2016 MnROAD/NCAT Cracking Group Construction
Weekly Construction Update
For the week of August 15, 2016

It was a dry weekend at MnROAD with no rainfall recorded. Work on Monday, August 15 began with a rubber tire roller and water truck on site. Compaction of the base in both the passing and driving lanes continued until early afternoon. DCP tests were conducted by American Engineering Testing (AET) to investigate if the compacted base would give passing results. As most DCPs passed, it was decided to test roll the base that afternoon. The TR 10 test roller setup was weighed and verified by WSB & Associates Inc., and brought to MnROAD for test rolling of the Class 6 aggregate base course for Cells 16-19. As test rolling showed good results, blue topping of the aggregate base was completed by the survey crew on Tuesday, August 16, followed by tolerancing of the base.

In preparation for sensor installation, MnDOT personnel extended conduit risers in Cells 17 and 19 on Wednesday, August 17. FWD testing was also done on the base on this day.

Thursday, August 18 was a busy day as it was the start of sensor installation in Cells 17 and 19, as well as the weekly construction meeting. An updated schedule was distributed at the meeting. The new schedule included sensor installation continuing through Monday, August 22, with trial mix paving and a pre-activity meeting for test section paving to occur on Tuesday, August 23. MnDOT personnel will prep the area of the access road behind the MnROAD pole barn for trial mix paving.

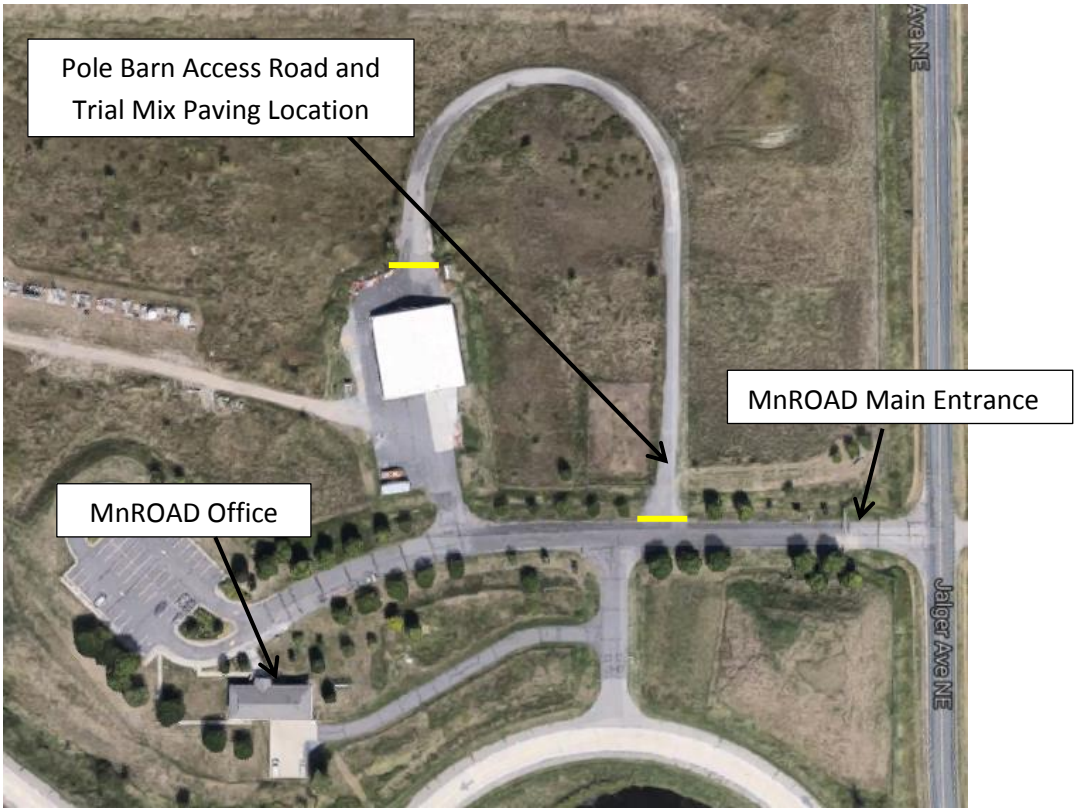

Figure 1: Trial Mix Paving Location

The first day of sensor installation began on Cell 17 by pulling a string ling grid to establish the installation area. Locations for pressure gauge, thermocouple, and moisture sensor installation were then measured out and marked with spray paint. A trenching tool attached to the skid loader was brought in and used to cut areas were the pressure gauges would be installed.

Figure 2: Organizing Pressure Gauges Before Installation

Figure 3: String Line Layout and Trenching for Pressure Gauge Installation

Figure 4: Pressure Gauge Installation

After trenching of pressure gauge areas, base material was sieved to obtain fine aggregate that would be used to level pressure gauges in both lateral and transverse directions. Pressure gauges in Cell 17 were installed 10.5 inches to top of base, while gauges in Cell 19 were installed at 10.75 inches to top of base. After pressure gauges were found to be level, additional sieved material was brought in several lifts and hand tamped. Holes were also drilled into the in-place conduit for pressure cell wires to be pulled into each Cell's respective vault.

Figure 5: Levelling of Pressure Gauge

Figure 6: Drilling Hole into Conduit

After gauges were installed and hand tamping was finished, a mechanical tamper was used to ensure good compaction above all pressure gauges.

Figure 7: Compaction of Base Above Pressure Gauges

While pressure gauge installation was happening, an auger was brought in for both moisture sensor and thermocouple installation. Moisture sensors were installed at 2 locations in Cells 17 and 19 at 3 different depths. Two thermocouples were also installed in both cells, with one extending from bottom of HMA into the existing sub-grade, and the other extending from the HMA to the top portion of Class 6 aggregate base.

Figure 8: Moisture Sensor Installation

Figure 9: Thermocouple Installation

Once all sensors and gauges were installed, wires were pulled from their respective conduit locations into the vault. It was critical to keep all wires labeled, organized, and straight during this process to avoid getting caught in the conduit. Thankfully this process went smoothly and all wires were successfully pulled from the installation area to the vaults, and finally to the hand holes located near the Cell cabinets.

Figure 10: Placing Wires into Conduit

Figure 11: Pulling Wires from Conduit into Vault

Figure 12: Pulling Wires from Vault to Hand Hole

Cones were placed around completed sub-surface sensor and gauge installation areas in Cells 17 and 19 to ensure no equipment would disturb instrumentation before strain gauge layout and paving.

Figure 13: Completed Sub-surface Sensor Installation in Cell 19

Work on Friday, August 19 consisted of organization and placement of strain gauges in Cell 19. There are a total of 15 strain gauges that will be placed in Cell 19 with 9 in the longitudinal direction and 6 in the transverse.

Figure 14: Marking Strain Gauge Locations

Figure 15: Unrolling of Strain Gauge Wires

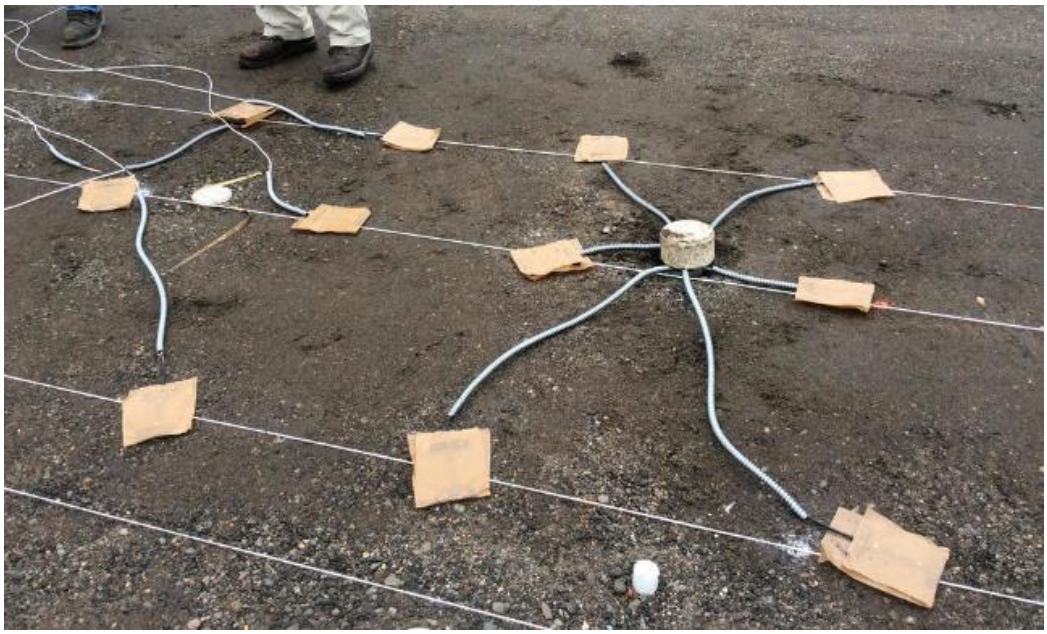

Figure 16: Strain Gauge Wires Placed in Conduit and Pulled to Vault

To protect the strain gauges from potential rain over the weekend, each was placed in a box which they were packaged in. A plastic tarp was also draped and secured over the entire area to keep out any moisture. Work will resume on Monday, August 22 with strain gauge installation on Cell 17.