



MEMORANDUM

GENERAL SUBJECT: Modified Acceptance Program for Fine, Coarse Open-Graded and Crusher Run Aggregates	NUMBER: MD 332-10
SPECIFIC SUBJECT: Materials Manual of Instructions: Section 204.02(b) – Sampling at Established Sources	DATE: April 27, 2010
DIRECTED TO: District Materials Engineers	SIGNATURE: Charles A. Babish, PE <i>Signature on original copy of memorandum</i>

This Memorandum notifies the users of the Materials Division Manual of Instructions that Chapter II, Methods and Frequencies of Sampling, Section 204.02(b) has been revised.

The purpose of the change is to reduce sampling and testing rates of fine, coarse open-graded and crusher run aggregate. Modified Acceptance Aggregates are very low-risk materials, tend to have stable job mix formulas and less variability and are either not shipped to VDOT, tested by other VDOT QA Programs or visually inspected multiples times.

Replace second paragraph and subsequent sections of Section 204.02(b) – Sampling at Established Sources with the following:

In addition to ~~quality-source approval~~ sampling performed by the Department, ~~it will be necessary for the~~ Producer shall ~~to~~ sample and test aggregates for size before shipping to the job site, in accordance with the frequencies outlined in Paragraph (b)(1) herein. See Secs. 109, 110, and 800 and Paragraph (d) herein for additional duties of Weighpersons, instructions for aggregate certifications and use of Form TL-102A.

(1) Modified Acceptance ~~Production Control~~ Plan for Fine, Coarse Open-Graded and Crusher Run Aggregates

Aggregate Producers shall be responsible for ~~sampling and~~ controlling their product for gradation and Atterberg Limits, in accordance with the ~~modified~~ plan outlined herein, when producing any type aggregate, other than Type I Select Material or any type subbase or base dense-graded, central-mixed aggregates specified respectively in Secs. 207 ~~208~~ and 208 ~~209~~ of the Road and Bridge Specifications. Approval of the Producer's Quality Control (QC) Plan ~~modified acceptance program~~ shall in no way relieve the Producer or

Contractor of responsibility for complying with all of the requirements of the contract or specifications. The ~~QC Plan program~~ shall meet the following specific requirements.

Test and Equipment: Test procedures shall be conducted in accordance with the ~~referenced~~ standards ~~referenced as noted~~ in the current specifications. Testing for gradation and Atterberg Limits (where required) will be conducted on the Department's ~~verification monitor~~ samples. Only the gradation test is necessary on the Producer's ~~QC acceptance~~ samples, unless a known problem exists. To accommodate the testing requirements, a field or plant laboratory shall be furnished and shall contain the following equipment:

1 - Motorized screen shaker for fine and coarse aggregate grading analysis.

1 - Set of sieves for the motorized shaker. The screen sizes shall include the specification sizes for the type of material being produced.

1 - Balance having a capacity of at least 45 lbs. (20 kg), with a sensitivity of one ounce (28 grams) or less.

1 - Balance having a capacity of at least 2.5 lbs. (1 kg), with a sensitivity of 0.1 gram or less.

1 - Drying apparatus.

1 - Set of liquid and plastic limit devices.

Producers ~~producing shipping only fine or only coarse~~ *open-graded* aggregate shall *not be required to obtain Atterberg Limit equipment* ~~have the applicable equipment~~.

Sampling Rate: The ~~QC guide~~ sampling rate shall be one (1) sample per 1000 tons per size of material produced. It is recognized that due to production schedules, past performance and perhaps ~~several~~ other factors, this rate may be changed, ~~either up or down~~, for a particular operation. Therefore, the actual rate for a specific location ~~shall will~~ be at the discretion of the District Materials Engineer.

Sampling Method: With the requirements of quality assurance and Producer certification of aggregate, the method of obtaining aggregate samples for grading tests becomes more critical. Therefore, the only way statistics will be meaningful is for the sampling, by both the Department and the Producer, to be performed in a similar manner.

Samples shall be obtained from each size material produced. These samples shall be selected from barges, conveyor belts, stockpiles or as approved by the Engineer. Sampling and testing shall be performed by qualified personnel. ~~"Qualified" does not imply that the personnel be certified under any formal program.~~

Sampling of aggregate shall follow the procedures outlined in AASHTO T2 as modified herein. The shovel used for sampling of aggregates ~~shall should~~ be a square nose shovel of spade design with slightly built up edges and back, capable of penetrating full depth into the stockpile. A short handle with butt handle grip is needed to obtain the leverage to remove the sample from the stockpile. The sample size should be as outlined in Paragraph (b)(2) herein.

For source approval sampling, segregation of the individual particles is not important, for they will be recombined into the testing sizes needed in the laboratory. Therefore, for coarse aggregate, a sample of approximately 40 lbs. (20 kg) each of No. 8 and No. 57, if available, will generally be sufficient to conduct quality tests. For fine aggregate, a single 40 lbs. (20 kg) sample is sufficient.

To determine gradation compliance, the sampler shall take care to follow the procedures outlined in Paragraph (b) (1) above exactly. When safe to do so, samples shall be taken at a point other than in stockpiles to reduce the error inherent with stockpile segregation. A sample of approximately 10 lbs. (5 kg) is typically sufficient for fine aggregate and one of 30 lbs. (15 kg) for coarse aggregate. Open-graded aggregates and Grading A fine aggregate shall be tested for minus 200 material by washing prior to the dry gradation being performed.

All verification samples shall be packed and marked, in accordance with Sec. 203, using Form TL-10, as outlined in Sec. 800. Special care shall be taken to ship the aggregate in a secure container or sample bag free of contaminants.

Five (5) types of sampling are permitted as follows:

(1) Truck Bed Sampling: For details of this type of sampling, see the Central-Mix Aggregate Quality Assurance Program (Certification Study Guide).

(2) Belt Sampling: At the request of the Producer, belt sampling may be used. A belt sample shall be a composite of three (3) separately selected samples. It is recommended that each of these samples shall be taken between two (2) templates inserted through the material to isolate the sample area, or by other means which will isolate the sample area on the belt, and all of the material within the sample area shall be collected. The quantity of material contained within the sample area shall be approximately 1/3 of the quantity required for the sample.

(3) Stockpile Sampling: The sample shall be made up of at least six (6) shovelfuls of material secured at approximately equal spacing around the stockpile at approximately the third points of the height of the stockpile. (See instructions above on the proper shovel use.) The area to be sampled shall be opened up to expose the interior material. The shovel should be inserted nearly perpendicular to the face of the exposed material, full depth of the shovel, and raised vertically to prevent segregation. Opening up of the face may be accomplished with the use of a front end loader.

(4) Miniature Stockpile Sampling: The Producer may build a miniature stockpile using a front end loader. The material sampled will then be spread and mixed by the loader bucket and the samples taken from three (3) points within the miniature stockpile.

(5) Sample Tube Sampling: A sampling tube may be used in sampling aggregate sizes smaller than the No. 10 size, and all fine aggregates. The sample tube should be 2 in. (50 mm) minimum diameter by 3 ft. (900 mm) minimum length. Samples shall be obtained from five (5) different locations of the stockpile and the various samples combined to form one (1) composite sample.

The importance of sampling is equivalent to the importance of good quality control. The primary concern of sampling is to take samples that will represent the stockpile as closely as possible and that will determine as accurately as *practical feasible* the properties of the complete stockpile.

Acceptance of Materials: Materials which fail to meet the specification requirements shall not be shipped to State projects nor for State uses under any circumstances.

~~In the event the Engineer specifies the use of No. 57 aggregate in lieu of No. 25 or No. 26 stone to backfill soft, yielding or unsuitable foundation on contracts which do not have a contract unit price for No. 57 aggregate, an additive price, determined semi-annually by the District Materials Engineer in cooperation with the District Contract Administrator will be added to the contract unit price for No. 25, or No. 26 stone. The determination of the additive price will be based on a District wide average price differential determined by polling several quarries. This price may be obtained from the District Materials Engineer.~~

All materials meeting the applicable specification requirements may be shipped and accepted based on the Producer's certification, which, among other things, shall state that the required tests by the Producer have been performed and have met the specification requirements of the material. See Paragraph (c) herein *and Road and Bridge Specifications Section 200.04* for additional details of the certification.

The Producer ~~shall~~ will furnish to the Department a copy of the test results for each size material produced, ~~on a signed, company letterhead. See Paragraph (f) below for format requirements. No particular format will be required. A worksheet or summary sheet will be sufficient.~~

The Producer shall keep all records pertinent to the production for a period of one (1) year, and they shall be available for review by the Engineer.

~~Verification Monitor System: The Department through the District Materials Engineer will conduct an independent assurance (monitor) testing program visually inspect stockpiles of produced materials. When deemed necessary by the Department, The purpose of the verification monitor testing may be performed is to verify the adequacy and accuracy of the Producer's quality control plan program. One sample per week, regardless of the size material being produced, or generally one sample per month for each size produced will be obtained from the production plant. When requested by the Materials Representative, This samples shall be taken by the Producer in the presence of the Materials Representative District Materials Monitor, and then either quartered or introduced through a sample splitter, with each party conducting the test on their half. Verification Monitor tests shall will be conducted in the VDOT District or Central Laboratory or by Materials personnel-AMRL-accredited consultant laboratories. The verification Monitor's test results shall be compared to the Producer's test results.~~

The verification Monitor's test results shall will in no way be used to judge acceptance. The Producer's half of the verification monitor sample may serve as its production sample for that 1000-ton lot day. If the comparisons indicate verification Monitor test results are not in relatively close agreement with the Contractor's results, an investigation shall will be made to determine the reason for the difference. In the event it is determined that the Contractor's test results are not representative of the product, the Contractor Department shall will take corrective such action to alleviate any problems identified. If corrective action is not performed in a timely manner or does not alleviate problems identified, the Department may withdraw approval of the Producer's QC Plan.as it deems appropriate to protect the interest of the Commonwealth.

General: The Producer's quality control plan program shall include a system by which the District Materials Engineer shall will be advised as to the amount and size of material shipped to each project or order. If the Producer's quality control plan program is found to be unsatisfactory, the Department may withdraw approval of the source.

~~(2) Fine Aggregate, Course Open-Graded Aggregate, and Crusher Run~~

~~Sampling aggregate for either quality or grading control shall follow generally the procedures outlined in AASHTO T2. For quality, segregation of the individual particles is not important, for they will be recombined into the testing sizes needed in the laboratory. Therefore, for coarse aggregate, a sample of approximately 40 lbs. (20 kg) each of #8 and #57, if available, will generally be sufficient to conduct quality tests. For fine aggregate, a single 40 lbs. (20 kg) sample is sufficient.~~

~~To determine grading compliance, the sampler must be very careful and the procedures outlined in Paragraph (b) (1) above followed exactly. When at all possible, samples should be taken at a point other than in stockpiles to reduce the error inherent with stockpile segregation. A sample of approximately 10 lbs. (5 kg) is usually sufficient for fine aggregate and one of 30 lbs. (15 kg) for coarse aggregate. Open graded aggregates and Grading A fine aggregate shall be tested for minus 200 material by washing prior to the dry gradation being performed.~~

~~All samples shall be packed and marked, in accordance with Sec. 203, using Form TL 10, as outlined in Sec. 800. Special care shall be taken to ship the aggregate in a secure container or sample bag free of contaminants.~~

~~(2) Dense-Graded Aggregates~~

~~This material shall be is accepted under a statistical, system-based quality assurance system program where the Producer samples the material for grading, Atterberg limits, cement content and water moisture content, as applicable. The Department's responsibility with regard to sampling is to secure an Independent Assurance (monitor) sample in accordance with the frequency specified in Paragraph (c) herein. The Producer shall is to sample in accordance with the Department's current Quality Assurance Program Policy. See Section 300 herein and Road and Bridge Specifications Sections 207 and 208.~~

(3) Dry Riprap

~~It is essential that~~ Contractors *shall* furnish and place the class of dry riprap specified on the plans. Although dry riprap is primarily mechanically sized during production as other aggregates are, the acceptance of riprap relies primarily on visual inspection for size and percentages to meet the Departments Specifications. Thus to avoid project delays and minimize material rejections the Project Inspector is to use the following procedures:

Stockpiled Dry Riprap - Verify the size and acceptability of the material at the quarry prior to shipment.

Dry Riprap to be shipped as it is produced - Establish by visual inspection with the Contractor and the Producer the size and percentages required to meet the Department's Specifications.

The Contractor *shall* ~~should~~ furnish samples of the minimum and maximum size riprap at the project site to be used for visual comparison of riprap delivered to the project and a sample should be maintained at the quarry for the Producers benefit. In the event a shipment is questionable as to ~~whether it meets~~ specification *conformance*, the District Materials Engineer *shall* ~~will~~ make the final determination as to acceptability.

(4) Sizes No. 1, No. 2, No. 3 and Gabion Stone

Except for use in hydraulic cement concrete, aggregate size No. 1, No. 2, No. 3 and Gabion Stone *shall* ~~may~~ be inspected visually for size, cleanliness and general conformance to the specified gradation. Gradation testing *shall* ~~will~~ be performed *by the Department* in the event of dispute.

(e) Field Sampling

~~Since source testing and acceptance will be provided almost in every case, field sampling and inspection normally will be limited to observation for cleanliness and segregation problems. Should material arrive on the job site without inspection, the District Materials Engineer's Office should be notified before allowing its use.~~

~~The minimum requirements for job acceptance sampling of aggregate, if necessary at the job site shall be as outlined below:~~

~~(1) Fine and Coarse Aggregate for Use in Hydraulic Cement Concrete~~

~~Acceptance samples for grading should be taken at the rate of one per size per 1,000 tons (1,000 metric tons).~~

~~(2) Crusher Run (Sizes 24, 25, & 26), Fine Aggregate for Other Uses, and Surface Treatment Aggregates~~

~~Same as Paragraph (c)(1) above. Requirements for documentation of weights will be as outlined in Paragraph (e) herein.~~

~~(3) Dense Graded Aggregates for Use As All Types of Base and Subbase Material and Type I Select Material~~

~~This material will be sampled at a frequency as outlined in Sec. 300, and weight documented as outlined in Paragraph (e) herein.~~

~~(4) Fine and Coarse Aggregates for Use in Asphalt Mixtures~~

~~If from a normal approved source, no further sampling is necessary since there are no grading requirements. If the source is new, which usually occurs in the case of local sand pits, it shall be sampled for quality in accordance with Paragraph (b) above. If there is reason to believe the quality has changed or visual changes have occurred in cleanliness, samples may be drawn for investigation.~~

(c) Certification of Aggregates

When fine aggregate and open-graded coarse aggregate are shipped to the job site and have been tested and approved at the source, each load of aggregate shall be accompanied by a materials certification statement

signed (either handwritten signature, handwritten initials, or computer printout of name or initials) by a responsible company official. This applies to such aggregates as fine aggregate, coarse aggregate for use in hydraulic cement concrete, aggregate for use in surface treatment work, rip-rap bedding stone, porous backfill stone and crusher run aggregate, although crusher run is not an open-graded aggregate. The certification may be stamped or printed on the delivery ticket, invoice, weigh ticket or *TL-102A Daily Summary Sheet*, or it may be a separate document altogether. This does not apply to aggregate or plant mix materials paid for on a tonnage basis, as outlined in Paragraph (b)(1) above. See Paragraph (d) herein.

(d) Documentation of Weights

A bonded Weighperson employed by the Producer *shall be* ~~is~~ responsible for furnishing a daily summary sheet (*Form TL-102A*) to each order and/or contract. See Sec. 800 for examples of the bond and daily summary sheet. This sheet *shall* ~~is to~~ be delivered by the Producer to the Department representative at the project or work area no later than the end of the next working day. On intermittent shipments, this form may be mailed to the appropriate Residency. Recipient of the summary sheet will then reconcile it against the delivery tickets. Any differences must be resolved. *See Post-Construction Manual for further requirements.* ~~This summary sheet, at the end of the project, must be turned in to the District Drafting Room for checking against the final estimate and the weigh tickets. Afterwards, it shall be forwarded to the State Materials Engineer.~~

(e) Reports

Laboratory test reports of aggregate materials *shall* ~~will~~ be made on Forms TL-22, TL-22A and TL-22B respectively, as outlined in Sec. 800. Shipments of aggregate materials paid for on a tonnage basis will be recorded on a daily summary sheet. (See Paragraph (d) above.) ~~Occasionally, physical tests of aggregates for use in asphalt concrete will also be reported on Form TL-50, as outlined in Paragraph (c)(4) above and Sec. 800.~~ Physical tests and shipments of central-mixed aggregate materials *shall* ~~will~~ be reported on Forms TL-52B (computer test report output form) and TL-102A respectively, as outlined in Sec. 800.

Also modify Table “MINIMUM ACCEPTANCE SAMPLING REQUIREMENTS” on Page II-70 as follows:

MINIMUM ACCEPTANCE SAMPLING REQUIREMENTS					
MATERIAL AND TEST	ROAD AND BRIDGE SPECIFICATION REFERENCE	RATE OF SAMPLING	LOCATION FOR SAMPLING	PROPER CONTAINER AND PACKING	REMARKS
2. Aggregates - (a) Any Type, Other Than Dense Graded, Central-Mixed, Type I, Select Material or Any Type Sub-base or Base Material - (1) Grading...	See Specs.	<i>Visual Inspection is used for verification. When deemed necessary by the District Materials Engineer, one 10 lb. (5 kg) sample (F.A.) or one 30 lb sample (15 kg) (C.A.) of aggregate may be sampled per size per 1000 tons (1000 metric tons), or as directed by District Materials Engineer, to be tested by Producer; supplemented by one monitor sample per week or one per month per size (produced, to be tested in the and sent to the Central Office or a Regional Laboratory District for testing.</i>	At source.	Secure container or sample bag free of contaminants, if shipped to another laboratory. Ship fine sizes in tight container or closely woven bag.	Aggregate Producers are responsible for sampling and controlling product for grading. Aggregate may be accepted at job site with certification from Producer stating that required tests have been performed and have met specification requirements for the material. Open graded aggregates for hydraulic cement concrete are to be sampled once per month at the ready mix concrete plant when production exceeds 100 cubic yards (100 cubic meters) per month to monitor shipping and stockpiling requirements. Open graded aggregate, for hydraulic cement concrete, when used in sign islands, sign footings, culvert joint mortar, or other small incidental items, in quantities of 50 tons (50 metric tons) or less per size per project require no testing. See Sec. 207 for acceptance.

cy: Commissioner
 Chief Engineer
 Chief of Operations
 Division Administrators
 Residency Administrators
 District Materials Engineers
 District Construction Engineers
 District Maintenance Engineers
 Areas Construction Engineers
 Virginia Asphalt Association

Virginia Transportation Research Council
 Virginia Ready-Mixed Concrete Association
 Precast Concrete Association of Virginia
 Virginia Transportation Construction Alliance
 Virginia Dept. of Minority Business Enterprise
 Federal Highway Administration
 American Concrete Paving Association
 NE Chapter, Southern Region
 Old Dominion Highway Contractors Association