**Special Provisions**

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STSP’S Revised June 15, 2017

**SPECIAL PROVISIONS**

1. General.

Perform the work under this construction contract for Project 1430-18-71, Rosendale – Fond du Lac, Townline Rd. – CTH VVV, and Project 1430-23-71, Village of Rosendale, Lafayette St. – Becker Blvd., Fond du Lac County, Wisconsin as the plans show and execute the work as specified in the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 2018 Edition, as published by the department, and these special provisions.

If all or a portion of the plans and special provisions are developed in the SI metric system and the schedule of prices is developed in the US standard measure system, the department will pay for the work as bid in the US standard system.

100-005 (20170615)

1. Scope of Work.

The work under this contract shall consist of asphaltic surface milling, HMA pavement, base aggregate dense, concrete pavement repair & replacement, B-20-23 deck overlay, storm sewer, culvert pipes, sidewalk, curb & gutter, signing, pavement marking and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

104-005 (20090901)

1. Prosecution and Progress.

Begin work within ten calendar days after the engineer issues a written notice to do so.

Provide the time frame for construction of the project within the 2018 construction season to the engineer in writing within a month after executing the contract but at least 14 calendar days before the preconstruction conference. Assure that the time frame is consistent with the contract completion time. Upon approval, the engineer will issue the notice to proceed within ten calendar days before the beginning of the approved time frame.

To revise the time frame, submit a written request to the engineer at least two weeks before the beginning of the intended time frame. The engineer will approve or deny that request based on the conditions cited in the request and its effect on the department’s scheduled resources.

Close STH 23 to through traffic for a maximum of 35 working days. Once STH 23 is closed to through traffic, do not reopen until completing the following work: cross culvert replacements, concrete base patching, guardrail replacement and approach slabs at structure B-20-23, and B-20-23 concrete deck overlay.

If contract time expires prior to completing all work specified in the contract, additional liquidated damages will be affixed according to standard spec 108.11.

Work under this contract that restricts pedestrian access in the Village of Rosendale must be complete prior to August 31, 2018 or the first day of the 2018-2019 school year for the Rosendale Brandon school district, whichever is later.

Maintain local and emergency vehicles at all times. The contractor shall notify the Village of Rosendale authorities and all emergency services a minimum of 10 days prior to closure. Advanced notification as described above is considered incidental to the Traffic Control item.

**Northern Long-eared Bat** (*Myotis septentrionalis*)

Northern Long-eared Bats (NLEB) have the potential to inhabit the project limits because they roost in trees. Roosts may not have been observed on this project, but conditions to support the species exist. The species and all active roosts are protected by the Federal Endangered Species Act. If an individual bat or active roost is encountered during construction operations, stop work and notify the engineer and the WisDOT Regional Environmental Coordinator (REC).

If additional construction activities beyond what was originally specified are required to complete the work, approval from the engineer, following coordination with WisDOT REC, is required prior to initiating these activities.

1. Traffic.

Maintain through traffic on STH 23 while construction is occurring, except for the 35 working day interim full closure as specified in the Progress and Prosecution article. STH 23 traffic during the interim full closure will be detoured as follows:

Eastbound STH 23 will be rerouted north on STH 26, then south on I 41, back to STH 23. Westbound STH 23 will follow the reverse path of the eastbound detour.

Lane closures on STH 26 will not be allowed during the implementation of the detour for project 1430-18-71.

During the period when STH 23 is open to through traffic, complete contract work using traffic control and flaggers to protect traffic at all locations where traffic is confined to a single lane. Work will be done using traffic control suitable for moving operations.

Limit single lane traffic to one mile in length at any given time unless permitted otherwise by the engineer. During working hours, maintain STH 23 traffic with a minimum one 10-foot travel lane. During non-working hours, maintain one travel lane in each direction.

At the end of each workday, do not leave a drop-off of 2 inches or greater between the driving lane and shoulders, and between the driving lane and adjacent intersection roadways or driveways.

Do not allow the milled surface to remain exposed for a period greater than 72 hours unless adverse weather prevents placement of asphalt surface layer. In the event of adverse weather, resume placement of asphalt surface layer as soon as conditions permit.

Local road traffic shall be maintained with a minimum base aggregate dense surface.

Maintain access for local, business and emergency traffic at all times. Maintain reasonable access to all properties in accordance to subsection 104.6.4 of the standard specifications. When construction operations will temporarily restrict access to a property or change existing access to a property, coordinate with the owner or resident at least 48 hours prior to the work.

Close and construct only one quadrant of sidewalk and curb ramps at a time along STH 23 to provide continuous pedestrian access throughout the project.

**OSOW Route**

STH 26 is a designated WisDOT Freight Network Route. Maintain a minimum of one thru lane of traffic with a width restriction no less than 16 feet at all times in each direction. Movement of OSOW freight is scheduled to occur during this construction project that will require a minimum of 16 feet of horizontal clearance.

**Portable Changeable Message Signs – Message Prior Approval**

After coordinating with Department construction field staff, notify the Northeast Region Traffic Section at 920-366-8033 (secondary contact number is 920-360-3107) 3 business days prior to deploying or changing a message on a PCMS to obtain approval of the proposed message. The Northeast Region Traffic Unit will review the proposed message and either approve the message or make necessary changes.

PCMS boards must be deployed 7 calendar days prior to the start of construction and 7 calendar days prior to implementing the detour.

**Wisconsin Lane Closure System Advance Notification**

Provide the following advance notification to the engineer for incorporation into the Wisconsin Lane Closure System (LCS).

**TABLE 108-1 CLOSURE TYPE AND REQUIRED MINIMUM ADVANCE NOTIFICATION**

|  |  |
| --- | --- |
| Closure type with height, weight, or width restrictions (available width, all lanes in one direction < 16’) | MINIMUM NOTIFICATION |
| Lane and shoulder closures | 7 calendar days |
| Full roadway closures | 7 calendar days |
| Ramp closures | 7 calendar days |
| Detours | 7 calendar days |
|  | |
| Closure type without height, weight, or width restrictions (available width, all lanes in one direction ≥16’) | MINIMUM NOTIFICATION |
| Lane and shoulder closures | 3 business days |
| Ramp closures | 3 business days |
| Modifying all closure types | 3 business days |

Discuss LCS completion dates and provide changes in the schedule to the engineer at weekly project meetings in order to manage closures nearing their completion date.

stp-108-057 (20161130)

1. Holiday Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying STH 23 or STH 26 traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following holiday periods:

* From noon Friday, May 25, 2018 to 6:00 AM Tuesday, May 29, 2018;
* From noon Friday, June 29, 2018 to 6:00 AM Monday, July 9, 2018;
* From noon Friday, August 31, 2018 to 6:00 AM Tuesday, September 4, 2018.

stp-107-005 (20050502)

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying STH 26 traffic, and entirely clear the traveled way and shoulders of such portions of the highway of equipment, barricades, signs, lights, and any other material that might impede the free flow of traffic during the following periods:

**(EAA Air Venture)**

* 3:00 PM to 9:00 PM daily from Monday, July 23, 2018 to Sunday July 29, 2018;
* 3:00 PM to 12:00 AM Wednesday, July 25, 2018 and Saturday, July 28, 2018.

**(Country USA)**

* 3:00 PM to 12:00 AM daily from Tuesday, June 19, 2018 to Saturday June 23, 2018.

**(Lambeau Field Events with an expected attendance of 30,000+)**

* 5 hours before to 8 hours after the scheduled start time of the event.

1. Information to Bidders, U.S. Army Corps of Engineers Section 404 Permit.

The department has obtained a U.S. Army Corps of Engineers Section 404 permit. Comply with the requirements of the permit in addition to requirements of the special provisions. A copy of the permit is available from the regional office by contacting Bryan Learst at (920) 366-5639.

stp-107-054 (20080901)

1. Utilities.

This contract comes under the provision of Administrative Rule Trans 220.

stp-107-065 (20080501)

There are utility facilities within the construction limits of this project. Coordinate construction activities with a call to Diggers Hotline or a direct call to the utilities for the underground facilities in the area, as required per statutes. Take all required precautions when working within 18-inches of underground utilities. Use caution to maintain the integrity of underground utilities and maintain OSHA code clearances from overhead facilities at all times.

Additional detailed information regarding the location of utility facilities is available at the region WisDOT office during normal working hours.

**1430-18-71:**

**AT&T WI** has underground communication facilities throughout the project limits. No conflicts are anticipated.

Coordinate with Chuck Bartelt (920) 410-5104 or [cb1461@att.com](mailto:cb1461@att.com) during construction.

**ATC Mgmt Inc** has overhead electric transmissionfacilities in three separate locations crossing STH 23: Approx. STA 567+00, STA 653+50, and STA 685+25. No conflicts are anticipated.

Coordinate with Gerald Rhode (920) 338-6523 or [grhode@atcllc.com](mailto:grhode@atcllc.com) during construction.

**Alliant Energy** has overhead electrical facilities throughout the project limits. No conflicts are anticipated.

Coordinate with Grayne Skibo (920) 948-4054 or [GrayneSkibo@alliantenergy.com](mailto:GrayneSkibo@alliantenergy.com) during construction.

**Alliant Energy** has underground gas facilities throughout the project limits. No conflicts are anticipated.

Coordinate with Grayne Skibo (920) 948-4054 or [GrayneSkibo@alliantenergy.com](mailto:GrayneSkibo@alliantenergy.com) during construction.

**Century Link** has underground facilities from Becker Blvd to Henrich Rd on both sides of STH 23. No conflicts are anticipated.

Coordinate with Tim Kroeze (920) 219-0112 or [tim.kroeze@centurylink.com](mailto:tim.kroeze@centurylink.com) during construction.

**Charter Com** has underground communicationfacilities from CTH Y to Hageman Rd on both sides of STH 23. No conflicts are anticipated.

Coordinate with Todd Hildebrandt (920) 794-4946 or [todd.hildebrandt@charter.com](mailto:todd.hildebrandt@charter.com) during construction.

**1430-23-71:**

**Alliant Energy (electricity)** – has facilities within the project limits. No conflicts are anticipated.

The field contact for this project is Andy Schmidt, (920) 748-4011, [andyschmidt@alliantenergy.com](mailto:andyschmidt@alliantenergy.com).

**Alliant Energy (gas/petroleum)** – has underground facilities within the project limits.

Alliant Energy will complete the following:

The existing gas line at station 446+58, 26’ RT heading south down Taft Street (not shown) will be retired in place. A new gas line will begin from the existing gas line at station 446+70, 26’ RT heading south down Taft Street.

The anticipated relocation will start August 1, 2016 with an estimated 18 working days.

The field contact for this project is Jeremy Rentmeester, (920) 322-6765, [jeremyrentmeester@alliantenergy.com](mailto:jeremyrentmeester@alliantenergy.com).

**CenturyLink (communication line)** – has underground facilities within the project limits. The existing copper cable is near manhole 103 and inlet 101 however, no conflicts are anticipated.

The field contact for this project is Tim Kroeze, (920) 326-2224, [tim.kroeze@centurylink.com](mailto:tim.kroeze@centurylink.com).

**Charter Communications (communication line)** – has overhead and underground facilities within the project limits. No conflicts are anticipated.

Underground facilities are not shown on the project plan from approximate station 435+75 to station 437+00, RT.

The field contact for this project is Nick Frase, (920) 304-6797, [tony.klatt@charter.com](mailto:tony.klatt@charter.com).

**Village of Rosendale (sewer)** – has underground facilities within the project limits. No conflicts are anticipated.

The field contact for this project is Daniel Holdridge, (920) 979-1983, [dholdridge@villageofrosendale.com](mailto:dholdridge@villageofrosendale.com).

1. Erosion Control Structures.

Within seven calendar days after the commencement of work on the bridge superstructure, place all permanent erosion control devices, including riprap, erosion mat, ditch checks, seed, fertilizer, mulch, soil stabilizer, or any other item required by the contract or deemed necessary by the engineer. These devices shall be in place in the area under the bridge and on both sides of the roadway, from the waterway to a point 100-feet behind the backwall of the abutment. Within said limits, place these devices to a height equivalent to the calculated water elevation resulting from a storm that occurs on the average of once every two years (Q2) as shown on the plan, or as directed by the engineer. Prior to initial construction operations, place turbidity barriers, silt screens, and other temporary erosion control measures as shown on the plans, and remove them after the permanent erosion control devices are in place unless directed otherwise by the engineer.

In the event that construction activity does not disturb the existing ground below the Q2 elevation, the above timing requirements for permanent erosion control shall be waived.

stp-107-070 (20030820)

1. Notice to Contractor, Verification of Asbestos Inspection, No Asbestos Found.

John Roelke, License Number All-119523, inspected Structure B-20-0023 for asbestos on November 4, 2015. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from: Jennifer Zavada at (920) 492-5720 or [jennifer.zavada@dot.wi.gov](mailto:jennifer.zavada@dot.wi.gov).

stp-107-127 (20120615)

1. Environmental Protection, Dewatering

*Add to subsection 107.18 of the standard specifications as follows:*

If dewatering is required, treat the water to remove suspended sediments by filtration, settlement or other appropriate best management practice prior to discharge. The means and methods proposed to be used during construction shall be submitted for approval as part of the Erosion Control Implementation Plan for dewatering at each location it is required. The submittal shall also include the details of how the intake will be managed to not cause an increase in the background level turbidity prior to treatment and any additional erosion controls necessary to prevent sediments from reaching the project limits or wetlands and waterways. Guidance on dewatering can be found on the Wisconsin Department of Natural Resources website located in the Storm Water Construction Technical Standards, Dewatering Code #1061, “Dewatering”. This document can be found at the WisDNR website: <http://dnr.wi.gov/topic/stormwater/standards/const_standards.html>

The cost of all work and materials associated with water treatment and/or dewatering is incidental to the bid items the work is associated.

(NER12-1010)

1. Coordination with Others – Existing Signal Timing

Contact the WisDOT NE Region Electrical Unit at (920) 492-5710 a minimum of 3 days prior to any work that will require any type of signal modifications.

1. Coordination with Businesses and Residents.

The contractor will arrange and conduct a meeting between the contractor, the department, affected residents, local officials and business people to discuss the project schedule of operations including vehicular and pedestrian access during construction operations. Hold the first meeting prior to the start of work under this contract and two meetings per month thereafter. The contractor shall notify all parties in writing a minimum of ten days prior to the first meeting being held.

(NER12-1003)

1. QMP Base Aggregate.

**A Description**

**A.1 General**

(1) This special provision describes contractor quality control (QC) sampling and testing for base aggregates, documenting those test results, and documenting related production and placement process changes. This special provision also describes department quality verification (QV), independent assurance (IA), and dispute resolution.

(2) Conform to standard spec 301, standard spec 305, and standard spec 310 as modified here in this special provision. Apply this special provision to material placed under all of the Base Aggregate Dense and Base Aggregate Open Graded bid items, except do not apply this special provision to material classified as reclaimed asphaltic pavement placed under the Base Aggregate Dense bid items.

(3) Do not apply this special provision to material placed and paid for under the Aggregate Detours, Breaker Run, Select Crushed, Pit Run, Subbase, or Riprap bid items.

(4) Provide and maintain a quality control program, defined as all activities related to and documentation of the following:

1. Production and placement control and inspection.

2. Material sampling and testing.

(5) Chapter 8 of the department’s construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes required sampling and testing procedures. The contractor may obtain the CMM from the department’s web site at:

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/default.aspx>

**A.2 Small Quantities**

(1) The department defines a small quantity, for each individual Base Aggregate bid item, as a contract quantity of 9000 tons or less of material as shown in the schedule of items under that bid item.

(2) The requirements under this special provision apply equally to a small quantity for an individual bid item except as follows:

**A.2.1 Quality Control Plan**

(1) Submit an abbreviated quality control plan consisting of the following:

1. Organizational chart including names, telephone numbers, current certification(s) with HTCP number(s) and expiration date(s), and roles and responsibilities of all persons involved in the quality control program for material under affected bid items.

**A.2.2 Contractor Testing**

1.

|  |  |
| --- | --- |
| **Contract Quantity** | **Minimum Required Testing per source** |
| ≤ 6000 tons | One stockpile test prior to placement, and two production or one loadout test.[1] [2] |
| > 6000 tons and ≤ 9000 tons | One stockpile and Three placement tests[3] [4] [5] |

[1] Submit production test results to the engineer for review prior to incorporating the material into the work. Production test results are valid for a period of 3 years.

[2] If the actual quantity overruns 6,000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

[3] If the actual quantity overruns 9000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

[4] For 3-inch material or lift thickness of 3-inch or less, obtain samples at load-out.

[5] Divide the aggregate into uniformly sized sublots for testing

2. Stockpile testing for concrete pavement recycled in place will be sampled on the first day of production.

3. Until a four point running average is established, individual placement tests will be used for acceptance. Submit aggregate load-out and placement test results to the engineer within one business day of obtaining the sample. Assure that all properties are within the limits specified for each test.

4. Material represented by a sublot with any property outside the specification limits is nonconforming. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

**A.2.3 Department Testing**

(1) The department will perform testing as specified in B.8 except as follows:

* Department stockpile verification testing prior to placement is optional for contract quantities of 500 tons or less.

**B Materials**

**B.1 Quality Control Plan**

(1) Submit a comprehensive written quality control plan to the engineer at or before the pre‑construction meeting. Do not place base before the engineer reviews and comments on the plan. Construct the project as that plan provides.

(2) Do not change the quality control plan without the engineer’s review. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in each of the contractor’s laboratories as changes are adopted. Ensure that the plan provides the following elements:

1. An organizational chart with names, telephone numbers, current certifications and/or titles, and roles and responsibilities of QC personnel.

2. The process used to disseminate QC information and corrective action efforts to the appropriate persons. Include a list of recipients, the communication means that will be used, and action time frames.

3. A list of source and processing locations, section and quarter descriptions, for all aggregate materials requiring QC testing.

4. Test results for wear, sodium sulfate soundness, freeze/thaw soundness, and plasticity index of all aggregates requiring QC testing. Obtain this information from the region materials unit or from the engineer.

5. Descriptions of stockpiling and hauling methods.

6. Locations of the QC laboratory, retained sample storage, and where control charts and other documentation is posted.

7. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.

**B.2 Personnel**

(1) Have personnel certified under the department’s highway technician certification program (HTCP) perform sampling, testing, and documentation as follows:

|  |  |
| --- | --- |
| **Required Certification Level:** | **Sampling or Testing Roles:** |
| Transportation Materials Sampling Technician (TMS)  Aggregate Technician I (AGGTEC-I)  Aggregate Assistant Certified Technician (ACT-AGG) | Aggregate Sampling[1] |
| Aggregate Technician I (AGGTEC-I)  Aggregate Assistant Certified Technician (ACT-AGG) | Aggregate Gradation Testing, Aggregate Fractured Particle Testing, Aggregate Liquid Limit and Plasticity Index Testing |

[1] Plant personnel under the direct observation of an aggregate technician certified at level one or higher may operate equipment to obtain samples.

(2) A certified technician must coordinate and take responsibility for the work an ACT performs. Have a certified technician ensure that all sampling and testing is performed correctly, analyze test results, and post resulting data. No more than one ACT can work under a single certified technician.

**B.3 Laboratory**

(1) Perform QC testing at a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Management Section

3502 Kinsman Blvd.

Madison, WI 53704

Telephone: (608) 246-5388

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/qual-labs.aspx>

**B.4 Quality Control Documentation**

**B.4.1 General**

(1) Submit base aggregate placement documentation to the engineer within 10 business days after completing base placement. Ensure that the submittal is complete, neatly organized, and includes applicable project records and control charts.

**B.4.2 Records**

(1) Document all placement observations, inspection records, and control adjustments daily in a permanent field record. Also include all test results in the project records. Provide test results to the engineer within one business day after obtaining a sample. Post or distribute tabulated results using a method mutually agreeable to the engineer and contractor.

**B.4.3 Control Charts**

(1) Plot gradation and fracture on the appropriate control chart as soon as test results are available. Format control charts according to CMM 8.30. Include the project number on base placement control charts. Maintain separate control charts for each base aggregate size, source or classification, and type.

(2) Provide control charts to the engineer within one business day after obtaining a sample. Post or distribute charts using a method mutually agreeable to the engineer and contractor. Update control charts daily to include the following:

1. Contractor individual QC tests.

2. Department QV tests.

3. Department IA tests.

4. Four-point running average of the QC tests.

(3) Except as specified under B.8.2.1 for nonconforming QV placement tests, include only QC placement tests in the running average. The contractor may plot process control or informational tests on control charts, but do not include these tests, conforming QV tests, or IA tests in the running average.

**B.5 Contractor Testing**

(1) Test gradation, fracture, liquid limit and plasticity index during placement for each base aggregate size, source or classification, and type.

(2) Perform one stockpile test from each source prior to placement.

(3) Test gradation once per 3000 tons of material placed or fraction thereof. Determine random sample locations and provide those sample locations to the engineer. Obtain samples after the material has been bladed, mixed, and shaped but before compacting; except collect 3‑inch samples or lift thickness of 3-inch or less from the stockpile at load‑out. Do not sample from material used to maintain local traffic or from areas of temporary base that will not have an overlying pavement. On days when placing only material used to maintain local traffic or only temporary base that will not have an overlying pavement, no placement testing is required.

(4) Split each contractor QC sample and identify it according to CMM 8.30. Retain the split for seven calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.

(5) The engineer may require additional sampling and testing to evaluate suspect material or the technician’s sampling and testing procedures.

(6) Test fracture for each gradation test until the fracture running average is above the lower warning limit. Subsequently, the contractor may reduce the frequency to one test per 10 gradation tests if the fracture running average remains above the warning limit.

(7) Test the liquid limit and plasticity index for the first gradation test. Subsequently, test the liquid limit and plasticity index a minimum of once per 10 gradation tests.

**B.6 Test Methods**

**B.6.1 Gradation**

(1) Test gradation using a washed analysis conforming to the following as modified in CMM 8.60:

Gradation AASHTO T 27

Material finer than the No. 200 sieve AASHTO T 11

(2) For 3-inch base, if 3 consecutive running average points for the percent passing the No. 200 sieve are 8.5 percent or less, the contractor may use an unwashed analysis. Wash at least one sample out of 10. If a single running average for the percent passing the No. 200 sieve exceeds 8.5 percent, resume washed analyses until 3 consecutive running average points are again 8.5 percent passing or less.

(3) Maintain a separate control chart for each sieve size specified in standard spec 305 or standard spec 310 for each base aggregate size, source or classification, and type. Set control and warning limits based on the standard specification gradation limits as follows:

1. Control limits are at the upper and lower specification limits.

2. There are no upper warning limits for sieves allowing 100 percent passing and no lower control limits for sieves allowing 0 percent passing.

3. Dense graded warning limits, except for the No. 200 sieve, are 2 percent within the upper and lower control limits. Warning limits for the No. 200 sieve are set 0.5 percent within the upper and lower control limits.

4. Open graded warning limits for the 1-inch, 3/8-inch, and No. 4 sieves are 2 percent within the upper and lower control limits. Upper warning limits for the No. 10, No. 40, and No. 200 sieves are 1 percent inside the upper control limit.

**B.6.2 Fracture**

(1) Test fracture conforming to CMM 8.60. The engineer will waive fractured particle testing on quarried stone.

(2) Maintain a separate fracture control chart for each base aggregate size, source or classification, and type. Set the lower control limit at the contract specification limit, either specified in another special provision or in table 301-2 of standard spec 301.2.4.5. Set the lower warning limit 2 percent above the lower control limit. There are no upper limits.

**B.6.3 Liquid Limit and Plasticity**

(1) Test the liquid limit and plasticity according to AASHTO T 89 and T 90.

(2) Ensure the material conforms to the limits specified in standard spec table 301-2.

**B.7 Corrective Action**

**B.7.1 General**

(1) Consider corrective action when the running average trends toward a warning limit. Take corrective action if an individual test exceeds the contract specification limit. Document all corrective actions both in the project records and on the appropriate control chart.

**B.7.2 Placement Corrective Action**

(1) Do not blend additional material on the roadbed to correct gradation problems.

(2) Notify the engineer whenever the running average exceeds a warning limit. When two consecutive running averages exceed a warning limit, the engineer and contractor will discuss appropriate corrective action. Perform the engineer’s recommended corrective action and increase the testing frequency as follows:

1. For gradation, increase the QC testing frequency to at least one randomly sampled test per 1000 tons placed.

2. For fracture, increase the QC testing frequency to at least one test per gradation test.

(3) If corrective action improves the property in question such that the running average after four additional tests is within the warning limits, the contractor may return to the testing frequency specified in B.5.3. If corrective action does not improve the property in question such that the running average after four additional individual tests is still in the warning band, repeat the steps outlined above starting with engineer notification.

(4) If the running average exceeds a control limit, material starting from the first running average exceeding the control limit and ending at the first subsequent running average inside the control limit is nonconforming and subject to pay reduction.

(5) For individual test results significantly outside the control limits, notify the engineer, stop placing base, and suspend other activities that may affect the area in question. The engineer and contractor will jointly review data, data reduction, and data analysis; evaluate sampling and testing procedures; and perform additional testing as required to determine the extent of potentially unacceptable material. The engineer may direct the contractor to remove and replace that material. Individual test results are significantly outside the control limits if meeting one or more of the following criteria:

1. A gradation control limit for the No. 200 sieve is exceeded by more than 3.0 percent.

2. A gradation control limit for any sieve, except the No. 200, is exceeded by more than 5.0 percent.

3. The fracture control limit is exceeded by more than 10.0 percent.

**B.8 Department Testing**

**B.8.1 General**

(1) The department will conduct verification testing to validate the quality of the product and independent assurance testing to evaluate the sampling and testing. The department will provide the contractor with a listing of names and telephone numbers of all QV and IA personnel for the project, and provide test results to the contractor within two business days after the department obtains the sample.

**B.8.2 Verification Testing**

**B.8.2.1 General**

(1) The department will have an HTCP technician, or ACT working under a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified in B.2 for contractor testing personnel for each test result being verified. The department will notify the contractor before sampling so the contractor can observe QV sampling.

(2) The department will conduct QV tests of each base aggregate size, source or classification, and type during placement conforming to the following:

1. Perform one stockpile test from each source prior to placement.

2. At least one random test per 30,000 tons, or fraction of 30,000 tons, placed.

(3) The department will sample randomly, at locations independent of the contractor’s QC work, collecting one sample at each QV location. The department will collect QV samples after the material has been bladed, mixed, and shaped but before compacting; except, for 3-inch aggregates or for a lift thickness of 3-inch or less, the department will collect samples at load-out. The department will split each sample, test half for QV, and retain half.

(4) The department will conduct QV tests in a separate laboratory and with separate equipment from the contractor’s QC tests. The department will use the same methods specified for QC testing.

(5) The department will assess QV results by comparing to the appropriate specification limits. If QV test results conform to the specification, the department will take no further action. If QV test results are nonconforming, add the QV to the QC test results as if it were an additional QC test.

**B.8.3 Independent Assurance**

(1) Independence assurance is unbiased testing the department performs to evaluate the department’s QV and the contractor’s QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform an IA review according to the department’s independent assurance program. That review may include one or more of the following:

1. Split sample testing.

2. Proficiency sample testing.

3. Witnessing sampling and testing.

4. Test equipment calibration checks.

5. Reviewing required worksheets and control charts.

6. Requesting that testing personnel perform additional sampling and testing.

(2) If the department identifies a deficiency, and after further investigation confirms it, correct that deficiency. If the contractor does not correct or fails to cooperate in resolving identified deficiencies, the engineer may suspend placement until action is taken. Resolve disputes as specified in B.9.

**B.9 Dispute Resolution**

(1) The engineer and contractor should make every effort to avoid conflict. If a dispute between some aspect of the contractor’s and the engineer’s testing program does occur, seek a solution mutually agreeable to the project personnel. The department and contractor may review the data, examine data reduction and analysis methods, evaluate sampling and testing procedures, and perform additional testing. Use ASTM E 178 to evaluate potential statistically outlying data.

(2) Production test results, and results from other process control testing, may be considered when resolving a dispute.

(3) If the project personnel cannot resolve a dispute, and the dispute affects payment or could result in incorporating non-conforming product, the department will use third party testing to resolve the dispute. The department’s central office laboratory, or a mutually agreed on independent testing laboratory, will provide this testing. The engineer and contractor will abide by the results of the third party tests. The party in error will pay service charges incurred for testing by an independent laboratory. The department may use third party test results to evaluate the quality of questionable materials and determine the appropriate payment. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

**C (Vacant)**

**D (Vacant)**

**E Payment**

(1) Costs for all sampling, testing, and documentation required under this special provision are incidental to this work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor’s pay. The department will administer pay reduction under the non-performance of QMP administrative item.

(2) For material represented by a running average exceeding a control limit, the department will reduce pay according to CMM 8-10.5.2 for the affected Base Aggregate bid items listed in subsection A. The department will administer pay reduction under the Nonconforming QMP Base Aggregate Gradation or Nonconforming QMP Base Aggregate Fracture Administrative items. The department will determine the quantity of nonconforming material as specified in B.7.2.

stp-301-010 (20170615)

1. Protection of Concrete.

Subsection 415.3.14 of the Standard Specifications is supplemented as follows:

The contractor shall provide for a minimum of one concrete finisher to remain on the project site after final finishing of all concrete surfaces until such time as the concrete has hardened sufficiently to resist surface scarring caused by footprints, handprints, or any other type of imprint, malicious or otherwise. The finisher shall actively and continuously patrol on foot the newly placed concrete and repair any damage to the surface that might be sustained as described above.

The cost for providing the finisher(s), the necessary equipment, and materials shall be construed to be included in the contract unit price for each concrete item.

(NER11-0127)

1. Ride Quality.

Replace standard spec. 440.3.4.2 (2) with the following:

Coordinate with the engineer to schedule profile runs for acceptance. Provide 48 hour notice to the engineer and Northeast Region Soils, Pavements and Materials Assistant at (920) 362-6360 prior to performing profile runs for all initial and rescheduled tests, unless otherwise approved by the department. The department may require testing to accommodate staged construction or if corrective action may be required.

(NER17-0714)

1. HMA Pavement Percent Within Limits (PWL) QMP.

**A Description**

This special provision describes percent within limits (PWL) pay determination, providing and maintaining a contractor Quality Control (QC) Program, department Quality Verification (QV) Program, required sampling and testing, dispute resolution, corrective action, pavement density, and payment for HMA pavements. Pay is determined by statistical analysis performed on contractor and department test results conducted according to the Quality Management Program (QMP) as specified in standard spec 460, except as required below.

**B Materials**

Conform to the requirements of standard specs 450, 455, and 460 except where superseded by this special provision. The department will allow only one mix design for each HMA mixture type per layer required for the project, unless approved by the engineer. The use of more than one mix design for each HMA pavement layer will require the contractor to construct a new test strip in accordance with HMA Pavement Percent Within Limits (PWL) QMP Test Strip Volumetrics and HMA Pavement Percent Within Limits (PWL) QMP Test Strip Density articles at no additional cost to the Department.

*Replace standard spec 460.2.8.2.1.3.1 for contracts with 5000 Tons of Mixture or Greater with the following:*

**460.2.8.2.1.3.1 Contracts under Percent within Limits**

(1) Furnish and maintain a laboratory at the plant site fully equipped for performing contractor QC testing. Have the laboratory on-site and operational before beginning mixture production.

(2) Obtain random samples and perform tests according to Appendix A Test Methods & Sampling for HMA Pavement PWL QMP. Obtain HMA mixture samples from trucks at the plant. For the sublot in which a QV sample is collected, the QC sample shall be discarded, and the QC team shall test a split of the QV sample.

(3) Sample size must be adequate to run the appropriate required tests in addition to one set of duplicate tests that may be required for dispute resolution (i.e., retained). This requires sample sizes which yield three splits for all random sampling per sublot. All QC samples shall provide the following: QC, QV, and Retained. The contractor shall take possession and test the QC portions. The department will observe the splitting and take possession of the samples intended for QV testing (i.e., QV portion from each sample) and the Retained portions. Additional sampling details are found in Appendix A. Samples shall be labeled in accordance with Appendix A. Additional handling instructions for retained samples are found in CMM 8-36.

(4) Use the test methods identified below to perform the following tests at a frequency greater than or equal to that indicated:

* Blended aggregate gradations in accordance with AASHTO T 30
* Asphalt content (AC) in percent according to AASHTO T 308 (ignition oven) or AASHTO T 164 (chemical extraction)
* Bulk specific gravity (Gmb) of the compacted mixture according to AASHTO T 166.
* Maximum specific gravity (Gmm) according to AASHTO T 209.
* Air voids (Va) by calculation according to AASHTO T 269.
* Voids in Mineral Aggregate (VMA) by calculation according to AASHTO R35.

(5) Lot size shall consist of 3750 tons with sublots of 750 tons. Test each design mixture at a frequency of 1 test per 750 tons of mixture type produced and placed on the project. Add a random sample for any fraction of 750 tons at the end of a project. Partial lots with less than three sublot tests will be included into the previous lot for data analysis/acceptance and pay. Volumetric lots will include all tonnage of mixture type under specified bid item unless otherwise specified in the plan.

(6) Conduct field tensile strength ratio tests according to AASHTO T283, without freeze-thaw conditioning cycles, on each qualifying mixture in accordance with CMM 8-36.6.14. Test each full 50,000 ton production increment, or fraction of an increment, after the first 5,000 tons of production. Perform required increment testing in the first week of production of that increment. If field tensile strength ratio values are below the spec limit, notify the engineer. The engineer and contractor will jointly determine a corrective action.

*Delete standard spec 460.2.8.2.1.5 and 460.2.8.2.1.6*

*Replace standard spec 460.2.8.2.1.7 Corrective Action with the following:*

**460.2.8.2.1.7 Corrective Action**

(1) Material must conform to the following action and conformance limits based on individual QC and QV test results (tolerances relative to JMF):

ITEM ACTION LIMITS CONFORMANCE LIMITS

Percent passing given sieve:

37.5-mm +/- 8.0

25.0-mm +/- 8.0

19.0-mm +/- 7.5

12.5-mm +/- 7.5

9.5-mm +/- 7.5

2.36-mm +/- 7.0

75-µm +/- 3.0

AC in percent - 0.5

Va - 1.5 & +2.0

VMA in percent*[1]* - 0.5 -1.0

*[1]* VMA limits based on minimum requirement for mix design nominal maximum aggregate size in table 460‑1.

(2) QV samples will be tested for air voids, VMA, Gmm, Gmb, and AC.

(3) Notify the engineer if any individual test result falls outside the action limits, investigate the cause and take corrective action to return to within action limits. If two consecutive test results fall outside the action limits, stop production. Production may not resume until approved by the engineer. Additional QV samples may be collected upon resuming production, at the discretion of the engineer. Additional QV tests must meet action limits or be subject to production stop and/or remove and replace.

(4) For any additional tests outside the random number testing conducted for volumetrics, the data collected will not be entered into PWL calculations. However, additional QV testing shall meet the tolerances for material acceptance as specified in the Standard Specification and this document.

(5) Remove and replace nonconforming material at no additional expense to the department. The engineer may allow nonconforming material to remain in place with a price reduction. The department will pay for the nonconforming HMA Pavement allowed to remain in place at 50 percent of the contract unit price. Nonconforming material is defined as any individual QC or QV tests results outside the conformance limits or a PWL value < 50.

*Replace standard spec 460.2.8.3.1.2 Personnel Requirements with the following:*

**460.2.8.3.1.2 Personnel Requirements**

(1) The department will provide at least one HTCP-certified HMA technician, certified at a level appropriate for sampling and mixture production control testing, to observe QV sampling of project mixtures.

(2) Under departmental observation, a contractor HMA technician certified at a level appropriate for sampling and mixture production control testing will collect and split samples.

(3) A department HMA technician certified at a level appropriate for sampling and mixture production control testing will ensure that all sampling is performed correctly and conduct testing, analyze test results, and report resulting data.

(4) The department will provide an organizational chart to the contractor before mixture production begins. The organizational chart will include names, telephone numbers, and current certifications of all QV testing personnel. The department will update the chart with appropriate changes, as they become effective.

*Replace standard spec 460.2.8.3.1.4 Department Verification Testing Requirements with the following:*

**460.2.8.3.1.4 Department Verification Testing Requirements**

(1) HTCP-certified department personnel will obtain QV random samples by directly supervising HTCP-certified contractor personnel sampling from trucks at the plant. Sample size must be adequate to run the appropriate required tests in addition to one set of duplicate tests that may be required for dispute resolution (i.e., retained). This requires sample sizes which yield three splits for all random sampling per sublot. All QV samples shall provide the following: QC, QV, and Retained. The department will observe the splitting and take possession of the samples intended for QV testing (i.e., QV portion from each sample) and the Retained portions. The department will take possession of retained samples accumulated to date each day QV samples are collected. Retention of samples will be provided until surpassing the analysis window of up to 5 lots, as defined in 460.2.8.3.1.7(2) of this document. Additional sampling details are found in Appendix A.

(2) The department will verify product quality using the test methods specified here in 460.2.8.3.1.4(3). The department will identify test methods before construction starts and use only those methods during production of that material unless the engineer and contractor mutually agree otherwise.

(3) The department will perform all testing conforming to the following standards:

* Bulk specific gravity (Gmb) of the compacted mixture according to AASHTO T 166.
* Maximum specific gravity (Gmm) according to AASHTO T 209.
* Air voids (Va) by calculation according to AASHTO T 269.
* Voids in Mineral Aggregate (VMA) by calculation according to AASHTO R 35.
* Asphalt Content (AC) in percent by ignition oven according to AASHTO T 308 or by chemical extraction according to AASHTO T 164

(4) The department will randomly test each design mixture at the minimum frequency of one test for each lot.

*Delete standard spec 460.2.8.3.1.6*

*Replace standard spec 460.2.8.3.1.7 Dispute Resolution with the following:*

**460.2.8.3.1.7 Data Acceptance for Volumetrics**

(1) Acceptance of test data for pay determination will be contingent upon QC and QV test results. Statistical analysis will be conducted on Gmm and Gmb test results for calculation of Va. If either Gmm or Gmb analysis results in non-comparable data as described in 460.2.8.3.1.7(2), subsequent testing will be performed for both parameters as detailed in the following paragraph.

(2) The engineer, upon completion of the first 3 lots, will compare the variances (F-test) and the means (t-test) of the QV test results with the QC test results. Additional comparisons incorporating the first 3 lots of data will be performed following completion of the 4th and 5th lots (i.e., lots 1-3, 1-4, and 1-5). A rolling window of 5 lots will be used to conduct F & t comparison for the remainder of the project (i.e., lots 2-6, then lots 3-7, etc.), reporting comparison results for each individual lot. Analysis will use a set alpha value of 0.025. If the F- and t-tests report comparable data, the QC and QV data sets are determined to be statistically similar and QC data will be used to calculate the Va used in PWL and pay adjustment calculations. If the F- and t-tests result in non-comparable data, proceed to the *dispute resolution* steps found below. Dispute resolution via further investigation is as follows:

[1] The Retained portion of the split from the most recent lot in the analysis window (specifically the sublot identifying that variances or means do not compare) shall be referee tested by the bureau's AASHTO accredited laboratory and certified personnel. If the non-comparison occurs following Lot 3, 4, or 5, all previous lots are subject to referee testing. Referee test results will replace the QV data of the sublot(s).

[2] Statistical analysis will be conducted with referee test results replacing QV results.

1. If the F- and t-tests indicate variances and means compare, no further testing is required for the lot and QC data will be used for PWL and pay factor/adjustment calculations.
2. If the F- and t-tests indicate non-comparable variances or means, the QV portion of the random QC sample will be tested by the department’s regional lab for the remaining 4 sublots of the lot which the F- and t- tests report not comparing. The department’s region lab and the referee test results will be used for PWL and pay factor/adjustment calculations.

[3] The contractor may choose to *dispute* the regional test results on a lot basis. In this event, the retained portion of each sublot will be referee tested by the department's AASHTO accredited laboratory and certified personnel. The referee Gmm and Gmb test results will supersede the regional lab results for the disputed lot.

1. If referee testing results in an increased calculated pay factor, the department will absorb the cost of the additional referee testing.
2. If referee testing of a disputed lot results in an equal or lower calculated pay factor, the contractor pays for the additional referee testing at $2,000/lot.

(3) The department will notify the contractor of the referee test results within 3 working days after receipt of the samples by the department's AASHTO accredited laboratory. The intent is to provide referee test results within 7 calendar days from completion of the lot.

(4) The department will determine mixture conformance and acceptability by analyzing referee test results, reviewing mixture project data, and inspecting the completed pavement according to Standard Spec, this special provision, and accompanying Appendix A.

(5) Nonconforming mix (i.e., resulting in a PWL value less than 50 or not meeting the requirements of 460.2.8.2.1.7 as modified here within) may be subject to remove and replace, at the discretion of the engineer. Replacement may be conducted on a sublot basis. If an entire PWL sublot is removed and replaced, the test results of the newly placed material shall replace the original data for the sublot. Any remove and replace shall be performed at no additional cost to the department. Testing of replaced material must include a minimum of one QV result. [Note: If the removed and replaced material does not result in replacement of original QV data, an additional QV test will be conducted and under such circumstances will be entered into the data analysis and pay determination.] If the engineer approves the nonconforming material to remain in place, it will be paid at 50% of the HMA Pavement contract unit price. The extent of nonconforming mix shall be determined by following the dispute resolution process detailed in 460.2.8.3.1.7(2) of this document. The quantity of material paid at 50% the contract unit price will be deducted from PWL pay adjustments, along with accompanying data of this nonconforming material.

*Delete standard spec 460.2.8.3.1.8 Corrective Action.*

**C Construction**

*Replace standard spec 460.3.3.2 Pavement Density Determination with the following:*

**460.3.3.2 Pavement Density Determination**

(1) The engineer will determine the target maximum density using department procedures described in CMM 8-15. The engineer will determine density as soon as practicable after compaction and before placement of subsequent layers or before opening to traffic.

(2) Do not re-roll compacted mixtures with deficient density test results. Do not operate continuously below the specified minimum density. Stop production, identify the source of the problem, and make corrections to produce work meeting the specification requirements.

(3) A lot is defined as 7500 lane feet with sublots of 1500 lane feet (excluding shoulder, even if paved integrally) and placed within a single layer for each location and target maximum density category indicated in table 460‑3. The contractor is required to complete 3 tests randomly per sublot and the department will randomly conduct one (1) QV test per sublot. A partial quantity less than 1500 lane feet will be included with the previous sublot. Partial lots with less than three sublots will be included into the previous lot for data analysis/acceptance and pay, by the engineer. If density lots/sublots are determined prior to construction of the test strip, any random locations within the test strip shall be omitted. Exclusions such as shoulders and appurtenances shall be tested in accordance with CMM 8-15. However, all acceptance testing of shoulders and appurtenances will be conducted by the department, and average lot (daily) densities must conform to Table 460-3.

(4) The three QC locations per sublot will represent the outside, middle, and inside of the paving lane. Each location will be measured with two one-minute gauge readings oriented 180 degrees from one another, in the same footprint as detailed in Appendix A. Each location will be the average of the two readings. If the two readings exceed 1.0 lb/ft3 of one another, a third reading shall be conducted in the same orientation as the first reading. In this event, all three readings shall be averaged, the initial of the three readings which falls farthest from the average value discarded, and the remaining two values averaged to represent the location for the gauge. Multiple locations are not to be averaged together.

(5) QV nuclear testing will consist of a randomly selected location per sublot. The QV is also comprised of two one-minute readings, averaged as described in 460.3.3.2(4) above.

(6) A certified nuclear density technician shall identify random locations and perform the testing. The responsible certified technician shall ensure that sample location and testing is performed correctly, analyze test results, and provide density results to the contractor weekly, or at the completion of each lot.

(7) For any additional tests outside the random number testing conducted for density, the data collected will not be entered into PWL calculations. However, additional QV testing must meet the tolerances for material acceptance as specified in the Standard Specification and this document. If additional density data identifies nonconforming material, proceed in accordance with CMM 8-15.11.

*Replace standard spec 460.3.3.3 Waiving Density Testing with Acceptance of Density Data with the following:*

**460.3.3.3 Acceptance of Density Data**

(1) Acceptance of test data for pay determination will be contingent upon test results from both the contractor (QC) and the department (QV).

(2) As random density locations are paved, the data shall be recorded in the PWL spreadsheet for analysis in chronological order. The engineer, upon completion of the analysis lot, will compare the variances (F-test) and the means (t-test) of the QV test results with the QC test results. Analysis will use a set alpha value of 0.025.

1. If the F- and t-tests indicate variances and means compare, the QC and QV data sets are determined to be statistically similar and QC data will be used for PWL and pay adjustment calculations.
2. If the F- and t-tests indicate variances or means do not compare, the QV data will be used for subsequent calculations.

(3) The department will determine mixture density conformance and acceptability by analyzing test results, reviewing mixture project data, and inspecting the completed pavement according to Standard Spec, this document, and accompanying Appendix.

(4) Density resulting in a PWL value less than 50 or not meeting the requirements of 460.3.3.1 is non-conforming and may be subject to remove and replace at no additional cost to the department, at the discretion of the engineer.

1. Replacement may be conducted on a sublot basis. If an entire PWL sublot is removed and replaced, the test results of the newly placed material shall replace the original data for the sublot.
2. Testing of replaced material must include a minimum of one QV result. [Note: If the removed and replaced material does not result in replacement of original QV data, an additional QV test must be conducted and under such circumstances will be entered into the data analysis and pay determination.]
3. If the engineer approves the nonconforming material to remain in place, it will be paid for at 50% of the HMA Pavement contract unit price. The extent of nonconforming density is addressed in accordance with CMM 8-15.11. The quantity of material paid at 50% the contract unit price will be deducted from PWL pay adjustments, along with accompanying data of this nonconforming material.

**D Measurement**

The department will measure the HMA Pavement bid items acceptably completed by the ton as specified in standard spec 450.4 and as follows in standard spec 460.5 as modified here within.

**E Payment**

*Replace standard spec 460.5.2 HMA Pavement with the following:*

**460.5.2 HMA Pavement**

**460.5.2.1 General**

(1) Payment for HMA Pavement Type LT, MT, and HT mixes is full compensation for providing HMA mixture designs; for preparing foundation; for furnishing, preparing, hauling, mixing, placing, and compacting mixture; for HMA PWL QMP testing and aggregate source testing; for warm mix asphalt additives or processes; for stabilizer, hydrated lime and liquid antistripping agent, if required; and for all materials including asphaltic materials.

(2) If provided for in the plan quantities, the department will pay for a leveling layer, placed to correct irregularities in an existing paved surface before overlaying, under the pertinent paving bid item. Absent a plan quantity, the department will pay for a leveling layer as extra work.

**460.5.2.2 Calculation of Pay Adjustment for HMA Pavement using PWL**

(1) Pay adjustments will be calculated using 65 dollars per ton of HMA pavement. The analysis template, including data, will be provided to the contractor by the department as soon as practicable upon completion of each lot. The department will pay for measured quantities of mix based on this price multiplied by the following pay adjustment calculated in accordance with the *Calculations* worksheet of the WisDOT PWL Analysis Template:

**PAY FACTOR FOR HMA PAVEMENT AIR VOIDS & DENSITY**

*PERCENT WITHIN LIMITS PAYMENT FACTOR, PF*

*(PWL) (percent of $65/ton)*

> 90 to 100 PF = ((PWL – 90) \* 0.4) + 100

> 50 to 90 (PWL \* 0.5) + 55

<50 50%[1]

where PF is calculated per air voids and density, denoted PFair voids & PFdensity

*[1]* Any material resulting in PWL value of 50 or less shall be removed and replaced unless the engineer allows for such material to remain in place. In the event the material remains in place, it will be paid at 50% of the contract unit price of HMA pavement.

For air voids, PWL values will be calculated using lower and upper specification limits of 2.0 and 4.3 percent, respectively. Lower specification limits for density shall be in accordance with Table 460-3. Pay adjustment will be determined on a lot basis and will be computed as shown in the following equation.

Pay Adjustment = (PF-100)/100 x (WP) x (tonnage) x ($65/ton)\*

\*Note: If Pay Factor <50, the contract unit price will be used in lieu of $65/ton

The following weighted percentage (WP) values will be used for the corresponding parameter:

|  |  |
| --- | --- |
|  | |
| Parameter | WP |
| Air Voids | 0.5 |
| Density | 0.5 |

Individual Pay Factors for each air voids (PFair voids) and density (PFdensity) will be determined. PFair voids will be multiplied by the total tonnage placed (i.e., from truck tickets), and PFdensity will be multiplied by the calculated tonnage used to pave the mainline only (i.e., travel lane) as determined in accordance with CMM 8-15.

The department will pay incentive for air voids and density under the following bid items:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 460.2005 | Incentive Density PWL HMA Pavement | DOL |
| 460.2010 | Incentive Air Voids HMA Pavement | DOL |
|  |  |  |

The department will administer disincentives under the Disincentive Density HMA Pavement and the Disincentive Air Voids HMA Pavement administrative items.

Note: PWL value determination is further detailed in the *Calculations* worksheet of the WisDOT PWL Analysis Template.

bts-HMA PWL QMP (20171002)

1. Reheating HMA Pavement Longitudinal Joints, Item 460.4110.S.

**A Description**

This special provision describes reheating the abutting edge of the previously compacted layer in the adjacent lane while paving mainline asphalt pavements.

**B (Vacant)**

**C Construction**

**C.1 Equipment**

Provide a self-contained heating unit that heats by convection only. Do not use forced air to enhance the flame. Provide a fireproof barrier between the flame and the heater’s fuel source. The heater must produce a uniform distribution of heat within the heat box. Provide automatic controls to regulate the heater output and shutoff the heater when the paver stops or the heater control system loses power.

Mount the heater on the paver inside the paver’s automatic leveling device.

**C.2 Reheating Joints**

Evenly reheat at least an 8 inch (200 mm) wide strip of the previously compacted layer in the adjacent lane as follows:

* Reheat the joint to within 60 degrees F (15 degrees C) of the mix temperature at the paver auger. Measure joint temperature immediately behind the heater.

The engineer may allow the required joint reheat temperatures to be cooler than specified to adjust for weather, wind, and other field conditions. Coordinate the heater output and paver speed to achieve the required joint reheat temperature without visible smoke emission.

**D Measurement**

The department will measure Reheating HMA Pavement Longitudinal Joints by the linear foot acceptably completed as measured along each joint for each layer of asphalt placed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 460.4110.S | Reheating HMA Pavement Longitudinal Joints | LF |

Payment is full compensation for all the work required under this bid item.

stp-460-015 (20140630)

1. Manhole, Inlet, and Catch Basin Adjusting Rings

*Add to standard specification 611.3 as follows:*

*When using concrete adjustment rings:*

The height of the grade ring shall equal (to within an inch and not to exceed) the height of the adjustment to minimize the number of joints in the chimney section. Multiple grade rings will not be allowed where one will suffice. Concrete grade rings less than 2-inches in thickness are not allowed. Concrete rings shall be of a size that closely matches the inside and outside dimensions of the structures.

*When using rubber adjustment rings:*

Rubber grade rings shall be in a flat and/or tapered configuration of a size to closely match the inside and outside dimensions of circular or rectangular structures, installed individually or in combination not to exceed 3-inches in height. If more than 3-inches of adjustment is necessary, use one concrete ring 3-inches or more in height with rubber rings on top of the concrete ring. If multiple rubber adjustment rings are necessary, a maximum of two adjustment rings can be used. Rubber grade rings shall be tapered to match the cross slope and profile of the roadway.

(NER13-0611)

1. Adjusting Manhole Covers.

This work shall be according to the pertinent provisions of standard spec 611, as shown on the plans, and as hereinafter provided.

Adjust manhole covers located in pavement areas in two separate operations. Initially, remove designated manhole covers along with sufficient pavement to permit installation of temporary cover plate over the opening. Fill the excavated area with asphaltic pavement mixture, which shall remain in place until contract milling and paving operations permit setting the manhole frames to grade. During the second phase, remove the asphaltic pavement mixture surrounding the manhole plus the temporary cover plate, and set the manhole cover to final grade. The department will measure and pay for the items of asphaltic pavement mixture, temporary cover plate, milling, and paving separately.

Revise standard spec 611.3.7 by deleting the last paragraph.

Set the manhole frames so that they comply with the surface requirements of standard spec 450.3.2.9. At the completion of the paving, a 6-foot straightedge shall be placed over the centerline of each manhole frame parallel to the direction of traffic. A measurement shall be made at each side of the frame. The two measurements shall be averaged. If this average is greater than 5/8 inches, reset the manhole frame to the correct plane and elevation. If this average is 5/8 inches or less but greater than 3/8 inches, the manhole frame shall be allowed to remain in place but shall be paid for at 50 percent of the contract unit price.

If the manhole frame is higher than the adjacent pavement, the two measurements shall be made at each end of the straightedge. These two measurements shall be averaged. The same criteria for acceptance and payment as above, shall apply.

stp-611-005 (20030820)

1. Survey Monument Coordination.

The CONTRACTOR is to notify the Northeast Regional Survey Coordinator, Cormac McInnis 920-492-5638, at least 30 days prior to the beginning of construction activities. The Regional Survey Coordinator will then make the arrangements to have the Public Land Survey Monument and Landmark Reference Monuments tied out.

After the majority of construction is complete (prior to restoration) the CONTRACTOR is again to notify the Survey Coordinator that the site is ready for the replacement of the monuments. The Survey Coordinator will then make arrangements to have the Public Land Survey Monument and Landmark Reference Monuments reset.   
(NER14-0429)

1. Traffic Control.

Perform this work in accordance to the requirements of Section 643 of the standard specifications, and as shown on the plans or as approved by the engineer, except as hereinafter modified.

Submit to engineer for approval a detailed traffic control plan for any changes to the proposed traffic control detail as shown on the plans. Submit this plan ten (10) days prior to the preconstruction conference.

Provide 24 hours-a-day availability of equipment and forces to expeditiously restore lights, signs, or other traffic control devices that are damaged or disturbed. The cost to maintain and restore the above items shall be considered incidental to the item as bid and no additional payment will be made therefore.

Supply the name and telephone number of a local contact person for traffic control repair before starting work.

Have available at all times sufficient experienced personnel to promptly install, remove and reinstall the required traffic control devices to route traffic during the construction operations.

The turning of traffic control devices when not in use to obscure the message will not be allowed under this contract.

Obtain prior approval from the engineer for the location of egress and ingress for construction vehicles to prosecute the work.

Cover existing signs which conflict with traffic control as directed by the engineer.

Conduct operations in such a manner that causes the least interference and inconvenience to the free flow of vehicles on the roadways. This includes the following:

1. Do not park or store any vehicle, piece of equipment, or construction materials on the right of way without approval of the engineer.
2. All construction vehicles and equipment entering or leaving live traffic lanes shall yield to through traffic.
3. Equip all vehicles and equipment entering or leaving the live traffic lanes with a hazard identification beam (flashing yellow signal) capable of being visible on a sunny day when viewed without the sun directly on or behind the device from a distance of 1000 feet. Activate the beam when merging into or exiting a live traffic lane.

Do not disturb, remove or obliterate any traffic control signs, advisory signs, shoulder delineators or beam guard in place along the traveled roadways without the approval of the engineer. Immediately repair or replace any damage done to the above during the construction operations at contractor expense.

The traffic requirements are subject to change at the direction of the engineer in the event of an emergency.

(NER09-1119)

1. Temporary Portable Rumble Strips, Item 643.0310.S.

**A Description**

This special provision describes providing, relocating, maintaining, and removing temporary portable rumble strips.

**B Materials**

Furnish RoadQuake2 or Roadquake2F temporary portable rumble strips, by Plastic Safety Systems. Do not use alternate products or methods without preapproval by the Bureau of Traffic Operations.

**C Construction**

**C.1 Placement**

Provide rumble strips where the plans show or the engineer directs as follows:

1. Before placing rumble strips, clean the roadway of sand and other materials that may cause slippage.

2. Place one end of the rumble strips 6 inches from the roadway centerline. Extend the strips perpendicular to the direction of travel. Ensure strips lay flat on the roadway surface.

3. Only one series of rumble strips, placed before the first work zone, is required per direction of travel for multiple work zones spaced 1 mile or less apart. Work zones spaced greater than 1 mile apart require a separate series of rumble strips.

**C.2 Maintenance**

Maintain rumble strips as follows:

1. If rumble strips slide, become out of alignment, or are no longer in the wheel path of approaching vehicles during the work period, thoroughly clean both sides of the rumble strips and reset on a clean roadway.

2. Repair or replace damaged rumble strips immediately.

**D Measurement**

The department will measure temporary portable rumble strips as a single lump sum unit of work acceptably completed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 643.0310.S | Temporary Portable Rumble Strips | LS |

Payment is full compensation for providing, relocating, maintaining or replacing, and removing temporary portable rumble strips.

stp-643-020 (20161130)

1. Temporary Curb Ramp, Item 644.1601.S.

**A Description**

This special provision describes providing, maintaining, and removing temporary curb ramps.

**B Materials**

Furnish materials as follows:

* Asphaltic surface conforming to standard spec 465.2.
* Engineer-approved ready mixed concrete or ancillary concrete conforming to standard spec 602.2 except no QMP is required.
* Commercially available prefabricated curb ramps conforming to Americans with Disabilities Act Accessibility Guidelines.

Furnish yellow detectable warning fields conforming to Americans with Disabilities Act Accessibility Guidelines. Use either an engineer-approved surface-applied type or cast iron from the department's approved products list.

**C Construction**

Provide and maintain temporary curb ramps, including detectable warning fields, throughout the project duration. Place and compact a dense graded aggregate foundation before placing the curb ramp, unless the curb ramp is to be placed on existing roadway surface.

Remove and dispose temporary curb ramps and associated detectable warning fields when no longer required.

**D Measurement**

The department will measure temporary curb ramps by each individual ramp, acceptably completed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 644.1601.S | Temporary Curb Ramp | Each |

Payment is full compensation for providing, maintaining, and removing temporary curb ramps.

stp-644-020 (20150630)

1. Locating No-Passing Zones, Item 648.0100.

For this project, the spotting sight distance in areas with a 55 mph posted speed limit is 0.26 miles (1373 feet).

stp-648-005 (20060512)

1. Adjusting Manhole Covers with Rubber Rings, Item SPV.0060.01

**A Description**

Provide and set rubber grade rings for manhole covers to final grade, along with adjusting the castings to final grade, in accordance to the applicable provisions of section 611 of the standard specifications and as hereinafter provided.

**B Materials**

Furnish materials in accordance to the applicable provisions of section 611 of the standard specifications.

Furnish rubber grade rings from the department’s approved list that have a flat and/or tapered configuration of a size that closely matches the inside and outside dimensions of circular or rectangular structures.

Joint sealant shall be in accordance with the rubber grade ring manufacturer recommendations. In lieu of a recommended sealant, a joint sealant, cold-applied, shall conform to ASTM-D-1850 Polyurethane Door, Window and Siding Sealant or PL Premium Polyurethane Concrete and Masonry Sealant or equivalent.

**C Construction**

Adjust manhole covers in accordance to the applicable provisions of section 611 of the standard specifications.

Install rubber grade rings individually or in combination not to exceed 4 inches in height and locate at the casting. If more than 4 inches of adjustment is necessary, use one concrete ring, 4 inches or more in height, with rubber rings on top of the concrete ring. Final casting placement shall conform to the finished crown of the road. Where a 4-inch concrete ring is needed, do not shim or mortar the concrete ring in order to meet the desired elevation and/or crown and slope of the proposed roadway. Taper the rubber grade rings to match the slope of the crown and profile of the road. Ensure that the concrete and metal surfaces to receive sealing compound are clean, dry and free of grease or oils. Bond the rubber grade rings to adjacent surfaces by laying a continuous bead 5/16-inch thick joint sealant on the top surface of the concrete of the bottom surface of the grade ring on a diameter 1-inch smaller than the outside diameter of the rubber grade ring. Where more than one grade ring is required, apply a continuous bead of sealant as above. Then apply sealant to the top surface of the grade ring and set the casting firmly in place taking care to properly center it over the structure opening and ensuring a firm contact between the casting and the grade ring. Exercise care in backfilling around grade rings and casting prior to joint sealant being fully cured.

Use concrete rings of a size that closely matches the inside and outside dimensions of the structures. If more than 4 inches of adjustment is necessary, use one concrete ring 4 inches or more in height with a maximum of one 2-inch concrete ring on top. Tie concrete rings to the structure using a minimum of two No. 4 rebars, spaced on opposite sides of the structure, when the total thickness of concrete rings is 6-inches or greater. Drill the hole for the bar to a depth of 6 inches into the top of the structure and to such a diameter as to provide a secure fit. The bar shall be of adequate length to secure the concrete rings to the structure without protruding out of the top concrete ring.

Compact around each manhole to prevent settling.

**D Measurement**

The department will measure Adjusting Manhole Covers Rubber Rings by the manhole acceptably installed.

**E Payment**

The department will pay for the measured quantity at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.01 | Adjusting Manhole Covers with Rubber Rings | Each |

Payment is full compensation for all work hereinafter described and will be in accordance to section 611 of the standard specifications.

(NER14-0807)

1. HMA Percent Within Limits (PWL) Test Strip Volumetrics, Item SPV.0060.02; HMA Percent Within Limits (PWL) Test Strip Density Item SPV.0060.03.

**A Description**

This special provision describes the Hot Mix Asphalt (HMA) density and volumetric testing tolerances required for an HMA test strip. An HMA test strip is required for projects constructed under HMA Percent Within Limits (PWL) QMP. A test strip is required for each pavement layer placed over a specific, uniform underlying material, unless specified otherwise in the plans. Each project is restricted to a single mix design for each mix type required (e.g., upper layer and lower layer may have different mix type specified).

Perform work according to standard spec 460 and as hereinafter modified.

**B Materials**

Use materials conforming to HMA Pavement Percent Within Limits (PWL) QMP special provision.

**C Construction**

**C.1 Test Strip**

Notify the department at least 5 calendar days in advance of construction of the test strip. On the first day of production for a test strip, produce approximately 750 tons of HMA. (Note: tonnage shall be adjusted to accommodate natural break points in the project.) Test strips shall be located in a section of the roadway to allow a representative rolling pattern (i.e. not a ramp or shoulder, etc.).

**C.1.1 Sampling and Testing Intervals**

**C.1.1.1 Volumetrics**

Laboratory testing will be conducted from a split sample yielding three components, with portions designated for QC (quality control), QV (quality verification), and retained.

During production for the test strip, HMA mixture samples shall be obtained from trucks prior to departure from the plant. Three split samples shall be collected during the production of test strip material. Sampling and splitting shall be in accordance with Appendix A: *Sampling for WisDOT PWL QMP*. These three samples will be randomly selected by the engineer from each *third* of the test strip tonnage (T), excluding the first 50 tons:

|  |  |
| --- | --- |
| **Sample Number** | **Production Interval (tons)** |
| 1 | 50 to |
| 2 | to |
| 3 | to T |

**C.1.1.2 Density**

Required field tests include contractor QC and department QV nuclear density gauge tests and pavement coring.

The engineer will identify two zones in which gauge/core correlation is to be performed. These two zones will be randomly selected within each *half* of the test strip length. (Note: Density zones shall not overlap and must have a minimum of 100 feet between the two zones; therefore random numbers may be shifted (evenly) in order to meet these criteria.) Each zone shall consist of five locations across the mat as identified in Appendix A. The following shall be determined at each of the five locations within both zones:

- two one-minute nuclear density gauge readings for QC team\*

- two one-minute nuclear density gauge readings for QV team\*

- pavement core sample

\*If the two readings exceed 1.0 lb/ft3 of one another, a third reading shall be conducted in the same orientation as the first reading. [In this event, the engineer will average all three readings, discard the initial of the three readings which falls farthest from the average value and then average the remaining two values to represent the location for the gauge.]

Both QV and QC teams shall have two nuclear density gauges present for correlation at the time the test strip is constructed. The above testing shall be conducted in accordance with Appendix A: *Test Methods & Sampling for PWL QMP HMA Pavements*.

All test reports shall be submitted to the department upon completion, and approved before paving resumes.

**C.1.2 Field Tests**

**C.1.2.1 Density**

Daily standardization of gauges on reference blocks and a project reference site shall be performed in accordance with CMM 8-15. A standard count shall be performed for each gauge on the material placed for the test strip, prior to any additional data collection. Nuclear gauge readings and pavement cores shall be used to determine nuclear gauge correlation in accordance with Appendix A. The two to three readings for the five locations across the mat for each of two zones shall be provided to the engineer. The engineer will analyze the readings of each gauge relative to the densities of the cores taken at each location. The engineer will determine the average difference between the nuclear gauge density readings and the measured core densities to be used as a constant offset value. This offset will be used to adjust raw density readings of the specific gauge for the remainder of the project and shall appear on the density data sheet along with gauge and project identification. An offset is specific to the mix and layer, therefore a separate value shall be determined for each layer of each mix placed over a differing underlying material for the project. This constitutes correlation of that individual gauge for the given layer. Two gauges per team are not required to be onsite daily after completion of the test strip. Any data collected without a correlated gauge will not be accepted.

The contractor is responsible for coring the pavement from the footprint of the density tests. Coring and filling of pavement core holes must be approved by the engineer. The QV team is responsible for the labeling and safe transport of the cores from the field to the QC laboratory. Testing of cores shall be conducted by the contractor and witnessed by department personnel. The contractor is responsible for drying the cores following testing. The department will take possession of cores following laboratory testing and will be responsible for any verification testing at the discretion of the engineer.

Each core 150 mm (6 inches) in diameter shall be taken at locations identified in Section C.1.1.2 Each random core shall be full thickness of the layer placed. Core densities shall be determined in accordance with AASHTO T 166. Thoroughly dry pavement cores in accordance with ASTM D 7227. The target maximum density to be used in determining core density is the average of the three volumetric/mix Gmm values from the test strip multiplied by 62.24 lb/ft3. (In the event mix and density portions of the test strip procedure are separated, the mix portion must be conducted prior to density determination. The target maximum density to determine core densities shall then be the Gmm four-test running average from the end of the previous day’s production multiplied by 62.24 lb/ft3.)

Fill all core holes with non-shrink rapid-hardening grout, mortar or concrete, or with HMA. When using grout, mortar or concrete, remove all water from the core holes prior to filling. Mix the mortar or concrete in a separate container prior to placement in the hole. If HMA is used, fill all core holes with hot-mix matching the same day’s production mix type at same day compaction temperature +/- 20 F. The core holes shall be dry and coated with tack before filling, filled with a top layer no thicker than 2.25 inches, lower layers not to exceed 4 inches, and compacted with a Marshall hammer or similar tamping device using approximately 50 blows per layer. The finished surface shall be flush with the pavement surface. Any deviation in the surface of the filled core holes greater than 1/4 inch at the time of final inspection will require removal of the fill material to the depth of the layer thickness and replacement.

All applicable laboratory and field testing associated with a test strip shall be completed prior to any additional mainline placement of the mix for the associated test strip. All test reports shall be submitted to the department upon completion, and approved before paving resumes. The department will notify the contractor within 24 hours from start of test strip regarding approval to proceed with paving, unless an alternate time frame is agreed upon in writing with the department.

[Exclusions such as shoulders and appurtenances shall be tested in accordance with CMM 8-15. However, all acceptance testing of shoulders and appurtenances will be conducted by the department, and average lot (daily) densities must conform to Table 460-3.]

**C.1.3 Laboratory Tests**

**C.1.3.1 Volumetrics**

Obtain random samples according to Appendix A. Obtain HMA mixture samples from trucks at the plant. Perform tests the same day as taking the sample.

Bulk specific gravities shall be determined for cores in accordance with AASHTO T 166. The bulk specific gravity values determined from field cores shall be used to calculate a correction factor (i.e., offset) for each QC and QV nuclear density gauge. The correction factor will be used throughout the remainder of the layer. QC and QV teams may wish to scan with additional gauges at the locations detailed in C.1.1 above, as only gauges used during the test strip correlation phase will be allowed on the remainder of the project.

**C.2 Acceptance**

**C.2.1 Volumetrics**

Conform to the following limits based on individual QC and QV test results (tolerances based on initial JMF/mix design):

ITEM CONFORMANCE LIMITS

Percent passing given sieve:

37.5-mm +/- 8.0

25.0-mm +/- 8.0

19.0-mm +/- 7.5

12.5-mm +/- 7.5

9.5-mm +/- 7.5

2.36-mm +/- 7.0

75-µm +/- 3.0

Asphaltic content in percent - 0.5

Air Voids -1.5 & +2.0

VMA in percent*[1]* - 1.0

Maximum specific gravity +/- 0.024

*[1]* VMA limits based on minimum requirement for mix design nominal maximum aggregate size in table 460‑1.

QV test results will be determined for air voids and VMA, Gmm, and Gmb, and AC.

Calculation of air voids shall use either the QC, QV, or retained split sample test results, as identified by conducting the paired t-test with the WisDOT PWL Analysis Template.

If QC and QV test results do not correlate as determined by the paired t-test, the retained split sample will be tested by the department’s AASHTO accredited laboratory and HTCP certified personnel as a referee test. Additional investigation shall be conducted to identify the source of the difference between QC and QV data. Referee data will be used to determine material acceptance and pay.

**C.2.2 Density**

Compact all layers of test strip HMA mixture to the applicable density shown in the following table:

TABLE 460-3 MINIMUM REQUIRED DENSITY*[1]*

|  |  |  |
| --- | --- | --- |
|  | MIXTURE TYPE | |
| LAYER | LT & MT | HT |
| LOWER | 93.0*[2]* | 93.0*[3]* |
| UPPER | 93.0 | 93.0 |

*[1]* If any individual core density test result falls more than 3.0 percent below the minimum required target maximum density, the engineer may investigate the acceptability of that material per CMM 8-15.11.

*[2]* Minimum reduced by 2.0 percent for a lower layer constructed directly on crushed aggregate or recycled base courses.

*[3]* Minimum reduced by 1.0 percent for lower layer constructed directly on crushed aggregate or recycled base courses.

Nuclear density gauges are acceptable for use on the project only if correlation is completed for that gauge during the time of the test strip and the department issues documentation of acceptance stating the correlation offset value specific to the gauge and mix design. The offset is not to be entered into any nuclear density gauge as it will be applied by the department-provided Field Density Worksheet.

**C.2.3 Test Strip Acceptance**

The department will evaluate material acceptance and make pay adjustments based on the PWL value of air voids and density for the test strip. The QC core densities and QC and QV mix results will be used to determine the PWL values as calculated in accordance with Appendix A.

The PWL values for air voids and density shall be calculated after determining core densities. An acceptable test strip is defined as the individual PWL value for air voids and density both above 75, and an acceptable gauge-to-core correlation.

If either PWL value for the test strip is below 50, the material is nonconforming and the test strip is unacceptable. Material allowed to remain in place requires another test strip prior to additional paving. If material is removed, a new test strip shall replace the previous one at no additional cost to the department. For simultaneously conducted density and volumetric test strip components, the following must be achieved:

1. Passing/Resolution of Split Sample Comparison
2. Volumetrics/mix PWL value > 75
3. Density PWL value > 75
4. Acceptable correlation

If not conducted simultaneously, the mix portion of a test strip must accomplish (i) & (ii), while density must accomplish (iii) & (iv). If any applicable criteria are not achieved for a given test strip, the engineer, with authorization from the Department’s Bureau of Technical Services, will direct an additional test strip (or alternate plan approved by the Department) be conducted to prove the criteria can be met prior to additional paving of that mix. For a density-only test strip, mix acceptance will be according to main production, i.e., HMA Pavement Percent Within Limits (PWL) QMP special provision.

**D Measurement**

The department will measure HMA Percent Within Limits (PWL) Test Strip as each unit of work, acceptably completed as passing the required air void, VMA, asphalt content, gradation, and density correlation for a Test Strip. Material quantities shall be determined in accordance with standard spec 450.4 and detailed here within.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.02 | HMA Percent Within Limits (PWL) Test Strip Volumetrics | EACH |
| SPV.0060.03 | HMA Percent Within Limits (PWL) Test Strip Density | EACH |
|  |  |  |

These items are intended to compensate the contractor for the construction of the test strip for projects paved under the HMA Pavement Percent Within Limits QMP article.

Payment for HMA Percent Within Limits (PWL) Test Strip Volumetrics is full compensation for volumetric sampling, splitting, and testing; for proper labeling, handling, and retention of split samples.

Payment for HMA Percent Within Limits (PWL) Test Strip Density is full compensation for collecting and measuring of pavement cores, acceptably filling core holes, providing of nuclear gauges and operator(s), and all other work associated with completion of a core-to-gauge correlation, as directed by the engineer.

Acceptable HMA mixture placed on the project as part of a volumetric or density test strip will be compensated by the appropriate HMA Pavement bid item with any applicable pay adjustments.

Pay adjustment will be calculated using 65 dollars per ton of HMA pavement. The department will pay for measured quantities of mix based on $65/ton multiplied by the following pay adjustment calculated in accordance with Appendix A.

The department will adjust pay for each test strip as follows:

PAY ADJUSTMENT FOR HMA PAVEMENT AIR VOIDS & DENSITY

*PERCENT WITHIN LIMITS PAYMENT FACTOR, PF*

*(PWL) (percent of $65/ton)*

> 90 to 100 PF = ((PWL – 90) \* 0.4) + 100

> 50 to 90 (PWL \* 0.5) + 55

<50 50%[1]

where,

PF is calculated per air voids and density, denoted PFair voids & PFdensity

*[1]*Material resulting in PWL value of 50 or less shall be removed and replaced, unless the engineer allows for such material to remain in place. In the event the material remains in place, it will be paid at 50% of the contract unit price of HMA pavement.

For air voids, PWL values will be calculated using lower and upper specification limits of 2.0 and 4.3 percent, respectively. Lower specification limits for density will be in accordance with Table 460-3 as modified here within. Pay adjustment will be determined for an acceptably completed test strip and will be computed as shown in the following equation.

Pay Adjustment = (PF-100)/100 x (WP) x (tonnage) x ($65/ton)\*

\*Note: If Pay Factor <50, the contract unit price will be used in lieu of $65/ton

The following weighted percentage (WP) values will be used for the corresponding parameter:

|  |  |
| --- | --- |
|  | |
| Parameter | WP |
| Air Voids | 0.5 |
| Density | 0.5 |

Individual Pay Factors for each air voids (PFair voids) and density (PFdensity) will be determined. PFair voids will be multiplied by the total tonnage produced (i.e., from truck tickets), and PFdensity will be multiplied by the calculated tonnage used to pave the mainline only (i.e., excluding shoulder) as determined in accordance with CMM 8-15.

The department will pay incentive for air voids under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 460.2005 | Incentive Density PWL HMA Pavement | DOL |
| 460.2010 | Incentive Air Voids HMA Pavement | DOL |

The department will administer disincentives under the Disincentive Density HMA Pavement and the Disincentive Air Voids HMA Pavement administrative items.

bts-PWL Test Strip (20171002)

**Appendix A**

**TEST Methods & Sampling for HMA Pavement PWL QMP.**

The following procedures are included to the HMA Pavement Percent Within Limits (PWL) Quality Management Program (QMP) special provision:

* WisDOT Procedure for Nuclear Gauge/Core Correlation – Test Strip
* WisDOT Test Method for HMA PWL QMP Density Measurements for Main Production
* Sampling for WisDOT HMA PWL QMP

**WisDOT Procedure for Nuclear Gauge/Core Correlation – Test Strip**

Density Testing Zone of Approximately 200 lane ft

Outermost locations to be kept approx. 1.5 ft from edge of lane to the center of gauge





Middle locations @ approx. Center of Lane (i.e., 6 feet to center of gauge for 12-ft lane)





Intermediate locations to be at approx. 3.5 & 9.5 feet from edge of lane to center of gauge

Paving Direction



~ 50ft

~ 50 ft

~ 50 ft

~ 50 ft

Centered @

Random Locations 1 & 2

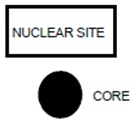
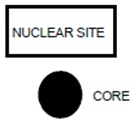
(identified by the Engineer)

**Figure 1: Nuclear/Core Correlation Location Layout**

The zones are supposed to be undisclosed to the contractor/roller operators. The engineer will not lay out density/core test sites until rolling is completed and the cold/finish roller is beyond the entirety of the zone. Sites are staggered across the 12-foot travel lane, and do not include shoulders. The outermost locations should be 1.5-feet from the center of the gauge to the edge of lane. [NOTE: This staggered layout is only applicable to the test strip. All mainline density locations after test strip should have a longitudinal- as well as transverse-random number to determine location as detailed in the *WisDOT Test Method for HMA PWL QMP Density Measurements for Main Production* section of this document.]



Individual locations are represented by the symbol as seen in Figure 1 above. The symbol is two-part, comprised of the nuclear test locations and the location for coring the pavement, as distinguished here:



The nuclear site is the same for QC and QV readings for the test strip, i.e., the QC and QV teams are to take nuclear density gauge readings in the same footprint. Each of the QC and QV teams are to take a minimum of two one-minute readings per nuclear site, with the gauge rotated 180 degrees between readings, as seen here:

1. (b)

**Figure 2: Nuclear gauge orientation for (a) 1st one-minute reading and (b) 2nd one-minute reading**

Photos should be taken of each of the 10 core/gauge locations of the test strip. This should include gauge readings (pcf) and a labelled core within the gauge footprint. If a third reading is needed, all three readings should be recorded and documented. Only raw readings in pcf should be written on the pavement during the test strip, with a corresponding gauge ID/SN (generalized as QC-1 through QV-2 in the following Figure) in the following format:



**Figure 3: Layout of raw gauge readings as recorded on pavement**

Each core will then be taken from the center of the gauge footprint, and will be used to correlate each gauge with laboratory-measured bulk specific gravities of the pavement cores. One core in good condition must be obtained from each of the 10 locations. If a core is damaged at the time of extracting from the pavement, a replacement core should be taken immediately adjacent to the damaged core, i.e., from the same footprint. If a core is damaged during transport, it should be recorded as damaged and excluded from the correlation. Coring after traffic is on the pavement should be avoided. The contractor is responsible for coring of the pavement. Coring and filling of core holes must be approved by the engineer. The QV team is responsible for the labeling and safe transport of the cores from the field to the QC laboratory. Core density testing will be conducted by the contractor and witnessed by department personnel. The contractor is responsible for drying the cores following testing. The department will take possession of cores following initial testing and is responsible for any verification testing.

Each core 150 mm (6 inches) in diameter will be taken at locations as identified in Figure 1. Each random core will be full thickness of the layer being placed. The contractor is responsible for thoroughly drying cores obtained from the mat in accordance with ASTM D 7227 prior to using specimens for in-place density determination in accordance with AASHTO T 166.

Cores must be taken before the pavement is open to traffic. Cores are cut under Department/project staff observation. Relabel each core immediately after extruding, or ensure that labels applied to pavement prior to cutting remain legible. The layer interface should also be marked immediately following extrusion. Cores should be cut at this interface, using a wet saw, to allow for density measurement of only the most recently placed layer. Cores should be protected from excessive temperatures such as direct sunlight. Also, there should be department custody (both in transport and storage) for the cores until they are tested, whether that be immediately after the test strip or subsequent day if agreed upon between Department and Contractor. Use of concrete cylinder molds works well to transport cores. Cores should be placed upside down (flat surface to bottom of cylinder mold) in the molds, one core per mold, cylinder molds stored upright, and ideally transported in a cooler. Avoid any stacking of pavement cores.

**WisDOT Test Method for HMA PWL QMP Density Measurements for Main Production**

For nuclear density testing of the pavement beyond the test strip, QC tests will be completed at three locations per sublot, with a sublot defined as 1500 lane feet. The three locations will represent the outside, middle, and inside of the paving lane (i.e., the lane width will be divided into thirds as shown by the dashed longitudinal lines in Figure 3 and random numbers will be used to identify the specific transverse location within each third in accordance with CMM 8-15). Longitudinal locations within each sublot shall be determined with 3 independent random numbers. The PWL Density measurements do not include the shoulder and other appurtenances. Such areas are tested by the department and are not eligible for density incentive. Each location will be measured with two one-minute gauge readings oriented 180 degrees from one another, in the same footprint as detailed in Figure 2 above. Each location requires a minimum of two readings per gauge. QV nuclear testing will consist of one randomly selected location per sublot. The QV is also comprised of two one-minute readings. This is depicted as follows, with QC test locations shown as solid lines and QV as dashed.

1 lot (7500 lane ft)

12 driving lane (typical)

Division of lane width into approximate thirds for distribution of transverse random numbers

Paving Direction

Note: 12 driving lane (typical), excludes shoulders even when paved integrally

Sublot 5

(1500 ln ft)

Sublot 4

(1500 ln ft)

Sublot 2

(1500 ln ft)

Sublot 3

(1500 ln ft)

Sublot 1

(1500 ln ft)

**Figure 5: Locations of main lane HMA density testing (QC=solid lines, QV=dashed)**

QC and QV nuclear density gauge readings will be statistically analyzed in accordance with the following section of this Appendix. (Note: For density data, if F- and t-tests compare, QC data will be used for the subsequent calculations of PWL value and pay determination. However, if an F- or t-test does not compare, the QV data will be used in subsequent calculations.)

**Sampling for WisDOT HMA PWL QMP**

*Delete CMM 8-36.4 Sampling Hot Mix Asphalt and replace with the following to update sublot tonnages:*

Sampling Hot Mix Asphalt

At the beginning of the project, the contractor determines the anticipated tonnage to be produced. The frequency of sampling is 1 per 750 tons (sublot) for QC and 1 per 3750 tons (lot or 5 sublots) for QV as defined by the PWL QMP SPV. A test sample is obtained randomly from each sublot. The contractor must submit the random numbers for all mix sampling to the department before production begins.

*Example 1*

Expected project production is 12,400 tons. The number of required samples is determined based on this expected production (per PWL QMP SPV) and is determined by the random sample calculation.

Sample 1 – from 50 to 750 tons

Sample 2 – from 751 to 1500 tons

Sample 3 – from 1501 to 2250 tons

Sample 4 – from 2251 to 3000 tons

Sample X – ………………………

Sample 16 – from 11,251 to 12,000 tons

Sample 17 – from 12,001 to 12,400 tons

The approximate location of each sample within the prescribed sublots is determined by selecting random numbers using ASTM Method D-3665 or by using a calculator or computerized spreadsheet that has a random number generator. The random numbers selected are used in determining when a sample is to be taken and will be multiplied by the sublot tonnage. This number will then be added to the final tonnage of the previous sublot to yield the approximate cumulative tonnage of when each sample is to be taken.

To allow for plant start-up variability, the procedure calls for the first random sample to be taken at 50 tons or greater per production day (not intended to be taken in the first two truckloads). Random samples calculated for 0-50 ton should be taken in the next truck (51-75 ton).

This procedure is to be used for any number of samples per project.

If the production is less than the final randomly generated sample tonnage, then the random sample is to be collected from the remaining portion of that sublot of production. If the randomly generated sample is calculated to be within the first 0-50 tons of the subsequent day of production, it should be taken in the next truck. Add a random sample for any fraction of 750 tons at the end of the project. Lot size will consist of 3750 tons with sublots of 750 tons. Partial lots with less than three sublot tests will be included into the previous lot, by the engineer.

It’s intended that the plant operator not be advised ahead of time when samples are to be taken. If the plant operator is involved in recording a Pb (%AC) to match up with the mix sample tonnage, then notification need not be earlier than 60 minutes before the mix sample being taken.

If belt samples are used during troubleshooting, the blended aggregate will be obtained when the mixture production tonnage reaches approximately the sample tonnage. For plants with storage silos, this could be up to 60 minutes in advance of the mixture sample that’s taken when the required tonnage is shipped from the plant.

*Delete CMM 8-36.4.2.1 through 8-36.4.2.3 and replace with the following PWL Split Sample Sizes*

*PWL Split Sample Sizes*

- Minimum sample sizes are referenced below and are guidance for meeting requirements for test completion.

|  |  |
| --- | --- |
| **Mixture NMAS** | **Minimum Individual Sample Size** |
| < 12.5mm (1/2") | 35 lb (4 x 35 = 140 lb) |
| 19.0mm - 25.0mm (3/4" – 1") | 50 lb (4 x 50 = 200 lb) |
| > 37.5mm ( 1-1/2") | 80 lb (4 x 80 = 320 lb) |

- The total sample for larger NMAS (nominal maximum aggregate size) mixtures will be enough to provide the required minimum testing sample size as defined in Figure 6.

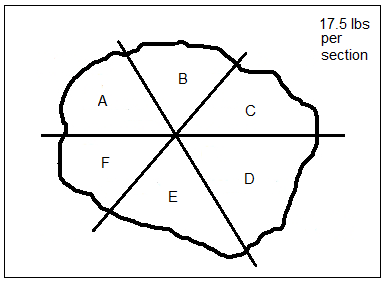
*Delete 8-36.5.1.1 Step 1 and replace with the following Initial Splitting of Sample*

***Initial Splitting of Sample***

For QC sample reduction the HMA sample in the containers is mixed and quartered. The quartering process should then proceed as follows:

i. Collect the minimum sample size given in the *PWL Split Sample Size* section above. Split the sample into “Test” and “Retained” samples. Place entire sample on table, quickly re-mix and split to minimize temperature loss. Split the Test & Retained samples as shown on Figure 6. For 1/2" mixes start with at least a total of 105 lb of HMA.

Figure 6 Superpave Sample for 105 lb for three-way split for QC, QV, and retained samples



|  |  |
| --- | --- |
| (a) | (b) |

ii. For a three-way split shown in Figure 3, *diagonal sections*, as indicated on the sketch, must be combined to form the QV sample (A+D), retained sample (B+E) and the QC test sample (C+F). The retained sample must be bagged, labeled, and stored in a safe dry place. The retained samples may be tested using the “rule of retained” (see “Definitions” section).

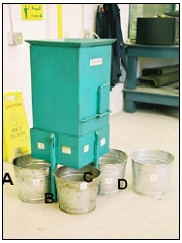
iii. The QC & QV test samples are then further split for the specified tests. Continue the splitting process in *Further Reduction of Samples to Test Sizes* for the test materials until individual samples are in the oven.

*Delete CMM 8-36.5.2 Use of Alternative Sampling / Quartering Devices (ex: Quartermaster) and replace with the following:*

*Use of Alternative Sampling / Quartering Devices (ex: Quartermaster)*

Use of other devices to assist in the sampling and splitting procedures may be used with approval of the department. The Quartermaster is one such device. A picture of a Quartermaster device is shown in Figure 7.

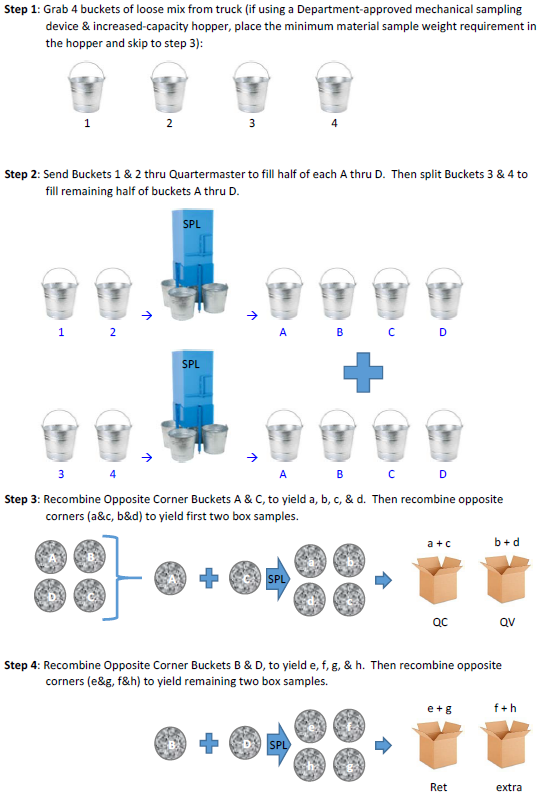
Figure 7 Quartermaster Quartering Device



*Example 3*

If a quartermaster is used to reduce a PWL split sample into the proper quanitites, it is required to collect four times the minimum sample size shown in *PWL Split Sample Sizes* (e.g. 4 x 35 is approximately 140 lb), use the selected device to split, and discard the extra quadrant of material. The quartermaster is used to blend the asphalt mixture to minimize any segregation during the splitting process. The following steps helps to ensure uniform splits for each party/quadrant and should be followed for each PWL sample collected.

Figure 8 PWL Sample Splitting with Quartermaster



Appendix A-TEST Methods & Sampling for PWL QMP HMA Pavements (20171002)

1. Grading, Shaping and Finishing Cross Culverts, Item SPV.0060.04

**A Description**

Excavate, fill, grade, shape, compact, and finish as necessary to accommodate cross culverts and endwalls as shown on the plans, in accordance to the pertinent requirements of the standard specifications, and as hereinafter provided.

**B (Vacant)**

**C Construction**

Construct embankment slopes as shown on the plans.

Properly dispose of all surplus and unsuitable material in accordance to 205.3.12 of the standard specifications.

**D Measurement**

The department will measure Grading, Shaping and Finishing Cross Culverts as a unit for each cross culvert acceptably completed. One completed unit shall consist of grading, shaping and finishing operations on both sides of the road.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.04 | Grading, Shaping and Finishing Cross Culverts | Each |

Payment is full compensation for all excavating, grading, shaping and compacting; and for furnishing and placing fill, topsoil, fertilizer, seed, and mulch.

(NER11-0201)

1. Grading, Shaping and Finishing Ditches, Item SPV.0090.01.

**A Description**

This special provision describes the excavating, grading, shaping, compacting, placing topsoil, and finishing of all disturbed areas necessary to construct and restore drainage ditches as shown on the plans or as directed by the engineer.

**B Materials**

All materials incorporated in the work shall be in accordance with the pertinent provisions of the standard specifications and special provisions.

**C Construction**

All work shall be in accordance with the pertinent provisions of the standard specifications.

Dispose of all unsuitable material in accordance with standard spec 205.3.12.

**D Measurement**

The department will measure Grading, Shaping and Finishing Ditches by length in linear feet along the ditch bottom acceptably completed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.01 | Grading, Shaping and Finishing Ditches | LF |

Payment is full compensation for all excavation, grading, shaping, and compacting; furnishing and placing fill if necessary; disposal of surplus material; furnishing and placing topsoil or salvaged topsoil, seed, fertilizer, erosion mat and mulch.

1. Railing Tubular Type J B-20-023, Item SPV.0105.01

**A Description**

This special provision describes removal and replacement of aluminum railing in accordance with section 203 and 513 of the Standard Specifications, as shown on the plans, and as hereinafter provided.

**B (Vacant)**

**C (Vacant)**

**D Measurement**

The department will measure the Railing Tubular Type J B-20-023 completed in accordance to the contract and accepted, as a single complete unit of work.

**E Payment**

The department will pay for the measured quantity at the contract price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.01 | Railing Tubular Type J B-20-023 | LS |

Payment is full compensation for removing, providing, fabricating, transporting, and erecting the railing; for metal shims under the bases; and, if necessary, for providing and placing the anchor bolts.

1. Removing Asphaltic Concrete Deck Overlay Modified B-20-023, Item SPV.0180.01

# A Description

Remove the asphaltic concrete overlay with or without an underlayment of waterproof membrane by milling the entire bridge deck in accordance to standard spec 204, the plans, and as hereinafter provided.

# (Vacant)

1. **Construction**
   1. **Milling**

Use a self-propelled milling machine that is specially designed and constructed for milling bridge decks. It shall mill without tearing or gouging the concrete masonry underlying the deck overlay. The machine shall consist of a cutting drum with carbide or diamond tip teeth. Space the teeth on the drum to mill a surface finish that is acceptable to the engineer.

Shroud the machine to prevent discharge of any loosened material into adjacent work areas or live traffic lanes. Equip the machine with electronic devices that provide accurate depth, grade and slope control, and an acceptable dust control system.

Perform milling in a manner that precludes damage to the bridge floor and results in a uniform textured finish that:

* + - Is free of sharp protrusions;
    - Has uniform transverse grooves that measure up to ¼-inch vertically and transversely; and
    - If applicable, is acceptable to the manufacturer of the sheet waterproof membrane.

Windrowing or storing of the removed milled asphaltic concrete on the bridge is only permitted in connection with the continuous removal and pick-up operation. During nonworking hours, clear the bridge of all materials and equipment.

# Cleaning

Blast-clean the vertical faces of curbs, sidewalks, and parapets to the depth of the adjoining overlay.

The removed asphaltic concrete shall become the property of the contractor; properly dispose of it in accordance to standard spec 204.

1. **Measurement**

The department will measure Removing Asphaltic Concrete Deck Overlay in area by the square yard acceptably completed.

**E Payment**

The department will pay for measured quantities at the contract unit price under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0180.01 | Removing Asphaltic Concrete Deck Overlay Modified B-20-023 | SY |

Payment is full compensation for removing the asphaltic concrete with or without an underlayment of waterproof membrane; cleaning the concrete surfaces; and for properly disposing of all materials.