UDOT’s First Double/Double

Western States Regional In-Place Recycling Conference
September 11 - 13
Ontario, California

Kirk Thornock, P.E.
Asset Management Engineer
Utah Department of Transportation, Region 4
Problem: US-191; MP 12.5 to MP 21 aka The Cracks
Project 191 18 to 23 Crack Project
M P Location 17.5 NB RWPTL
Core #9
Date 3-22-10
Project 181 12 to 23, Crack Project
MP Location 15 SB LW8 TL
Core # 14
Date 3-22-10
- What to do with this section?
- Started discussions with various manufactures on solutions.
- Needed to be able to bridge these cracks with as much material as possible
- Started thinking about our success with CIR Projects
- Contacted a local CIR contractor about the ability to go 6” deep
- Discussion of Central Plant Recycle (CPR)
- Received “Buy In” from Region Senior Leadership
- Started the process of designing UDOT’s first Double/Double
- CIR/CPR Specification
Initial Pavement Strategy:

- Maximum Compaction
- Switched to a 3” CIR / 3” CPR after Bid
SPECIAL PROVISION

PROJECT #

SECTION 02968S

IN-PLACE AND CENTRAL PLANT COLD RECYCLED ASPHALTIC BASE WITH SOLVENTLESS EMULSION

Add Section 02968S

PART 1 GENERAL

1.1 SECTION INCLUDES

A. In-place Cold Recycled Asphaltic Base: Mill existing asphalt material to required depth and width. Mix with emulsified asphalt, quicklime slurry, and water according to approved Mix Design. Place to line and grade and compact.

B. Central Plant Cold Recycled Asphaltic Base: Mill, haul, stockpile, size and blend – emulsified asphalt, quicklime slurry, water and RAP according to approved Mix Design. Haul processed material back to origin and place to line and grade and compact.
Advertisement, Bid, & Construction

- Advertised: September 16, 2010
- Bid Open Date: October 19, 2010
- Awarded to Aggregate Industries (Frehner Construction)
  - Chose Coughlin Company to do the CIR Operation
- Bid 69 Calendar Days
- Construction began April 12, 2011
Construction:
Finished Product
2 Months Later
1.5 Years Later
Results

- Project Completed in 54 Calendar Days
- Total Project Funds Expended: $3.6 M
- Distress Indices Improvement
  
<table>
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<tr>
<th>Year</th>
<th>RIDE</th>
<th>Env Crack</th>
<th>RUT</th>
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<td>46</td>
<td>56.2</td>
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- Heavy Truck Traffic Is Increasing
Results

Asphalt Recycling Section

By Dan Brown, Contributing Editor

Going Deep with COLD

How can you cold-recycle the top 6 inches of a road, stretch by stretch, at asphalt hammers for just $11 million? In several stages, says the Utah DOT, and they did just that this spring on US 91 near Salt Lake City. The first stage involved milling 5 inches of asphalt and stockpiling the restricted asphalt pavement (RAP) at a central plant location in the second stage, Coughlin Co. of St. George, Utah, cold-recycled it in-place—the second 3-inch RAP and added bone dry stone and crusher run in the process. The third stage involved reprocessing the stockpiled RAP with emulsion and stone at the central control plant, then paving it back. A double shift completed the process.

The thought process

Black cracking on this section of US 91 was severe. Over the years, cracks had grown wider and deeper. Some of them reached up to 15 to 12 inches wide and extended to the full depth of the 12-inch thick asphalt, says Thomcock. Fortunately for traffic, most of the cracks were longitudinal. “It was a very tough road for the traveling public,” says Thomcock.

A few years ago, the Utah DOT named a budget figure at $1 million to fix the road, several companies had tried to fill the cracks with some sort of material. “Every one of them failed,” says Thomcock. “Now, the price for milling and filling these areas with asphalt at some sort of asphalt got out of hand, even for that simple type of work.”

Meanwhile, Utah had been with cold in-place recycling. “We started thinking about cold-recycling to help bridge these cracks, knowing this would not be a 100 percent solution, but a very good alternative,” says Thomcock. “I recall that the Nevada DOT had incorporated central cold plant recycling into their spec, and the Utah DOT had not tried it yet.”

Thomcock wanted to bring back the pavement as deeply as possible—a minimum of 6 inches. Livestock trucks presented milling 6 inches deep, then placing back with a bottom overlay and using in-place recycling could only go 4 inches deep in one step.

Ultimately, cold-milling 3 inches off and then doing a 4-inch Overlay. But UDOT officials discussed that with contractors and other teams. “They decided to do it in two steps, then cold-recycling 3 inches would be a superior solution. One, we would get better compaction, and two, it is easier for contractors,” says Thomcock. “The cost of cold-recycling is less and more cost effective, compared to hot asphalt.”

How the train works

Two milling machines fed the 600-ton thresher. The first was a Caterpillar P400B, 42-inch drum, with a separate pass, 1-foot wide and placed 3 feet in advance for the second milling machine, a Caterpillar P500B. Both cut a 12-foot wide, 2-foot overlap pass. Quicklime slurry, at the rate of 12 percent, was added in the mulling chamber of the feeders. A working in a closed-circuit system, the UL-510 with a high-velocity nozzles, is an emissions-free, efficient, and economical solution for cold-recycling.

The drum, with the slurry, is a 600-ton thresher. UDOT touted the closed-circuit system over an open system, adding that the UL-510 meets all emissions standards. The contractor used CTS Cold, Inc., and the UDOT’s Quality Assurance Team, the cement in the slurry is treated with a proprietary solution, which reduced odor and emissions.

The payload was focused on the 42-inch-wideConfiguration is a 50-foot-wide, single pass, with a 2-foot width, 1-foot overlap cut, and a second pass at 1-foot wide, 2-foot overlap, and a third pass at 1-foot wide, 2-foot overlap. The drum, with the slurry, is a 600-ton thresher. The contractor used CTS Cold, Inc., and the UDOT’s Quality Assurance Team, the cement in the slurry is treated with a proprietary solution, which reduced odor and emissions.
QUESTIONS???