Wisconsin Department of Transportation
Division of Transportation System Development
Bureau of Technical Services
Material Management Section

USH 51
Oneida County
Concrete Pavement Repair and Preservation
Using SHRP2 – R26 Implementation Assistance Funds

Construction Report

Prepared by:
Jed P. Peters, P.E.
Pavement Research and Warranty Engineer

December 11, 2013 - Draft

Background

During 2013 the Wisconsin Department of Transportation (WisDOT) completed a reconstruction of USH 51 in the City of Minocqua in Oneida County (Project 1174-10-70/71). The project limits were defined as Front Street – Old Hwy 70. In reality, the southern construction limit was approximately 750 LF north of Front Street where the existing USH 51 pavement surface changes from Portland cement concrete (PCC) surface to hot mix asphalt (HMA) surface. As designed, the project was not intended to address the PCC. The PCC pavement is programmed to be rehabilitated or replaced in 2017 under project 1170-19-60. Scoping for this project is not scheduled to occur until 2014.

During the course of the 2013 construction it became evident that the PCC pavement and joint distress had progressed much more rapidly than expected. The photos included in the work plan in Appendix A are a representation of the pavement condition. As the pictures show there are several distress types present; including instances of mid-slab cracking and corner breaks indicating possible support and/or structural issues. However, these distresses are relatively sparse. The primary pavement distress observed is deterioration or spalling at the joints.

The Department was presented with two basic options to address the concrete. First, accelerate the 2017 project programmed to address this section of USH 51. Given that most of the concrete appears to be structurally sound this may not be the most cost effective solution for WisDOT. This leads to the second option of completing repair work and preserving the pavement's life to achieve satisfactory performance until at least the 2017 project.

The decision to repair the existing concrete with the intent of preserving the pavement until the 2017 project closely coincided with the WisDOT receiving $75,000 of SHRP2 – R26 (*Guidelines for the Preservation of High-Traffic-Volume Roadways*) Implementation assistance funding. It was WisDOT's intent to use this funding on 3 or 4 pavement repair projects. The hope was to split the funding evenly amongst asphalt and concrete repairs. Documentation regarding the SHRP2 Implementation Assistance Funds, including WisDOT's application and miscellaneous correspondence in included in Appendix B.

Early in the project identification process it became evident that funding rules and time restrictions were going to drastically limit the number and type of projects selected. The Department identified multiple

concrete repair projects and obtained FHWA approval to use the SHRP2 funds to complete the concrete repairs using two experimental products (TechCrete and PhosCrete). Due to environmental document requirements, the list of multiple projects was reduced to a single project, USH 51 in Minocqua. Approval was granted by FHWA (see email in Appendix B) to expend the entire $75,000 on the single project, and WisDOT proceeded with investigating the pavement repair/preservation strategies to employ on this highway.

Consultation of the Transportation Research Board's (TRB) *Guidelines for the Preservation of High-Traffic-Volume Roadways* provided multiple treatment methods for agencies to consider when addressing the smoothness AND light to moderate surface distress present on USH 51. These include partial-depth concrete patching, full-depth concrete patching (using conventional concrete mixtures or the experimental materials), placement of an ultra-thin (0.4" – 0.8") bonded wearing course, and thin (0.875" – 1.5") HMA overlay. Further review of the TRB guidelines for these repair/preservation options showed that each would be a suitable strategy for the climate, necessary closure durations/restrictions, and desired performance life. As such, the Department pursued completing any combination of the aforementioned strategies via a contract change order (CCO) to the contract controlling the work of project 1174-10-70/71.

With the reduction of scope to a single project, the completion of partial or full depth concrete patching using the experimental materials was immediately discounted. It was determined to be impractical to install the experimental materials when there would be such a limited comparison.

The remaining strategies, partial/full depth patching with conventional mixtures, ultra-thin bonded concrete overlay, or thin HMA overlays were investigated using a cost analysis, discussed below. The outcome of which showed the thin HMA overlay to be the most cost effective solution. However, the actual unit prices submitted by the contractor came back just the opposite. The full quantity analysis, including WisDOT estimates and contractor submitted pricing is included in the work plan in Appendix A.

The repair and preservation strategy chosen based on the SHRP2 guidelines and the cost analysis was a thin HMA overlay. This segment of USH 51 is an urban cross section (with curb and gutter). As such, to maintain proper storm water management, the profile and elevations of the repaired road had to match that of the existing distressed concrete. To achieve this, the repair strategy included a partial depth concrete removal.

Construction

Partial Depth Concrete Removal

The concrete pavement repair strategy was put into action on October 1, 2013. One and a half inches of the existing concrete pavement was removed using two milling machines. Figures 1 and 2 show the large machine in operation. This machine was used to mill the mainline and as tight to the curb face as the road radiuses would allow. The areas of tight curvature or areas with storm drain inlets were milled using a small, 1 foot wide, mill. This small mill is shown in Figure 3.

Figure 1. Large Mill Removing Mainline Concrete

Figure 2. Large Mill Removing Tight to Curb Face

Figure 3. Small Mill Removing Concrete Around Structure

According to project personnel's field diaries, included in Appendix C, the existing concrete milled up easily. It became evident early in the milling operations that the joints were much more distressed, and the concrete possibly much softer, than originally estimated. As shown in Figures 4, the cone of deterioration at the joints or cracks extended well below the 1.5" depth the concrete was removed.

Figure 4. Concrete Distress Extent and Severity

Had the partial/full depth concrete option been identified as the most cost effective repair strategy, it appears that most, if not all, of the distress joints would have required full depth patches. Leading to significant quantity, and consequently cost, overruns.

Joint/Foundation Prep

Prior to placing the thin HMA overlay, the milled concrete surface was swept (Figure 5.).

Figure 5. Sweeping Mill Tailings from Pavement

The deteriorated pavement removed from the joints using a high pressure air lance (Figures 6 and 7).

Figure 6. Air Lance Removing Debris/Deteriorated Concrete from Joint

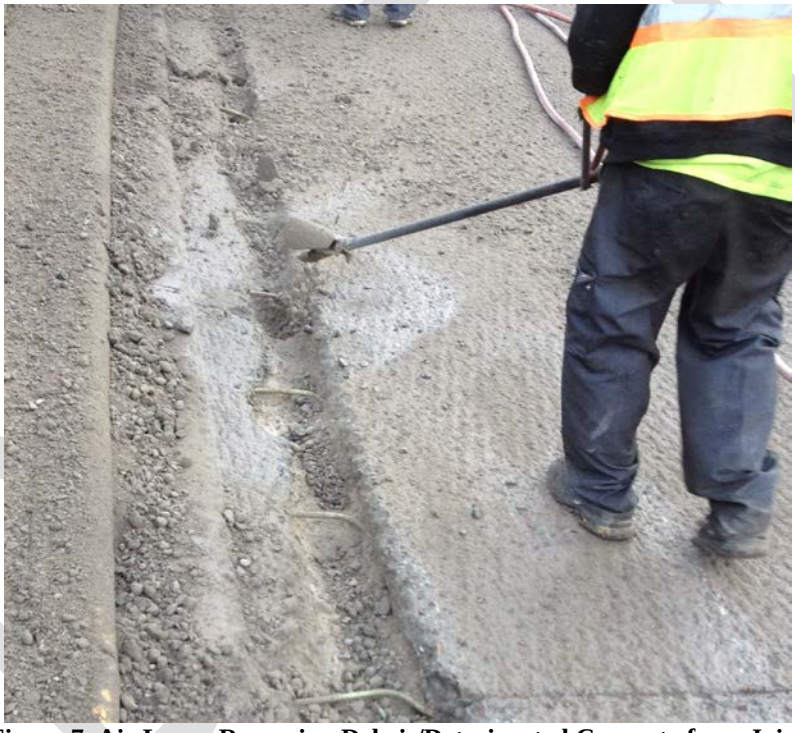


Figure 7. Air Lance Removing Debris/Deteriorated Concrete from Joint

The joint cavities were then patched with HMA material to provide a planar surface for the thin HMA overlay to be applied to (Figure 8).

Figure 8. Patching Joint Cavities with HMA

Finally, just prior to paving, the concrete surface and HMA packed joints had a tack coat applied (Figure 9) to provide a bond between the existing concrete and the thin HMA overlay.

Figure 9. Tack Coat

Paving

Paving was accomplished using the prime contractor's standard paving equipment. A single, activated screed, HMA paver fed directly into the hopper by quad-axle dump trucks (Figures 10 and 11). Compaction was provided using the contractor's standard HMA dual steel drum, vibratory rollers (Figure 12).

Figure 10. Paving Unit and Quad-Axle Dump Truck

Figure 11. Paving Unit Approaching Project Butt Joint

Figure 12. Compaction Equipment

Materials

HMA Mixture

Current WisDOT specifications require a minimum nominal aggregate size of 12.5mm for upper and lower layer HMA layers. For the 12.5mm HMA mixtures the standard prescribed minimum lift thicknesses is 1.75" to ensure fluidity of the aggregates in the mixture to provide for proper compaction. The standard specifications include provisions for 9.5mm HMA and SMA mixtures that would allow for a 1.5" lift thickness (thin lift). These provisions are not typically used on WisDOT projects. However, HMA paving contractors within the state have been using thin lift 9.5mm HMA mixtures for local and private entities with great success for years.

To ensure success and allow the contractor's experience to be best utilized, WisDOT requested that the contractor submit a 9.5mm mix design for approval to construct the thin lift. The design submitted, and approved, was for a mixture composed of 100% manufactured sand, with 100% fractured face count, meeting the gradation requirements of Table 1.

Table 1. Aggregate Gradation Requirements

Sieve Size	Percent Passing		
	Contractor Mix Design	WisDOT 9.5mm HMA	WisDOT 9.5mm SMA
3/4 – Inch (19 mm)	100	-	-
1/2 – Inch (12.5 mm)	99	100	100
3/8 – Inch (9.5 mm)	84	90 – 100	90 – 100
#4 (4.75 mm)	38	90 max	35 – 45
#8 (2.36 mm)	24	20 – 65	18 – 28
#16 (1.19 mm)	19	-	-
#30 (0.595 mm)	14	-	-
#100 (0.150 mm)	11	-	-
#200 (0.075 mm)	7	2 – 10	10 – 14

This aggregate skeleton is held together by PG64-34 asphaltic cement, composing a minimum of 6.5% of the HMA mix (by weight). The mixture specification also calls for inclusion of a fiber additive.

The remaining piece of the volumetrics puzzle, air voids, is targeted for between 2.0 and 2.5%.

To guide the Department's approval decision, the contractor mix design values were compared to the WisDOT 9.5mm HMA and SMA specifications. The contractor mix design very nearly meets the requirements for either of the WisDOT 9.5mm mixtures. Discrepancies are found in the 12.5mm and 0.5mm gradation requirements for both SMA and HMA (see Table 1), the 0.075mm gradation for the SMA (see Table 1), the inclusion of a fiber additive (this would match the WisDOT 9.5mm SMA spec, but not the HMA), and the target air void. WisDOT specifies an air void design target of 4.0%, but the specification range will allow for as low as 2.0%.

The contractor mix design so closely matched the WisDOT 9.5mm designs, that the design was approved for use on this project as a WisDOT E-10, 9.5mm mixture.

HMA Density

The thin lift HMA was nuclear density tested after final compaction and prior to loading with traffic. Minimum required density was as specified for a standard E-10 mixture, or 92%. The density data is summarized in Table 2, and the field density worksheets are included in Appendix C. Average density of the 10 total recorded measurements was approximately 94.5%, with one failing test at 90%. Since density incentive was not included on the pavement preservation HMA, there was no deduct for the failing density material.

Table 2. Density Measurements		
Station	Offset from CL	% Max Density
433+50	5.1	90
430+57	6.5	95.2
426+22	7.7	94.9
431+02	4.9	95.17
431+20	4.1	98.07
434+12	4.6	95.7
427+31	8.1	92.37
435+19	5.6	95.66
434+74	1.6	92.09
428+98	10.8	95.58
	Average:	94.47
	Standard Dev:	2.32
	Median:	95.19
	Maximum:	98.07
	Minimum:	90.00

Miscellaneous Materials
Any other materials incorporated included in the pavement preservation work; including pavement markings and tack coat, were accepted in accordance with WisDOT specifications as part of the larger improvement project.

Future Activities

As stated in the work plan (Appendix A) this preservation section of USH 51 will be monitored and reported upon semi-annually for the life of thin lift HMA surface. Defined as replacement due to deterioration or as part of a larger improvement project (currently a project is programmed to replace this section of USH 51 pavement in 2017).

The results of this thin lift HMA pavement preservation on USH 51 is anticipated to aid with the Department's overall initiative of evaluating and implementing thin lift overlays. This initiative has been identified as a priority by the Department's Asphalt Pavement Oversight Group. Any semi-annual reports will be shared with the champion of the initiative for consideration in any future specifications or implementation efforts.

Appendix A

USH 51
Concrete Pavement Repair and Preservation
Work Plan

Wisconsin Department of Transportation
Division of Transportation System Development
Bureau of Technical Services
Material Management Section

USH 51
Oneida County
Concrete Pavement Repair and Preservation

Work Plan

Prepared by:
Jed P. Peters, P.E.
Pavement Research and Warranty Engineer

September 11, 2013

Background

During 2013 the Wisconsin Department of Transportation (WisDOT) is completing a reconstruction of USH 51 in the City of Minocqua in Oneida County (Project 1174-10-70/71). The project limits are defined as Front Street – Old Hwy 70. In reality, the southern construction limit is approximately 750 LF north of Front Street where the existing USH 51 pavement surface changes from Portland cement concrete (PCC) surface to hot mix asphalt (HMA) surface. As designed, the project was not intended to address the PCC. The PCC pavement is programmed to be rehabilitated or replaced in 2017 under project 1170-19-60. Scoping for this project is not scheduled to occur until 2014.

During the course of the 2013 construction it became evident that the PCC pavement and joint distress had progressed much more rapidly than expected. The photos included in Appendix A are a representation of the pavement condition. As the pictures show there are several distress types present; including instances of mid-slab cracking and corner breaks indicating possible support and/or structural issues. However, these distresses are relatively sparse. The primary pavement distress observed is deterioration or spalling at the joints.

The Department is presented with two basic options to address the concrete. First, accelerate the 2017 project programmed to address this section of USH 51. Given that most of the concrete appears to be structurally sound this may not be the most cost effective solution for WisDOT. This leads to the second option of completing repair work and preserving the pavement's life to achieve satisfactory performance until at least the 2017 project.

Problem Statement

The current AADT on USH 51 at this location is approximately 19,000. This level of traffic volume leads to several perceived drawbacks to repairing, rather than replacing, the distressed pavement; including shorter construction windows, increased risk of failure, and consequently greater liability and increased negative public perception if there is a failure. Though repair/preservation may have its perceived drawbacks, it may be a more cost effective solution.

Consultation of the Transportation Research Board's (TRB) *Guidelines for the Preservation of High-Traffic-Volume Roadways* provides multiple treatment methods for agencies to consider when addressing the smoothness AND light to moderate surface distress present on USH 51. These include partial-depth concrete patching, full-depth concrete patching, placement of an ultra-thin (0.4" – 0.8") bonded wearing

course, and thin (0.875" – 1.5") HMA overlay. Further review of the TRB guidelines for these repair/preservation options shows that each would be a suitable strategy for the climate, necessary closure durations/restrictions, and desired performance life. As such, the Department will pursue completing any combination of the aforementioned strategies via a contract change order (CCO) to the contract controlling the work of project 1174-10-70/71. Final determination of which strategies to employ will be pending the results of cost negotiations and a cost analysis. For the purpose of the cost analysis, partial-depth and full-depth repair will be grouped as one treatment strategy.

Procedures

Cost Analysis

Cost estimates for completing the pavement repair using each strategy wholly on its own will be prepared prior to negotiations. See Appendix B.

Quantity estimates and draft specifications will be submitted to the prime contractor for preparation of unit prices.

Unit prices will be compared against the previously prepared estimates and if necessary, negotiation on prices will occur. Final outcome of these negotiations will determine the final treatment strategies employed.

Construction/Installation Evaluation

Construction or completion of the repair/preservation strategies will be monitored by project inspection staff. The staff will ensure contractor compliance with any specifications governing the work; as well as compliance with sound construction practices. The inspectors will further determine installation quantities and consequently payment amounts.

Performance Evaluation

Pavement performance will be monitored semi-annually until such a time as the pavement repairs fail, or a programmed project further rehabilitating or replacing the pavement is completed. The semi-annual investigations will be completed by the Bureau of Technical Services (BTS) pavement research engineer, regional pavement design engineer, or regional maintenance engineer.

Further investigation through discussions with county and municipal maintenance forces may also be completed if necessary.

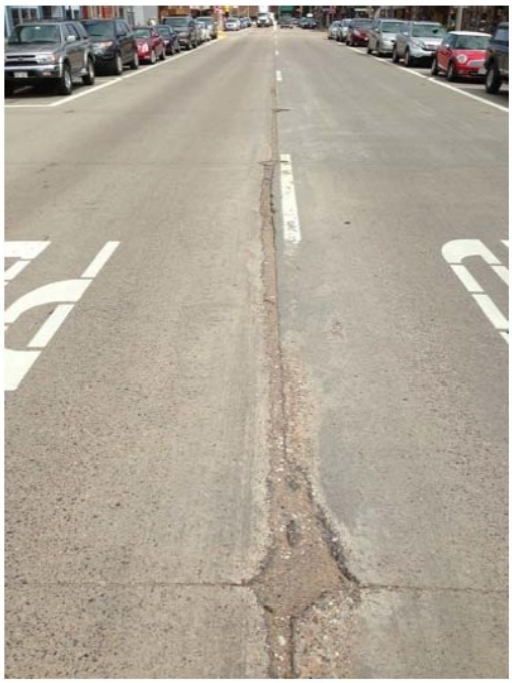
Reporting

Annual interim reports, consisting primarily of site visit notes and any conclusive results, will be prepared by the BTS pavement research engineer. After the anticipated four year or actual service life (whichever comes last) of the repaired sections has elapsed, a final report will be prepared, published, and distributed by the BTS pavement research engineer. Interim guidance presentations and/or the final report may also be prepared if overall conclusive results can be drawn prior to the end of the performance evaluation period.

Implementation

Results of this effort can be implemented as guidance in FDM Chapter 14, as well as in the WisDOT Highway Maintenance Manual. This guidance will have the potential to impact both improvement and maintenance projects. Recommendations will be made as to which repair methods and/or materials may be suitable for high-traffic-volume application.

Appendix A
USH 51 Photographs



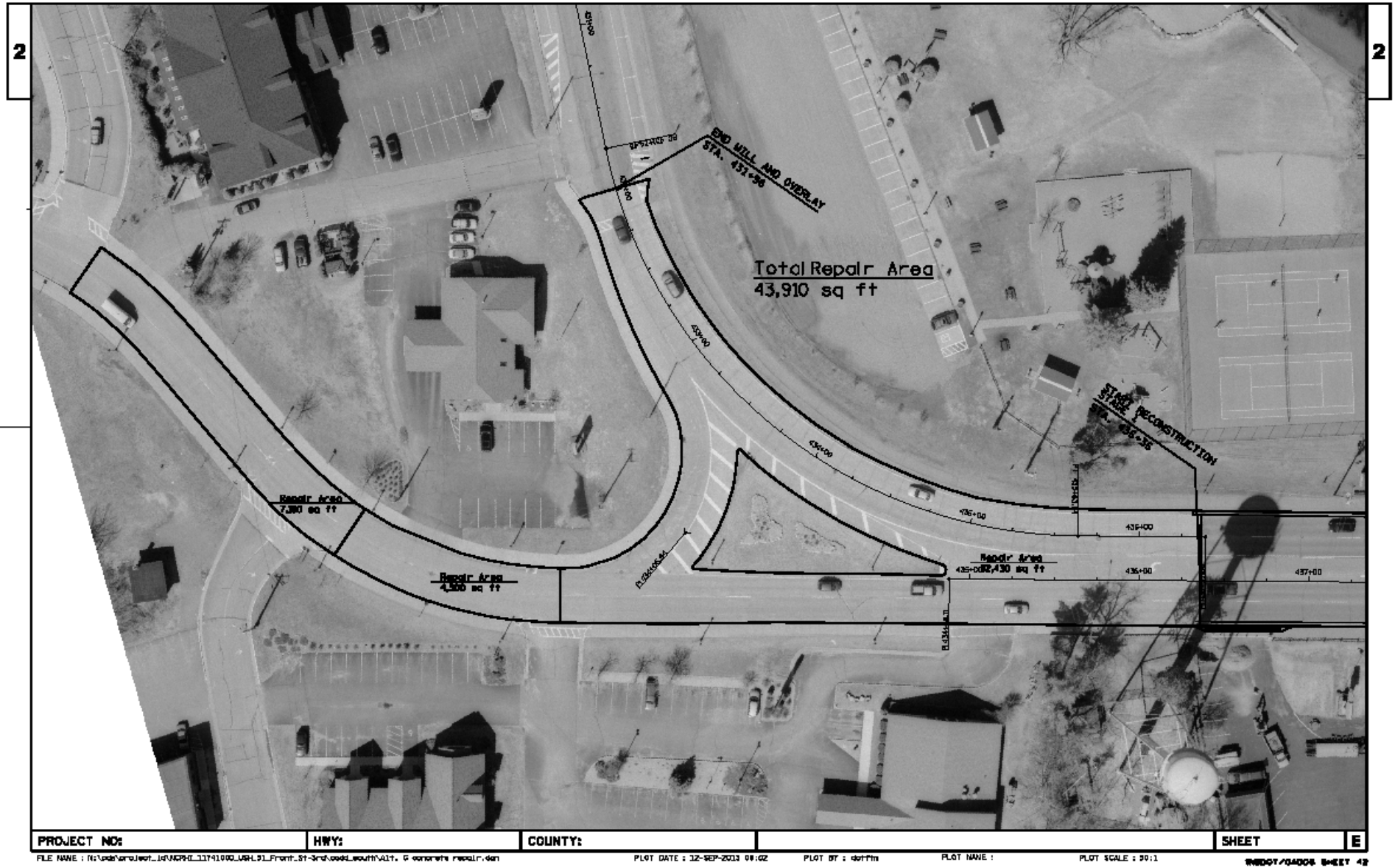
Appendix B
Cost
Estimates/Budget

Concrete Repair Asphalt Overlay - Minocqua - Preliminary Budget Estimate and Contractor Price Submittal

				DOT Estimates			Change Order Submittal	
Item No.	**Item Description**	**Units**	**Quantity**	**DOT Unit Price Estimate**	**Estimated Budget Amount**	**Unit Price (Sub)**	**Unit Price (Prime)**	**Amount**
204.0109.S	Removing Concrete Surface Partial Depth	SF	43910	$2.25	$98,797.50		$1.07	$46,983.70
211.0100	Prepare Foundation for Asphalt Paving	LS	1	$5,060.00	$5,060.00		$5,800.00	$5,800.00
455.0115	Asphaltic Material PG 64-22	ton	22	$425.00	$9,350.00		$576.00	$12,672.00
460.1110	HMA Pavement	ton	410	$55.00	$22,550.00		$28.21	$11,566.10
							$0.00	$0.00
							$0.00	$0.00
							$0.00	$0.00
							$0.00	$0.00
	TOTALS				$135,757.50			$77,021.80

Concrete Joint Repair - Minocqua - Updated Unit Prices 2013-09-05

				DOT Estimates			Change Order Submittal	
Item No.	**Item Description**	**Units**	**Quantity**	**DOT Unit Price Estimate**	**Estimated Budget Amount**	**Unit Price (Sub)**	**Unit Price (Prime)**	**Amount**
416.0750.S	Concrete Pavement Partial Depth Repair Joint Repair	LF	706	$15.00	$10,590.00	$20.00	$22.00	$15,532.00
416.0758.S	Full Depth Adjustment	SF	100	$35.00	$3,500.00	$45.00	$49.50	$4,950.00
204.0100	Removing Pavement	SY	412	$6.30	$2,595.60	$10.00	$11.00	$4,532.00
416.0610	Drilled Tie Bars	EA	350	$6.20	$2,170.00	$6.00	$6.60	$2,310.00
416.0620	Drilled Dowel Bars	EA	250	$13.00	$3,250.00	$18.00	$19.80	$4,950.00
416.1710	Concrete Pavement Repair	SY	412	$65.00	$26,780.00	$155.00	$170.50	$70,246.00
416.1720	Concrete Pavement Replacement	SY		$60.00	$0.00	$155.00	$170.50	$0.00
619.1000	Mobilization	LS	1	$12,000.00	$12,000.00	$25,000.00	$27,500.00	$27,500.00
	TOTALS				$60,885.60			$130,020.00


2
2
END MILL AND OVERLAY
STA. 431+36
Total Repair Area
43,910 sq ft
START RECONSTRUCTION
STA. 435+38
Repair Area
7,380 sq ft
Repair Area
4,520 sq ft
Repair Area
435+00 2,430 sq ft
PROJECT NO:
HWY:
COUNTY:
SHEET
E
PLOT DATE : 12-SEP-2013 09:02
PLOT BY : dottm
PLOT SCALE : 20:1

Appendix B

SHRP 2 Implementation Assistance Funding Documentation
And
Correspondence

SHRP 2 Round 2 Implementation Assistance Funding

R-26 High Traffic Volume Pavement Preservation

WisDOT Application Narrative

Many of the pavement preservation techniques discussed in the SHRP2 Report 2S-R26-RR-1 have been used on roads and highways owned and maintained by the State of Wisconsin. The decision authority to determine which technique to use when and where is primarily held in the State's five transportation regions; each of which operate somewhat uniquely and independently from one another. Ultimately this leads to varying levels of experience with and frequency of use of the different techniques based upon the locality of the pavement.

The Wisconsin Department of Transportation's (WisDOT's) experience, or comfort level, is generally limited to the techniques the State regularly specifies on let improvement projects (bid on and constructed by private contractors) and force account preventative maintenance projects (completed by county or local maintenance crews). The techniques used most regularly include, but are not limited to, crack and joint filling/sealing/resealing, chip sealing, milling and diamond grinding with or without an overlay, overlays, inlays, partial depth concrete repairs, full depth concrete repairs, and dowel bar retrofits, which are constructed under WisDOT's warranted pavement program and carry a three year performance warranty.

One of the goals of the warranted pavement program is to allow for contractor innovation by transferring some of the risk for the pavement performance onto the contractor completing the work. In partial thanks to this warranted pavement program, contractors completing work within the State of Wisconsin have experience with techniques WisDOT has yet to adopt. By allowing for this transfer of risk and consequently innovation, Wisconsin paving contractors are not only experimenting with, but at times, using as their standard treatment techniques such as microsurfacing, rejuventation, and ultra-thin asphalt overlays.

Beyond the aforementioned preservation techniques, WisDOT has also actively pursued expanding its breadth of preservation experience by constructing pilot, or experimental projects. The techniques and technologies the Department has attempted or are actively investigating, include cold-in-place recycling, hot-in-place recycling, whitetopping, and precast concrete panel replacement in-lieu of standard cast-in-place full depth concrete repairs.

WisDOT recognizes the need to adopt new techniques to continually expand upon and improve the core set of preservation techniques utilized in maintaining the pavement on Wisconsin's low and high-traffic-volume roadways.

U.S. Department of Transportation
Federal Highway Administration

Memorandum

Subject: **ACTION**: SHRP2 Implementation Assistance Funds Allocated to Wisconsin Department of Transportation

Date: JUN 11 2013

From: Butch Wlaschin, Director
Office of Asset Management

In Reply Refer To:
HIAM-10

To: George Poirier
Division Administrator
Madison, WI

This memorandum allocates $75,000 of SHRP2 implementation assistance funds to the Wisconsin Department of Transportation (DOT) for SHRP2 Renewal Project 26 to implement Preservation of High-Traffic-Volume Roadways projects. The primary goal of implementing the Preservation of High-Traffic-Volume Roadways project is to provide understanding and technical expertise for using appropriate pavement preservation treatments on roadways with high-traffic-volumes. The use of the Guidelines developed under the SHRP2 Renewal Research (R26) program is an essential part of demonstrating the feasibility of using preservation techniques on busy highways. In addition to this incentive grant, the SHRP2 program will provide technical support and assistance to participating States in conducting the program. This funding will be used to perform the tasks outlined in the attached Statement of Work.

By copy of this memorandum, we request that the Office of Financial Management, Office of the Chief Financial Officer (HCFM-30), make $75,000 available for obligation by the Wisconsin DOT. These funds should be obligated through the Fiscal Management Information System (FMIS) using FHWA program code 15X0434060.0000.05041TE500 (41TE). The State's obligation limitation will be increased by the amount of this allocation. The Federal share of these activities is 100 percent. **The funds must obligated by September 26, 2013.**

Amount	Program Code	Fund Year
$75,000	15X0434060.0000.05041TE500 (41TE)	2012

Mr. Thomas Van in the Office of Asset Management (HIAM) is the Headquarters contact for this effort and can be reached at (202) 366-1341. This allocation memorandum has been discussed with David Kopacz of your office.

Attachment

cc: FMIS Team, HCFM-30
David Kopacz, HDA-WI
Arlan FinFrock, HAAM-10
Carin Michael, SHR2 Team
Liz Simpson, SHRP2 Team
Stephen Gaj, HIAM
Ken Jacoby, SHRP2 Implementation Coordinator
Thomas Van, HIAM-10
Laura Lawndy, HIF-1

STATEMENT OF WORK

This Statement of Work describes the tasks, deliverables, schedule, and cost estimate required for the use of funds provided to the Wisconsin Department of Transportation for the SHRP2 Incentive Implementation Assistance Grant to implement three projects for Preservation on High-Traffic-Volume Highways.

Use of Funds
Engineering and Construction of three pavement preservation projects

Expected Deliverables
Pavement Preservation on three roadways, locations to be determined as part of the project.

Schedule & Cost Estimate
SHRP funds are limited to $75,000 total for all projects. Complete cost for projects to be determined.
Projects must be completed within 3 years after the date of this memorandum.

Reporting and Monitoring
Applicants are required to report annually on the performance of the completed projects.

Presentations
The FHWA may ask the project applicant to present their case on webinar, expert panels, peer exchanges, or other instances where it would be useful to present the challenges, and successes in implementing this project.

Point of Contact
Mr. Steven Krebs
Chief Materials Management Engineer
Wisconsin Department of Transportation
608-246-7930
steven.krebs@dot.wi.gov

Outline of State Participation in the SHRP 2 R26 Project
Reference: Guidelines for the Preservation of High-Traffic-Volume Roadways

R26 is about Preservation on High-Traffic Volume Roadways. Therefore:

1. Incentive funds are strictly for Preservation Projects, ideally from the matrix on Pages 20-22 of the Guidelines.

2. High-traffic-volume-roadway means roads with ADT > 5000 for non-urban roads and ADT > 10000 for urban roads.

3. Funds can be used for engineering, materials, equipment, and labor on the project. Traffic control is an eligible expense.

4. The SHRP2 funds do not have require matching funds. However, if other federal funds are used for the balance of project costs, the SHRP2 incentive funds may not be considered as matching funds. For example:

Say a preservation project costs $100,000 and SHRP2 provides $40,000 incentive. The State wants to use some of its STP funding to help fund the balance. The project could be funded with $48,000 STP funds and $12,000 from a non-federal source.

5. The State agrees to use the Guidelines from the R26 Research Project for selection and engineering of the projects. The SHRP 2 R26 Team will provide technical assistance as needed in addition to the incentives. Included in this technical assistance will be the development of a prototype decision aid customized for each individual State program.

6. The State agrees to provide engineering and construction oversight for the project to assure adherence to specifications, use of appropriate materials and techniques. Where needed, the SHRP 2 R26 Team will provide technical assistance.

7. The State agrees to permit documentation of the process used for selection, engineering, and construction of the project and understands that a case study may be developed from this documentation. All documentation work will be done by the SHRP 2 R26 Team at no cost to the State.

8. For "Lead Adopter" States, the State agrees to permit key project staff to speak at government and/or industry events to promote the program to other States. Travel and other costs for these events will be at no cost to the State.

9. The State must obligate the funds in FMIS prior to **September 26, 2013**. Projects may be conducted in the subsequent years provided the funds are obligated prior to the deadline.

Peters, Jed - DOT

From: Krebs, Steven - DOT
Sent: Monday, May 06, 2013 8:29 AM
To: Grasser, Daniel - DOT; Rhinesmith, Rory - DOT; Miller, Donald - DOT; Burkel, Rebecca - DOT
Cc: Arndorfer, Robert - DOT; Peters, Jed - DOT
Subject: FW: SHRP2 Implementation Assistance Program Selection - Product R26

Our SHPR-2 Implementation project has been accepted for funding.

From: Ken.Jacoby@dot.gov [mailto:Ken.Jacoby@dot.gov]
Sent: Friday, May 03, 2013 12:08 PM
To: Krebs, Steven - DOT
Cc: Thomas.Van@dot.gov
Subject: SHRP2 Implementation Assistance Program Selection - Product R26

Dear Mr. Krebs

Thank you for your participation in the FHWA SHRP2 Implementation Assistance Program. I'm happy to inform you that you will be receiving assistance for your project under this program. The first round of implementation assistance was very successful with 34 states and the District of Columbia participating in implementation opportunities on more than 100 projects. In the next week, someone from our office will be contacting you to talk about next steps.

Once again, thank you for your participation and we look forward to working with you on this implementation opportunity.

Sincerely,

Ken Jacoby, P.E.
SHRP2 Renewal Program Coordinator
Federal Highway Administration
Office of Infrastructure
1200 New Jersey Avenue, SE, Room E73-314
Washington, DC 20590
Phone: 202-493-3186
Cell: 703-447-1186

Peters, Jed - DOT

From: Thomas.Van@dot.gov
Sent: Monday, June 10, 2013 11:41 AM
To: Kopacz, David; Ken.Jacoby@dot.gov
Cc: Peters, Jed - DOT
Subject: RE: SHRP2 Project R26 - Wisconsin
Attachments: SHRP2 R26 Guidelines Document.pdf

David:

Thanks for the email. I have been trying to reach you but it seems our schedules have not matched up very well. The SHRP2 R26 project does include an award to Wisconsin for $75,000 based on the proposed work in the application that was submitted by Steven Krebs. We have just about resolved all of the issues on the funding mechanisms and will be sending some funds out soon. The mechanism we are using for this is to transfer the funds and obligation authority to FMIS so that the State will be able to obligate the funds with a minimum of paperwork issues. The only catch here is that the program was funded out of older funds that expire at the end of the fiscal year, so we need an obligation soon. The actual work can occur next year or even later, if needed. We will be sending the fund transfer memorandum to the DA within the next day or so.

For the questions below:

1. The application says three or four preservation projects. This is a guideline. As long as the State is following the R26 guidelines (copy attached or available for free from TRB website), we can adjust the number of projects accordingly. The key thing here is that the funding is intended to promote preservation of high-traffic-volume roadways.
2. Spent means obligated as discussed above.
3. We would like to see the SHRP2 activities finished by 2015 but that is not a hard and fast rule.
4. We do not anticipate any special reporting requirements beyond what you would normally do on a project. We assume that the State will be collecting pavement condition on the road as a regular part of their Pavement Management program in the future that should point out whether the preservation activity on the projects was effective or not. In addition, since SHRP2 R26 is intended to promote preservation, we have a separate contract (not part of the $75K) to assist with documenting the activities and publishing the results of the projects.

To assist with putting together the projects, we are hiring the author of the "Guidelines" document (also not out of the $75K) to provide technical assistance to the State where needed and to help document the issues, concerns, and solutions involved with the projects. There is still a little paperwork to be completed but I expect to have him ready to help out in a week or so.

There have also been some emails from Jacqueline Kamin from WisDOT about setting up some future conference calls, but I am not certain what her role is in these projects.

Thanks for the interest in this program. My apologies for the delays and I am looking forward to getting started with the projects in Wisconsin.

Thomas Van
FHWA – Office of Asset Management
Washington, DC
Tel: 202-366-1341
Email: Thomas.van@dot.gov

From: Kopacz, David (FHWA)

Sent: Thursday, June 06, 2013 5:03 PM
To: Van, Thomas (FHWA); Jacoby, Ken (FHWA)
Cc: Peters, Jed - DOT (Jed.Peters@dot.wi.gov)
Subject: SHRP2 Project R26 - Wisconsin

Thomas/Ken,

WisDOT has asked some questions regarding the SHRP2 R26 grant that they received. We'd appreciate your assistance in answering their questions in the email below.

Thanks

David L. Kopacz, P.E.
Programs Manager
FHWA - Wisconsin Division
City Center West
525 Junction Road, Ste. 8000
Madison, WI 53717

Phone: 608-829-7522
<< OLE Object: Picture (Device Independent Bitmap) >>

From: Peters, Jed - DOT [mailto:Jed.Peters@dot.wi.gov]
Sent: Wednesday, June 05, 2013 7:35 AM
To: Kopacz, David (FHWA)
Subject: RE: SHRP2 Project Discussion

Absolutely. The application form was simply an online submittal found here: http://www.fhwa.dot.gov/goshrp2/GetInvolved/ImplementationAssistance/R26/Preservation_Options_for_LongLife_Pavements/ . For the "essay" at the end, we submitted the attached narrative. The questions I do have up front are:

1. The application states that for the ($75,000) user incentive we received it stated that this is for 3 projects with $25,000/project, is the $25,000 a true max, or just a guideline?
2. Steve said when he talked with FHWA HQ they mentioned the funds had to be spent by the end of the Federal FY. What will be considered spent?
3. It the requirements for the program it mentions that all projects have to be complete by January 1, 2015, or whenever the program ends. Is it the January 1, 2015 date? And for projects complete; does that mean the SHRP2 part of a project if this is tied to a larger improvement project, or does the entire contracted project need to be completed?
4. Does FHWA have any report out requirements when the projects are all completed?

Any info would be much appreciated. I was going to contact the FHWA technical liaison, Thomas Van, but saw merit in involving the Wisconsin Division office first.

Thanks,

Jed

Peters, Jed - DOT

From: David.Kopacz@dot.gov
Sent: Thursday, August 29, 2013 12:53 PM
To: Peters, Jed - DOT
Subject: FW: SHRP2-R26 for Wisconsin

Importance: High

Jed,

I was able to talk with Thomas Van this afternoon. He agreed that the US-51 project in Minocqua is acceptable as a SHRP2 R26 project. In order to get the $75,000 in SHRP2 funds obligated, can you put together a statement of work along with an estimate for the proposed work? I'll work with our Finance folks to make sure they know that this project will be coming.

Dave

David L. Kopacz, P.E.
Programs Manager
FHWA - Wisconsin Division
City Center West
525 Junction Road, Ste. 8000
Madison, WI 53717

Phone: 608-829-7522

From: Kopacz, David (FHWA)
Sent: Tuesday, August 27, 2013 1:50 PM
To: Van, Thomas (FHWA)
Cc: Peters, Jed - DOT (Jed.Peters@dot.wi.gov); Jacoby, Ken (FHWA)
Subject: SHRP2-R26 for Wisconsin
Importance: High

Tom,

I've been working with WisDOT to find acceptable federal-aid construction projects that have some elements of work which can meet the SHRP2 R26 criteria. This has been very difficult given the timing to obligate the funds by the end of FY13. The State was not planning to implement in such a short timeframe so they've had to make some adjustments to their original plans. Due to the obligation schedule, we've only been able to identify the following federal-aid project: US-51 in Minocqua, WI – Work to include full-depth and partial-depth concrete repair.

We realize the goal was to have 3-4 projects, but given the constraints, Wisconsin's work will take place entirely on the above project. Please let us know if this will be acceptable.

Dave

David L. Kopacz, P.E.
Programs Manager
FHWA - Wisconsin Division

Appendix C

Construction and Materials Documentation

Contract Modification

Wisconsin Department of Transportation

9/23/2013 8:52 AM

FieldManager 4.9a

Contract: 20130212012, MINOCQUA - WOODRUFF

Cont. Mod. Number	Revision Number	Cont. Mod. Date	Net Change	Awarded Contract Amount
9		9/23/2013	$82,565.80	$4,553,659.72
Route 51				**Entered By** Pat Bailey
Contract Location USH 51				

Short Description

Concrete pavement repair

Description of Changes

The background of and basis for this contract modification is as follows:

This contract modification involves milling 1.5" of existing concrete pavement as well as 1.5" from the existing concrete gutter, cleaning the exposed surface and deteriorated joints, and overlaying the prepared surface with 1.5" of HMA pavement. This section of concrete pavement is a southerly continuation of the newly reconstructed US 51 in Minocqua. The concrete pavement and especially the joints show signs of severe distress with some cracks approaching 12 inches wide.

The attached documents dated and noted as follows are hereby included as part of this contract moficiation:

1. Letter from contractor 2013 09 11 with regard to pricing of two new contract items.
2. Limits of work from WisDOT 2013 09 17.

This work shall be in accordance with the State of Wisconsin Standard Specifications for Highway and Structure Construction, 2013 Edition, the Special Provisions, and Addenda of this contract.

There will be no extension of the completion date, interim or final, provided by this contract modification.

There will be no additional claim for this contract modification.

New Items

Project: 1174-10-62, MINOCQUA - WOODRUFF

Category: 0010, CONCRETE REPAIR

Item Description	Item Code	Prop.Ln.	ItemType	Unit	Proposed Qty.	Unit Price	Dollar Value
REMOVING CONC SURFACE PARTIAL DEPTH	204.0109.S	2340	Change Order	SF	43,910.000	1.07000	$46,983.70
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
PREPARE FOUNDATION FOR ASPHALTIC PAVING CLEAN CONCRETE SURFACE	211.0100	2345	Change Order	LS	1.000	5,800.00000	$5,800.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							

New Items

Project: 1174-10-62, MINOCQUA - WOODRUFF

Category: 0010, CONCRETE REPAIR

Item Description	Item Code	Prop.Ln.	ItemType	Unit	Proposed Qty.	Unit Price	Dollar Value
ASPHALTIC MATERIAL PG58-34 CONCRETE REPAIR AREA	455.0110	2380	Change Order	TON	22.000	697.00000	$15,334.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
TACK COAT CONCRETE REPAIR AREA	455.0605	2385	Change Order	GAL	122.000	3.00000	$366.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
HMA PAVEMENT TYPE E-10 CONCRETE REPAIR AREA	460.1110	2355	Change Order	TON	410.000	28.21000	$11,566.10
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
PAVEMENT MARKING EPOXY 4-INCH CONCRETE REPAIR AREA	646.0106	2360	Change Order	LF	800.000	0.45000	$360.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
PAVEMENT MARKING EPOXY 8-INCH CONCRETE REPAIR AREA	646.0126	2365	Change Order	LF	400.000	0.85000	$340.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
PAVEMENT MARKING DIAGONAL EPOXY 12-INCH CONCRETE REPAIR AREA	647.0726	2370	Change Order	LF	200.000	3.33000	$666.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							
PAVEMENT MARKING CROSSWALK EPOXY 6-IN CONCRETE REPAIR AREA	647.0766	2375	Change Order	LF	200.000	5.75000	$1,150.00
Reason: PC town requested that the distressed concrete at the south end of the project be repaired as part of this project.							

Subtotal for Category 0010: $82,565.80

Subtotal for Project 1174-10-62: $82,565.80

Contract Modification

Wisconsin Department of Transportation

9/23/2013 8:52 AM

FieldManager 4.9a

Prepared By Signature 9/23/2013 Date	Authorized By Signature 9/23/13 Date
Recommended By Signature 9/23/2013 Date	Prime Contractor Signature 9/23/13 Date
FEDERAL PARTICIPATION - ACTION BY F.H.W.A.	
___Approved ___Not Eligible ___See Letter Dated _____	_____ _____ (Signature) (Date)

Wisconsin Department of Transportation

CONTRACT MODIFICATION JUSTIFICATION

CONTRACT ID: 20130212012	CONTRACT MODIFICATION NO: 09
PROJECT ID: 1174-10-62	FEDERAL ID: WISC 2013 051
HIGHWAY OR LOCAL ROAD: US 51	COUNTY: Oneida
PROJECT DESCRIPTION: Minocqua - Woodruff, Front St. - Old Hwy 70	
MANAGING OFFICE: NCR - Rhinelander	LOCAL PROGRAM: ☐
PRIOR APPROVAL REQUIRED: ☒ Yes ☐ No (If yes, attach justification) Attach Contract Modification ☒ Other Supporting Documentation Attached ☐	

1. **Description & need for change:**
   CONCRETE PAVEMENT REPAIR: This work involves milling 1.5" of existing concrete pavement as well as 1.5" from the existing concrete gutter, cleaning the exposed surface and deteriorated joints, and overlaying the prepared surface with 1.5" of HMA pavement. This section of concrete pavement is a southerly continuation of the newly reconstructed US 51 in Minocqua. The concrete pavement and especially the joints show signs of severe distress with some cracks approaching 12 inches wide. Joints are continually patched. At some point in the not too distant future and without being repaired, total failure could occur. Repairing this area under the current US 51 contract work now makes sense from a traffic control standpoint and minimizing the number of public disturbances.

2. **Consequences if this Contract Modification is not approved:**
   CONCRETE PAVEMENT REPAIR: This section of concrete pavement has failed. Joints are continually patched. At some point in the not too distant future and without being repaired, total failure could occur. Emergency repair work would be very costly and could lead to major disruptions to the tourism industry in and around the Minocqua area.

3. **Alternatives considered:**
   CONCRETE PAVEMENT REPAIR: The alternative of concrete joint repair combined with concrete pavement repair and replacement was considered but deemed too costly. Pricing received from contractor showed this alternative to be about $50,000 more than the selected alternative of milling 1.5" of concrete pavement followed by a 1.5" HMA overlay. A 'Do Nothing' alternative is not a feasible alternative.

4. **Estimated cost:**
   CONCRETE PAVEMENT REPAIR: $82,565.80

5. **Justification of price:**
   CONCRETE PAVEMENT REPAIR: Existing contract unit prices were used for all but 2 of the items. Those 2 items, Removing Concrete Surface Partial Depth and Preparing Asphalt Surface, have pricing that is consistent with milling work but with some added cost due to extra effort involved with milling concrete and then cleaning the concrete joints prior to HMA paving.

6. **Does this change affect the contract time?** ☐ Yes ☒ No
   Explanation for consideration of time:
   Additional Number of days: **New completion date:** **To be determined:**

7. **Is this contract subject to Federal Oversight?** ☐ Yes ☒ No
   If attached prior approval, enter date received from FHWA _____
   (Date)

Prepared By _____ _____
Project Leader / Project Manager **Date**

Approved _____ _____
Project Manager / Supervisor (If required) **Date**

Approved _____ _____
Section Chief (If required.) **Date**

Approved _____ _____
FHWA **Date**

PITLIK & WICK INC.™
Driveways to Highways

8075 Highway D
Eagle River, WI 54521
Telephone (715) 479-7488
FAX (715) 479-7438

9/11/13
Pat Bailey
REI Engineering
USH 51, Minocqua, 1174-10-70

Pat,

The following are prices as requested for removing concrete pavement partial depth (1.5") and for preparation of foundation for asphaltic pavement.

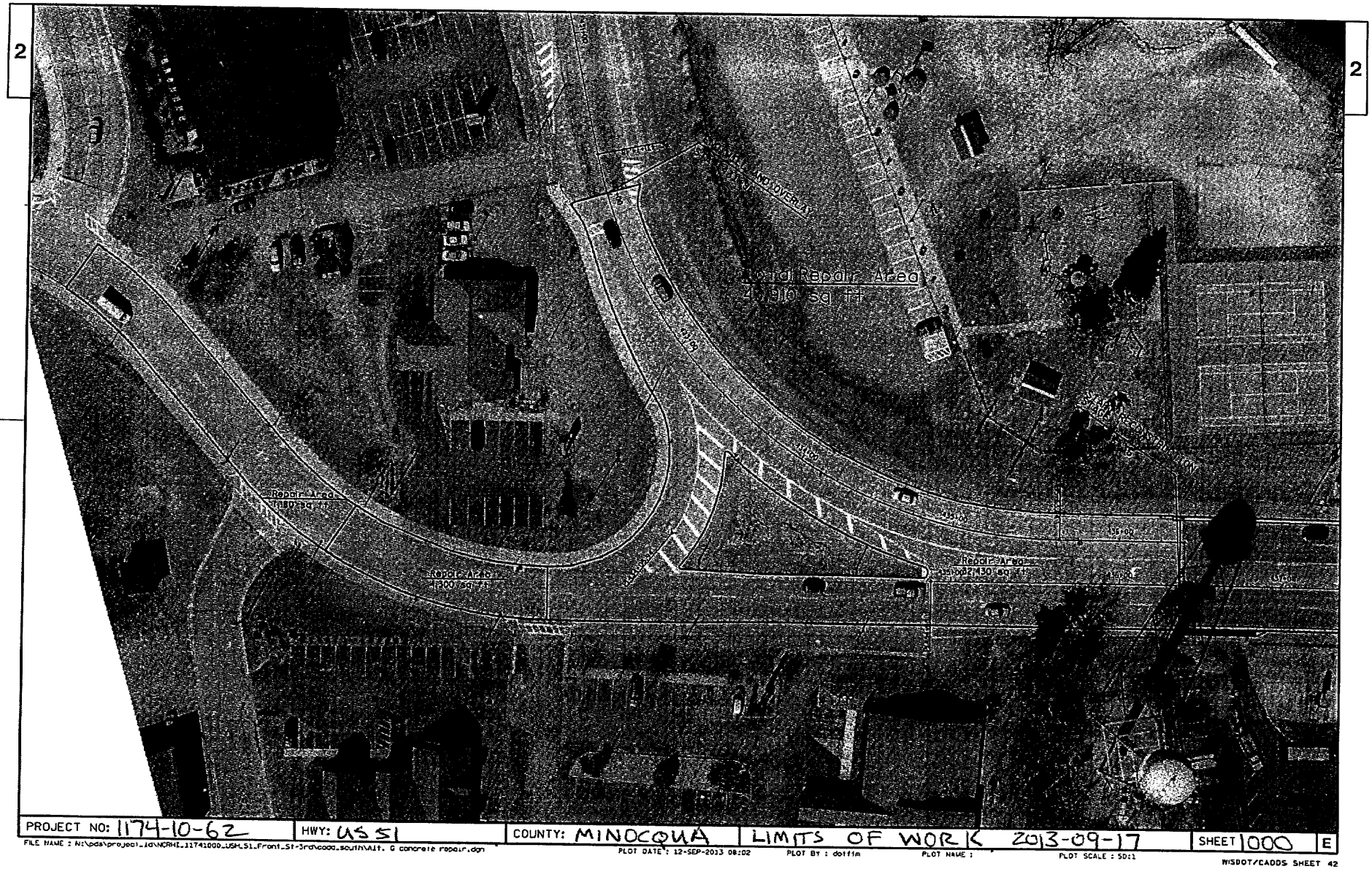
204.0109.S Removing Concrete Surface Partial Depth - $1.07/SF
This price includes milling concrete pavement to 1.5" depth, sweeping, and mini grinding around manholes/water boxes.

211.01 Prepare Foundation for Asphaltic Paving - $5,800 LS

If you have any other questions please call me at (715) 891-0233.

Sincerely,

George Lurvey
Executive Vice-President



PROJECT NO: 1174-10-62	HWY: US 51	COUNTY: MINOCQUA	LIMITS OF WORK 2013-09-17	SHEET 000	E

FILE NAME : N:\pds\project_id\NORHI_11741000_USH_51_Front_St-3rd\cadd_south\Alt. G concrete repair.dgn
PLOT DATE : 12-SEP-2013 08:02 PLOT BY : dotfjm PLOT NAME : PLOT SCALE : 50:1
WISDOT/CADDS SHEET 42

Inspector's Daily Report

Wisconsin Department of Transportation

10/10/2013 10:10 PM

FieldManager 4.9a

Contract: 20130212012, MINOCQUA - WOODRUFF

IDR Date	Day of Week	Seq. No.	Import Date	Project Engineer	Resident Engineer
10/7/2013	Monday	1	N/A	Pat Bailey	Robin Stafford

Inspector's Initials-Name	Federal Project Number	Elec. Attachments
BAB Brad A Belmas	WISC 2013051	None

Prime Contractor

PITLIK & WICK, INC.

Entered By	Revised By	Revision Date	Revision No.
PB, Pat Bailey			

Temperatures	Weather
Low: 41 **° F** **High:** 57 **° F**	sunny

Comments

Pitlik & Wick - asphalt paving:

700 Pitlik is sweeping the road, was dirtier than expected. Put plant on hold. Brought in the town's street sweeper. We are increasing the tack application rate to ensure better adhesion to prevent delamination.

935 Began paving at the NB to SB turn lane, paving south. Continued paving the parking lane at STA 432+00 LT to 425+61.

1100 Finished first pass @ SB lane, STA 425+61.
DD-24 roller had a plugged up spray bar. Left a mess on the mat. Crew raked in asphalt to fix the area and rolled with the BW 205.

1120 set back to pull SB turn lane @ STA 436+20.

1145 set back @ STA 436+20. Began SB pass lane.

1250 finished SB pass lane. Moved to NB pass lane. Had Pitlik blow all the leaves out of the curb line.

145 finished NB pass lane @ STA 436+20. Set back to SB driving lane.

300 finished SB driving lane @ STA 425+61.

315 set back and pulled SB parking lane +-STA 432+00.

415 finishe SB park/turn lane.

440 pulled off of joint @ Front St, NB drive lane.

545 hit match line, NB drive lane, STA 436+20.
Cleaned out paver, finished cold rolling.

630 quit.

Contractors

Contractor's Name	Personnel	No.	Hrs.	Equipment	No.	Hrs.
PITLIK & WICK, INC.	flagger	1	11.50	Broom - Rosco RB 48	1	11.50
	foreman	1	11.50	Dump Truck - Quad	5	11.50
	operator	5	11.50	Paver - CAT AP1000E	1	11.50
	tack truck driver	1	11.50	Roller - Bomag 11AS	1	11.50
	truck driver	5	11.50	Roller - Bomag BW205	1	11.50
				Roller - IR DD24	1	11.50
				Tack Truck	1	11.50
				Water Truck	1	11.50

Reviewed By: _____ _____

(Signature) (Date)

Inspector's Daily Report

Wisconsin Department of Transportation

10/9/2013 11:33 PM

FieldManager 4.9a

Contract: 20130212012, MINOCQUA - WOODRUFF

IDR Date	Day of Week	Seq. No.	Import Date	Project Engineer	Resident Engineer
10/3/2013	Thursday	1	N/A	Pat Bailey	Robin Stafford

Inspector's Initials-Name	Federal Project Number	Elec. Attachments
BAB Brad A Belmas	WISC 2013051	None

Prime Contractor

PITLIK & WICK, INC.

Entered By	Revised By	Revision Date	Revision No.
PB, Pat Bailey			

Temperatures	Weather
Low: 55 **° F** **High:** 64 **° F**	partly cloudy

Comments

Pitlik & Wick - milling:

700 Town of Minocqua back out cleaning up the milled section. Pavement is wet from the rain last night - no dust today

1100 Pitlik on site to finish patching, fix broken inlet, and patching.

Met with Brad Pitlik, paving foreman. He is going to touch up the milling by the inlets.

130 Brad & Rob milled out around 3 inlets where the big mill missed. Remainder of the crew is patching.

330 finished with cleanup and patching. Will check weather at 7 a.m. tomorrow morning. Earliest they may pave is 9 a.m. with rain coming tonight.

Contractors

Contractor's Name	Personnel	No.	Hrs.	Equipment	No.	Hrs.
PITLIK & WICK, INC.	foreman	1	4.50	Mill Machine - Wirtgen	1	2.00
	laborer	3	4.50	Street Sweeper (City)	1	4.00
	operator	1	4.50			

Reviewed By: _____ _____

(Signature) (Date)

Inspector's Daily Report

Wisconsin Department of Transportation

10/9/2013 11:20 PM

FieldManager 4.9a

Contract: 20130212012, MINOCQUA - WOODRUFF

IDR Date	Day of Week	Seq. No.	Import Date	Project Engineer	Resident Engineer
10/2/2013	Wednesday	1	N/A	Pat Bailey	Robin Stafford

Inspector's Initials-Name	Federal Project Number	Elec. Attachments
BAB Brad A Belmas	WISC 2013051	None

Prime Contractor

PITLIK & WICK, INC.

Entered By	Revised By	Revision Date	Revision No.
PB, Pat Bailey			

Temperatures	Weather
Low: 42 ° **F** **High:** 72 ° **F**	sunny

Comments

Pitlik & Wick - milling:

700 Pitlik is sweeping and cleaning up milled areas.
720 called George to see if he can get a water truck here. Talked to foreman - they should be about done sweeping - city is going to finish sweep with their street sweeper.

1245 Pitlik's cleanup crew finished. Town of Minocqua has street sweeper cleaning up now.
Sweeping operation is really dusty. Asked if they could increase the water, even at max water it is quite dusty.

230 Brad Pitlik came to look at the milled section. We want a few of the inlets touched up with the 1' mill. There is also an inlet casting that is broke. The mill's tracks crushed the rings.

George told the city to finish sweeping tomorrow after it rains.

300 finished sweeping. Pitlik cleaned out inlet protections.

Contractors

Contractor's Name	Personnel	No.	Hrs.	Equipment	No.	Hrs.
PITLIK & WICK, INC.	foreman	1	5.75	Broom - Rosco RB 48	1	5.75
	laborer	1	5.75	Dump Truck - Quad	1	5.75
	operator	1	5.75	Skidsteer - Deere 325	1	5.75
	operator	1	2.25	Street Sweeper (City)	1	2.25
	truck driver	1	5.75			

Reviewed By: _____ _____

(Signature) (Date)

Inspector's Daily Report

Wisconsin Department of Transportation

10/9/2013 11:07 PM

FieldManager 4.9a

Contract: 20130212012, MINOCQUA - WOODRUFF

IDR Date	Day of Week	Seq. No.	Import Date	Project Engineer	Resident Engineer
10/1/2013	Tuesday	1	N/A	Pat Bailey	Robin Stafford

Inspector's Initials-Name	Federal Project Number	Elec. Attachments
BAB Brad A Belmas	WISC 2013051	None

Prime Contractor

PITLIK & WICK, INC.

Entered By	Revised By	Revision Date	Revision No.
PB, Pat Bailey			

Temperatures	Weather
Low: 50 ° **F** **High:** 72 ° **F**	partly cloudy

Comments

Pitlik & Wick and WK - milling:

700 began milling concrete on NB pass lane beginning @ E. Front St.
720 talked to George about getting inlet protections in. He called Lakeland Landscaping and left message for Tom.

725 millin going well - set back for 2nd pass.
900 Concrete millin up easy. We told George to have WK go back and mill tight to the curb head. They stayed out 10" initially, but they can get tighter. We only have 2 light poles in the way where they will have to clean up with the 1' mill. Pitlik is patching the joints with asphalt after cleaning them out. The curb is very rotten, exposing rotten concrete under the tie bars in certain sections. Some of the tie bars are being exposed once 1.5" is milled off.

10:30 began milling asphalt @ STA 431+96, SB.
12:00 moved traffic to inside lane - NB. Began milling NB driving lane @ E. Front ST.
100 switched SB traffic to inside lane.
130 began milling outside lanes - SB.
400 finishe milling. Pitlik cleaning up behind mill.
600 quit.

Contractors

Contractor's Name	Personnel	No.	Hrs.	Equipment	No.	Hrs.
PITLIK & WICK, INC.	foreman	1	11.00	Broom - Rosco RB 48	1	11.00
	laborer	6	11.00	Dump Truck - Quad	3	9.00
	operator	2	11.00	Mill Machine - Wirtgen	1	9.00
	truck driver	3	9.00	Patch Truck & Hopper	2	11.00
				Skidsteer - CAT 262	1	11.00
				Water Truck	1	9.00
TWIN LAKES TRANSIT, LTD	truck driver	1	9.00	Dump Truck - Quad	1	9.00
W.K. CONSTRUCTION COMPANY, INC.	operator	3	9.00	Wirtgen Milling Machine	1	9.00

Reviewed By: _____ _____

(Signature) (Date)

Nuclear HMA Density Test Records
WS4602

Wisconsin Department of Transportation

Project ID.		Highway Number & Road Name		Project Engineer	
1174-10-62		Front Street - Old Hwy 70		Pat Bailey	
Course	[X] Upper [ ] Lower	[ ] Shoulder [ ] Other		County: Oneida	Region: NC
Required Relative Density %	92%	Nominal Thickness (inches): 2"	Asphalt Mix Design No.: "New Road"	Contractor & Paving Contractor	Pitlik & Wick
Lot No.	Lot Length	Lot Limits Station: 425+61 - 436+36		Lot Quantity (Tons) (Nominal)	
Test No.					
Station	433+50	430+57	426+22	431+02	
Offset	5-1	6.5	7.7	4.9	
A/C Used %					
Maximum Theoretical Density x (62.24)	2.357 146.70	146.70	146.70	146.70	~~146.70~~
Contact Reading / Density Count	16359	15204	15256	15194	
Air Gap Reading / Moisture & Density STD	3285	3859	3953	3514	
Bulk Density (PCF) / Total / Wet Density	132.0	139.6	139.2	139.6	
% of Maximum Density	90.0	95.2	94.9	95.17	
Density Sum					
Density Average of Lot %	~~10-7-13~~				
Date Placed	10-7-13	10-7-13	—	—	
Date Tested	10-7-13	10-7-13	—	—	
Operator Name	K Klesenow	K Klesenow	—	—	
Set Serial No.	7495	7495	—	—	

Test Remarks

	Left turn lane, NB to SB offset from left curb	Parking lane, offset from edge of curb Right Side	Lt turn lane off set from Lt curb/gutter	Parking lane offset from edge of curb. Left side

Remarks

Dstd 31771
Mstd 19501

Information only

Nuclear HMA Density Test Records
WS4602

Wisconsin Department of Transportation

Project ID. 1174-10-62		Highway Number & Road Name Front Street - Old Hwy 70		Project Engineer Pat Bailey	
Course [X] Upper [ ] Lower		[ ] Shoulder [ ] Other		County Oneida	Region NC
Required Relative Density % 92%		Nominal Thickness (inches) 2"	Asphalt Mix Design No. "New Road"	Contractor & Paving Contractor Pitlik & Wick	
Lot No.	Lot Length	Lot Limits Station 425+61 - 436+36		Lot Quantity (Tons) (Nominal)	
Test No.					
Station	431+20				
Offset	4.1				
A/C Used %					
Maximum Theoretical Density x (62.24)	146.7				
Contact Reading **Density Count**	14602				
Air Gap Reading **Moisture & Density STD**	3580				
Bulk Density (PCF) **Total / Wet Density**	143.9				
% of Maximum Density	98.07				
Density Sum					
Density Average of Lot %					
Date Placed	10-7-13				
Date Tested	10-7-13				
Operator Name	K Kleckner				
Set Serial No.	7495				
Test Remarks					
	NB Driving Lane Offset from CL				

Remarks
Dstd - 31771
Mstd - 19501
Information Only

Nuclear HMA Density Test Records
WS4602

Wisconsin Department of Transportation

Project ID.		Highway Number & Road Name		Project Engineer	
1174-10-62		Front Street - Old Hwy 70		Pat Bailey	
Course	[X] Upper / [ ] Lower	[ ] Shoulder / [ ] Other		County: Oneida	Region: NC
Required Relative Density %	92	Nominal Thickness (inches): 2"	Asphalt Mix Design No.: "New Road"	Contractor & Paving Contractor	Pitlik & Wick
Lot No.	Lot Length	Lot Limits Station	435+61 - 436+36	Lot Quantity (Tons) (Nominal)	

Test No.					
Station	434+12	427+31	435+19	434+74	428+98
Offset	4.6	8.1	5.6	1.6	10.6
A/C Used %					
Maximum Theoretical Density x (62.24)	146.7	146.7	146.7	146.7	146.7
Contact Reading **Density Count**	15086	15811	15091	15863	15107
Air Gap Reading **Moisture & Density STD**	3901	4076	3841	3665	3877
Bulk Density (PCF) **Total / Wet Density**	140.4	135.5	140.4	135.1	140.2
% of Maximum Density	95.7	92.37	95.66	92.09	95.58
Density Sum					
Density Average of Lot %	~~10-7-13~~				
Date Placed	10-7-13	~	~	~	~
Date Tested	10-7-13	~	~	~	~
Operator Name	K. Kleppe	~	~	~	~
Set Serial No.	7495	~	~	~	~
Test Remarks					
	SB Passing lane offset from CL	SB Passing lane offset from CL	NB Passing lane offset from CL	SB Driving lane offset from CL	SB Driving lane Offset from CL

Remarks

Dstd - 31771

Mstd - 19501

Information only