



ENERGY-SECTOR BRIEF

Maintenance Division, Roadway Asset Management



15-04 LEVEL UP PATCHING

A variety of roadway maintenance repair techniques and materials are used by TxDOT Districts to extend pavement life. This brief documents techniques and materials most used by districts in South and West Texas for “Level Up Patching” of pavements damaged by traffic generated by the development of the energy sector of the Texas economy. Other Energy Sector Briefs available include the following:

- 14-03 Shoulder/Edge Repair Techniques
- 15-01 Maintenance Repair Techniques
- 15-02 Shallow Patching
- 15-03 Deep Patching
- 15-05 Surface Treatment/ Seal Coat/Chip Seal
- 15-06 Pavement Strengthening

The maintenance methods summarized in these briefs represent current practices of the districts in these two regions of the state. As materials and equipment change, these methods will be altered. Feedback on performance of various maintenance treatments used in the energy sector will also result in change to these methods, materials and techniques. Report 409186-01 “Current TxDOT Practices for Repair of Road Damage Associated with Energy Development and Production” provides additional details for these routine maintenance operations.

This report and related documents are available on the TxDOT Maintenance Division (MNT) SharePoint site at <https://txdot.sharepoint.com/sites/division-mnt/SitePages/Home.aspx>.



DESCRIPTION

- Placement of a relatively thin asphalt bound surfacing material on an existing pavement for the purpose of improving ride quality or filling ruts
- Typically the level-up patch is placed without removing existing pavement materials

CONDITIONS FAVORING USE

- Use to repair localized pavement roughness and rutting
- Repaired area is typically a lane width and covering over 100 ft. in length
- Partial lane widths are sometimes repaired with this activity
- Pavement should not exhibit distress that requires structural or load carrying improvement
- Placement should be scheduled for warm and dry weather conditions to allow volatiles to escape when using non hot mix asphalt patching materials
- This type of patch is intended to have a life of several years if possible

PROCEDURE

- Some localized repairs may be needed on the existing surface (the number of localized repairs should be small in number as this is not a repair technique that will provide a structural strength or load carrying improvement to the pavement)
- Clean the existing surface as needed
- Apply an emulsified asphalt tack coat that will break and set prior to application of surfacing material
- Place patching material on existing surface and spread with blade or maintainer
- Depth of repairs will vary across and along the pavement as this technique is used to repair rough riding and rutted roadways
- Typical depths are 2 inches plus or minus
- Compact with steel wheel and/or pneumatic rollers
- If possible, time should be allowed after compaction and prior to trafficking to allow for volatiles to escape (warm or hot and dry weather will speed the loss of volatiles)
- Broom after placement of patching materials to remove loose materials
- Fog seals are sometimes placed after the patching operation to help control raveling

PERFORMANCE

- Due to the relatively thin layers of patching materials utilized, rutting is typically not a performance problem
- If depths are greater than about 2.5 inches, cold million should be combined in combination with a thin lift
- Raveling can be a problem if adequate compaction is not obtained
- Level-up patches are commonly used on pavements placed on swelling clay soil subgrades

MATERIALS/EQUIPMENT/CREW SIZE/PRODUCTION

Typical materials, equipment, crew size and production as reported by districts are shown below.

Level-Up Patch

Materials	Equipment	Crew Size	Production	Comments
HM-CL Type CC	Pneumatic and flat wheel roller, maintainer, backhoe, two belly dumps, distributor		2 to 4 areas per day depending on area treated and traffic	Blade lay
CM-CL Type 1, Gr. C surface with HFRS-2 tack (0.05 gal/sq. yd.)	Pneumatic roller, flat wheel, maintainer, 3 ten cu. yd. dump trucks, distributor	8-10	8,500 sq. yds. using 350 cu. yds. of material	Blade lay
LRA		8-10		Used by several districts
HMA Type D or F	Rut box			<ul style="list-style-type: none"> • 20 to 25% of maintenance budget in some districts • Thin layers of HMA on FB poor performance

CM-CL-Cold Mixed-Cold Laid

HFRS-2-High Float Rapid Set Emulsion

HMA-Hot Mix Asphalt-Item 340, 341

HM-CL-Hot Mix-Cold Laid-Item 334

LRA-Limestone Rock Asphalt-Item 330

SCHEDULING

- Warm or hot dry weather is preferred
- Patching in cool/damp weather should be avoided

COMMENTS

- Follow department and district guidance regarding traffic control plan



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