

GETTING THE MOST FROM YOUR LTPP SECTION

Guidance for Rehabilitation

Introduction

Pavement rehabilitation in a number of States and Provinces consumes the majority of the pavement funds. Highway agencies have many questions related to selecting the right rehabilitation strategy considering the pavement condition, traffic, and desired performance period. In response to this need, one of LTPP's objectives is to develop improved design methodologies and strategies for the rehabilitation of existing pavements. Of the approximately 2,400 LTPP sections, there are 442 rehabilitated pavement sections in the GPS-6 and -7 and SPS-5 and -6 experiments. These 442 are the source of the data used to address LTPP's rehabilitation goal.

To increase the quality and applicability of the LTPP rehabilitation products requires an increase in the number of rehabilitated test sections in the LTPP program while not increasing the total number of sections in the program. A means to increase the number of rehabilitated sections is to continue to monitor an LTPP section after the State or Province has completed a pavement rehabilitation. For an LTPP test section to be considered for future monitoring after a rehabilitation, three criteria must be met: (1) the rehabilitation treatment must fall within certain types and ranges, (2) the section rehabilitation must be completed and open to traffic by the end of 2002, and (3) the State or Province must meet certain data collection responsibilities.

Definitions

Maintenance: Maintenance activities include seal coats, crack sealing, patching, crack and joint sealing, grinding, milling less than 25 mm deep, and grooving.

Rehabilitation: Rehabilitation activities include overlays and associated pretreatments (patching, milling, joint repair, etc.), inlays (mill and fill), pressure-relief joints in PCC pavements, subsealing or undersealing, retrofitted subdrainage, joint load transfer restoration, and shoulder restoration.

Acceptable Rehabilitation Treatments

The general categories of rehabilitation treatments that are acceptable for continued monitoring by the LTPP program are shown in Table 1. Treatments applied to LTPP test sections that are not described in Table 1 or activities described under the unsuitable treatments portion of this document are unacceptable for continuation in the LTPP program.

The following definitions relate to the items shown in Table 1:

- AC:** Dense-graded, hot-mix asphalt-aggregate concrete using either a conventional or modified asphalt cement. Mixtures designed in accordance with current Superpave guidelines are acceptable. The thickness restriction applies to the material in excess of that which is used to replace portions of the milled pavement structure. The thickness restriction does not apply to thin seal coats or open-graded friction courses that may be required by agency policy.
- PCC:** Portland cement concrete pavement layers. PCC pavement layers must be either Jointed Plain Concrete Pavement (JPCP), Jointed Reinforced Concrete Pavement (JRCP), or Continuously Reinforced Concrete Pavement (CRCP). JPCP layers must have either no-load transfer devices or smooth dowel bars only. JRCP layers must contain smooth dowel bars for joint load transfer. Unbonded PCC overlay layers must be thicker than 126 mm (GPS-9 requirement).
- CPR:** Concrete pavement restoration. Allowable CPR techniques include partial depth patching, full-depth patching and joint replacement, load-transfer restoration, full-surface diamond-grinding, undersealing or subsealing, and retrofitted edge drains. The distinction between classification as CPR or maintenance activity depends on the extent and nature of the applied treatments.
- Debond Interlayer:** An interlayer of material placed between the original PCC surface and PCC overlay to prevent bonding. Examples include Stress-Absorbing Membrane Interlayers (SAMI), asphalt-rubber seal coat, sand asphalt, aggregate interlayer, etc.
- Milling:** Cold milling of the AC structural layers. The milling depth must be less than half the total thickness of the existing AC structural layers.
- Fracture:** Fracture pretreatments to PCC pavements include crack and seat, break and seat, and rubblization.

Table 1. Acceptable rehabilitation treatments for monitoring continuation in LTPP program.

Existing Pavement Type — LTPP Experiment	Pretreatment	Overlay Materials and Thickness Restrictions
AC <i>GPS-1</i> <i>GPS-2</i> <i>SPS-1</i> <i>SPS-3</i> <i>SPS-8 (AC)</i> <i>SPS-9 (PCC)</i>	None	AC < 127 mm
	Maintenance and Repair	AC < 127 mm
	Milling	AC < 127 mm
	None	PCC
	Maintenance and Repair	PCC
	Milling	PCC
PCC <i>GPS-3</i> <i>GPS-4</i> <i>GPS-5</i> <i>SPS-2</i> <i>SPS-4</i> <i>SPS-8 (PCC)</i>	CPR	None
	None	AC > 102 mm, < 203 mm
	CPR	AC > 102 mm, < 203 mm
	Fracture	AC > 102 mm, < 203 mm
	Debond Interlayer	PCC > 126 mm
AC over AC <i>GPS-6</i> <i>SPS-5</i> <i>SPS-9 (Overlay)</i>	None	PCC < 127 mm
	Maintenance and Repair	PCC < 127 mm
	Milling	PCC < 127 mm
AC over PCC <i>SPS-7</i> <i>SPS-6</i>	None	PCC < 203 mm
	Milling	PCC < 203 mm
	Milling + CPR	PCC < 203 mm
	None	PCC > 126 mm
	Milling + Debond Interlayer	PCC > 126 mm

Unsuitable Treatments

If any of the following treatments or construction activities are applied to a test section, they will render the existing test section unsuitable for continued monitoring as part of the LTPP pavement rehabilitation studies:

- Widening of the LTPP test lane.
- Added lane next to the LTPP test lane.
- Intersections or ramps added inside maintenance control zone around test section.
- Tied concrete shoulders added to test lane.
- On pavements in the non-rehabilitated asphalt concrete pavement experiments, such as those in GPS-1, GPS-2, SPS-1, or SPS-8, removal of more than half the total thickness of the AC structural layer(s).
- Application of non-uniform treatments that result in a difference in layer thicknesses of greater than 25-mm over more than one-third of the test section length. This restriction is intended to apply primarily to milling depths and overlay thicknesses and not variations due to spot patching and repair of localized distresses.
- Use of non-standard paving materials that are considered experimental. Determination of what is considered experimental will depend upon the extent of highway agency's routine use of the material.
- Performing construction activities that either hide surface distresses or alter the structural pavement response, prior to completion of LTPP monitoring measurements to document the condition of the existing pavement prior to rehabilitation.
- Use of bonded PCC overlays on existing PCC pavement sections. (The GPS-8 study on bonded PCC overlays was abandoned in 1988.)

When one or more of these conditions apply to a test section, or if the agency does not desire to participate in the continued monitoring of a test section after rehabilitation, the LTPP Regional Coordination Office should be contacted so that final monitoring measurements can be performed prior to the test section going out-of-study.

Highway Agency Responsibilities

In order for a test section to be considered for LTPP monitoring after rehabilitation, the participating highway agency must either have performed, or agree to perform, the following activities:

1. Traffic data collection on the test section prior to overlay must have met the minimum requirements relative to the LTPP experimental designation.
2. Agency agrees to perform at least the minimum level of traffic data collection on the test section after rehabilitation in accordance with current LTPP guidelines.
3. Agency notifies LTPP regional representatives sufficiently in advance of construction to permit scheduling and conduct of deflection, profile, and distress measurements prior to the start of construction.
4. Agency agrees to provide traffic control for all LTPP field-monitoring activities.
5. Agency marks and signs the test section in accordance with LTPP program procedures.
6. Agency completes and submits all required LTPP data forms to document the rehabilitation construction activities.
7. Agency performs field materials sampling and testing in accordance with LTPP guidelines.
8. Agency performs, or has performed, all laboratory material tests that are not performed by the LTPP contract laboratories.

References

GO-09, "Guidelines for Monitoring Continuation on Rehabilitated Test Sections," August 1998.

GO-13, "Guidelines for Classification of Rehabilitated Test Sections," August 1998.

GO-14, "Rehabilitation Information Form RI-2 — Monitoring Continuation Request," October 1998.

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