

THE ILLINOIS STATE TOLL HIGHWAY AUTHORITY

May 12, 2015

CONSTRUCTION BULLETIN No. 15-02 SUBJECT: TOLLWAY AGGREGATES CERTIFICATION PROGRAM

This program describes how the Illinois Tollway will test and evaluate aggregate materials being produced for Tollway construction contracts.

- 1. IDOT Approved Sources and IDOT Approved Materials for Virgin Aggregates and Recycled Concrete Aggregates.**
 - a. QC and QA testing and approvals are covered within the guidelines of IDOT Policy Memorandum "Aggregate Gradation Control System (AGCS)" (and the IDOT Recycled Concrete Aggregates policy, if appropriate).
 - b. Materials oversight is covered by QA and independent assurance (IA). If materials appear to be outside the specification, investigative testing will be conducted by QC, QA and/or IA to verify. If the material is confirmed to be outside of the specification, the contractor shall halt production and remedy the issue immediately.

- 2. IDOT Approved Sources for Virgin Aggregates and Recycled Concrete Aggregates which requires Tollway approval of the materials.**
 - a. QC by the supplier and QA testing by the Tollway Construction Manager (CM) shall be in accordance with the guidelines of IDOT's AGCS program. The attached QC testing frequencies from AGCS shall be followed; aggregates for pavement applications shall follow the AGCS Category III protocol. Tollway specified porous granular embankment (PGE) will be sampled and tested using the attached sampling procedure.
 - i. Start-up QC gradation testing (two samples) shall be conducted by the off-site recycled concrete producer or virgin aggregate producer, and the initial results shall be uploaded onto the E-Builder as a Start-up QC submittal. Enough material will be sampled by QC to ensure both QA and IA testing can be conducted.
 - ii. Start-up QA gradation testing will be conducted by the CM: one of two start-up samples is tested; the second sample is tested if the first one doesn't compare to QC. The data will be added to the E-Builder Start-up QC submittal.
 - iii. IA also conducts start-up gradation testing; one of two start-up samples will be tested. The data will be added to the E-Builder Start-up QC submittal.
 - iv. QC shall perform preliminary quality testing, if determined necessary by Tollway Materials.
 - b. QA & IA will review the start-up gradation results. Additional start-up gradation testing (by QC, QA and/or IA) will be conducted as required by the AGCS protocol. Final acceptance of the start-up gradations will be given by QA in eBuilder.
 - c. QA, any existing Construction Corridor Manager (CCM) and IA will track the on-going testing frequencies and test results during the construction contract. Sampling and testing will be reviewed in the weekly CM Materials Coordination meeting. QA will test at least one of five QC split gradation samples during production. IA will conduct gradation tests

as needed for dispute resolution. (For contracts not involving a CCM, sampling and testing will be reviewed weekly by the Tollway Materials department and IA.)

- d. The proposed use of an existing aggregate stockpile will be evaluated using the current version of the IDOT Policy Memorandum "Use of Non-certified Aggregate Stockpiles Under the Aggregate Gradation Control System (AGCS)."
- e. If the Approved Source aggregate is being used on multiple Tollway contracts, QA data from one contract can be used for the material approval on multiple contracts.

3. "Jobsite" Recycled Concrete – These recycling locations will be developed and maintained specifically for the Tollway contract(s) to produce Tollway specified material only.

- a. Tollway Materials and IA reviews and approves the contractor's Materials Management Plan (MMP) submitted in eBuilder.
- b. Applicable portions of the IDOT AGCS policy, the IDOT Recycling Portland Cement Concrete into Aggregate policy, and the Tollway Construction Bulletin 12-02 shall be referenced in the MMP and followed for stockpile development, crushing procedures, and testing. The attached testing frequencies from AGCS for start-up production and load-out shall be followed. Recycled concrete for pavement base applications follows AGCS Category III protocol. PGE shall be sampled and tested using the attached sampling procedure.
 - i. Start-up QC gradation testing (two samples) shall be conducted by the recycled concrete producer, and the initial results shall be input to E-Builder as a Start-up QC submittal. Enough material will be sampled by QC to ensure both QA and IA testing can be conducted.
 - ii. Start-up QA gradation testing will be conducted by the CM: one of two start-up samples will be tested; the second sample will be tested if the first one doesn't compare to QC. The data will then be added to the E-Builder Start-up QC submittal.
 - iii. IA also will conduct start-up gradation testing; one of two start-up samples will be tested. The data will then be added to the E-Builder Start-up QC submittal.
 - iv. QC shall perform preliminary quality testing, if determined necessary by the Tollway materials.
- c. QA & IA will review the start-up gradation results. Additional start-up gradation testing (by QC, QA and/or IA) will be conducted as required. Final acceptance of the start-up gradations will be given by QA in E-Builder.
- d. QA, CCM and IA will track the on-going testing frequencies and test results during the construction contract. Sampling and testing will be reviewed in the weekly CM Materials Coordination meeting. QA will test at least one of five QC split samples during production. IA will conduct tests as needed for dispute resolution. (For contracts not involving a CCM, sampling and testing will be reviewed weekly by the Tollway Materials department and IA.)
- e. If the "Jobsite" Recycled Concrete is being used on multiple Tollway contracts, QA data from one contract can be used for the material approval on multiple contracts

4. Reclaimed Asphalt Pavement (RAP) millings for capping.

- a. The contractor's Materials Management Plan shall describe whether the material will be taken to an asphalt producer for production, or if it will be produced at a "jobsite" location specifically developed and maintained for the Tollway contract(s).
- b. The RAP shall be sampled per the requirements in the IDOT Policy Memorandum 13-31.0, RAP for Aggregate Applications. QC samples and tests for gradation at a minimum of 1 test every 1,000 tons for the first 5,000 tons during production. After the first 5,000 tons, the material shall be sampled and tested at a minimum of 1 test every 5,000 tons. QA will witness the sampling of one of the first 5 samples, and test a split sample using the same sieve size as QC as a comparison. QA, CM and IA will track the on-going production and use of the RAP material during the construction contract, which will be reviewed in the weekly CM Materials Coordination meeting. (For contracts not involving a CCM, sampling and testing will be reviewed weekly by the Tollway Materials department and IA.)
- c. Non-Tollway RAP will be evaluated in the same manner as above. Stockpiles containing non-RAP construction debris or materials (e.g. paving fabric) will be rescreened and retested prior to use.

5. Fractionated Reclaimed Asphalt Pavement (FRAP) for use in Asphalt Mixtures.

- a. RAP millings that are brought to the asphalt plant shall be placed in separate stockpiles according to type (Cat 1, Cat 2), prior to being fractionated or sized.
- b. Records shall be generated and on file for the type, source, and quantity of RAP millings that are brought in. These records must be available to the QA/IA on request. If the records are unavailable the engineer can halt production of the related asphalt mix.
- c. At least five reflux extractions of individual FRAP components (e.g. coarse and fine) shall be completed by QC for the mix design process. FRAP extractions results will be reviewed by the Tollway Materials during the mix design approval, and compared to previous test data for consistency.
- d. During asphalt production, FRAP stockpiles shall be tested by QC at least once for every 2,000 tons of FRAP usage, with more intensive investigation when mix control issues arise. Since FRAP aggregates may be applied to multiple mix designs for multiple Tollway projects, IA will take a comparison sample of each FRAP stockpile at the start of each contractor's Tollway production, and once for every 10,000 tons of FRAP usage thereafter. QC shall notify IA for sampling. The comparison with the QC test results will be verified by IA, and the approved comparison will be submitted into eBuilder by the CM for each contract on which that asphalt producer provides mixtures.
- e. FRAP averages shall be posted in the QC Lab. FRAP averages shall be updated as new samples are taken and results available.

6. Reclaimed Asphalt Shingle (RAS) Approval for use in Asphalt Mixtures.

- a. At least five RAS chemical extractions shall be completed by QC for the mix design process. RAS extractions will be compared to the RAS producer's approved master band for the specific RAS source by the Tollway Materials during the mix design approval.

Note that each RAS producer will be accepted as an individual source, and RAS sources cannot be interchanged or substituted within a given mix design.

- b. During asphalt production, RAS stockpiles shall be tested by QC at least once every 1,000 tons, with more intensive investigation when mix control issues arise. IA will take a RAS comparison sample at the start of each contractor's Tollway production, and once for every 5,000 tons of RAS usage thereafter. QC will notify IA for sampling. Acceptance will be verified by IA, and submitted into eBuilder for each contract. The comparison with the QC test results will be verified by IA, and the approved comparison will be submitted into eBuilder by the CM for each contract on which that asphalt producer provides mixtures.
- c. RAS averages shall be posted in the QC Lab. RAS averages must be updated as new samples are taken and results available.

7. Virgin aggregates used in concrete and asphalt mixtures.

These aggregates shall be tested by QC and QA in conjunction with the concrete and asphalt QC programs. Materials approvals/acceptance shall be conducted daily by QC, QA, and IA through the evaluation of QC and QA test data, field construction operations, and construction inspection.

8. Tollway procedure for PGE sampling

1. Sample Collection

- a. Have one certified technician collect all samples; preferably QC.
- b. Shovel type: pointed, width greater than 5" with 1.5" side and back wall

2. Sample Mini Pile

- a. Minimum of 3 representative buckets from an end loader or comparable amount of material if using an excavator
- b. Mix pile to satisfaction of Materials Coordinator or QA.
- c. Collect aggregate from at least 3 different locations horizontally and vertically from test pile.
- d. QC and QA (and IA if start up or investigatory sample) will take one (1) five (5) gallon bucket from each location to ensure that both parties get a representative and comparable sample from the mini stockpile.

3. Sample Size

- a. 110 lbs minimum
- b. 3, five gallon buckets
 - i. Safety; do not overload buckets
 - ii. Distributes collection area to ensure a representative sample is taken.

4. Testing

- a. Testing lab must have:
 - i. 5" sieve
 - ii. Gilson Shaker
- b. Top half does not need to be washed
- c. 3/8" sieve separation between coarse and fine aggregate
- d. Illinois Modified AASHTO T 27 and T 11 for material passing 3/8"

- e. Minimum dry sample mass of 1500.0 grams passing 3/8" obtained using Illinois Modified AASHTO T 248
- f. Document the amount of RAP passing 4" if mechanically-blended PGE (RAP and Recycled Concrete).
- g. Document the amount of RAP and other deleterious material if the material is produced using stationary crushing plant.
- h. Current BMPR MI504 or IDOT QC/QA Package Printout are both acceptable forms for reporting.
- i. 72 hour turn around for results
- j. Upload results into E-Builder

Category	Use	Start of Production	Normal Production	Stockpile/Loadout	Control Charts	Masterband
I (Notes 1 & 5)	Coarse Aggregate and Manufactured Sand Used in QC/QA HMA and PCC Coarse Aggregate for Pavement Drainage Coarse Aggregate for All PCC and Class I / Superpave HMA Projects	5@1,000 T (all wash)	1@2,000 T 2 per day max (wash 1/3 coarse agg.) (wash all manufactured sand)	2/week (all wash) (Note 3)	Yes	Yes (Note 8)
II (Notes 1 & 5)	Coarse Aggregate and Manufactured Sand for All Non-Class I / Superpave HMA Projects	3@1,000 T (all wash) (Note 2)	1@5,000 T 2 per day max 1 per week min (all wash) (Note 2)	1/week (all wash) (Notes 2 & 7)	Yes	Yes (Note 8)
III (Notes 1 & 5)	Natural Sand for All PCC and HMA Projects Aggregate Surface Course Granular Shoulders Granular Sub-base Granular Base Granular Embankment Special Cover/Seal Coat Sand Bedding Porous Granular Embankment and Bedding, Sand Backfill for Underdrains French Drains Membrane Waterproofing Mortar Sand Blotter Granular Embankment Aggregate Subgrade (Note 9)	2@2,000 T (all wash) (Note 2)	1@10,000 T 2 per day max 1 per week min (all wash) (Notes 2 & 6)	1/week (all wash) (Notes 2 & 7)	No	No

Category	Use	Start of Production	Normal Production	Stockpile/ Loadout	Control Charts	Masterband
IV (Note 4)	Rock Fill Erosion and Sediment Control Rip-Rap Bedding Ice Control Abrasives Trench Backfill	Department Testing				

Note 1: A producer may adjust gradation bands for any product in accordance with Article 6.2 of the AGCS.

Note 2: Wash only products used for HMA, PCC, Seal/cover coat and products with # 200 sieve requirements.

Note 3: No loadout tests for quantities under 500 tons or less shipped weekly. When loadout occurs but no weekly loadout test is run, the tonnage shipped shall be accumulated from the start of that week. When the accumulated tonnage exceeds 500 tons, a loadout sample shall be run.

Note 4: Testing to be performed by IDOT personnel.

Note 5: Testing frequency may be reduced based on conformance to QC requirements, consistency in meeting sieves' midpoints, statistical consistency, etc.

Note 6: Minimum of 1 per week after the first 10,000 tons of production per week for aggregate surface course, granular shoulders, granular subbase, granular base, and granular embankment special; minimum of 1 every 2 weeks if production less than 10,000 tons per 2-week period.

Note 7: No loadout tests for quantities under 1,000 tons or less shipped weekly. When loadout occurs but no weekly loadout test is run, the tonnage shipped shall be accumulated from the start of that week. When the accumulated tonnage exceeds 1,000 tons, a loadout sample shall be run.

Note 8: Refer to current QC/QA Procedure, "Aggregate Producer Control Chart Procedure" for required gradation.

Note 9: Only Normal Production testing shall apply. No Wash.



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5/15/15

Date