

5.02 AGGREGATES

5.02.01 GENERAL

This section covers the inspection, sampling, testing and acceptance of aggregates.

5.02.02 TYPES OF PRODUCTION

Aggregate production is classified into two groups according to the methods of operation. Commercial production is defined as production from deposits by permanently established plants which are operated on a regular basis to supply both commercial consumers and contractors performing KDOT work.

Non-commercial or roadside production is defined as production from deposits by portable plants that are moved in to produce aggregate for one or more State projects and are moved out soon after such production ceases.

5.02.03 INSPECTION RESPONSIBILITIES

(a) The Contractor performs or causes to be performed all inspections and tests necessary to provide and maintain an adequate process control system. An adequate process control system is one that provides that all aggregates or aggregate combinations submitted for acceptance will conform to contract requirements whether manufactured or processed by the Contractor, or procured from sub-contractors or vendors.

The Contractor is responsible for the establishment of individual aggregate gradations and proportions for mix designs (within the limits established by the contract documents), which are then submitted to the Department for approval prior to use. The Contractor is responsible for performance of all process control activities for all aggregate and aggregate combinations during production, handling, stockpiling, blending, mixing and placing operations.

(b) All aggregate acceptance tests will be conducted by the Department at the point of usage, unless designated otherwise by the Engineer.

The Department reserves the right to run any test at any time or place to determine the level of contract compliance. When test results on aggregates or mineral filler supplements indicate non-compliance with contract requirements, the Engineer may reject the material and cause it to be removed at the Contractor's expense.

Department inspection does not replace the need for Contractor inspection or otherwise relieve the Contractor of responsibility to furnish acceptable aggregates.

5.02.04 APPROVAL OF DEPOSITS

(a) General.

Aggregate shall not be used for KDOT work until the deposit from which it is being produced and the production process has been approved. The aggregate producer shall record and document the point of quarry operations using GPS coordinates. An aggregate source will be approved only after tests on "Official Quality" samples taken by a KDOT representative, or by the producer while under the direct

supervision of a KDOT representative, have been completed and the test results show that aggregate produced from a specific deposit produced using a specific production process, meets the quality requirements of the contract documents. If the current Official Quality fails, then the source will no longer be approved for projects not yet under contract until production is again approved.

Tests on "Official Quality" samples taken to determine aggregate source approval are conducted in the Materials and Research Center at Topeka. The tests are as follows:

- ◆ Soundness
- ◆ Coal and/or lignite content
- ◆ Wear
- ◆ Organic Impurities
- ◆ Mortar Strength
- ◆ Acid Insoluble Residue
- ◆ Specific Gravity
- ◆ Absorption

Additional Testing is required for 'Mixed Aggregates for all concrete' and 'Coarse Aggregates for on grade concrete'.

- ◆ Tests required for Class I and Class II aggregates or other special uses.
- ◆ Wetting and Drying (Mixed Aggregate for Concrete)

Refer to the Standard Specifications for more detailed information on specific applications.

It is the responsibility of the District Materials Engineer to see that aggregate deposits and processed aggregates are sampled and tested to determine compliance with all applicable requirements.

It is the responsibility of the Field Engineer to confirm that aggregates comply with all applicable requirements prior to use. The delivery of aggregate to KDOT projects before "Official Quality" tests show compliance with contract requirements is prohibited.

(b) Basis of Approval.

(1) Active production sources: Deposits approved on the basis of "Official Quality" tests conducted on either processed (crushed, screened, washed, etc.) or "pit-run" production samples remain approved only if there are no major changes in processing, production methods or deposit characteristics. KDOT quarry and project inspection personnel should be alert for any significant changes and when changes occur they should immediately arrange for submission of new "Official Quality" samples that reflect such changes. Extreme caution must be exercised in approving the use of aggregate sources which may be "borderline" in quality.

It is the policy of the Department that once approval of aggregate from a specific source has been given to a contractor for use in a specific project, that approval will be maintained for the duration of that project. If the official quality test result effective at the time of letting is greater than two years old, continued approval for use on such projects is contingent upon subsequent passing verification tests. Exceptions will be made, when tests indicate that a significant change in production, processing or deposit characteristics has resulted in a serious deterioration of the product.

Should any sample taken from the project and submitted for quality testing fail, a new "Official Quality" sample should be collected and submitted forthwith. In the event that the project sample

indicates serious deterioration of the product, the production from that source should be discontinued immediately. The results of the new "Official Quality" sample will be used to determine whether further use of production on the project will be permitted or whether the contractor will be required to obtain acceptable material from another source. The new sample test results will also serve as the basis for approval of the material for use on future projects.

Aggregate produced and stockpiled at the quarry under an approved "Official Quality" will be good for 2 years in the stockpile. Aggregate which has been stockpiled at the quarry for more than 2 years must pass verification testing before use on KDOT projects. This does not apply to stockpiles contracted for specific projects. Do not add new production to existing stockpiles more than 2 years old before verification of the stockpile and an "Official Quality" of the current production have been completed.

(2) Inactive Production Sources: Samples of sand-gravel and stone for quality tests taken from non-producing deposits will be for information only.

(c) Appeal of Official Quality Test Results.

Aggregate producers must notify the District Materials Engineer if they wish to appeal "Official Quality" test results. Two additional samples will be taken. Both samples must "pass" before approval is given. The first resample will be taken immediately after the results of the initial sample are made available and the producer has appealed. The second resample will be taken after a minimum of 2500 tons have been produced or 5 days of production from the first resample, whichever is the greater tonnage. If either of the two resamples fail, no further "Official Quality" testing will be conducted on the location until the District Materials Engineer has determined the operations have moved a significant distance or there is a significant change in deposit characteristics, or geological classification.

5.02.05 INSPECTION, SAMPLING AND TESTING

(a) General.

This section of the manual pertains to general policy covering quarry inspection and the frequency of and procedures for sampling aggregates for quality, production and acceptance testing. The detailed methods to be followed when sampling are set forth in Section **5.16** of this manual.

(b) Sampling for Quality Determination.

(1) General Sampling Procedures: When obtaining "Official Quality" samples, the Department representative must thoroughly examine the exposed portions of the deposit, record the GPS coordinates at the ledge face where production is occurring, observe and document production and processing operations.

Samples for "Official Quality" should always be obtained from locations or from production points that will provide a representative sample of the aggregates that will be used for state work.

"Official Quality" samples for deposit approval should never be taken from an aggregate that has been in a producer's stockpile over a period of time. Quality samples obtained from stockpiles other than current production will only determine the acceptability of the aggregate in the individual pile. Tests for quality conducted on Verification Samples are not to be considered "Official Quality" tests. Verification Samples are obtained only as a check on the quality of material being delivered to the project.

Aggregate producers may use the sampling methods outlined in **5.02.05**(b), (2) and (3) to obtain preliminary quality information from prospective aggregate deposits. Samples so obtained under the supervision of a representative of the Department may be submitted to the Materials and Research Center for quality testing. No charges will be made for such tests.

When exploring for new deposits, each producer will be permitted to submit a maximum of 10 samples for quality tests during each calendar year to represent new locations or deposits. No limit will be imposed on the number of samples a producer may submit from deposits explored for use on a specific project which has been advertised for letting. Exploration submittal requirements do not apply to currently producing locations.

The District Materials Engineer will make "Official Quality" test results available to the producer.

(2) Stone Deposits:

a. Opened Deposits.

Commercial quarries, non-commercial or roadside quarries, and newly opened quarries that are operational are sampled for "Official Quality" from normal production.

Commercial stone production is sampled yearly, while non-commercial or roadside production is sampled each calendar year that aggregate is being produced

b. Unopened Deposits.

Unopened quarries are sampled by opening the quarry face the full depth of the usable ledge or ledges far enough back from exposure to reach unweathered stone. From this opening, the full depth of the unweathered face is shot down and a representative portion of the material is crushed at an operating quarry site by regular production crushing methods. The sample is obtained from this crushed product. Test conducted on samples following this procedure will be for information only. "Official Quality" samples will be obtained from the processing plant (crusher, gradation unit) only after production at the site has commenced.

Uncrushed ledge samples and drilled cores are tested for information only and are not a basis for approval or disapproval of aggregate that will be used after crushing. When crushing facilities are not available and the stone is intended for use in the construction of crushed stone backfill, stone rip rap, stone wash checks, stone ditch lining and other miscellaneous uses, uncrushed ledge samples are acceptable as "Official Quality" samples for these uses only. Such samples are prepared in the Materials and Research Center to produce samples of proper size and gradation for testing.

(3) Sand and Gravel Deposits:

a. Definitions (Sand and Gravel)

"Pit Run" material shall be defined as a sand or sand-gravel taken from a deposit which may or may not have been subjected to minimal processing. Such processing shall be limited to the removal of excess soil and/or oversize material. "Official Quality" samples of sand or sand-gravel shall be "Pit Run" material if feasible.

In the event that the quality characteristics exhibited by the "Pit Run" material do not meet the specification requirements for the anticipated production, changes in production methods may be effected which will improve the aggregate quality by selective removal of some of the lower quality aggregate. "Official Quality" samples may then be taken from the altered material.

b. Operating or Opened Deposits.

Commercial deposits and those under intermittent production are sampled for "Official Quality" from normal production. Samples are to include all size fractions retained by the producer. Commercially operated deposits are to be resampled for "Official Quality" when results from verification samples show significant variation from past results, and at least every ten years. Non-commercially operated deposits are to be sampled at the direction of the District Materials Engineer.

c. Unopened Deposits.

Unopened deposits may be sampled prior to production by thoroughly drilling or otherwise sounding out the deposit. Samples taken for quality tests from unopened deposits will be for information only. "Official Quality" samples will be taken from actual production.

(4) Chat Deposits: Chat deposits are sampled by the most appropriate method. Chat piles or the products of screening plants from which material is being produced are sampled yearly for "Official Quality."

(5) Lightweight Aggregate: Lightweight aggregate is sampled by the most appropriate method. "Official Quality" samples are obtained at a frequency to be determined by the Engineer.

(c) Class I and Class II Aggregate

(1) General

Class I and Class II Aggregates are composed of crushed limestone or dolomite. Additional testing is performed on concrete produced with Class I and Class II Aggregates to determine if acceptable levels of concrete freeze/thaw resistance are provided. The freeze/thaw testing is intended to reduce the risk of the occurrence of premature "D-Cracking". Class I and Class II Aggregates are intended for use in "on-grade" concrete slabs such as Portland cement concrete pavement. Prequalification to produce Class I and Class II Aggregate is granted to a quarry on a bed by bed basis for each distinct bed in the quarry face. "Official Quality" sampling and testing is also required. The acceptance of Class I and Class II

Aggregate is contingent upon production being from approved beds and in compliance with "Official Quality" requirements.

(2) Initial Prequalification of Quarries

a. Initial Request Procedure

The District Materials Engineer (DME) is responsible to initiate KDOT's prequalification activities for quarries in their districts. Upon receipt of a written request from a quarry operator the DME will contact the KDOT Chief Geologist to schedule a quarry inspection. The DME will forward a copy of the written request to the Chief Geologist and the Engineer of Tests.

b. Initial Quarry Inventory and Sampling Procedure

The Chief Geologist will arrange for a regional geologist to meet with district inspection personnel at the quarry. The regional geologist is responsible for preparing a KDOT Quarry Report (including GPS coordinates and color photographs) for the quarry and collecting samples from the appropriate beds in the quarry face. A plan view of the quarry indicating the location(s) in the quarry that are intended to be mined for Class I and Class II Aggregate must be provided by the quarry operator prior to sampling. The plan view must show appropriate landmarks for future reference. The quarry inventory and sampling procedures will be conducted in accordance with written guidelines maintained by the Chief Geologist. The regional geologist will arrange to deliver the bed samples to the Engineer of Tests.

The Chief Geologist will distribute the KDOT Quarry Report to the following: Quarry owner/operator (1 copy); DME responsible for quarry inspection (2 Copies); Appropriate regional geologist (1 copy); and Chief Geologist (1 copy).

c. Initial Testing and Reporting Procedures

The Engineer of Tests will process and test the ledge samples to determine if each bed is in compliance with the specified requirements for Class I and Class II Aggregate. The Engineer of Tests will report the test results to the quarry owner/operator, the appropriate DME and enter into CMS. Additionally, the Engineer of Tests will maintain a complete list of each bed tested and the test results by quarry. The Engineer of Tests will prepare and distribute a listing showing the approved Class I and Class II beds for each quarry. This listing will be given wide distribution and updates will be issued semi-annually.

Should a specific bed from a specific quarry fail to pass prequalification testing, resampling will not be permitted until significant changes occur (generally the changed conditions to be met prior to resampling a failed bed are the same as those necessitating reinventory inspection for continuation of prequalified status - see 5.02.05(c)(5) below). When the changed conditions are deemed to justify resampling, all beds within the ledge or geological unit will be resampled. Requests for resampling should be made in accordance with the guidelines for

initial prequalification. Exception to this process will require approval of the Chief of Materials and Research.

(3) Inspection of Class I and Class II Aggregate Production

a. Responsibility

The DME is assigned the responsibility to provide periodic inspection of quarry operations to verify that Class I and Class II Aggregates produced for Department work are produced from only those beds approved for Class I and Class II Aggregates. In addition, the DME is responsible to verify that the production process is essentially the same as that used to produce the aggregates selected for the Class I and Class II Aggregate "Official Quality" test. The necessary level of inspection may vary by quarry. For example, when all beds in a quarry have been prequalified to produce Class I and Class II Aggregates, normal quarry inspection activities may be sufficient to verify that Class I and Class II Aggregates of the proper quality are being produced. However, when it is necessary to separate out specific approved bed(s) from a ledge being mined, additional inspection effort is warranted. The proper level of inspection is to be determined by the DME based on the unique circumstances encountered at each quarry.

b. Approved Production Plan

The DME will obtain a written production plan for Class I and Class II Aggregates from the quarry operator prior to providing inspection of Class I and Class II Aggregate. The production plan should include but not be limited to the following information: the location(s) in the quarry that will be mined; the approved bed(s) that will be mined; the methods that will be used to separate the approved beds from the nonapproved material; and the procedures to prevent any nonapproved material from mixing with the Class I and Class II material throughout the entire mining, hauling, crushing, stockpiling, and shipping processes. Quarry owners/operators shall provide updated production plans to the DME at the beginning of each production season, or as otherwise determined by the DME, and any time significant changes occur in the production processes.

c. Notification of shipment

Quarry owners/operators shall notify the DME responsible for inspection of Class I and Class II Aggregates production prior to shipping such aggregates to concrete production sites for use on KDOT projects. The DME will then notify the appropriate Construction Office of the pending delivery of Class I and Class II Paving Aggregates.

d. Quarry Inspection Requirements

KDOT quarry inspectors must familiarize themselves with the plan view of the quarry, the Class I and Class II Aggregate production plan and the KDOT Quarry Report. These three documents should provide the inspector with sufficient information to verify that only approved beds are being mined from approved

locations within the quarry and that the aggregates are processed in the appropriate manner. Inspectors are required to document their inspection activities during each visit to the quarry. The documentation is to be kept in a diary or other hard copy form approved by the DME. The quarry inspector should occasionally visit concrete production sites to assist project personnel with identification of Class I and Class II Aggregates produced and hauled from quarries they inspect. When visitation of concrete production sites is not practical due to extreme distances then extra effort by the quarry inspector should be made to communicate with project personnel to verify that Class I and Class II Aggregate is actually being delivered and used in the concrete production.

(4) Production Sampling

a. Responsibility

It is the responsibility of the DME to monitor production of Class I and Class II Aggregates at quarries within their respective district and collect aggregate samples for verification testing. The Chief of Materials and Research will coordinate such activities for out-of-state quarries. Reassignment of such responsibility between DME's may be made when mutually agreeable. Documentation of such reassignments should be circulated to concerned parties.

b. Sampling Frequency and Location

The DME is responsible for collecting Production Samples that represent Class I and Class II Aggregate produced from each quarry for which they provide inspection. A minimum of one Production Sample is to be collected representing each 20,000 tons of Class I and Class II Aggregate Production at each quarry. For any quarry that is projected to produce less than 60,000 tons of Class I and Class II Aggregate per year, the DME should schedule their sampling activities so that at least three Production Samples are collected. For each project requiring more than 5000 tons of Class I and Class II Aggregate, at least one additional Production Sample is to be collected from the project concrete production site. If extraordinary travel is required to sample Class I and Class II Aggregate at the concrete production site, then the DME responsible for quarry inspection may make arrangements with the other district's DME to sample the stockpile.

c. Testing

Collected samples are to be delivered to the Engineer of Tests. The Engineer of Tests is responsible for testing the samples and for comparing the test results with the historical test data for that quarry. The Engineer of Tests will notify the DME of atypical test results in a timely manner. The Engineer of Tests may choose not to perform all Class I and Class II testing if the preliminary test results compare favorably with historical test data. However, the Engineer of Tests will review sample records and perform Class I and Class II testing on at least three samples per quarry per year provided sufficient samples are submitted for testing.

(5) Continuation of Prequalified Status for Class I and Class II Aggregate Production

After a quarry has been prequalified to produce Class I and Class II Aggregate from a specific bed(s) the prequalified status will continue as long as no major changes are made in the production process or occur in the deposit characteristics. Changes in deposit characteristics may be discovered either visually or through test results performed on Production Samples.

The DME is assigned the responsibility to notify the Chief Geologist and request that the quarry be reinspected under any of the following circumstances:

- ◆ When the location of the mining operation has moved a significant distance from where the last inventory inspection was made (Generally, this is requested when mining operations have moved ¼ mile or more from the most recent inspection site.).
- ◆ When significant changes are observed in the deposit characteristics. Typical examples of such changes would be a significant color change in any of the bed(s) being mined, the disappearance of a bed(s) from the ledge being mined, significant changes in the thickness of the individual bed(s) being mined and/or a significant change in the type or amount of fossils observed in any of the bed(s).
- ◆ When an active quarry has not reinventoried in the preceding two-year time period.
- ◆ When a Production Sample fails.

When any party feels that any change in the prequalified status of a quarry is warranted they should notify the DME responsible for quarry inspection who in turn will advise the Chief of Materials and Research. The Chief of Materials and Research will review all available information on the changed conditions and render a decision on any such changes. Official notification of any change in Class I and Class II Aggregate Production status for a quarry will be provided by the DME to the quarry owner/operator and the appropriate contractors.

(6) Class I and Class II Aggregates **produced and stockpiled at the quarry** for more than 2 years shall be retested for Class I or Class II status before being used on any KDOT Project. **This does not apply to stockpiles contracted for specific projects.**

(d) Specific Gravities for the Hot Mix Asphalt (HMA) Specific Gravity List

(1) Establishing a Location and Specific Gravity Value

(a) General

Specific Gravity values, verification date, and GPS coordinates for HMA aggregate sources shall be posted on the Specific Gravity List published by the Bureau of Materials and Research. The list will be published monthly when changes occur. These specific gravity values may be used by hot mix contractors for that month's letting or a more current agreed upon value as established within this section. If no changes occur during a month, the previous month's values **may be used**. The Specific Gravity List will contain two sections. KDOT will allow the values in the upper section to be used for each month's letting. The lower section of the list will contain "deleted" values. The deleted values are for reference only and shall be verified by KDOT before they are allowed to be used on HMA projects. There is generally no need to determine a Procedure I specific gravity value for a material that has less than 10% material retained on the #4 (4.75 mm)

sieve. There is generally no need to determine a Procedure II specific gravity value for a material that has less than 10% material passing the #4 (4.75 mm) sieve.

When a contractor or aggregate producer wishes to have an aggregate source placed on the HMA Specific Gravity List, a sample of the aggregate shall be split between the contractor and/or producer, the District Lab and the Materials and Research Center. Contractors or producers must test and report their portion of the sample or the Department will not report or publish the test results. This sample shall be taken in the presence of District personnel, aggregate producer and contractor (when applicable). The processing at the time the sample is obtained should be noted in CMS. GPS coordinates for the location of the sample source or mining operations, not the stockpile or crusher location, will be recorded by District personnel at the time the sample is taken.

For each product the average Bulk Dry, Saturated Surface Dry, Apparent Specific Gravities and Absorption submitted by the Aggregate Producer, and/or the Contractor, the District Laboratory, and the Materials and Research Center will be computed. The products being produced and the Geologic Class of the beds must be considered when determining an aggregate's specific gravity. Aggregate producers must notify the District Materials Engineer when changes in processing, geology, or geological classification occur.

KDOT reserves the right to not place an aggregate location on the specific gravity list due to a lack of cooperation from the aggregate producer, or variations in specific gravity values within the location.

(b) Procedure I Specific Gravities.

If the range of Bulk Dry Specific Gravity values is less than or equal to 0.040, then all values for that individual aggregate will be used to calculate the combined Bulk Dry Specific Gravity of the mix.

If the range of Bulk Dry Specific Gravity values is greater than 0.040, then "Outliers" must be eliminated using the following procedure. Eliminate the value that is furthest from the average, and recalculate the average with the remaining values. Continue to eliminate outliers until the range of remaining values is less than or equal to 0.040 or until there are only 2 sets of data remaining. If the last 2 sets of remaining data have a range greater than 0.040, then an additional split sample will be obtained and tested. If the second sample fails the criteria then the Aggregate Producer's production must be reviewed and a possible cause for the wide range of values must be identified. No additional sampling will be permitted until the producer identifies and corrects the problem.

If several products from a given source are tested then values for each product will be averaged and if no individual product varies from the average of all products from that source more than 0.020 then the combined average value for all samples will be placed on the list otherwise they will be listed individually by product or geology.

(c) Procedure II Specific Gravities.

If the range of Bulk Dry Specific Gravity values is less than or equal to 0.060, all values for that individual aggregate will be used to calculate the combined Bulk Dry Specific Gravity of the mix.

If the range of Bulk Dry Specific Gravity values is greater than 0.060, then "Outliers" must be eliminated using the following procedure. Eliminate the value that is furthest from the average, and recalculate the average with the remaining values. Continue to eliminate outliers until the range of remaining values is less than or equal to 0.060 or until there are only 2 sets of data remaining. If the last 2 sets of remaining data have a range greater than 0.060, then an additional split sample will be obtained and tested. If the second sample fails the criteria then the Aggregate Producer's production must be reviewed and a possible cause for the wide range of values must be identified. No additional sampling will be permitted until the producer identifies and corrects the problem.

If several products from a given source are tested then values for each product will be averaged and if no individual product varies from the average of all products from that source more than 0.030 then the combined average value for all samples will be placed on the list otherwise they will be listed individually by product or geology.

(2) Verification of Location,

Aggregate Producers must notify the District Materials Engineer when operations move more than 1320 feet (within the same geological classifications for quarries) from the location on the list, or crosses a quarter section line.

If a crushed aggregate source has not been verified within two years or if a sand/sand gravel aggregate source has not been verified within five years, it will be the responsibility of the aggregate producer to notify the District Materials Engineer that the location where that material is being quarried needs to be checked. If the District Materials Engineer determines that operations have not moved more than 1320 feet (within the same geological classification for quarries) from the location noted on the HMA Specific Gravity list, the District Materials Engineer shall notify the Engineer of Tests and the verification date on the list shall be changed. Otherwise, the location will be placed on the deleted values list until the location of operations is verified.

If the District Materials Engineer determines that operations have moved more than 1320 feet from the location noted on the HMA Specific Gravity list, a new split sample shall be tested.

The District Materials Engineer may check the location of quarry operations at any time.

(3) Verification or Modification of Specific Gravity Values

The use of an aggregate on a HMA project does not necessarily mean that the specific gravity value of that aggregate will be verified.

Specific gravity values for Chat must be verified every 2 years, regardless of GPS coordinates.

Verification samples of HMA aggregates submitted to the Materials and Research Center may be used to verify specific gravity values on the list. Official Quality test results for sand/sand and gravel locations may also be used to verify the specific gravity. Districts may also verify the specific gravities of an

aggregate when they check the contractors mix design. Districts shall notify the Engineer of Tests when these values are verified.

A contractor or producer may ask that an existing value be verified or modified by the procedure used to establish values on the list. **The requesting producer or contractor must participate in the split sample testing and reporting.**

KDOT may ask that an existing value be verified or modified by the procedure used to establish values on the list. The producer or a contractor will be invited to participate in the 3-way split. If the producer or contractor declines to participate or does not provide test results in a timely manner then only values from the District Lab and the Materials and Research Center will be used to calculate average values.

A Procedure I specific gravity value will be considered verified if the single test result (District or MRC) does not vary from the value on the list by more than 0.040. If the verification test result does vary from the value on the list by more than 0.040, then the Engineer of Tests may request a 3-way split to modify the list value. The Procedure I value will be considered verified if the average of a 3-way split does not vary from the current value on the list by more than 0.020. The Procedure I value will be modified if the average of a 3-way split does vary from the current value on the list by more than 0.020.

A Procedure II specific gravity value will be considered verified if the single test result (District or MRC) does not vary from the value on the list by more than 0.060. If the verification test result does vary from the value on the list by more than 0.060, then the Engineer of Tests may request a 3-way split to modify the list value. The Procedure II value will be considered verified if the average of a 3-way split does not vary from the current value on the list by more than 0.030. The Procedure II value will be modified if the average of a 3-way split does vary from the current value on the list by more than 0.030.

Aggregate Sources not kept current as outlined in these procedures will be removed from the list of Specific Gravities used for Bid Letting Estimates. It's not necessary for a source to be on the list in order for the Contractor to use the aggregate on a Project. Specific Gravities for any single Project can still be established by any method agreeable to the DME. The DME may require the contractor to perform Specific Gravity verification tests on aggregates used from these sources during production on the project.

- (e) Inspection and Testing of Project Aggregates.
- (1) Project Control:

The Field Engineer in charge of the project is responsible for monitoring inspection and testing procedures which will offer reasonable assurance that all aggregate used meets specification requirements. Minimum sampling and testing frequencies are set forth in Appendix A of this manual. The frequencies should be increased if there is evidence that aggregate is consistently near or slightly outside specification limits. Adjustment of frequencies is not appropriate under statistical sampling plans as currently specified for hot mix acceptance.

The sampling and testing of aggregates is an important operation since the results are part of the basis for payment to the contractor by the Department. On Federal-aid projects, the test results are part of the basis for reimbursement to the State for the Federal Government's share of the expenditure. Therefore, it is imperative that all sampling and testing be performed in the prescribed manner. The volume of aggregate tested and accepted for State use each year represents a considerable sum of money and the inspection of such aggregate should always be considered a most important part of project administration. The various types of tests are defined in section **5.01.04** (b).

(2) Inspection, Sampling and Testing.

a. Inspection.

1. The Contractor is responsible for proper inspection during the production of aggregates and the processing of aggregates for use on state contracts. Proper control requires the services of a quality control technician with adequate experience and training and who is capable of exercising good judgment and common sense. The technician should never devote his entire time to mechanically sampling and testing aggregates. While prescribed sampling and testing procedures should always be followed, it is also advisable that the technician observes production or processing methods on a regular basis and become thoroughly familiar with all phases of these operations.

If the finished product is stockpiled prior to delivery to the project site or prior to delivery to the roadway, stockpiling operations should be observed and any specifications pertaining to stockpiling and removal of material from stockpiles should be enforced.

2. Department personnel will inspect aggregate production sites in order to verify that the source of the aggregate was deposits, ledges or beds which meet specified quality requirements.

Inspection requirements for Department personnel at processing plants vary with the type of material being produced. A thorough knowledge of applicable specifications is necessary to perform the proper inspections. Department personnel shall follow all posted safety and security rules required by producers of all visitors and contractors to production site.

Department personnel should keep in mind that at no time should the Inspector give instructions to the Contractor or producer as to the setting of dials, gauges, scales or meters. However, the Inspector may question and warn the Contractor against the continuation of any operation or sequence of operations which would obviously result in unsatisfactory compliance with specification requirements.

b. Sampling.

Since it is physically impractical to test the entire production of aggregate, the proper taking of samples to represent the material is as important as correctly following the proper test procedure.

The sampling methods outlined in subsection **5.16.01** of this manual have been developed from many years of experience and observation. They are not infallible, but if applied universally, they will establish a firm basis for the acceptance of test results as being representative of the material sampled. The methods of sampling included in this manual may not be applicable to every

situation and condition. Consequently, the inspector must rely somewhat on his judgment when deciding on the proper methods of procuring samples in each given situation. When modifications in sampling methods are required, agreement between the Engineer and the Contractor should be obtained and documented in the project records.

c. Testing.

To be of value, all tests must be conducted in strict accordance with prescribed procedures and equipment. The test equipment must be in good condition. Written instructions covering test procedures should be reviewed frequently to keep the operator from "drifting away" from prescribed procedures. Equipment should be checked regularly to verify that it is in adjustment and performing satisfactorily. Specific test methods are set forth in Section **5.16** of this manual.

(f) Documentation and Reporting.

(1) Documentation.

For proper documentation, it is essential that all observed data from each test be clearly recorded, the inspector's initials and the date affixed and the data permanently filed as a part of the project "source document" files. Such data is not to be recorded on scraps and odd bits of paper with such paper being discarded after the data has been copied into note books or onto specified forms. All observed data must be recorded in permanent document form at the time the observation is being made. The pertinent data is then transferred to the proper report form or CMS Screen and distributed to the required offices. Reports should be issued covering all tests conducted by each inspection agency.

The Contractor is to maintain records of all inspection and tests performed by his representatives, and the documentation procedures shall be approved by the Engineer prior to starting the work. Upon completion of work, copies of all charts, forms and records documenting the Contractor's process control tests and inspection are to be provided to the Engineer upon his request.

(2) Reporting.

The Contractor is to provide the Engineer access to all process control test results and furnish copies to the Engineer upon request.

When test results fall outside of the specification limits, underline or circle in red the points of noncompliance. Results reported in CMS should reference the points of noncompliance in the remarks or elsewhere on the data screen.

KANSAS DEPARTMENT OF TRANSPORTATION

CERTIFICATION OF AGGREGATES USED BY _____

(Producer or Contractor name)

KDOT CONTRACT NUMBER _____

KDOT PROJECT NUMBER _____

Aggregate Description	Quantities Tons or Cu Yards	Location of Deposit				Ledge, Beds, or Thicknesses	KDOT Quality CMS. No.
		Sec.	Twp.	Range	County		
1.							
2.							
3.							
4.							
5.							

This is to certify (check applicable box)

All the aggregates described above:

- (A) That will be provided to the project are in compliance with all applicable specifications.
- (B) That were provided to the project were in compliance with all applicable specifications.

CMS Producer Code

Name of Producer

Date

Signature

Title

