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RESEARCH UPDATE

U 96-10

**PERFORMANCE OF COLD RECYCLED BITUMINOUS PAVEMENT
DERBY-CHARLESTON, VT ROUTE 105****REFERENCES:**

WP 93-R-1, Research Report 94-6

INTRODUCTION:

Derby-Charleston Project STP 9248(1)/C1 was constructed during the summer of 1993. The project was one of the earlier pavement rehabilitation efforts using cold recycled bituminous pavement (CRBP) with special equipment for in-place recycling. Current interest in this project, as well as several others which have utilized the CRBP rehabilitation technology is high, and the principal issue is cost effectiveness.

PROJECT DESCRIPTION:

Construction on the Derby-Charleston project began on VT Route 105 at MM 0.800 in Charleston and proceeded southerly and easterly for 7.828 km to MM 0.800 in Charleston. Project work included 102 mm of cold recycled pavement, resurfacing of the recycled pavement with a 45 mm binder course of Type II bituminous concrete and a 38 mm wearing course of Type III bituminous concrete.

Recycling began during mid-June of 1993 and was completed in 12 days. Paving began on 9 Jul 93 and was completed on 8 Sep 93. The paving activity included the construction of a 0.32 km control section in Charleston, which did not include any recycling activity, but was a simple overlay comprised of the same pavement layers as the section with the recycling.

All units in metric. Exceptions: mile markers/mileage references for project location; supplier's costs (presented in dual English/Metric units).

PERFORMANCE:

As of mid-summer 1996, the condition of the CRBP compares favorably with that of the control section. The three year performance of the two pavements is shown in the table below.

| DERBY-CHARLESTON THREE YEAR PERFORMANCE COMPARISON | | |
|---|---|--|
| | AVERAGE RECYCLE (All Experimental Test Sections) | AVERAGE CONTROL (All Control Test Sections) |
| 1994 CRACKING | 0 | 73 km/m |
| RUTTING | 0 | 0 |
| MAYS | 1.7 m/km | 1.4 m/km |
| 1995 CRACKING | 42 m/100 m | 127 m/ 100 m |
| RUTTING | 0 | 0 |
| MAYS | 1.0 m/km | 1.3 m/km |
| 1996 CRACKING | 128 m/100 m | 293 m/100 m |
| RUTTING | 1 mm | 3 mm |
| MAYS | 1.7 m/km | 2 m/km |

COSTS:

The cost to recycle the Derby-Charleston pavement to a 102 mm depth was \$2.54/m² (\$2.12/SY). This total cost included \$1.98/m² (\$1.65/SY) for Supplemental Specification Pay Item 415.20 (Cold Recycled Bituminous Pavement) and an average cost of \$0.56/m² (\$0.47/SY) for the asphalt emulsion. The total cost of the pavement rehabilitation, including resurfacing with 83 mm (3.25 in) of bituminous concrete pavement was \$9.53/m² (\$7.97/SY). The cost for the 83 mm overlay alone was \$7.00/m² (\$5.85/SY).

SUMMARY:

An examination of the table shown above suggests superior performance in the recycled sections as compared with the simple overlay. However, but given that the CRBP was approximately 36% more costly than the simple overlay, it is felt that the 3 year performance record is too short a time frame in which to draw conclusions regarding cost effectiveness.

FOLLOW-UP:

The evaluation will continue until supportable conclusions can be drawn regarding the cost effectiveness of CRBP.