



BUREAU OF MATERIALS

MATERIALS PROCEDURES

MP NUMBER: 20-25

EFFECTIVE DATE: 03/03/25

APPROVAL: Edward Inman

CONCRETE BRIDGE DECK RIDE QUALITY ACCEPTANCE TESTING USING WALKING PROFILER
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PURPOSE:

To establish a standard procedure for calibration and testing of concrete bridge deck ride quality using a walking profiler device.

SUPERSEDES:

Materials Procedure Number 28 – Dated 07/01/2008

REFERENCES:

NJDOT Standard Specifications for Road and Bridge Construction, Addenda and Attachments
Construction Procedures Handbook (CPH)

SurPRO User's Guide and Operating Manual

ProVal User's Guide

INSTRUCTIONS:

I. Scheduling

- A. The Resident Engineer will request testing of concrete bridge decks and approaches.
- B. Determine all areas to be tested and advise the Resident Engineer. Refer to the plans and Special Provisions to determine lanes to be tested, lot limits, and whether approach slabs need to be tested Under the 2019 Standard Specifications, concrete bridge deck lots are defined as the travel lanes from joint assembly to joint assembly. Construction joints do

not affect lot limits. Testing will generally have to be coordinated with curing and other construction operations on the deck.

II. Preparation for Testing

- A. The equipment used will be the walking profiler manufactured by International Cybernetics (ICC).
- B. The profiler should be fully charged prior to use (It is strongly recommended to leave the charger continuously attached to the power source when the unit is not in use).
- C. Safety, sweeping and wheelpath layout should be provided by the contractor.
- D. Three feet on either side of the centerline of the lane will be considered the wheelpaths. Wheelpath designation will be based on the final lane designations.
- E. Profiling in heavy rain, sleet, hail, snow, dusty or particularly dirty conditions is not recommended. Avoid operating under conditions where sand or other contaminants may adhere to the wheel surface resulting in degradation of profiling quality.

III. Testing

- A. It is recommended that operators of the SurPRO walking profiler be trained in its use and use of ProVal software. Refer to the instructions
- B. It is necessary to take complete field notes of test locations, distance, reference number, and concrete bridge finishing type (machine or manual). It will be necessary to match up the location of each wheelpath tested to its respective file name when data is processed, and reports are created.
- C. Warmup and Calibration: Unpack, assemble, and warm up the profiler for 15 minutes. Perform a closed loop calibration according to the instructions.
- D. Perform wheelpath runs according to recommendations in the guide. Be sure to walk the device smoothly between a speed of 0.8 – 1.2 MPH.
- E. After each run, press “Stop”, followed by “Save.” Allow sufficient time after each command for the unit to process the data and scroll through its display. The display will indicate the filename as an 8-digit alphanumeric with the 1st 4 digits being the date and the last 4 being the time of completion of the run. Record this filename along with the location of the test. Press clear (“CLR”) before starting the next run.
- F. Perform a minimum of one run per wheelpath in the direction of travel. Repeat runs are recommended, if practical, to improve confidence in the accuracy of data.

IV. Data Transfer

- A. After completing the testing, data must be transferred from the SuprPro hard drive to the USB drive as follows:
 - 1. Hit the “SEND” command on the SURPRO.
 - 2. Scroll to option “D” which reads “Send ERD/PPF/PRO”. Hit Yes.
 - 3. Press, 1: USB Drive.
- B. In order to transfer data from USB drive to a computer, use the following steps:
 - 1. Insert USB into USB Port on PC.
 - 2. Open USB Drive from its location on the PC.

3. Create a new location on the PC and then save the data from the USB to this new location. Once this file is saved on the computer, the USB can be removed.
- C. Return the profiler to its storage location, set it on its stand, and connect the battery charger.

V. Analyze Data

- A. Download ProVAL software (free download from www.roadprofile.com, need Windows Service
- B. Pack 3 to install.)
- C. Analyze Data for each wheelpath using ProVal Rolling Straightedge analysis feature. As inputs, use 10 ft for the straightedge length. For projects bid under profiler spec use 1/8" (0.125"). Use butterworth low pass filter.
- D. Export analyzed data to Excel for calculations (Report Menu). ProVal will generate a will generate a spreadsheet using the report command. In Excel, use the defective segments page to calculate the length of the defects from the start and stop distance. (Defect Length = Stop distance minus Start distance) Total each wheelpath, divide by the length tested and convert to percent to obtain Percent Defective. Calculate the lot Percent Defective based on all included wheelpaths. Format as a percentage to the nearest 0.1%.
- E. Calculate the Reduction Per Lot (Percent) for each lot using table 507.03.02-2.

VI. Report

- A. Compile report in Excel of all lots tested. Include:
 1. A summary page including a breakdown of the lots tested, the percent defective (to the nearest
 2. 0.1%), and the Pay Reduction as provided in Table 507.03.02-2, if applicable.
 3. Tabulations of defects (Exceeded thresholds pages)
 4. Graphs of elevation profile and deviation profile should be included as additional information pages. These can be copied from ProVAL and pasted into Excel.
 5. Alternately, the .PDF option (Report menu) may be used for the tabulation of defects (this includes a deviation profile graph) and included with the summary page.
 6. Distribute report to RE, Field Manager, Regional Section Chief, and Team Leader