

# Project Profile

## General Project Information

**Project Location:** Route 279 Helena, Montana  
**Project Length:** 6½ miles  
**Date Placed:** August 2003



Situated in the mountains and a climate with temperature extremes, Route 279 had severe transverse thermal cracking and early signs of intermittent fatigue cracking, but the base was structurally sound. In 2001 the Montana Department of Transportation had done one of the first projects using ReFlex® technology near Red Lodge, and they chose the process again for this secondary state highway northwest of Helena. The project was a trial to determine if the partial depth cold in-place recycling would reduce the amount of thermal and reflective cracking and be a cost-effective pavement maintenance technique.

## Construction Information

**The Project:** 3½ inches of the distressed pavement was milled, leaving sufficient base to support the recycling train. A seal and cover was placed on the CIR ten days after the job was completed.

**Construction Notes:** Valentine Surfacing Company of Vancouver, Washington was the main contractor for the project, with Century Companies of Lewiston, Montana as a sub for the laydown. Prior to construction, the shoulders were bladed back to prevent incorporation into the recycled mix. There was little disruption of traffic. The existing pavement was milled using a PR-1000 rotomill, and the millings were processed with an El Jay screen deck and a Cedar Rapids Hammermill crusher. An Eagle pugmill and an Asphalt Equipment Service Co. blending system were used to blend the engineered ReFlex® emulsion with the millings.

## Photos

Surface Before Recycling

ReFlex® Cold In-Place Recycling Process

One Lane Recycled



## The Engineered Design

Prior to the project, cores were taken from the road following the ReFlex® sampling protocol. These cores were crushed into two gradations (medium and coarse) and the resultant reclaimed asphalt pavement (RAP) was used for mix designs. The specifications and the design test results for this project are given in the table. The design emulsion content was 3% for the medium gradation and 2.5% for the coarse. Design water content for both gradations was 2-4%.

Requirement	Specification	Average Result for Medium Gradation	Average Result for Coarse Gradation
Marshall Stability @ 40° C	1250 lb min	1775	1465
\$ Vacuum Saturated	55-75	64.9	70.4
% Retained Stability (moisture sensitivity)	70% Min	76.3%	81.6%
Raveling Test, % (raveling resistance)	2% Max	0.3%	
Indirect Tensile (IDT) cracking temperature	-29.3 Max	-29.8° C	

## Performance Results

The CIR maintained the current profile of the roadway, and MDT measurements showed improved rideability. Tom Roberts, MDT maintenance review manager, comments, "The provided mix design and excellent technical support made this project very successful. MDT is planning similar projects."

For more on this project, the ReFlex process or other solutions available in your area, contact your local Road Science™ representative.

