



## **INERTIAL PROFILER AND OPERATOR CERTIFICATION PROGRAM**

### **A SCOPE**

Per NCDOT Standard Specifications for Roads and Structures, Inertial Profilers are to be used to measure the longitudinal pavement profile for construction quality control and smoothness acceptance. Inertial Profilers and their Operators that are utilized to collect data on NCDOT projects must maintain certification by the NCDOT Materials and Tests Unit (M&T). The following program is not intended for network level certification – all network level certifications should reference their respective contracts for information on certification requirements. The Inertial Profiler and Operator Certification Program is intended only for certifying the equipment and operators that will be operating, collecting data, and producing pay adjustment documents in accordance to the NCDOT Standard Specifications for Roads and Structures Section 610 & 710 and does not eliminate the need for daily calibration of equipment. While performing project specific tests, refer to NCDOT Standard Specifications for Roads and Structures Section 610 & 710 for all procedures and requirements related to Inertial Profiling on NCDOT related activities.

### **B REFERENCES**

- NCDOT Standard Specifications for Roads and Structures Section 610 & 710
- AASHTO R 56-14 -Standard Practice for Certification of Inertial Profiling Systems

### **C CONTACT AND SCHEDULING**

All Inertial Profiler and Operator Certifications will be administered by NCDOT M&T Data Collection & Investigation Section personnel at the designated certification site. Please refer to the website for all program updates, test scheduling, and for obtaining record of all NCDOT certified Inertial Profilers and Operators.

### **D INERTIAL PROFILER CERTIFICATION**

Upon successful completion of the following tests (as administered by NCDOT M&T Data Collection & Investigation Section personnel), the Inertial Profiler will be granted certification that is valid for 1 calendar year from the date that it is issued. The Inertial Profiler's NCDOT certification number, Agency, certificate issued date, certificate expiration date, vehicle description, profiler SN, profiler make/ model, and laser geometry type will be documented and reflected on the issued NCDOT Inertial Profiler Certificate and NCDOT Inertial Profiler and Operator Certification Program website.

#### **PHASE 1**

In Phase 1, the Inertial Profiler's lasers, accelerometers, and distance measuring instrument (DMI) will be verified.



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- Block Test: Left and right wheel path lasers must be accurate to within  $\pm 0.01''$ . Blocks will be provided during test by NCDOT M&T personnel.
- Bounce Test: When in bounce mode, the Inertial Profiler must be able to demonstrate its accelerometer's ability to counteract body roll when the vehicle is in park and the body is being physically rocked left to right.
- DMI Test: The certification site will have a defined 1000 ft section where the Inertial Profiler's DMI can be calibrated. Once calibrated, the Inertial Profiler's DMI will be tested with acceptance criteria being  $\pm 1$  ft over 1000 ft.

## PHASE 2

Phase 2 consists of repeatability and accuracy tests. Two defined 528 ft asphalt sections will be ran 10 times each by the Inertial Profiler (20 total profiles containing both left and right raw wheel path data). Immediately after both sections have been ran, the raw data will be given to the NCDOT M&T personnel on site for analysis and will check both sections for the following acceptance criteria for repeatability and accuracy (NCDOT M&T will use data collected via ICC SurPRO device to establish ground truth measurements for the reference profile). If the acceptance criteria is not met (due to failing results or faulty data), the Inertial Profiler will be allowed only one additional set of 10 runs per section to achieve passing results. Both Sections must pass to qualify for certification. Partial Acceptance will not be issued.

- Repeatability: AASHTO R56 repeatability cross correlation of at least 92% (as computed by ProVAL Profiler Certification Module).
- Accuracy: The mean IRI for each individual run will be computed, summed, and divided by 10 to obtain the average IRI for each wheel path on each section. The calculated average IRI will be compared to the NCDOT M&T reference profile IRI and must be within 5 in/mi of one another ( $\pm 5$  in/mi).

## **E OPERATOR CERTIFICATION**

Operators must successfully complete the following criteria prior to being issued their Inertial Profiler Operator certification. All Operator certifications are valid for 3 calendar years from the date that they are issued. The Operator will be issued an NCDOT Inertial Profiler Operator Certificate which contains their NCDOT certification number, certification issued date, certification expiration date, their name, agency name, photograph (for identification purposes), and the Inertial Profiler certification number upon which they have been approved to operate on.

- All Operators will be expected to perform all of the activities necessary to complete all of the tasks defined in the Inertial Profiler Certification (section D above) without the assistance of their colleagues or NCDOT M&T personnel.
- All Operators will be issued a written, timed exam which they must complete at the certification site. The exam will cover topics related to block tests, bounce tests, DMI calibration, data



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collection best practices and scenarios, and generating pay adjustments per NCDOT Standard Specifications for Roads and Structures.