

# CRAB-walking toward Montana

Boise contractor named Hayes finalist for reconstructing highway in southern Idaho

By Allen Zeyher  
Managing Editor

**W**hen the spring wind picks up in southern Idaho, it can quickly suck the heat out of an asphalt mat, so when Knife River Corp. was paving I-86 a couple of years ago, the crew at times added a compactor to the pattern to make sure the mat reached the right density before it cooled too much.

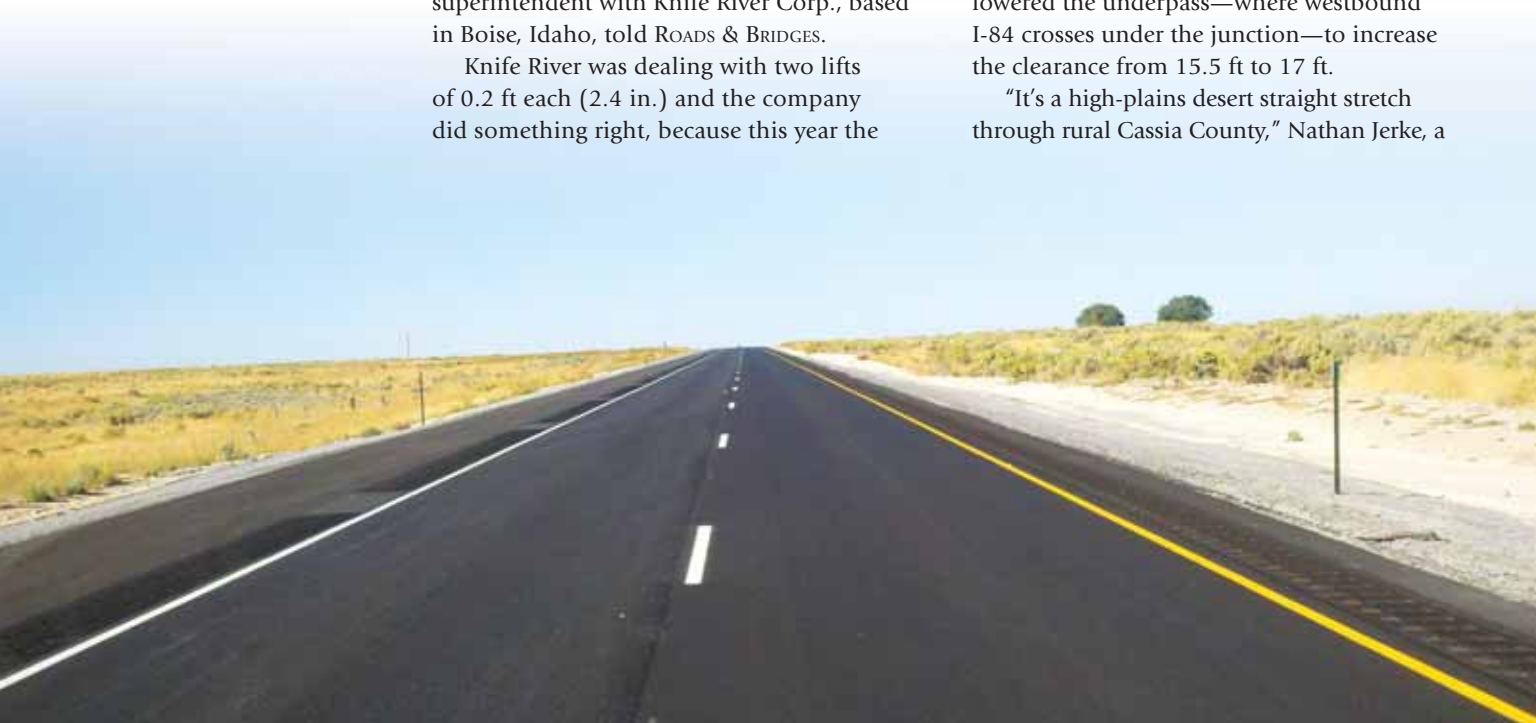
"The more temperature that you lose at a quicker rate, the more aggressive you've got to be with your rolling," Devin Hurt, paving superintendent with Knife River Corp., based in Boise, Idaho, told *ROADS & BRIDGES*.

Knife River was dealing with two lifts of 0.2 ft each (2.4 in.) and the company did something right, because this year the

project was a finalist for the Sheldon G. Hayes Award, the asphalt paving industry's highest honor. To get to be a finalist, Knife River first had to meet the benchmarks for a Quality in Construction Award on the basis of how well they met the specifications and achieved density on the project. Then a year later, the project pavement was tested for smoothness and visually inspected by an independent pavement consultant. The Hayes Award is given by the National Asphalt Pavement Association.

Knife River repaved the on- and off-ramps at the junction of I-84/I-86 and the eastbound lanes of I-86 for 15 miles from the junction east toward Pocatello. The contractor also lowered the underpass—where westbound I-84 crosses under the junction—to increase the clearance from 15.5 ft to 17 ft.

"It's a high-plains desert straight stretch through rural Cassia County," Nathan Jerke, a



# Under a microscope

## Iowa warm-mix project earns spot as NAPA Hayes finalist

By Jeff Zagoudis  
Associate Editor

The recently completed widening of Highway 34 in southern Iowa has drawn a lot of national attention lately, both as a finalist for the National Asphalt Pavement Association's Sheldon G. Hayes Award and as part of a countrywide study by the National Cooperative Highway Research Program (NCHRP).

NCHRP's interest in the project stemmed from its use of warm-mix asphalt (WMA). The agency is studying WMA's susceptibility to moisture damage over time. Similar test sites also were under surveillance in Montana and Texas.

This was uncharted territory for contractor Norris Asphalt, as President Brady Meldrem admitted that his crews—more accustomed to hot mix—had never used WMA before. "When you've been schooled for years that asphalt that's anything less than 300°F is, No. 1, not very compactible and, No. 2, not very easy to work with . . . we had to deal with the thought process that, 'Hey, we can turn this down and still work with it.'"

The first step in addressing Highway 34, according to Meldrem, was excavating 4 ft to either side of the road—already 24 ft wide—with a Wyler W730 road widener. Once they got to the pouring stage, the first layer to go down was a traditional 1 million-ESAL Iowa DOT base mix, followed by 23,000 tons of a 2-in. layer of traditional Iowa DOT 3 million-ESAL mix, with 60% crushed particles.

From there, it was time to start pouring the surface layer. Part of this 2-in. cover was poured using the traditional 3 million-ESAL Iowa mix. State regulations, however, required a 75% crushed particle content at the surface. As a result, the remaining content—about 15,000 tons—was WMA enhanced by Sasobit and Evotherm. Sasobit was produced at 1.5% of asphalt content, while Evotherm was produced at 0.4%, by weight, of asphalt content.

"To our pleasure and surprise, there wasn't really any difference that we could tell with the flowability," Meldrem told ROADS & BRIDGES.

"We did find that it maintained its heat a little better," he added.

The asphalt mix was produced by a Gencor 400 TPH Ultradrum, and placement was handled with a Roadtec RP-195 paver. Final compaction was achieved with a pair of Bomag BW284AD steel rollers and an Ingersoll Rand PT240R rubber-tire roller.



Norris Asphalt widened Highway 34 from 24 ft to 32 ft, adding a new 4-ft shoulder on each side of the roadway.



spokesman for the Idaho Transportation Department (ITD), told ROADS & BRIDGES.

The freeway is the main route from Idaho north to Montana, Hurt said.

"Instead of turning off on I-84 and heading down to Salt Lake, you'd stay on I-86 and head to Pocatello and then turn left and head up to Montana."

The \$11 million project started by milling off 0.2 ft of the existing pavement, which was rough and cracking, said Jerke, showing the age of a pavement first constructed in the mid-1960s. The millings were recycled back into the hot-mix asphalt (HMA) used to repave the highway later. The remaining base under what was milled off was pulverized.

Once the base was pulverized to the right size, cement was injected into it and a little moisture was added "to begin the strengthening process," Jerke said, "and then it also pulls moisture from the ground to really strengthen and solidify that base even more."

The cement-recycled asphalt base stabilization (CRABS) process is "becoming our 'go-to' rehabilitation process," Jerke said. "With CRABS we get a little bit longer life for not a whole lot more cost." It also lets ITD save money on liquid asphalt and aggregate by recycling the old asphalt into the new pavement.

The CRABS pavement should last for another 20 years, ITD estimates.

To seal the moisture inside the base while it was curing, Knife River sprayed a tack coat over the surface. They let it cure for a couple of days, and when they tried to place the bottom lift of asphalt, they found the mat was sliding on top of the base. So they sprayed a second coat of tack over the base, and that kept the lower lift in place.

To ensure smoothness, Knife River used a custom-made ski on the paver.

"I've designed a new design for the ski and made it a 40-ft-long ski," Hurt



Knife River repaved the on- and off-ramps at the junction of I-84/I-86 and the eastbound lanes of I-86 for 15 miles from the junction east toward Pocatello.

said, "instead of the normal Topcon automatic SAS ski, which is 27 ft long."

The contractor also measured smoothness with a high-speed profilograph after each asphalt lift. Measuring the smoothness of the bottom lift told the paving crew where the issues were. Measuring the top lift told the crew they were in the money. Knife River earned 93% of the available ride bonus.

The HMA for the I-86 project came from a Gencor 400 asphalt plant about 30 minutes away and was dumped by belly-dump trucks in a windrow down the road. From there, it was picked up by a conveyor and dumped into a Roadtec SB 2500 Shuttle Buggy material transfer vehicle,

which held 24-28 tons. The Shuttle Buggy does not have heaters of its own, but it does a good job of retaining the heat in the mix and minimizing segregation in terms of heat and aggregate size. The Shuttle Buggy conveyed the hot mix and dropped it into the hopper of a Cat 1055D paver with a 1020 Extend-A-Mat screed and Topcon automatic elevation controls. Knife River uses Topcon controls on all of the company's paving jobs.

The paving machine made one pass 22 ft wide covering one 12-ft lane plus the 10-ft outside shoulder, and one pass 17 ft wide covering the other 12-ft lane plus the 5-ft inside shoulder of the divided highway.

During paving, Knife River built a crossover and put all eastbound traffic—6,500 vehicles a day—on one of the westbound lanes. The traffic shift kicked off the project on April 6, 2011. The project was completed on Aug. 8, 2011. The company also built a temporary lane down the median so trucks carrying asphalt could get to the paving machine without traveling over the pulverized and tack-coated base section.

Both asphalt lifts consisted of PG 64-34 binder and 3/4-in. nominal maximum aggregate supplied by a quartzite quarry. Knife River laid about 108,000 tons of asphalt mix on I-86.

"The material out of this pit was really easy to work with," Hurt said.

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Knife River earned 93% of the available ride bonus.

"It was a hard material, and it really stood up to the rollers, so you didn't have any prefracturing going on with your rollers."

"One of the biggest challenges that we had with this project was it was early in the season, and that area is really windy," Hurt said, "so it was challenging keeping the rolling pattern close enough to the paver at the tons per hour that we were paving. We were paving right around 397 to 420 tons per hour. There was times that we had to throw on an extra roller. The wind draws the heat right out of it."

To see how much heat the mix was

losing, Hurt measured its temperature every 15 minutes at the windrow and behind the screed.

"When we were dumping that material out on the road it was around 290°," Hurt said. "By the time it got back behind the screed it was hitting around 275°. That's pretty good for the conditions that we were in."

Knife River used two Caterpillar 634 double-drum rollers, one for breakdown, one for intermediate. Each made three passes. The third roller in the lineup was an Ingersoll Rand 105 combination roller, which had tires in the back and an 82-in. drum in the

front. It was used to knead the material together. Finally, a 534 Cat roller did the finish work.

Their target was 92-95% of theoretical maximum density. They achieved 93%.

The westbound lanes of I-86 have not yet been repaved. The contract is expected to be awarded this year. Knife River would love to win the contract and complete another award-winning performance, but there is no guarantee. **R&B**

**For more information about this topic, check out the Asphalt Channel at [www.roadbridges.com](http://www.roadbridges.com).**



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*— Nathan Jerke,  
ITD spokesperson*

