Memorandum

U.S. Department
of Transportation

**Federal Highway
Administration**

6300 Georgetown Pike
McLean, Virginia 22101

Subject: **ACTION**: LTPP Directive S-15
SPS -10 Construction Report Requirements

Date: May 9, 2016

From: Jack Springer
for Long Term Pavement Performance Team

Reply to
Attn of: HRDI-30

To: Mr. Gabe Cimini, PM - LTPP North Atlantic Regional Contract
Mr. Gabe Cimini, PM - LTPP North Central Regional Contract
Mr. James Sassin, PM - LTPP Southern Regional Contract
Mr. Kevin Senn, PM - LTPP Western Regional Contract

Attached is Long Term Pavement Performance (LTPP) Program Directive S-15. Construction reports for all projects accepted into the SPS-10 study shall be prepared by the Long-Term Pavement Performance (LTPP) program. The Regional Support Contractors (RSC) should follow the guidelines contained in this directive. Please ensure that all personnel involved with the process are aware of this new directive.

Should you have any questions concerning this directive, please do not hesitate to contact me on (202) 493-3144 or jack.springer@fhwa.dot.gov.

Attachment

FHWA:HRDI-30:JSpringer:JHarris:493-3144:05/09/16
File: M:\LTPP Directives\Distress\S-15
cc:
Jonathon Groeger (TSSC)
Jane Jiang
Directive Binder
Official File

LONG TERM PAVEMENT PERFORMANCE PROGRAM DIRECTIVE

For the Technical Direction of the LTPP Program

Program Area:	SPS Support	Directive Number:	S-15
Date:	May 9, 2016	Supersedes:	
Subject:	SPS-10 Construction Report Requirements		

INTRODUCTION

Construction reports for all projects accepted into the SPS-10 study shall be prepared by the Long-Term Pavement Performance (LTPP) program Regional Support Contractors (RSC) following the guidelines contained in this document.

REPORT SPECIFICATIONS

All reports shall be prepared in accordance with the Federal Highway Administration (FHWA) Communications Reference Guide (CRG). These documents are considered as research reports and shall follow the guidelines contained in Chapter 5 of the CRG for Research Reports. A Times New Roman 12-point font shall be used for all text. Contractors' names may not appear in the report, except in block 9 of the Technical Report Documentation Page (form DOT F 1700.7). Contractor logos should not appear at all. Paid consultants should not be acknowledged anywhere else in FHWA publications.

The following list provides the required elements for each SPS-10 Construction Report:

- Front Cover
  - Front cover
  - Inside front cover (R&D Foreword and Disclaimer Notice)
- Front Matter
  - Technical Report Documentation Page (Form DOT F 1700.7)
  - SI/Metric Conversion Chart
  - Table of Contents (preferably auto-generated using the MS Word Style feature)
  - List of Figures (preferably auto-generated using the MS Word Style feature)
  - List of Tables (preferably auto-generated using the MS Word Style feature)
  - List of Abbreviations and Symbols
- Body of Report
  - Chapter 1: Introduction
  - Chapter 2: Project Description
  - Chapter 3: Construction Details

  - Chapter 4: Summary
  - Chapter 5: Key Observations
- Back Matter
  - Appendix A: Construction Photographs
  - Appendix B: Mix Designs
  - Appendix C: Materials Sampling and Testing Layouts
  - Appendix D: Other Construction Documents
  - Appendix E: Complete set of SPS-10 Construction Forms
  - Appendix F: Deviation Report (if any)
- Back Cover (blank)

The minimum contents for each element of the report are described below.

FRONT COVER

The front cover page shall use the current LTPP research report cover design. RSC shall obtain the current cover format from their LTPP Contract Officer Representative at the start of creation of each construction report. The title of the construction report shall include the official reference and title of the SPS-10 study, name of participating highway agency, short name for project location and other elements required by the FHWA CRG.

FRONT MATTER

The front matter shall include the latest Technical Report Documentation Page (Form DOT F 1700.7), SI/metric conversion chart, and table of contents, and lists of figures, tables, and abbreviations and symbols.

BODY OF REPORT

The body of the report shall contain the following chapters, in the specified order, whose content shall include the following elements as a minimum, but can also include other information of significance based on RSC's judgment.

Chapter 1: Overview

The following overview shall be included in the introduction of each SPS-10 Construction Report.

General Overview of SPS-10 Study

The SPS-10 experiment is designed to capture information on the performance of warm mix asphalt (WMA) in comparison to hot mix asphalt (HMA), both in the short and long term. For the purposes of the experiment, WMA is defined by LTPP as asphalt mixtures produced at least 30°F below conventional hot-mix asphalt production temperatures, or asphalt produced at or below 275°F. The experiment provides the ability to directly compare long term performance of WMA to HMA, thereby evaluating the difference in relative performance between WMA and HMA. Field performance will be captured over the long term and data from laboratory testing of WMA materials will be provided to researchers looking to evaluate various features of WMA. Collectively, this information will be used for a better understanding of the potential benefits of WMA and for performance predictions.

S-15 SPS-10 Construction Report Requirements

The objectives of the SPS-10 experiment are to:

- Evaluate and improve the practical aspects of implementing the Warm Mix Asphalt (WMA) system through a hands-on field trial by interested highway agencies.

- Compare the performance of the WMA technologies against mixes designed with current highway agencies' hot mix asphalt specifications, asphalt-aggregate specifications, and mix design procedures.

- Provide long-term performance data for evaluation and refinement of the WMA technologies, design procedures, and models.

- Test the sensitivity of the WMA technology relative to moisture damage, low temperature cracking, fatigue, or permanent deformation distress factors.

- Provide highway agencies the opportunity to evaluate the performance of other experimental features by the construction of supplemental sections.

The SPS-10 experiment is intended for test sections not previously in the LTPP program. Because these sections will be nominated into the program prior to rehabilitation, all construction activities, materials properties, and sampling over the entire history of the roadway on which the test sections are located shall be documented in this report.

Specific Project Summary Overview

Included in the introduction of the construction report shall be a summary overview description of the project which includes basic information that includes as a minimum:

- Location details that include route designation, direction of travel, and Highway Performance Monitoring System (HPMS) functional classification
- Existing pavement structure and history of pavement construction events at the site
- Total number of experimental test sections constructed
- Types of WMA technologies used along with references to any available WMA standard specifications
- Type of recycled asphalt pavement used
- Agencies standard overlay design for the project site

Report Organization

A brief description of the report organization shall be included to provide a summary of the report sections/chapters and their respective contents. For example:

- Chapter 2 of this report gives the project location, description, and other attributes of the project.
- Chapter 3 describes the materials and construction procedures for each layer and then continues to detail construction sequence and operations.
- Chapter 4 provides a summary of the test section construction.
- Chapter 5 contains a documentation of the key observations.

- Appendix A contains a collection of construction photographs from the project.
- Appendix B contains the mix designs for each section.
- Appendix C contains the materials sampling and testing layouts.
- Appendix D contains construction documents including the plans, specifications, and special provisions of the project; strip charts during production; and daily logs and field notes of activities, equipment, and weather.
- Appendix E contains the SPS-10 Construction Forms.
- Appendix F contains the Deviation Report (if any).

Chapter 2: Project Description

The project description will include basic information on the project with the use of text as well as tables and figures. It will serve as an introduction to the specific SPS-10 experiment. Project information will contain, at a minimum, the following:

Test Section Layout

Include a figure or figures that show the test section layout, stationing, transition areas, pavement layers, intersections, ramps, driveways, bridges, subsurface drainage features, nearby bodies of water, etc.

Physical Attributes

The report should include the physical attributes of the project (i.e. project location, surrounding terrain, road geometry, existing pavement condition, etc.). The highway, interstate or state route, the nearest township/city, and the Global Positioning System (GPS) coordinates shall be described. A figure of the location of the project on a map shall be included. Also included should be the immediate terrain (rolling hills, flat, etc), embankments, cuts, side-slope cut/fill, cut/fill transitions, etc. The description of existing pavement should include the structure, layers, maintenance and rehabilitation history, shoulder types, lane and shoulder width, horizontal curves, pavement cross slope, super-elevation transitions, vertical grades, and condition. The existing pavement condition should also be included. The condition of the pavement prior to construction shall be presented in terms of distresses, transverse profile, longitudinal profile, and texture at each test section location.

Climate

Summary climate statistics shall be presented for the project location which includes as a minimum:

- Average annual precipitation
- Average annual freeze index
- Annual hours of sunshine
- By month, average daily high air temperature, average daily low air temperature, average precipitation, average snowfall, and hours of sunshine.
- The location of the climate statistics

Traffic

To provide a brief overview of the traffic conditions of the project, a table should be used to describe the annual average daily traffic (AADT) of the project site in each direction. Also to be included in the table should be the percent of heavy trucks and combination vehicles in the LTPP test lane. Finally the table should include the estimated cumulative 18,000 lb equivalent single-axle loads (ESAL) for the study lane at the start of construction, and the design traffic data for the overlay which may include 18-Kip ESAL applications, traffic load spectra, assumed growth rates, etc. If load spectra traffic data are available, it shall be described in this section of the construction report and included in an appendix.

This portion of the report shall also document traffic control plans and actions during construction of the test sections.

The traffic monitoring measurement plan during the performance observation period shall be described in as much detail as possible. The plan should indicate the type of monitoring equipment, equipment location, sampling time intervals, calibration details, and other information that will assist in proper interpretation of the resulting traffic monitoring data.

Supplemental Test Sections

Sponsoring Highway Agencies have the opportunity to expand the experiment to address their own interests and concerns as well as to incorporate innovative technology through the construction of supplemental test sections. If supplemental test sections are included in the project, a brief overview shall be included which includes all of the information noted for the core test sections.

Project Personnel

The project personnel involved in the project should be noted. This will include personnel from the governing Highway Agency, and construction contractor(s). The Highway Agency should be noted along with the personnel from the project including the resident engineer for the project, the assistant resident engineer, the inspector(s) and their responsibilities, the field sampling and testing crew, and any others involved with the coordination and execution of the project. The prime contractor should be noted along with the project manager and construction superintendent. Also included with the prime contractor should be the subcontractors, if used, and the aspects of the project they were tasked with, respectively. When possible, include pictures of project personnel in a report appendix. The figure title shall identify people in each picture.

Project Timeline

A project timeline shall be presented which documents the date and time of significant events in the implementation of the project site. Such events include as a minimum:

- Dates of preconstruction distress, profile, and deflection measurements
- Date of start of associated construction activities as it relates to each test section
- Traffic closure

- Pre-paving construction activities including milling, patching, shoulder restoration, maintenance actions, etc.
- Plant inspections and mixture quality control tests
- Start and finish of paving activities
- Traffic opening date/time
- Dates and time of material sampling including cores, bulk materials from mix plant, etc.

Chapter 3: Construction Details

Detailed construction information (in text as well as tables, figures, and pictures) shall be provided including, at a minimum:

- Work activity dates, including pre-overlay work such as patching, crack sealing, and mill work, and any overlay work.

- Description of equipment on-site (and at plant). Information should be included for the asphalt plant and the pavement equipment. The asphalt plant information should include the type of plant used, description, and the location, along with hauling distance and haulers. Information for the paving equipment should include the paver used, the pick-up machine, and the rollers and number of passes.

- Detailed materials information (full mix designs should be included in Appendix B) should include the aggregate source and the number of stockpiles used. Source and composition of the recycle asphalt pavement (RAP) materials should also be detailed.

- Field Quality Control (QC) test results performed by the Highway Agency or contractor.

- Section by section details including lift thickness, paving widths, density, detailed temperature information at plant and laydown, ambient temperature, temperatures during paving, compactive effort, and construction issues or problems.

All pictures shall include global coordinates and timestamps in the electronic metadata stored in the picture file.

Chapter 4: Summary

The Summary chapter shall be an overview of key project details and construction activities. The summary will note the number of LTPP test sections within the project, the highway, interstate or state route number, and the nearest city where the project was located. A brief recap of each section's attributes shall also be included. Attributes to include will be pavement thicknesses, WMA technologies (if used), and pre-overlay preparation practices performed. Also included shall be the project's beginning construction date and ending construction date. Finally, any construction issues encountered shall be included, with a more detailed description included in Chapter 5.

Chapter 5: Key Observations

The Key Observations chapter will capture noteworthy observations by test section. This chapter will also document issues encountered during construction, including, but not limited to equipment

breakdowns, weather and/or material variability, experiment deviations, or other details that may be important to understand the resulting performance of the experimental test sections.

SUPPORTING DOCUMENTATION

This part of the report includes the appendices.

Appendix A: Construction Photographs

Appendix A shall contain photos of each section before, during, and after rehabilitation. Photographs of the plant and paving operation shall also be contained in this Appendix. All pictures shall include GPS coordinates and timestamps in the electronic metadata stored in the picture file.

Appendix B: Mix Designs

Appendix B will contain complete mix design information for each section (core and supplemental). Appendix B1 should be for HMA, B2 for the foaming, and B3 for the chemical additive. Appendices for supplemental sections should start at B4 and continue sequentially based on the number of supplemental sections.

Appendix C: Materials Sampling and Testing Layouts

Appendix C will contain copies of the layouts from the Materials Sampling and Testing (MS&T) Plan. This shall include a copy of the "as-sampled" layout for the time zero sampling from the MS&T Plan used in the field and the original/design MS&T Plan, with any differences noted between the two plans.

Appendix D: Other Construction Documents

Appendix D will contain other construction documents pertaining to the project. This will include the following (if available):

- Plans, Specifications, and Special Provisions
- Strip charts during production
- Daily log of activities/equipment/weather
- Other available construction information
- Daily field notes from personnel on-site

Appendix E: SPS-10 Construction Forms

Construction data for the SPS-10 experiment include primarily items related to the WMA technologies and the placement temperatures and properties of the overlay material. Copies of the construction data forms and notes collected for the project shall be contained in this appendix.

Appendix F: Deviation Report

Include the deviation report, if applicable.

Prepared by: TSSC

Approved by:

Aramis López, Jr.
LTPP Team Leader