

DIVISION 400 - PAVEMENTS

SECTION 401 - HOT MIX ASPHALT (HMA) PAVEMENT

**401.01 Description.** This section describes furnishing and placing HMA pavement on a prepared surface.

**401.02 Materials.**

Asphalt Cement (PG 64-16)	702.01
Emulsified Asphalt	702.04
Aggregate for Hot Mix Asphalt Pavement	703.09
Filler	703.15
Hydrated Lime	712.03

**(A) General.** HMA pavement shall be plant mixed and shall include mixture of aggregate and asphalt cement, and may include reclaimed asphalt pavement (RAP) or filler, or both.

HMA pavement shall include surface course and may include one or more binder courses, depending on HMA pavement thickness indicated in the contract documents.

RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RAP by crushing until 100 percent of RAP passes 3/4-inch sieve. Size, grade uniformly, and combine materials such that blend of RAP and aggregate material conforms to grading requirements of Subsection 703.09 - Aggregate for Hot Mix Asphalt Pavement.

In surface and binder courses, aggregate for HMA may include RAP quantities up to 15 percent of total mix weight.

Quantity of filler material to correct deficiencies in aggregate gradation passing the No. 200 sieve shall not exceed 3 percent by weight of fine aggregates.

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**(B) Job-Mix Formula and Tests.** Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's *Mix Design Methods for Asphalt Concrete and Other Hot Mix Types*, Manual Series No. 2 (MS-2) for either Marshall Method or Hveem Method of Mix Design.

Limit compacted lift thickness and asphalt content of job-mix formula as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

<b>TABLE 401.02-1 - LIMITS OF COMPACTED LIFT THICKNESS AND ASPHALT CONTENT</b>				
<b>MIX NO.</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>
Minimum to Maximum Compacted Thickness for Individual Lifts (Inches)	2-1/4 to 3	2 to 3	1-1/2 to 3	1-1/4 to 3
Asphalt Content Limits (Percent of Total Weight of Mix)	3.8 to 6.1	4.3 to 6.1	4.3 to 6.5	4.8 to 7.0

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Asphalt content limits for porous aggregate may be exceeded only if accepted in writing by the Engineer.

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Meet job-mix formula design criteria specified in Table 401.02-2 - Job-Mix Formula Design Criteria.

<b>TABLE 401.02-2 - JOB-MIX FORMULA DESIGN CRITERIA</b>	
<b>Hveem Method Mix Criteria (AASHTO T 246 and AASHTO T 247)</b>	
Stability, minimum	37
Air Voids (percent) <sup>1</sup>	3 - 5
<b>Marshall Method Mix Criteria (AASHTO T 245)</b>	
Compaction (number of blows each end of specimen)	75
Stability, minimum (pounds)	1,800
Flow (x 0.01 inch)	8 - 16
Air Voids (percent) <sup>1</sup>	3 - 5
<b>Notes:</b>	
1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269.	

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Minimum percent voids in mineral aggregates (VMA) of job-mix formula shall be as specified in Table 401.02-3 - Minimum Percent Voids in Mineral Aggregates (VMA).

<b>TABLE 401.02-3 - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES (VMA)</b>					
Nominal Maximum Particle Size, (Inches)	1-1/2	1	3/4	1/2	3/8
VMA, (percent) <sup>1</sup>	11	12	13	14	15
<b>Notes:</b>					
1. VMA: See Asphalt Institute Manual MS-2, Chapter 4.					

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65 (C) **Submittals.** Establish and submit job-mix formula for each type of  
 66 HMA pavement mix indicated in the contract documents as follows:

- 67
- 68 (1) Design percent of aggregate passing each required sieve size.
- 69
- 70 (2) Design asphalt content added to aggregate, based on total  
 71 weight of mix.
- 72
- 73 (3) Design proportion of processed RAP.
- 74
- 75 (4) Design temperature of mixture at point of discharge at paver.
- 76
- 77 (5) Source of aggregate.
- 78
- 79 (6) Grade of asphalt cement.
- 80
- 81 (7) Test data used to develop job-mix formula.
- 82

83 With the exception of item (4) in this subsection, if design  
 84 requirements are modified after the Engineer accepts job-mix formula,  
 85 submit new job-mix formula before using HMA produced from modified mix  
 86 design.

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 88 Submit a certificate of compliance for asphalt cement, accompanied  
 89 by substantiating test data.

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 91 (D) **Range of Tolerances for HMA.** Provide HMA within allowable  
 92 tolerances of accepted job-mix formula as specified in  
 93 Table 401.02-4 - Range of Tolerances for HMA.

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TABLE 401.02-4 - RANGE OF TOLERANCES FOR HMA	
Passing No. 4 and larger sieves (percent)	± 7
Passing No. 8 to No. 100 sieves (inclusive) (percent)	± 4
Passing No. 200 sieve (percent)	± 3
Asphalt Content (percent)	± 0.4
Mixture Temperature (degrees F)	± 20

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96 **401.03 Construction.**

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98 **(A) Weather Limitations.** Placement of HMA will not be allowed under  
99 the following conditions:

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(1) On wet surfaces as determined by the Engineer.

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(3) When weather conditions prevent proper method of construction.

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**(B) Equipment.**

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(1) **Mixing Plant.** Use mixing plants that conform to AASHTO M 156, supplemented as follows:

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**(a) All Plants.**

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1. **Automated Controls.** Control proportioning, mixing, and mix discharging automatically. When RAP is incorporated into mixture, provide positive controls for proportioning processed RAP.

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2. **Dust Collector.** AASHTO M 156, Requirements for All Plants, Emission Controls is amended as follows:

Equip plant with dust collector. Dispose of collected material. In the case of baghouse dust collectors, dispose of collected material or return collected material uniformly.

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3. **Modifications for Processing RAP.** When RAP is incorporated into mixture, modify mixing plant in accordance with plant manufacturer's recommendations to process RAP.

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**(b) Drum Dryer-Mixer Plants.**

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1. **Bins.** Provide separate bin in cold aggregate feeder for each individual aggregate stockpile in mix. Use bins of sufficient size to keep plant in continuous

141 operation and of proper design to prevent overflow of  
 142 material from one bin to another.

143  
 144 **2. Stockpiling Procedures.** Separate aggregate  
 145 into at least three stockpiles with different gradations as  
 146 follows: coarse, intermediate, and fine. Separate  
 147 aggregates for Mix V into at least two stockpiles.  
 148 Stockpile RAP separately from virgin aggregates.

149  
 150 **(c) Batch and Continuous Mix Plants.**

151  
 152 **1. Hot Aggregate Bin.** Provide bin with three or  
 153 more separate compartments for storage of screened  
 154 aggregate fractions to be combined for mix. Make  
 155 partitions between compartments tight and of sufficient  
 156 height to prevent spillage of aggregate from one  
 157 compartment into another.

158  
 159 **2. Load Cells.** Calibrated load cells may be used  
 160 in batch plants instead of scales.

161  
 162 **(2) Hauling Equipment.** Use trucks that have tight, clean, smooth  
 163 metal beds for hauling HMA.

164  
 165 Thinly coat truck beds with minimum quantity of non-stripping  
 166 release agent to prevent mixture from adhering to beds. The use of  
 167 diesel or petroleum-based liquid release agents, except for paraffin  
 168 oil, will not be allowed.

169  
 170 Equip each truck with tarpaulin conforming to the following:

- 171  
 172 **(a)** In good condition, without tears and holes.  
 173  
 174 **(b)** Large enough to be stretched tightly over truck bed,  
 175 completely covering mix.

176  
 177 **(3) Asphalt Pavers.** Use asphalt pavers that are:

- 178  
 179 **(a)** Self-contained, power-propelled units.  
 180  
 181 **(b)** Equipped with activated screed or strike-off assembly,  
 182 heated if necessary.

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 184 **(c)** Capable of spreading and finishing courses of HMA  
 185 mixtures in lane widths applicable to typical section and  
 186 thicknesses indicated in the contract documents.

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 188 **(d)** Equipped with receiving hopper having sufficient

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capacity for uniform spreading operation.

(e) Equipped with automatic feed controls to maintain uniform depth of material ahead of screed.

(f) Equipped with automatic screed controls with sensors capable of sensing grade from outside reference line, sensing transverse slope of screed, and providing automatic signals to control screed grade and transverse slope.

(g) Capable of operating at constant forward speeds consistent with satisfactory laying of mixture.

(4) **Rollers.** Rollers shall be self-propelled, steel-tired tandem, pneumatic-tired, or vibratory-type rollers capable of reversing without shoving or tearing HMA mixture. Unless otherwise indicated in the contract documents, provide sufficient number, sequencing, type, and weight of rollers to compact mixture to required density while mixture is still in workable condition. Do not use equipment that will excessively crush aggregate. Operate rollers in accordance with manufacturer's recommendations.

(a) **Steel-Tired Tandem Rollers.** Steel-tired tandem rollers used for initial breakdown or intermediate roller passes shall have minimum gross weight of 12 tons and shall provide minimum 250-pound weight per linear inch of width on drive wheel.

Steel-tired tandem rollers used for finish roller passes shall have minimum gross weight of 3 tons.

Do not use roller with grooved or pitted rolling drum. Replace excessively worn scrapers and wetting pads.

(b) **Pneumatic-Tired Rollers.** Pneumatic-tired rollers shall be oscillating-type, equipped with smooth-tread pneumatic tires of equal size and diameter. Maintain tire pressure within 5 pounds per square inch of designated operational pressure when hot. Space tires so that gaps between adjacent tires are covered by following set of tires.

230 Equip pneumatic-tired rollers used for breakdown or  
 231 intermediate roller passes, with ballast capable of establishing  
 232 an operating weight per tire of not less than 3,000 pounds.  
 233 Equip rollers with tires having minimum 20-inch wheel  
 234 diameter. Inflate tires to 70 to 75 pounds per square inch  
 235 pressure when cold and 90 pounds per square inch when hot.  
 236 Equip rollers with skirt-type devices to maintain temperature of  
 237 tires during rolling operations.

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 239 Equip pneumatic-tired rollers used for kneading finished  
 240 asphalt surfaces, with ballast capable of establishing an  
 241 operating weight per tire of not less than 1,500 pounds. Equip  
 242 rollers with tires having minimum 15-inch wheel diameter.  
 243 Inflate tires to 50 to 60 pounds per square inch pressure.

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 245 **(c) Vibratory Rollers.** Vibratory rollers shall be steel-tired  
 246 tandem rollers having minimum weight of 3 tons. Equip  
 247 vibratory rollers with amplitude and frequency controls and  
 248 speedometer. Operate vibratory roller in accordance with  
 249 manufacturer's recommendations.

250  
 251 **(5) Hand Tools.** Keep hand tools used in production, hauling, and  
 252 placement of HMA clean and free of contaminants. Liquids such as  
 253 diesel or mineral spirits may be used to clean hand tools. Do not  
 254 contaminate HMA with cleaning liquids. Clean hand tools over catch  
 255 pan with capacity to hold all the cleaning liquid. Dry hand tools before  
 256 using with HMA.

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 258 **(6) Material Transfer Vehicle (MTV).**

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 260 **(a) Usage.** Unless otherwise indicated in the contract  
 261 documents, MTV usage applies to surface courses of paving  
 262 projects on all Islands except Lanai. When placing HMA  
 263 surface course, use MTV to independently deliver mixtures  
 264 from hauling equipment to paving equipment. MTV usage will  
 265 not be required for the following:

- 266  
 267 1. Projects with less than 1,000 tons of HMA.  
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 269 2. Temporary pavements.  
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 271 3. Bridge deck approaches.  
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 273 4. Shoulders.  
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 275 5. Tapers.  
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 277 6. Turning lanes.



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7. Driveways.

8. Areas with low overhead clearances.

**(b) Equipment.** When using MTV, install minimum 10-ton-capacity hopper insert in conventional paver hopper. Provide the following equipment:

1. High-capacity truck unloading system in MTV capable of receiving HMA from hauling equipment.
2. MTV storage bin with minimum 15-ton capacity.
3. Auger mixing system in MTV storage bin, paver hopper insert, or paver hopper to continuously mix HMA prior to discharging to conveyor system.

Coordinate plant production rate, number of haul units, and MTV and paver speeds to avoid stop-and-go operations and to provide continuous, uniform, segregation-free material flow.

**(c) Performance Evaluation.** The Engineer will evaluate performance of MTV and mixing equipment by measuring mat temperature profile immediately behind paver screed on first day of paving.

Six temperature profile measurements will be taken of mat surface using non-contact thermometers at 50-foot intervals behind paver. Each temperature profile will consist of three surface temperature measurements taken transversely across mat in approximately a straight line from screed while paver is operating. For each profile, temperatures will be measured approximately 1 foot from each edge and in middle of mat; and difference between maximum and minimum temperature measurements within each temperature profile shall not exceed 10 degrees F. If any two or more temperature profiles exceed allowable 10-degree F temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that material placed by paver meets specified temperature requirements.

Once adjustments are made, the Engineer will repeat measurement procedure to verify that material placed by paver meets specified temperature requirements. Terminate paving if temperature profile requirements are not met during repeated measurement procedure. If equipment fails to meet

326 requirements after measurement procedure is repeated once,  
327 equipment replacement will be required before the Engineer  
328 conducts any further temperature profile measurements.

329  
330 The Engineer may perform additional surface  
331 temperature profile measurements at any time during project.  
332 If two consecutive temperature profiles fail to comply with  
333 specified allowable temperature differential, halt paving  
334 operation and adjust MTV or mixing equipment to ensure that  
335 HMA placed by paver complies with temperature requirements.

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337 **(d) Transport.**

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339 **1. Trailered MTV.** Transport MTV by means of  
340 truck-tractor/trailer combination in accordance with  
341 Chapter 104 of Title 19, Department of Transportation,  
342 entitled "The Movement by Permit of Oversize and  
343 Overweight Vehicles on State Highways".

344  
345 **2. Crossing Bridges for Self-Powered MTV.**  
346 When self-powered MTV exceeds legal axle or total  
347 weight limits for vehicles under the HRS, Chapter 291,  
348 conform to the following when crossing bridges within  
349 project limits unless otherwise indicated in the contract  
350 documents:

- 351  
352 **a.** Completely remove mix from MTV.  
353  
354 **b.** Move MTV at relatively constant speed  
355 not exceeding 5 miles per hour. MTV will not be  
356 allowed to stop on bridge.  
357  
358 **c.** No other vehicle or equipment will be  
359 allowed on bridge.

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361 **(C) Preparation of Surface.** Clean existing pavement in  
362 accordance with Section 310 - Brooming Off. Apply tack coat in accordance  
363 with Section 407 - Tack Coat.

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365 Where indicated in the contract documents, bring irregular surfaces to  
366 uniform grade and cross section by furnishing and placing one or more  
367 leveling courses of HMA Mix V. Spread leveling course in variable  
368 thicknesses to eliminate irregularities in existing surface. Place leveling  
369 course such that maximum depth of each course, when thoroughly  
370 compacted, does not exceed 3 inches.

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371  
372 In multiple-lift leveling course construction, spread subsequent lifts  
373 beyond edges of previously spread lifts in accordance with procedures  
374 contained in current edition of the Asphalt Institute's *Construction of Hot Mix*  
375 *Asphalt Pavements*, Manual Series No. 22 (MS-22) for leveling wedges.  
376

377 **(D) Plant Operation.**  
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379 **(1) Preparation of Asphalt Cement.** Uniformly heat asphalt  
380 cement and provide continuous supply of heated asphalt cement from  
381 storage to mixer. Do not heat asphalt cement above 350 degrees F.  
382

383 **(2) Preparation of Aggregate.** Dry and heat aggregate material  
384 at temperature sufficient to produce design temperature of job-mix  
385 formula. Do not exceed 350 degrees F. Adjust heat source used for  
386 drying and heating to avoid damage to and contamination of  
387 aggregate. When dry, aggregate shall not contain more than 1  
388 percent moisture by weight.  
389

390 For batch plants, screen aggregates immediately after heating  
391 and drying into three or more fractions. Convey aggregates into  
392 separate compartments ready for batching and mixing with asphalt  
393 cement.  
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395 **(3) Mixing.** Measure aggregate and asphalt; or aggregate, RAP,  
396 and asphalt into mixer in accordance with job-mix formula. Mix until  
397 components are completely mixed and adequately coated with  
398 asphalt in accordance with AASHTO M 156. Percent of coated  
399 particles shall be 95 percent when tested in accordance with  
400 AASHTO T 195.  
401

402 **(4) Plant Inspection.** For control and acceptance testing during  
403 periods of production, provide testing laboratory next to plant. Provide  
404 space, utilities, and equipment required by the Engineer for  
405 performing specified tests.  
406

407 **(E) Spreading and Finishing.** Prior to each day's paving operation,  
408 check screed or strike-off assembly surface with straight edge to ensure  
409 straight alignment. Provide screed or strike-off assembly that produces  
410 finished surface without tearing, shoving, and gouging HMA. Discontinue  
411 using spreading equipment that leaves ridges, indentations, or other marks,  
412 or combination thereof in surface that cannot be eliminated by rolling or be  
413 prevented by adjustment in operation.  
414

415 Maintain HMA at minimum 250 degrees F temperature at discharge to  
416 paver. Measure temperature of mix in hauling vehicle just before depositing  
417 into spreader.  
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### 401.03

419 Deposit HMA in a manner that minimizes segregation. Raise truck  
420 beds with tailgates closed before discharging HMA.

421  
422 Lay, spread, and strike off HMA upon prepared surface. Use asphalt  
423 pavers to distribute mixture.

424  
425 Control horizontal alignment using automatic grade and slope controls  
426 from reference line, ski and slope control device, or dual skis.

427  
428 Obtain sensor grade reference from 30-foot ski for first pass. For  
429 subsequent passes, substitution of one ski with joint-matching shoe riding on  
430 finished adjacent pavement is acceptable. Use of a comparable non-contact  
431 mobile reference system and joint matching shoe is acceptable.

432  
433 Avoid stop-and-go operation. Minimize changing forward speed of  
434 paver during paving operation.

435  
436 Offset longitudinal joint in successive lifts by approximately 6 inches.  
437 Position joint in surface course at centerline of pavement when roadway  
438 comprises two lanes of width, or at lane lines when roadway is more than two  
439 lanes in width.

440  
441 In areas where irregularities or unavoidable obstacles make use of  
442 mechanical spreading and finishing equipment impracticable, spread, rake,  
443 and lute mixture by hand tools. For such areas, deposit, spread, and screed  
444 mixture to required compacted thickness.

445  
446 Demonstrate competence of personnel operating grade and crown  
447 control device before placing surface courses. If automatic control system  
448 becomes inoperative during the day's work, the Engineer will permit the  
449 Contractor to finish day's work using manual controls. Do not resume work  
450 until automatic control system is made operative. The Engineer may waive  
451 requirement for electronic screed control device when paving gores,  
452 shoulders, transitions, and miscellaneous reconstruction areas.

453  
454 When production of HMA can be maintained and when practicable,  
455 use pavers in echelon to place surface course in adjacent lanes.

456  
457 At the end of each workday, HMA pavement that is open to traffic  
458 shall not extend beyond an adjacent panel of new lane pavement by more  
459 than distance normally covered in one workday. At end of each workweek,  
460 complete full width of pavement, including shoulders, to same elevation with  
461 no drop-offs. Construct transition taper along lane line at longitudinal  
462 pavement drop-off. Maximum drop-off height shall be 3 inches. Remove  
463 and dispose of transition taper before placing adjoining panel.

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**(F) Compaction.** Immediately after spreading and striking off HMA and adjusting surface irregularities, uniformly compact mixture by rolling.

Initiate compaction at highest mix temperature allowing compaction without excessive horizontal movement. Temperature shall not be less than 220 degrees F.

Finish rolling using tandem roller while HMA temperature is at or above 175 degrees F.

On superelevated curves, begin rolling at lower edge and progress to higher edge by overlapping of longitudinal trips parallel to centerline.

If necessary, repair damage immediately using rakes and fresh mix. Do not displace line and grade of HMA edges during rolling.

Keep roller wheels properly moistened with water or water mixed with small quantities of detergent. Use of excess liquid, diesel, and petroleum-based liquids will not be allowed on rollers.

Along forms, curbs, headers, walls and other places not accessible to rollers, compact mixture with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, trench roller or cleated compression strips under roller may be used to transmit compression.

Remove pavement that is loose, broken, or contaminated, or combination thereof; pavement that shows an excess or deficiency in asphalt cement content; and pavement that is defective in any way. Replace with fresh HMA pavement of same type, and compact. Remove and replace defective pavement and compact at no increase in contract price or contract time.

Operate rollers at slow but uniform speed with drive wheels nearest paver. Continue rolling to attain specified density and until roller marks are eliminated.

**(1) HMA Pavement Courses One and a Half Inches Thick Or Greater.** Where HMA pavement compacted thickness indicated in the contract documents is 1-1/2 inches or greater, compact to not less than 92 percent nor greater than 97 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate.

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Place HMA pavement in individual lifts that are within minimum and maximum allowable compacted thickness for various types of mixture as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

**(2) HMA Pavement Courses Less Than One and a Half Inches Thick.** Where HMA pavement compacted thickness indicated in the contract documents is less than 1-1/2 inches, compaction to a specified density will not be required.

Initiate rolling using non-vibratory, steel-tired, tandem roller. Roll entire surface with minimum of two roller passes. A roller pass is defined as one trip of the roller in one direction over any one spot.

For intermediate rolling, roll entire surface with minimum of four passes of roller.

Finish rolling using steel-tired, tandem roller. Continue rolling until entire surface has been compacted with minimum of three passes of roller, and roller marks have been eliminated.

Do not use rollers that will excessively crush aggregate.

**(3) HMA Pavement Courses One and a Half Inches Thick Or Greater In Special Areas Not Designed For Vehicular Traffic.** For areas such as bikeways that are not part of roadway and other areas not subjected to vehicular traffic, compact to not less than 90 percent of maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Increase asphalt content by at least 0.5 percent above that used for HMA pavements designed for vehicular traffic.

**(G) Joints, Trimming Edges and Utility Marking.** At HMA pavement connections to existing pavements, make joints vertical to depth of new pavement. Saw cut existing pavement and cold plane in accordance with Section 415 - Cold Planing of Existing Pavement to depth equal to thickness of surface course or as indicated in the contract documents.

At HMA connections to previously placed lifts, form joints by cutting back on previous run to expose full depth of course. Dispose of material trimmed from edges. Protect end of freshly laid mixture from rollers.

Apply tack coat in accordance with Section 407 - Tack Coat to contact surfaces of joints before placing additional HMA.

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**401.04 Measurement.**

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After paving, identify and mark location of existing utility manholes, valves, and handholes on finished surface. Adjust existing frames and covers and valve boxes to final pavement finish grade in accordance with Section 604 - Manholes, Inlets and Catch Basins and Section 626 - Manholes and Valve Boxes for Water and Sewer Systems.

**(H) HMA Pavement Samples.** Obtain test samples from compacted HMA pavement within 72 hours of lay down. Provide minimum 4-inch diameter cores consisting of undisturbed, full-depth portion of compacted mixture taken at locations designated by the Engineer in accordance with the "Sampling and Testing Guide for Acceptance and Verification" in Hawaii DOT Highways Division, *Quality Assurance Manual for Materials*, appendix 3.

Restore HMA pavement immediately after obtaining samples. Apply tack coat in accordance with Section 407 - Tack Coat to vertical faces of sample holes. Fill sampled area with new HMA pavement of same type as that removed, and compact.

Only sample and test leveling course if 1-1/2 inches or greater. No compaction requirements for less than 1-1/2 inches.

**(I) HMA Pavement Surface and Thickness Tolerances.** The Engineer will test surface of completed HMA pavement using 10-foot straightedge placed parallel and at right angles to the roadway centerline at selected locations. Pavement surface that varies more than 3/16 inch from testing edge of straightedge between two contacts exceeds surface tolerance.

Thickness of finished HMA pavement shall be within 1/4 inch of thickness indicated in the contract documents.

Correct pavement exceeding specified tolerances by methods accepted by the Engineer, including removal and replacement, at no increase in contract price or contract time.

**(J) Protection of HMA Pavement.** Except for construction equipment directly connected with paving operations, keep traffic off HMA pavement.

Protect HMA pavement from damage until it has cooled and set.

Do not refuel equipment or clean equipment or hand tools over paved surfaces unless catch pan or device that will contain spilled fuel is provided. After completion of refueling or cleaning, remove catch pan or device.

**(A)** Asphalt concrete pavement will be paid on a lump sum basis. Measurement for payment will not apply.

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(B) The Engineer will measure leveling course per ton in accordance with the contract documents.

**401.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for each of the following pay items when included in the proposal schedule:

<b>Pay Item</b>	<b>Pay Unit</b>
HMA Pavement, Mix No. _____	Lump Sum
Leveling Course	Ton

(1) 5% of the contract bid price upon submitting a job-mix formula acceptable to the Engineer;

(2) 75% of the contract bid price upon preparing the surface, spreading, and finishing the mixture; and compacting the mixture by rolling;

(3) 20% of the contract bid price upon cutting samples from the compacted pavement for testing; placing and compacting the sampled area with new material conforming to the surrounding area; protecting the pavement; and final analysis and payment reduction.

The Engineer will pay for cold planing in accordance with and under Section 415 - Cold Planing of Existing Pavement.

The Engineer will pay for adjusting existing frames and covers and valve boxes in accordance with and under Section 604 - Manholes, Inlets and Catch Basins and Section 626 - Manholes and Valve Boxes for Water and Sewer Systems.

**END OF SECTION 401**