

MnDOT sets new standards using 3D milling and cloud monitoring of milling depths

Measurements of milled surface performed in real-time and transferred to the cloud

Up to 25% unbonded concrete overruns prior to 3D milling

1% overruns after completion of the project

BACKSTORY:

Interstate 90 runs through the southern part of Minnesota, linking the cities of Blue Earth and Fairmont. This well traveled stretch of road faces drastic weather shifts throughout the year with exceptionally cold winters and hot, humid summers, causing a higher level of distress and wear.

PROBLEM:

I-90 was built with concrete and had received several asphalt overlays over the years. The asphalt overlays experienced reflective cracking at the joints and the extreme weather conditions resulted in a weathered, rough pavement. Traditional rehabilitation consisted of milling the existing asphalt to a specified depth prior to applying an unbonded concrete overlay. Milling to a constant depth removes the humps but not the dips and resulted in a large quantity of unbonded concrete overruns-- the standard approach would not suffice for I-90. These challenges were also compounded by budgetary restrictions.

“ This approach really raised the bar. The state has become big believers in the process. ”

— Dan Schellhammer, President, Midstate Reclamation

SOLUTION:

Midstate Reclamation teamed with Advanced Materials and Technology Engineer, Rebecca Embacher to develop a special 3D milling process technique that met stringent state specifications and provided tighter tolerances. Midstate Reclamation performed variable depth milling (profile milling) utilizing 3D milling technology. Additionally, a survey technician verified the depths of milling directly behind the milling crew. This information was transmitted to the cloud, allowing the team to compare as built and computer model depths. MnDOT was able to monitor milling progress and accuracy from remote workstations in real-time. This technology will eliminate the need for onsite inspection of the milled surface on future projects. The first phase of the project was completed in 2019, completing the project in 2020. The process resulted in a smoother overall surface with a longer lifespan for the roads. The consistent milling of the surface worked so well, it opened the state to additional 3D milling projects across the state moving forward.

PHOTOS:



