

**Experimental Feature Construction Report
 September 2021**

Experimental Feature:	Diamond Road Smoothing
Location:	Butte District, Broadwater County, US Hwy 287/12, RP 68.00 – 77.57
MDT Project Name:	Townsend – North
MDT Project Number:	NH 8-4(79)68[9470]
Experimental Project Number:	MT-21-02
Principle Investigator:	Chad DeAustin, Experimental Project Manager, (ExPM)
Technical Contact:	Miles Yerger, Pavement Design Engineer
Construction Date:	August 2021

Project Map



Project Description & Outline

Road smoothing is a practice of grinding the surface of a roadway to eliminate bumps and rutting while maintaining a proper profile by means of a diamond grinding mill. MDT chose the Townsend-North job to test this equipment as the road was structurally in good condition but was experiencing rutting and bump issues. The Diamond Road Smoother is a semi and trailer combo that moves down the roadway intaking information with averaging level arms and outputting a smooth road via the diamond grinding blades on a revolving drum. Listed are a few resources of the equipment and construction projects using the equipment.

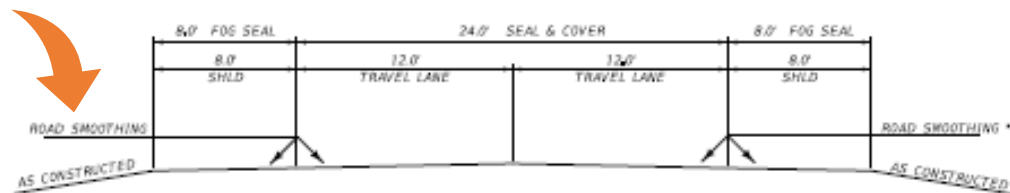
<https://diamondroad.com/products/diamond-road-smoother/>

<https://www.youtube.com/watch?v=Y3FwxlgS1Kc>

<https://www.youtube.com/watch?v=AZ2VDaJaCEA&t=15s>

TYPICAL SECTION NO. 5 MAINLINE

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See above for an example of a typical section that includes the road smoothing call out. A more detailed description can be found in the 'Summary' page of the plans which breaks down total distance for the road smoothing work. To complete each travel lane, the semi-trailer combo will need to make 2 passes in each lane. Where this experimental feature takes more effect is in the 'Special Provisions' of the contract. See below for the special provisions included in this contract for the road smoothing item.

32. ROAD SMOOTHING [NH 8-4(79)68]

A. Description. This work consists of asphalt pavement smoothing by the means of diamond milling (Road Smoothing) at locations shown in plans or as directed by the Project Manager.

B. Materials. None

C. Construction

1) Equipment. The contractor shall provide equipment utilizing diamond tipped teeth mounted to a self-contained, highly mobile machine specifically designed for grinding and texturing asphalt pavement.

a) Equipment must include dual parallel independent support arms that carry the cutting drum at the outer extent of the drum. The minimum length of the support arms shall be 32 feet.

b) The cutting drum must be tapered on the outer edges to eliminate a vertical edge. A vertical edge is not acceptable, grind a sufficient width until a vertical edge is eliminated.

c) Equipment must be capable of moving at highway speeds between grinding and texturing pavement.

2) Pavement Surface Smoothing Requirements.

a) Provide a uniform finished texture.

b) Perform smoothing in a longitudinal direction. Begin and end smoothing at lines normal to pavement centerline.

c) Taper in and out of smoothing area to provide a smooth transition.

d) Do not cause damage to underlying asphalt pavement.

e) Maintain existing cross slope drainage and existing roadway crown.

f) Provide a uniform transverse slope of the asphalt pavement with no depression or misalignment of slope greater than ¼ inch in 10 feet when measured with a 10-foot straight edge

3) Remove and dispose of all existing bituminous or concrete materials in accordance with subsection 202.03.3.

4) Existing IRI measurements are available upon request.

5) The target values for this contract are as follows:

a) Any area with an existing IRI of 100 inches/mile or greater, improve to an IRI of 90 inches/mile or less.

b) Any area with an existing IRI between 100 inches/mile and 90 inches/mile, improve to an IRI of 70 inches/mile or less.

c) Smooth passing lanes regardless of IRI to remove existing rutting ensuring existing ride values are maintained or improved.

Evaluation Procedures & Schedule

The measure of effectiveness (MOE) prevalent with this project will focus on:

- Construction practices (constructability, construction time, cost effectiveness, etc.),
- Visual inspection of the smoothed and chip sealed surface,
- Driven inspection of the smoothed and chip sealed surface,
- Comparison of ride and rut data from prior to construction, after construction and annually.

In accordance with the Department's 'Experimental Project Procedures,' Research will monitor and report on performance for a minimum of five years annually. This includes delivery of a work plan, construction report, annual reports, and final project report.

2021: Installation/Construction Report
2022-2025: Annual Inspections/Evaluation Reports
2026: Final Evaluation Report/Project Conclusion

A web page will be dedicated to display all reporting from the project.

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