

CONSTRUCTION

and Maintenance

# TIPS



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**Guidance  
Document for:**

**Item 585 - Ride  
Quality of  
Pavement  
Surfaces**

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## General

This document is provided to assist TxDOT district staff with managing and proper documentation of Ride Quality data and corresponding bonus/penalties. Ride quality data is no different from any other pay item. It must be verified and the documentation must be maintained to support the payments made. This document addresses Verification and Referee Testing and the department's documentation procedures for Ride Quality data.

## Verification and Referee Testing

Verification testing is optional and should be done in cases when the engineer has concerns regarding the validity of the Ride Quality data or believes it prudent to verify the QA testing performed by the contractor. The total acceptable IRI difference between any two inertial profiler measurements is the overall IRI average of 6.0 in/mile or less as stated in Item 585.3.C.2.b. If verification IRI data differs by 6.0 in/mile or more, referee testing should be performed. If the difference is less than 6.0 in/mile but greater than 3.0 inches per mile and the engineer is satisfied that the data is valid, the department may accept the results of either the contractor or the department. If the engineer is not satisfied with the results after verification testing, the district should contact Magdy Mikhail, P.E., at 512/465-3686 of CST for additional guidance. Please remember that all verification and referee testing should be performed within 10 days of the QA testing done by the contractor.

The following guidelines are provided to assist the engineer with verification and management of Ride Quality data. Item 585 and Tex-1001-S should be reviewed carefully before consulting this document.

- The engineer must verify the certification of the profiler and the operator before allowing the contractor to perform the QA testing for the project.
- The files provided by the contractor should be checked to verify that the VIN Number on the second line of the file matches the unit used by the contractor for the QA testing.
- Common inertial profile operator errors to check for include missing the start or stop locations of a test section, missing the start or stop locations of leave-outs, and wheel or travel lane wander. Wheel or travel lane wander can cause differences in quality assurance test results between inertial profilers.
- In addition, possible inertial profile measurement differences can be caused by the use of non-conventional, non-contact displacement sensors (lasers), but these are not addressed here. Please note that all of TxDOT's inertial profilers use the conventional single small spot laser as the displacement sensor for inertial profile measurements. If differences are noted and it has been determined that line lasers used by some of the contractor inertial profilers are different from point lasers used by TxDOT inertial profilers, contact Magdy Mikhail, P.E., at 512/465-3686.

The following best practices should be followed on all projects using item 585.

### ➔ Section Layout

- a. Clearly mark the start and stop locations of each verification or referee test section on the paving project in question so that the contractor and TxDOT inertial profiler operators are measuring the same travel lanes and wheel paths.
- b. Do not include pavement sections within the verification or referee test site that are considered to be leave-outs or where Surface Test Type A is to be used (**NOTE:** reference Items 585.3.B.1 and 585.3.b.2).
- c. The verification or referee test section length should be a minimum of 0.1 mile and will be laid out multiples of 0.1 mile if longer than 0.1 mile.
- d. There must be sufficient lead-in and lead-out distance at the beginning and end of each test section so that the inertial profiler can be started and stopped safely. The lead-in must have at least 300 feet prior to the start of the test section for the inertial profiler to reach operational speed and its long wavelength filter to stabilize. Be aware that some inertial profilers implement reverse filtering. These profilers will require a lead-out distance at the end of the verification or referee test section of length as required by the inertial profiler manufacturer.

### ➔ Evaluation of Measurements

- a. Verify the header to ensure the sample interval for data collected is set as required by test method Tex-1001-S (3 inches or less). The new version (Release 2011.01.10) of the Ride Quality software will not analyze files with a sample interval greater than 3 inches.
- b. Verify that the reverse filter is applied to the data as required in the certification of the inertial profilers at Texas Transportation Institute (TTI).
- c. Run the Ride Quality program on the \*.pro files from each inertial profiler.
- d. Compare the total distance of the test section being reported by each inertial profiler.
- e. Compare the IRI results from each inertial profiler.
- f. The total acceptable average IRI difference between any two inertial profiler measurements is 6.0 in/mile or less as stated in Item 585.3.C.2.b.(1).

## Ride Quality Documentation and Data Management

Ride Quality test data may result in the assessment of bonuses or penalties. Therefore, the test results must be retained and properly managed as supporting documentation for the payments made. The department will use SiteManager as the repository for this data. Therefore, Ride Quality test results must be imported into SiteManager.

### Procedures

When using Surface Test Type B for measuring Ride Quality please perform the following:

1. Use the ride quality program RideQC\_585.exe to evaluate files produced by the inertial profiler and provided by the contractor.
2. Compute ride quality results and save the output file.
3. Save the output file with ride quality results as Excel (\*.csv); this option will appear in the dropdown box titled 'Save as type':
4. Create a sample.
5. Open the SiteManager template named Tx1001.xls and click on the gray, shaded box located at the top, right side labeled IMPORT.
6. Select the ride quality output file with the \*.csv extension.
7. Save the file and repeat for each available ride quality output file for each CSJ.
8. Import these files into SiteManager.

Projects may have multiple files because an output file from the inertial profiler used for surface test type B is produced for each lane for each direction of travel. At a minimum, SiteManager must contain the Ride Quality data for the final riding surface for each lane in each direction of travel.

## Contact Information

If there are any questions regarding any of the topics in this document, please contact Magdy Mikhail, P.E., at 512/465-3686 or Ken Barnett, P.E., at 512/416-2456.