Montana Department of Transportation
Helena, Montana 59601-1001

Great Falls Experimental Whitetopping Annual Evaluation

Location:	Great Falls, Montana; Intersection of N. W. Bypass & 3rd St. N. W. (U5206 & U5203). Three southbound lanes of 3rd St. N. W.
P. O. Number:	305626 (Original Project)
Report Date:	September 6, 2001
Report Origin:	Pavement Analysis & Research Craig Abernathy

History

This Whitetopping project was initially constructed in fall of 1999 to alleviate the continued heavy rutting and shoving of the asphalt concrete at this intersection. During late summer of 2000, a small portion of the right-turn lane developed severe cracking. This was documented in the fall of 2000 evaluation report on this project. This failure of the pavement occurred at a rapid rate, estimated at 3-6 weeks. The failed section comprised five panels longitudinally and three panels transversely, approximately 10' x 15' located in the right-hand turn lane. This section went through the entire 2000-2001 winters in this condition, withstanding freeze-thaw cycles, traffic and maintenance snow removal. The failed area was removed and repaired in the spring of 2001 (see construction documentation report dated April, 30 2001). No stress related faulting between the whitetop and full-depth was observed.

Evaluation

Since the 2000 evaluation, additional panel cracking was observed in the right-hand turn lane adjacent to the repaired area (see figure 1). This panel cracking may be an extension of the underlying AC stripping which was determined as the main factor of failure and consequential replacement of the 10' x 15' panels earlier in the year. The moisture stripping the bottom AC layer may be attributed to the close proximity of the storm sewer line directly under the lane. Cracking is mostly hairline in nature and no debonding of the individual panels was noticed during this inspection.

Cracked panels were observed at the end of the whitetop where it meets the AC pavement (right-turn lane onto the N. W. Bypass). As current diagrams show, no storm lines are in this area. Figure 2 shows the area of deterioration. The red arrow points to cracking, which is indicative of isolated AC failure possibly due to sufficient lack of support to the overlying PCCP layer. The white arrow points to a sympathy crack. This panel was over-large and should have been sawed initially, which may have eliminated this type of crack. It should be noted that historically, this lane carries the highest truck traffic.

Sympathy cracking was also observed in the far side of the right-turn lane (Figure 3), the yellow lines depict the outline and direction of the crack, arrows show where the saw cut ended and panel cracking began.

Continuing the saw cut through to the adjacent panels may have eliminated this set of cracks. However, the panels could be too small, when cut, to transfer loads effectively. This area will be watched closely in future inspections.

Additional cracking was observed in the same lane just prior to the repaired area (several feet north of the area). As in other sections of the right-lane, this may be an indication of AC stripping due to abnormal water infiltration or normal corner-cracking indicative of this type of pavement. Figure four shows cracking around the first manhole cover going south when approaching the whitetop pavement.

The two through lanes, at this evaluation, are showing no signs of cracking or any other visual deterioration. There are no visible signs of panel delaminations on any of the cracked panels in the right-hand lane.

This project has been rated as performing well. The next evaluation will be in the fall of 2002.