.
 - a. Sign faces, posts and bases shall be in conformance with the following materials specifications. All nonstandard sign faces, posts and bases must be approved by the Town. Private property or nonstandard signs will be maintained by the property owner. Contact the Town for additional details and submit shop drawings for approval prior to fabrication. All signs shall conform to current M.U.T.C.D. Standards and Colorado Supplements.
2. Sign Posts.
 - a. For large signs greater than 12" W x 18" H and for multiple signs of any size mounted on the same post: sign posts shall be two (2) inch by two (2) inch galvanized telespar tube.
 - b. For regular single signs 12" W x 18" H or smaller: sign posts shall be one and one-half (1-1/2) inch by one and one-half (1-1/2) inch galvanized telespar tube.
 - c. Galvanized telespar tube shall have 0.120-inch wall thickness, and three-eighths (3/8) inch holes drilled on one (1) inch centers, on all sides over full length. Tube shall be minimum of ten (10) feet in length.
3. Sign Post Anchor Bases (Stubs): All sign post anchor bases shall be twist resistant square galvanized telespar tube post with thickness and hole pattern the same as sign posts. Use 2-1/4" by 2-1/4" anchor for large posts and 1-3/4" by 1-3/4" anchor for regular posts. Bases shall be embedded a minimum of 36" below finished grade and shall extend 3" above finished grade.

Town of Mead Design Standards and Construction Specifications

4. Signs Post Anchor Bases with concrete footing: Sign, post, base and compacted soil shall be rigid and able to withstand wind loads. Where predominantly clay soils are present which will not properly compact at sign base, install a 6" diameter by 36" deep concrete footing around signs post anchor base for all signs in landscaped areas.
 5. All signs and posts shall be mounted and secured with municipal-approved vandal-proof type TL-3896 drive rivets with washers, or accepted substitute.
 6. All posts shall be mounted and secured with break-away capability, per M.U.T.C.D.
- B. Pavement Marking: Specified pavement marking materials shall be used at locations as identified below.
1. Striping shall be white, blue, yellow and red color epoxy meeting requirements of CDOT Standard Specification 713. Verify colors and extent of epoxy prior to application. Unless noted on plans, evident at existing striping or instructed, provide white in color for traffic striping, parking stalls, and other control markings on parking zone pavement, yellow in color for traffic control markings or restricted parking or where indicated, blue in color for accessible parking stalls, and red in color for curbs where no parking is indicated. Reflectorized paint required for traffic stripes and control markings on public road or street pavements.
 2. 3M Stamark 5730 preformed plastic marking material or an accepted substitute shall be used for crosswalks, stop bars, symbols (i.e. turn arrows) and striping for separation of turn and through lanes in right-of-way.

2.3 MIXES/SOURCE QUALITY CONTROL

- A. Determine full depth design mix based upon aggregates furnished.
1. Test mix shall be provided by independent laboratory at Contractor's expense.
 2. Submit mix designs for review and acceptance by Town Engineer
- B. Submit mix design giving unit weight and to meet following requirements prior to placement of asphalt:

Property	S (75)	SX (75)
Air Voids in Mix %, (N Design)	3.5-4.5	3.5-4.5
Initial Gyration	7	7
Design Gyration	75	75
Hveem Stability	28 minutes	28 minutes
Voids Filled w/ Asphalt (%)	65 - 80	65 - 80

Town of Mead Design Standards and Construction Specifications

- C. Establish a single percentage passing each sieve size, a single percent of asphalt and a mix temperature. Maintain job mixes within following ranges of design mix:

Property	Allowable Range with Respect to Design Mix
Aggregate Sieve Size: ¾-inch and larger	± 6%
Aggregate Sieve Size: #4 - #8	± 5%
Aggregate Sieve Size: #30	± 4%
Aggregate Sieve Size: #200	± 2%
Asphalt Content Tolerance	± 0.3%
Discharge Mix Temperature Tolerance	± 20° F

PART 3 EXECUTION

3.1 EXAMINATION

- A. Establish and maintain required lines and elevations. Provide grade and location stakes under this section as required for asphaltic concrete paving work.
- B. Operate heavy, rubber-tired front loader or fully loaded water truck over subgrade of paved areas. Where soft spots occur, remove loose materials and replace with Class 5 or 6 road base aggregate complying with CDOT standards compacted to level of subgrade.

3.2 PREPARATION

- A. Prepare subgrade under provisions of Section 31 00 00 Earthwork
- B. Loose and Foreign Material
1. Remove loose and foreign material from compacted subgrade surface immediately before application of paving. Clean surface with mechanical sweeper, blowers, or hand brooms, until surfaces are free from dust.
- C. Weed Control
1. If weeds or vegetation exist at or on the subgrade, apply "Round-up" at rates following manufacturer's instructions. Apply "Round-up" three days prior to removal of vegetation, subgrade preparation and application of Casoron as described below to allow "Round-up" to kill all vegetation. Remove all living and dead weeds, root balls, tree/shrub roots, vegetation, and/or any organic matter from on or in the subgrade per applicable earthwork specifications prior to subgrade preparation and paving at all areas to be paved.
 2. After all fine grading, checking, shaping, and compacting of the subgrade has been completed, and just prior to placing asphalt or aggregate base course, all subgrade soil in the area to receive asphalt pavement shall be thoroughly treated with Casoron soil sterilant (in addition to "Round-up" and regardless of presence of existing weeds or vegetation). Casoron shall be thoroughly sprinkled to distribute the chemical through the first two or three inches of the subgrade. For all areas to be paved, apply Casoron weed control at a minimum rate per 100 square yards of 2.4 pounds for G-10 or 4.0 pounds for 50w at rates and methods recommended by manufacturer within one day of paving.
 3. The Contractor shall provide all necessary protection to prevent injury to animal, fish, or plant life and property occasioned by the application of the soil sterilant. Apply on a calm, wind-free day. The Contractor will be held responsible for all application of soil sterilant or the storage of same. Protect existing and new trees and shrubs beyond the limit of paving from damage due to weed killer or soil sterilant overspray or root contact. Extra caution is required to prevent over-application of products in areas to be paved under tree canopies. Trees and shrubs damaged or killed by weed killer or sterilant application shall be replaced by the contractor at contractor's expense.
 4. Do not apply within 20 feet of trees or shrubs.

Town of Mead Design Standards and Construction Specifications

D. Tack Coat

1. Apply in similar manner as prime coat, except as modified.
2. Dilute material with equal parts of water and apply to contact surfaces of previously constructed asphaltic concrete or Portland cement concrete and surfaces.
3. Apply at rate of 0.05 to 0.15 gallons per square yard of surface using a mechanical distributor (for main line paving).
4. Apply tack coat by brush to contact surfaces of curbs, gutters, catch basins, and other structures projecting into or abutting asphaltic concrete pavement.
5. Allow surfaces to dry until material is at condition of tackiness to receive pavement.

3.3 COLD MILLING

- A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.
 1. Mill to minimum depth of 1 ½-inches, or as indicated on the plans.
 2. Mill to a uniform finished surface free of gouges, grooves, and ridges of more than ¼ inch depth.
 3. Control rate of milling to prevent tearing of existing asphalt course.
 4. Repair or replace curbs, manholes, and other construction damaged during cold milling.
 5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
 6. Transport milled hot-mix asphalt to asphalt recycling facility. Town may request that material be stockpiled at Town facility.
 7. Keep milled pavement surface free of loose material and dust.

3.4 RING/FRAME ADJUSTMENTS

- A. Set ring/frames of subsurface structures to final grade as a part of this work.
- B. Placing Ring/Frames
 1. Surround ring/frames set to elevation with a ring of compacted asphalt or concrete base prior to paving.
 2. Place asphalt concrete mixture up to 1-inch below top of ring/frame, slope to grade, and compact by hand tamping.
- C. Adjust frames to proper position to meet paving.
- D. If permanent covers are not in place, provide temporary covers over openings until completion of rolling operations.
- E. Set ring/frames to grade, flush with surface of adjacent pavement.

3.5 PREPARING THE MIXTURE

- A. Comply with ASTM D995 for material storage, control, and mixing and for plant equipment and operation.
- B. Stockpile
 1. Keep each component of the various sized combined aggregates in separate stockpiles.
 2. Maintain stockpiles so that separate aggregate sizes will not be intermixed and to prevent segregation.

Town of Mead Design Standards and Construction Specifications

C. Heating

1. Heat the asphalt cement at the mixing plant to viscosity at which it can be uniformly distributed throughout mixture.
2. Use lowest possible temperature to suit the temperature viscosity characteristics of asphalt.
3. Do not exceed 350 degrees F.

D. Aggregate

1. Heat-dry aggregates to acceptable moisture content.
2. Deliver to mixer at recommended temperature to suit the penetration grade and viscosity characteristics of asphalt cement, ambient temperature, and workability of mixture.
3. Accurately weigh or measure dry aggregates and weigh or meter asphalt cement to comply with job-mix formula requirements.

- E. Mix aggregate and asphalt cement to achieve 90-95 percent coated particles for base mixtures and 85-90 percent coated particles for surface mixture, per ASTM D2489.

3.6 EQUIPMENT

A. Bituminous Pavers:

1. Pavers shall be self-propelled, spread material without tearing surfaces, be equipped with an activated screed assembly, be heated if necessary, control pavement edges to true lines without use of stationary forms and capable of spreading and finishing the asphalt plant mix material in widths applicable to the typical sections and thicknesses for the work.
2. Pavers used for roadway shoulders, recreational paths and similar construction will be capable of spreading and finishing the courses of asphalt plant mix material in widths shown in the contract documents.
3. Pavers will be equipped with automatic screed controls with sensors capable of sensing grade from an outside reference line, and maintaining the screed at the specified longitudinal grade and transverse slope. The sensor will be constructed to operate from either or both sides of the paver and will be capable of working with the following devices:
 - a. Ski-type device at least 30 feet in length
 - b. Short ski or short shoe
 - c. At least 5,000 feet of control line and stakes
4. The controls will be capable of maintaining the screed at the specified transverse slope within plus or minus 0.1 percent.
5. Manual operation will be permitted:
 - a. For constructing irregularly shaped or minor areas
 - b. If the automatic controls fail or malfunction the equipment may be operated manually for the remainder of the normal working day, provided specified results are obtained. However, if specified surface tolerances cannot be achieved, paving operations will be suspended until satisfactory correction, repairs of equipment or replacements are made.
6. Placement of hot mix asphalt on a waterproofed bridge deck shall be accomplished with equipment that will not damage the membrane or other protective covering.

B. Rolling Equipment

1. Steel-wheel roller: Self-propelled, contact pressure of 250 to 350 psi per inch of width of roller wheel, equipped with adjustable scrapers and means for keeping wheel wet to prevent mix from sticking.

Town of Mead Design Standards and Construction Specifications

- 2. Pneumatic-tired rollers: Self-propelled, contact pressure under each tire of 85 to 110 psi, wheels spaced so that one pass will accomplish one complete coverage equal to rolling width of machine, oscillating wheels. Remove and replace immediately tires picking up fines.
- C. Hand Tools: Provide rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heaters, and other miscellaneous small tools as required.

3.7 PLACING THE MIX

- A. Place asphalt concrete mixture on prepared surface, spread and strike-off using paving machine.
- B. Complete placement over full width of section on each day's run.
- C. Spread mixture at minimum temperature specified by CDOT Table 401-5 for the specific binder used in the asphalt mix:
 - 1. PG 64-22: 320 F minimum mix discharge temperature, 235 F minimum delivered mix temperature
 - 2. PG 58-28: 275 F minimum mix discharge temperature, 235 F minimum delivered mix temperature
 - 3. The maximum mix discharge temperature shall not exceed the minimum discharge temperature by more than 30 F.
 - 4. Delivered mix temperature shall be measured behind the paver screed.
 - 5. Hot asphalt mixture shall be produced at the lowest temperature with the specified temperature range:
 - a. A workable mix that provides for uniform coating of aggregates, in accordance with AASHTO T195.
 - b. Allowing the required compaction to be achieved.
- D. Inaccessible and small areas may be placed by hand.
- E. Conform to the grade, cross section, finish thickness, and density indicated.
- F. Lift Thickness
 - 1. Place in multiple lifts. Place asphalt in lifts such that each compacted lift thickness is no less than 2.0" thick and no greater than 3.0" thick. Top lift to be 2" thick.
 - 2. Typical Lift Thickness Sequencing:

Final Asphalt Section Required (inches)	No. of Lifts	Thickness of each Lift from bottom to top lift (inches)
2"	1	2
3"	1	3
4"	2	2-2
5"	2	3-2
6"	3	2-2-2
7"	3	3-2-2
8"	3	3-3-2
9"	4	3-2-2-2
10"	4	3-3-2-2
>10	Review with Town Engineer	

Town of Mead Design Standards and Construction Specifications

G. Paver Placing

1. Unless otherwise directed, place pavers along centerline of areas in crowned section and at high side on one-way slope and in direction of traffic flow.
2. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips.
3. Complete base courses before placing surface courses.
4. Place mixture in as continuous an operation as practicable.

H. Hand Placing

1. Spread, tamp, and finish mixing using hand tools in areas where machine spreading is not possible as acceptable to Town Engineer.
2. Place mixture at a rate that will insure handling and compaction before mixture becomes cooler than acceptable working temperature.

I. Joints

1. Construct transverse joint at right angles to centerline when operations are suspended long enough for mixture to chill.
2. Construct joints to have same texture, density, and smoothness as adjacent sections of asphalt concrete course.
3. Clean contact surfaces free of sand, dirt, or other objectionable material and apply tack coat.
4. Offset transverse joints in succeeding courses not less than 24 inches.
5. Cut back edge of existing pavement or previously placed course to expose an even, vertical surface for full course thickness.
6. Offset longitudinal joints in succeeding courses not less than 6 inches.
7. When the edges of longitudinal joints are irregular, honeycombed or inadequately compacted, cut back unsatisfactory sections to expose an even, vertical surface for full course thickness.
8. Wearing course constructed in even number of strips; place 1 longitudinal joint on centerline of road.
9. Wearing course constructed in odd number of strips; place the centerline of 1 strip on centerline of road.
10. Joints shall not be placed in traffic wheel paths.

- J. Gutter: Finish surface high adjacent to concrete gutter so when compacted surface is slightly higher than edge of curb and flashing.

3.8 COMPACTING THE MIX

- A. All paving will be compacted to 94 +/- 2% of Maximum Theoretical (RICE) density, CP-51 or AASHTO T209: Maximum Specific Gravity of Bituminous Paving Mixtures, as determined by ASTM D 2950. RICE values will be used in calculating Relative Compaction according to CP-44 or AASHTO T166.
- B. Provide pneumatic and steel-wheel type rollers to obtain the required pavement density, surface texture and rideability.
- C. Begin rolling operations when the mixture will bear weight of roller without excessive displacement and complete as quickly as possible after placement occurs.

Town of Mead Design Standards and Construction Specifications

- D. Compaction operations will be continuous until the required density is achieved or the density requirements are not met and the mix temperature falls below 185° F or there is obvious surface distress or breakage. Minimum compaction temperatures may be adjusted according to the asphalt binder supplier recommendations. Adjusted minimum compaction temperatures must be shown on the approved mix design or on the asphalt binder supplier documentation kept on file at the jobsite.
- E. Do not permit heavy equipment, including rollers to stand on finished surface before it has thoroughly cooled or set.
- F. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
- G. Start rolling longitudinally at extreme lower side of sections and proceed toward center of pavement. Roll to slightly different lengths on alternate roller runs.
- H. Do not roll centers of sections first under any circumstances.
- I. Breakdown Rolling
 - 1. Accomplish breakdown or initial rolling immediately following rolling of transverse and longitudinal joints and outside edge.
 - 2. Operate rollers as close as possible to paver without causing pavement displacement.
 - 3. Check crown, grade, and smoothness after breakdown rolling.
 - 4. Repair displaced areas by loosening at once with lutes or rakes and filling, if required, with hot loose material before continuing rolling.
- J. Second Rolling
 - 1. Follow breakdown rolling as soon as possible, while mixture is hot and in condition for compaction.
 - 2. Continue second rolling until mixture has been thoroughly compacted.
- K. Finish Rolling
 - 1. Perform finish rolling while mixture is still warm enough for removal of roller marks by combination of steel and pneumatic rollers.
 - 2. Continue rolling until roller marks are eliminated and course has attained specified density, and required surface texture and surface tolerances.
 - 3. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled and attained its maximum degree of hardness.
- L. Patching
 - 1. Remove and replace defective areas.
 - 2. Cut-out and fill with fresh, hot asphaltic concrete.
 - 3. Remove deficient areas for full depth of course.
 - 4. Saw cut sides perpendicular and parallel to direction of traffic with edges vertical.
 - 5. Apply tack coat to exposed surfaces before placing new asphaltic concrete mixture.
 - 6. Compact by rolling to specified surface density and smoothness.

3.9 JOINING TO EXISTING WORK

- A. Saw cut sides vertically and apply tack coat to exposed asphalt surfaces before placing new pavement. Meet existing thickness of surface and base courses, but not less than specified for new work.

Town of Mead Design Standards and Construction Specifications

- B. All joints shall be compacted to 94.0% +/- 3.0% of RICE, taken fully on each side of joint, every 200 lineal feet. RICE values shall be used in calculating Relative Compaction according to AASHTO T166.

3.10 FIELD QUALITY CONTROL

- A. The Contractor will engage a certified testing agency to perform field testing to determine compliance of in-place asphaltic concrete paving materials and compaction.
- B. It is the Contractor's responsibility to initiate, coordinate and accommodate all required tests and inspections.
- C. Testing Agency will test in-place pavement for density and thickness.
- D. Asphalt density testing:
 - 1. Every one-hundred fifty (150) lineal feet per driving lane
 - 2. Every 2,000 square feet of parking lot
 - 3. Densities shall be between ninety-four percent (94%) and ninety-six percent (96%) of the RICE unit weight
- E. Contractor to verify final surfaces are of uniform texture, conforming to required grades and cross sections.
- F. The Contractor will core the pavement as required by the testing agency for field density tests in accordance with AASHTO T 230, Method B, or for field calibration of nuclear density equipment in accordance with ASTM D 2950.
 - 1. Minimum testing frequency shall be 1/500 lane feet per lift (min. of 1 per street) or as directed by the Town or testing agency.
 - 2. Testing agency will take not less than 4-inch diameter pavement specimens.
 - 3. At the testing agency's discretion, cores may be required at the beginning of placement of each pavement layer or change of mixture materials or gradation.
 - 4. Untested areas during placement will require cores to be taken to verify compaction.
 - 5. Contractor to repair holes from test specimens.
- G. For each completed course or from locations directed by the testing agency, and at a minimum, a representative asphalt pavement sample shall be taken from the first one thousand (1,000) tons, and all mix properties shall be verified. The percent voids filled with asphalt cement, Hveem stability, and Lottman shall be verified at a minimum of every ten thousand (10,000) tons. Asphalt testing shall comply with ASTM D1559. Two copies of all test reports shall be submitted directly to the Town Engineer.
- H. Acceptable density of in-place course materials is between 92 and 96 percent of the recorded laboratory RICE unit weight. Immediately re-compact asphaltic concrete not conforming to acceptable density. Remove and replace all sections not in conformance density requirements.
- I. Thickness: Variations from approved drawings
 - 1. Base course: 1/4-inch +
 - 2. Remove and replace paving less than minimum thickness
- J. Grade Tolerance: ±0.1 feet
- K. Surface Smoothness
 - 1. Test using a 10-foot straight edge applied parallel to direction of drainage.
 - 2. Advance straight edge five feet, maximum 1/4-inch per foot from nearest point of contact.
 - 3. Do not permit pockets or depressions where water may pool.

Town of Mead Design Standards and Construction Specifications

4. Remove and replace areas, deficient in smoothness. Overlay corrections may be permitted only if acceptable to the Town.
- L. Inspection: The work of this section is subject to the inspection and approval of the Town. The following inspections are required:
 1. Protection of adjacent property
 2. Staking and establishment of elevations
 3. Establishment and compaction of subgrade
 4. Placement and compaction of bituminous base course and wearing surface
 5. Final inspection
 6. Obtain approval of each element of work listed above in sequence of its completion before proceeding with the next item

3.11 CLEANING

- A. After completion of paving operations, clean surfaces of excess or spilled asphalt materials to the satisfaction of the Town.

3.12 PROTECTION OF FINISHED WORK

- A. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened, and in no case sooner than 6 hours.
- B. Provide barricades and warning devices as required to protect pavement and the general public.

3.13 WARRANTY

- A. Provide installer's 2-year written warranty endorsed by the contractor warranting the pavement from creeping, shoring, cracking, softening, settling, ponding and other defects due to improper placing or defective materials. Replace defective materials upon notification by the Town in accordance with the requirements of the original work.

3.14 SCHEDULE OF MIX PLACEMENT:

- A. Refer to approved drawings for asphalt thickness and subgrade requirements.

END OF SECTION 32 12 00