



RECYCLED ASPHALT SHINGLE SUPPLIERS – NEW

DEFINITIONS

- Deleterious Material: Paper, plastics, wood, metals, glass, rubber, soil, brick, tars, and any other material not part of the asphalt shingle.
- End User: One who incorporates processed recycled asphalt shingles into an asphalt mixture.
- RAS: Pre-consumer or post-consumer shingles that have been processed, sized, and ready for incorporation into an asphalt mixture.
- Source: A Supplier’s operational site
- Supplier: One who collects, processes, or distributes pre-consumer or post-consumer shingles for incorporation into an asphalt mixture.

SCOPE

This IM describes requirements for the collection, sorting, sizing, processing, and stockpile management of raw and recycled asphalt shingles (RAS). Secure Iowa DOT approval for each operational site (source) before furnishing RAS to the End User. Approved Suppliers and sources are listed in [Appendix A](#) of this IM.

APPLICATION FOR APPROVAL

Suppliers seeking source approvals may submit a written application and quality control plan to the District Materials Engineer (DME) in each district of operation. A sample application is provided in [Appendix B](#). End Users may not collect or process raw shingle material at portable facilities. In addition to the requirements stated in this IM, all Suppliers (both in-state and out-of-state) shall comply with local, state, and federal environmental regulations. The appropriate District Materials Office may recommend the approval when assured that the Supplier has met all DOT qualifications. The Office of Materials will issue a letter of approval. This letter shall serve as a Supplier’s approval until [Appendix A](#) can be updated.

CERTIFICATION REQUIREMENTS

Certified RAS shall meet the following requirements:

- A. Pre-processing
 - 1. Remove all visible materials not part of the shingle, including but not limited to wood, paper, rubber, metals, and plastics prior to processing. Unroll or remove shingles found in rolls prior to processing.
 - 2. Identify and reject loads with Asbestos Containing Materials (ACM).
- B. Processing Operation
 - Process the raw shingles by ambient grinding or granulating methods such that the following gradation is met:

Sieve Size	Minimum % Passing (by weight)
½ - inch	100
– inch	98
#4	90

Separately process pre-consumer and post-consumer raw material.

Ensure the RAS material does not contain more than 1.5% deleterious content by weight. Notify the Engineer 48 hours prior to processing. Collect samples for quality control testing to be performed by a qualified lab.

C. Storage

Separately construct RAS stockpiles based on similarities in source (pre-consumer or post-consumer) and place them on a base with adequate drainage to prevent contamination. Assign each stockpile a unique identification number. Document the size of each stockpile by weight. Notify the Engineer 48 hours prior to adding to or moving an existing stockpile. Properly remove discarded non-shingle material from the site.

D. Stockpile Uniformity

Take proper measures to ensure a uniform stockpile.

Approval to deliver certified material may be withdrawn for inadequate compliance with these requirements.

QUALITY CONTROL PROGRAM

The Supplier has the overall responsibility of certifying that material being placed in a certified stockpile is produced under and conforms to a Quality Control (QC) Program. The Iowa DOT, through its monitoring activities (sampling/testing, visual observation, etc.), will verify the continued compliance to the program. Any certified stockpile must meet the designated quality before shipment. Intentional shipment of untested or out of specification material will constitute grounds for immediate rejection of material and placement of the source and/or the Supplier on conditional status. Develop a QC program in writing that contains the following aspects:

1. Knowledge of Current Specifications

Maintain up-to-date knowledge of the specifications that apply to RAS products. Maintain copies of the current Standard Specifications, all applicable Supplemental Specifications and all applicable Instructional Memorandums (IMs) at the testing lab. Be aware of any Special Provisions, which change current RAS specifications. The Supplier shall be responsible for providing these up-to-date publications to their QC representative.

2. RAS Production Log

Maintain a production log when operating under the QC program. This production log shall contain detailed information on test samples that include date, time, stockpile identification number, asbestos testing results, QC representative information, quantity, gradation results, deleterious content results, moisture content, pass/fail results, corrective actions, etc. Keep

the log at a designated location and readily available to the Iowa DOT representative for review.

3. Visual Inspection

Visually inspect the shingle collection, sorting, sizing, and processing operations on a frequent basis. Visual inspection can be defined as observing the processing area, as well as the condition of the RAS in the flow stream or stockpiles. Observe the overall operation to detect ACMs as well as oversized and deleterious materials that are detrimental to the quality of the product.

Visual inspection does not replace testing, but enhances the quality control program.

4. Production

A. Testing and Reporting

Perform and report testing for deleterious content, gradation, and moisture content of the RAS material. The Engineer may obtain a split sample to verify QC results.

Testing for RAS Certification

The Supplier shall be responsible for performing and reporting the following tests for each sample. The testing laboratory shall be approved by the Engineer.

1. Deleterious Content

Determine the percentage of deleterious material retained on the #4 sieve. Pick, remove, and weigh the waste material from a 500-700 gram sample. Calculate deleterious content as follows:

$$P = \frac{C}{W} \times 100\%$$

Where P = percentage of deleterious material
C = Mass of deleterious material, g
W = Mass of test sample, g

No sample shall exceed 1.5% deleterious content.

2. RAS Particle Distribution

Determine the RAS gradation in accordance with [Materials IM 302](#). Oven-dry a 500 to 700 g sample at 90°F for 70 minutes. Do not remove the deleterious content from the sample. Shake the sample over the ½", 3/8", and #4 sieves. At least 90% of the samples shall meet gradation requirements described above for the material to be certified (i.e. if 2 out of 3 samples meet requirements, the material would only be 67% compliant and thus would be rejected).

3. Determine the percentage of moisture by weight within 48 hours of delivery in accordance with [Materials IM 381](#). Results shall be logged and provided to the End User.

4. Certify the product does not contain ACMs.

Testing for Mix Design

Additional information on the RAS material is required before it may be used in an asphalt mixture. When the End User has an existing contract for a DOT project, the District may sample from a pile dedicated to the project at an in-state Supplier's location in accordance with [IM 505](#).

B. Sampling

A minimum of 6 random samples or 1 per 250 tons, whichever is greater, of each stockpile shall be tested during its construction. Collect a minimum of 20 pounds of RAS per sample. Obtain samples for moisture content within 48 hours of delivery from a cross section of the material to be delivered. A certified Level I Aggregate Technician shall obtain the samples.

Test results shall be known before delivery to the End User. All test results will be available at a designated location within 24 hours of sampling when the material is being placed into a certified stockpile.

5. Delivery

Ensure delivery of RAS material from proper stockpiles by verifying the stockpile identification number and associated test results match.

6. Quality Control Structure

In order to ensure quality as a priority, the source QC personnel shall have a line of communication directly to their management, as well as their production operation.

MONITORING ACTIVITIES

Monitoring activities of Suppliers, including inspection of test reports and shipping records will be conducted by the appropriate District Materials Engineer. The Engineer may obtain samples from the source or End User's stockpile to verify compliance to quality standards. If the DME does not choose to split samples during production to verify sizing and deleterious content, the sample submitted by the End User to the Central Materials Lab for extraction testing during mix design will also serve as the verification sample for the Supplier's certification. If the DME conducts verification testing, the district test results for sizing and deleterious content shall govern over those from the Central Materials Lab for the purposes of verifying the Supplier's certification. Noncompliant verification results may require re-sampling and re-testing.

All District Materials Office monitoring activities shall be reported to the Central Materials Office.

DOCUMENTATION

Documentation shall be required to establish a chain of possession of raw shingle and processed RAS materials. Make all forms available to the Iowa DOT and Iowa DNR upon request.

A. Transactions of raw, unprocessed shingles

Keep on file a signed Form 820010a (See [Appendix C](#)) for each accepted load of unprocessed raw shingles. Loads of unknown origin may not be processed and added to certified piles for use on DOT projects.

B. Transactions of processed RAS

Keep on file a signed Form 820010b (See [Appendix D](#)) for each load of RAS delivered to the End User to certify compliance with DOT specifications. Suppliers who are also End Users should complete this form. Copies of this form shall be furnished to the Engineer and End User at the time of delivery.

C. RAS Stockpile Inventory

The owner of the stockpile shall document accumulation, consumption, and current testing results for each RAS stockpile in Form 820009ras (See [IM 505 Appendix B](#)). Before January 1st of each year, the owner shall update report form 82009ras on the status of each RAS stockpile. In addition, the owner shall provide annually, an electronic tabulated spreadsheet containing load origin information compiled from Form 820010a.

ACCEPTANCE

Properly identified and certified materials may be incorporated into a project. Final acceptance will be based on the certifications and the results of tests on samples secured in accordance with [IM 204](#) or in accordance with special requirements when specified. Verification samples with noncompliant test results may require additional tests. Continued approval of a source will be based on the following:

- A. Ability to consistently supply material meeting specifications
- B. Maintenance of required records
- C. Proper documentation of shipments
- D. Proper handling and storage of the material