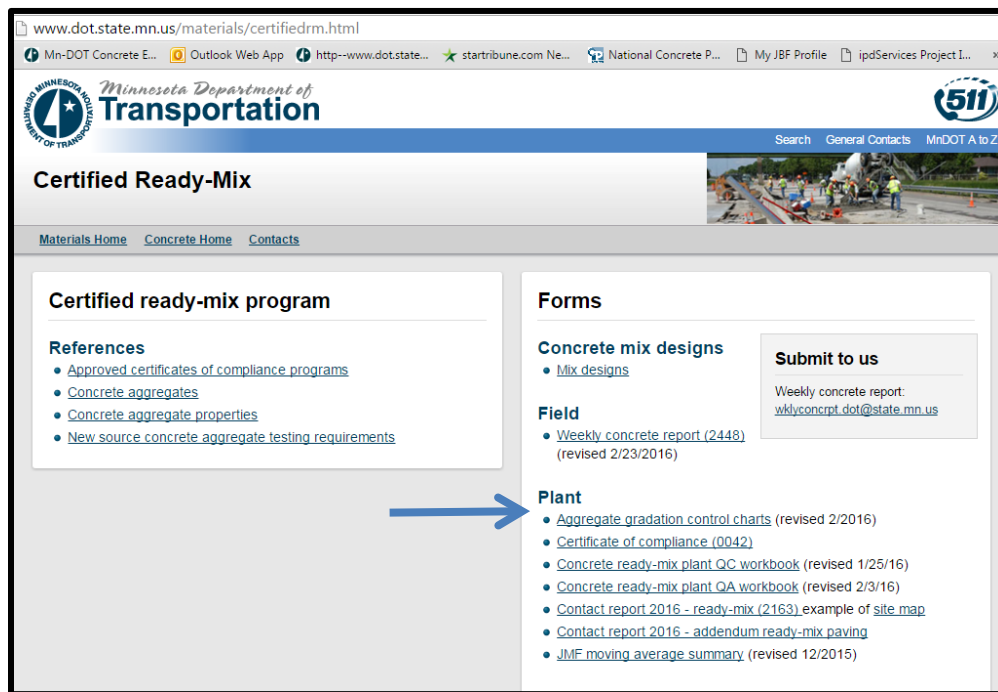


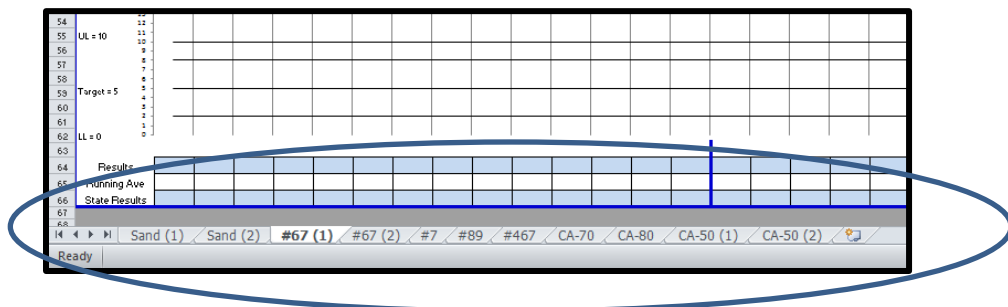
MnDOT Guidance for Gradation Testing and Acceptance

MnDOT Specification 2461.2.G.6.a defines the requirements for Aggregate Gradation Acceptance. MnDOT will use a moving average of 4 Producer gradations for acceptance. This does not apply to Job Mix Formulas (JMF) gradations.

1. The Producer is required to run gradations and verification companion gradations at a rate specified in the Schedule of Materials Control.
2. The Agency is required to run verification gradations at a rate specified in the Schedule of Materials Control.
3. The Producer is required to chart the Producer and MnDOT gradation test results for each specification sieve on the *MnDOT Aggregate Gradation Control Charts*. The aggregate gradation control charts can be found on the Concrete Engineering Website at <http://www.dot.state.mn.us/materials/certifiedrm.html>

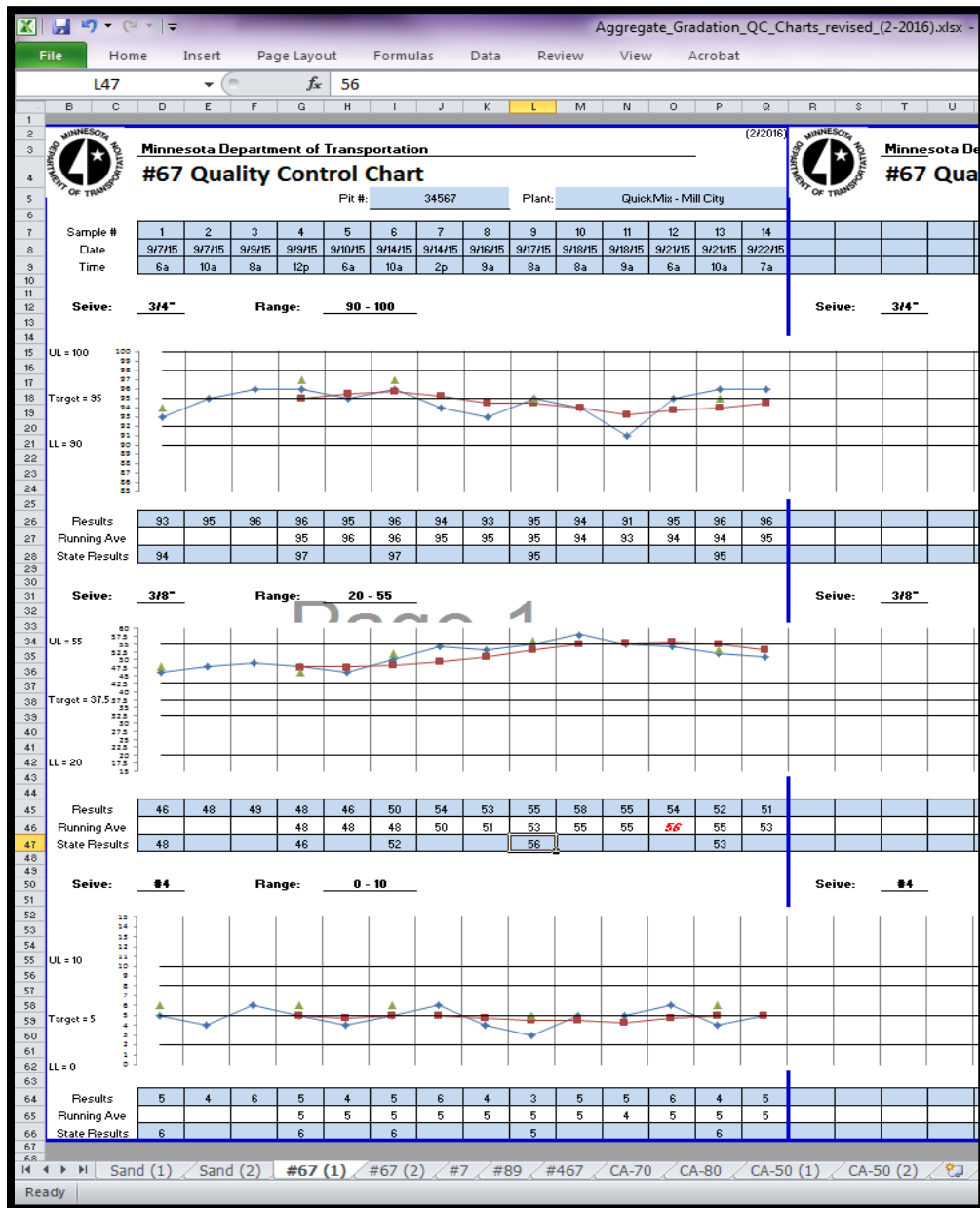


4. There is a tab for each material type and fraction the Producer is using when producing Agency concrete.



MnDOT Guidance for Gradation Testing and Acceptance

- The Agency should check the Control Charts each time they visit the certified ready-mix plant. The Producer should notify the Agency immediately if they have a moving average failure.

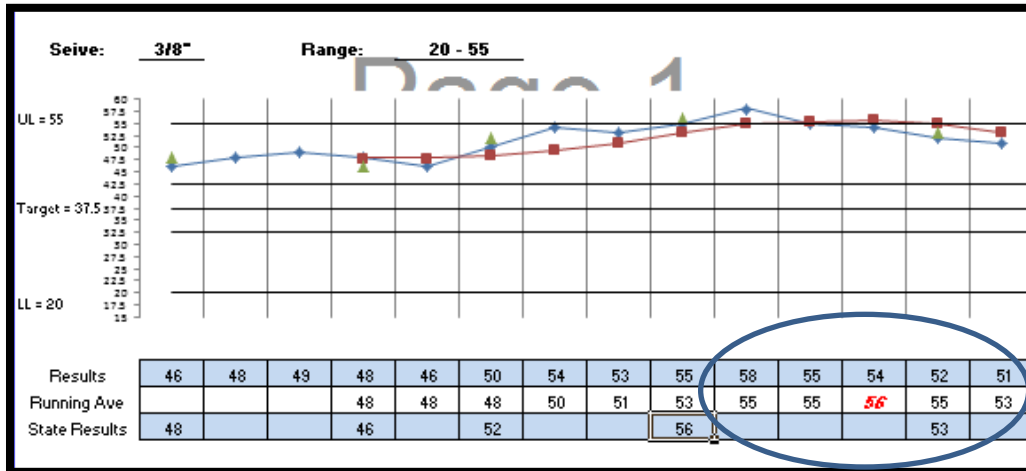


All Passing Gradation Results: If there are not any gradation failures at the ready-mix plant supplying concrete to your project, the aggregate gradation acceptance requirements have been met.

Individual Gradation or Moving Average Failures: However, if there are individual gradation failures or moving average failures, document as Materials Exceptions and provide a resolution on the Materials Exception Summary. Table 2461-14 explains what actions are required for gradation failures.

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Let's take a closer view of the results:



Example #1

For Sample #9, the Producer verification companion results are 55% and the Agency verification results are 56%.

- Even though the Agency results are outside of the #67 gradation limits, the results are within Lab-Field Tolerance in accordance with Table 2461-16, so the Producer results are acceptable and can be used in the moving average calculation.

Example #2

For Sample #10, the Producer results are 58%, this requires action by the Producer.

- The Producer is required to immediately take another gradation
- The Producer completed a second gradation 1 hour after the first gradation was completed.
- In this case, the Producer's second gradation passed so they can resume testing at the specified rate.
- No monetary adjustment applies to the individual gradation failure, however a moving average failure may occur due to the failing gradation which may result in a monetary adjustment

Example #3

The running average from Samples 9, 10, 11, 12 have caused a moving average failure, this requires immediate action by the Producer.

- Stop production and contact Engineer
- Determine the cause of continual borderline or failing material
- Resume production when corrective action results in a passing gradation
- Increase gradation testing at a rate of 1 per 100 cubic yards until the moving average is within the gradation limits

Determine and Document Monetary Adjustment:

The Engineer determined that the concrete represented by samples 9, 10, 11, 12 represented 190 cubic yards of concrete.

- Per Table 2461-15, the monetary adjustment is \$500 or \$5 per cubic yard, whichever is greater.
- 190 cubic yards x \$5 = \$950
 - Since \$950 is greater than \$500, the Engineer will assess of monetary adjustment as a backsheets item: Concrete Curb and Gutter B624 Gradation Failure -\$950.00