



Wisconsin Department of Transportation

Division of Transportation Systems Development

Bureau of Project Development
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October 10, 2017

NOTICE TO ALL CONTRACTORS:

Proposal #03: 1010-02-85, WISC 2017 501
Madison – Portage
CTH CS To Portage Interchange
IH 39
Columbia County

November 14, 2017

This is Addendum No. 01, which provides for the following:

Special Provisions:

Added Special Provisions	
Article No.	Description
48	HMA Percent Within Limits (PWL) Test Strip Volumetrics, Item SPV.0060.07; HMA Percent Within Limits (PWL) Test Strip Density Item SPV.0060.08

Deleted Special Provisions	
Article No.	Description
36	HMA Percent Within Limits (PWL) Test Strip, Item SPV.0060.05

Schedule of Items:

Revised Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
460.2005	Incentive Density PWL HMA Pavement	DOL	49,890	-18,572	31,318
460.2010	Incentive Air Voids HMA Pavement	DOL	49,890	-18,572	31,318

Added Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
SPV.0060.07	HMA Percent Within Limits (PWL) Test Strip Volumetrics	EA	0	2	2
SPV.0060.08	HMA Percent Within Limits (PWL) Test Strip Density	EA	0	2	2

Deleted Bid Item Quantities					
Bid Item	Item Description	Unit	Old Quantity	Revised Quantity	Proposal Total
SPV.0060.05	HMA Percent Within Limits (PWL) Test Strip	EA	2	-2	0

Plan Sheets:

Revised Plan Sheets	
Plan Sheet	Plan Sheet Title (brief description of changes to sheet)
99	Miscellaneous Quantities – Revised quantity table

The responsibility for notifying potential subcontractors and suppliers of these changes remains with the prime contractor.

Sincerely,

Mike Coleman

Proposal Development Specialist
Proposal Management Section

ADDENDUM NO. 01

1010-02-85

October 10, 2017

Special Provisions

36. DELETED

48. HMA Percent Within Limits (PWL) Test Strip Volumetrics, Item SPV.0060.07; HMA Percent Within Limits (PWL) Test Strip Density Item SPV.0060.08.

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:

<u>Sample Number</u>	<u>Production Interval (tons)</u>
<u>1</u>	50 to $\frac{T}{3}$
<u>2</u>	$\frac{T}{3}$ to $\frac{2T}{3}$
<u>3</u>	$\frac{2T}{3}$ 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]

LAYER	MIXTURE TYPE	
	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:

- i. Passing/Resolution of Split Sample Comparison
- ii. Volumetrics/mix PWL value > 75
- iii. Density PWL value > 75
- iv. 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.0060.07	HMA Percent Within Limits (PWL) Test Strip Volumetrics	EACH
SPV.0060.08	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

<i>PERCENT WITHIN LIMITS</i>	<i>PAYMENT FACTOR, PF</i>
<i>(PWL)</i>	<i>(percent of \$65/ton)</i>
> 90 to 100	$PF = ((PWL - 90) * 0.4) + 100$

$$\begin{array}{ll} \geq 50 \text{ to } 90 & (\text{PWL} * 0.5) + 55 \\ < 50 & 50\%^{[1]} \end{array}$$

where,

PF is calculated per air voids and density, denoted PF_{air voids} & PF_{density}

^[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.

$$\text{Pay Adjustment} = (\text{PF} - 100) / 100 \times (\text{WP}) \times (\text{tonnage}) \times (\$65/\text{ton})^*$$

*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:

<u>Parameter</u>	<u>WP</u>
Air Voids	0.5
Density	0.5

Individual Pay Factors for each air voids (PF_{air voids}) and density (PF_{density}) will be determined. PF_{air voids} will be multiplied by the total tonnage produced (i.e., from truck tickets), and PF_{density} 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)

Schedule of Items

Attached, dated October 10, 2017 are the revised Schedule of Items Pages 3, 11 and 12.

Plan Sheets

The following 8½ x 11-inch sheets are attached and made part of the plans for this proposal:
Revised: 99

END OF ADDENDUM



Proposal Schedule of Items

Proposal ID: 20171114003 Project(s): 1010-02-85

Federal ID(s): WISC 2017501

SECTION: 0001 ROADWAY

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0064	460.2005 Incentive Density PWL HMA Pavement	31,318.000 DOL	1.00000	31,318.00
0066	460.2010 Incentive Air Voids HMA Pavement	31,318.000 DOL	1.00000	31,318.00
0068	460.4110.S Reheating HMA Pavement Longitudinal Joints	75,563.000 LF	_____.	_____.
0070	460.5225 HMA Pavement 5 LT 58-28 S	2,185.000 TON	_____.	_____.
0072	460.7224 HMA Pavement 4 HT 58-28 S	24,561.000 TON	_____.	_____.
0074	460.7424 HMA Pavement 4 HT 58-28 H	24,561.000 TON	_____.	_____.
0076	465.0105 Asphaltic Surface	70.000 TON	_____.	_____.
0078	465.0110 Asphaltic Surface Patching	15.000 TON	_____.	_____.
0080	465.0305 Asphaltic Surface Safety Islands	2.000 TON	_____.	_____.
0082	465.0400 Asphaltic Shoulder Rumble Strips	82,982.000 LF	_____.	_____.
0084	502.0100 Concrete Masonry Bridges	59.000 CY	_____.	_____.
0086	502.3100 Expansion Device (structure) 01. B-11-98	LS	LUMP SUM	_____.
0088	502.3200 Protective Surface Treatment	65.000 SY	_____.	_____.
0090	502.3210 Pigmented Surface Sealer	9.000 SY	_____.	_____.
0092	502.4204 Adhesive Anchors No. 4 Bar	76.000 EACH	_____.	_____.
0094	502.4205 Adhesive Anchors No. 5 Bar	4.000 EACH	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20171114003 Project(s): 1010-02-85

Federal ID(s): WISC 2017501

SECTION: 0001 ROADWAY

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0316	690.0150 Sawing Asphalt	73.000 LF	_____.	_____.
0318	690.0250 Sawing Concrete	5,213.000 LF	_____.	_____.
0320	715.0415 Incentive Strength Concrete Pavement	2,480.000 DOL	1.00000	2,480.00
0322	715.0502 Incentive Strength Concrete Structures	150.000 DOL	1.00000	150.00
0324	ASP.1T0A On-the-Job Training Apprentice at \$5.00/HR	1,200.000 HRS	5.00000	6,000.00
0326	ASP.1T0G On-the-Job Training Graduate at \$5.00/HR	800.000 HRS	5.00000	4,000.00
0328	SPV.0045 Special 01. Portable Automated Real-Time Traffic Queue Warning System (QWS)	185.000 DAY	_____.	_____.
0330	SPV.0060 Special 01. Tension Anchor Rods	2.000 EACH	_____.	_____.
0332	SPV.0060 Special 02. Concrete Barrier Wall Surface Repair	10.000 EACH	_____.	_____.
0334	SPV.0060 Special 03. Replace Sign Bridge ID Plaque	1.000 EACH	_____.	_____.
0336	SPV.0060 Special 04. Sawing Concrete Barrier Wall	1.000 EACH	_____.	_____.
0340	SPV.0060 Special 06. Replace Rodent Screen	2.000 EACH	_____.	_____.
0342	SPV.0090 Special 01. Removing HMA Pavement Longitudinal Joint Milling	75,563.000 LF	_____.	_____.
0344	SPV.0090 Special 02. Sawing Concrete Partial Sawcut	48.000 LF	_____.	_____.



Proposal Schedule of Items

Proposal ID: 20171114003 Project(s): 1010-02-85

Federal ID(s): WISC 2017501

SECTION: 0001 ROADWAY

Alt Set ID: Alt Mbr ID:

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price	Bid Amount
0346	SPV.0090 Special 03. Clean and Fill Crack Treatment	6,431.000 LF	_____.	_____.
0348	SPV.0105 Special 01. Removing Sign Structure Station 956+12F	LS	LUMP SUM	_____.
0350	SPV.0105 Special 02. Remove and Replace Guardrail	LS	LUMP SUM	_____.
0352	SPV.0165 Special 01. Modular Block Wall Repair	70.000 SF	_____.	_____.
0354	SPV.0165 Special 02. Shotcrete Facing	875.000 SF	_____.	_____.
0356	SPV.0180 Special 01. Continuously Reinforced Concrete Pavement SHES Repair	30.000 SY	_____.	_____.
0358	SPV.0180 Special 03. Concrete Pavement HES 6-Inch	227.000 SY	_____.	_____.
0360	SPV.0060 Special 07. HMA Percent Within Limits (PWL) Test Strip Volumetrics	2.000 EACH	_____.	_____.
0362	SPV.0060 Special 08. HMA Percent Within Limits (PWL) Test Strip Density	2.000 EACH	_____.	_____.
Section: 0001			Total:	_____.
			Total Bid:	_____.