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Georgia Department of Transportation
Office of Materials and Testing

Standard Operating Procedure (SOP) 1

Monitoring the Quality of Coarse and Fine Aggregates

I. General

The Pit and Quarry Control Branch of the Office of Materials and Testing is charged with the responsibility of monitoring all coarse and fine aggregates used on Department of Transportation projects. In order to facilitate the accomplishment of this task, lists of fine and coarse aggregate sources are maintained and published in the form of Qualified Products Lists 1 and 2, Sections A, B, C, and D. In addition, those sources that are listed on Qualified Products List 2, Sections A, B and C will be subject to the conditions of the Aggregate Rating System. Those sources that are listed in Section A, B, and C of Qualified Products List 1 and 2 are also required to transfer aggregate certification data electronically. A Producer desiring placement or re-instatement to one of these lists must meet the requirements set forth in this Standard Operating Procedure.

II. Fine and Coarse Aggregate Source Lists

The following is a general description of the Qualified Products Lists.

A. Qualified Products List 1 - "Fine Aggregate Sources"

This is a list of sources that may supply fine aggregate for use in Departmental construction as stipulated within the following sections:

1. **Q.P.L. 1 - Section A - "Standard List"**

   This is a list of Fine Aggregate Sources that meet the quality requirements of Subsection 801.2.02 of the Specifications. All of these sources are approved to certify fine aggregates for use in Portland Cement Concrete and asphaltic concrete. Acceptable Quality Control Programs have been established for these sources. These source code numbers will end in an F, designating specification sand or a B designating a gradation deficiency that requires blending at the point of use to correct the grading deficiency.

2. **Q.P.L. 1 - Section B - "Temporary Sources"**

   This is a list of sources that are approved to certify fine aggregates only for those uses that are listed. Acceptable Quality Control Programs have been established. These source codes will end in a T, indicating the occasional use or temporary status of the source.

3. **Q.P.L. 1 - Section C - "Vendor Sources"**

   This is a list of sources that are approved to vend and certify fine aggregates originating from an approved source or stockpile. Acceptable Quality Control Programs have been established for handling and certification of the materials to be vended. These source codes will end in a V, designating them as Vendor Sources.

4. **Q.P.L. 1 - Section D - "Stockpile Basis Only Sources"**

   This is a list of sources that do not meet the criteria for being placed under Sections A or B of Qualified Products List 1. However, these sources can supply fine aggregates for Departmental use as they are available. Shipments from these sources will require prior certification by a Departmental representative on a stockpile basis. These source codes will end in an S, designating Stockpile Basis. **The current Qualified Products List 1 may not list any stockpile-basis-only fine aggregate sources due to the rarity of this type of source.**

B. Qualified Products List 2 - "Coarse Aggregate Sources"

This is a list of sources that may supply coarse aggregate for Departmental use as stipulated under the following sections:

1. **Q.P.L. 2 - Section A - "Standard List"**

   This is a list of sources that meet the quality requirements of Subsection 800.2.01 of the Specifications. All of these sources are approved to certify aggregates for use in Portland Cement Concrete and/or asphaltic concrete. Depending upon plant design and deposit characteristics, these sources typically supply a full range of products. Acceptable Quality Control Programs have been established for routine control and documentation of all products potentially for DOT use. These source codes will end in a C, designating a coarse aggregate source.

2. **Q.P.L. 2 - Section B - "Temporary Sources"**

   This is a list of sources that due to plant or deposit characteristics, or, simply not having a need to meet the criteria for Section A, are approved to certify only a limited number of items. Only those products that are specifically listed may be certified by the Producer. Acceptable Quality Control Programs have been established for the specific items listed. These source codes will end in a T, indicating the occasional use or temporary status of the source.

3. **Q.P.L. 2 - Section C - "Vendor Sources"**

   This is a list of sources that are approved to vend and certify aggregates originating from an approved source or stockpile. Acceptable Quality Control Programs have been established for handling and certification of the various materials to be vended. These source codes will end in a V, designating them as Vendor Sources.

4. **Q.P.L. 2 - Section D - "Stockpile Basis Only Sources"**

   This is a list of sources that do not meet the criteria for being placed under Sections A or B of QPL 2. However, these sources can supply aggregates for Departmental use as they are available. Shipments from these sources will require prior certification by a Departmental representative on a stockpile basis. These source codes will end in an S, designating Stockpile Basis.

III. Source Evaluations

Initial inspection of aggregate sources is required in the following situations:

A. New Sources

This may be a totally new operation for which there is no previous listing or quality data, or an old operation that has not previously requested an evaluation.

B. Reopened Sources or Sources Requesting Reinstatement

Sources that have been removed from the Qualified Products List for whatever reason will require a reevaluation prior to approval. This action is necessary to evaluate any changes which may have occurred in the deposit, production processes and/or Quality Control Programs.

C. New Owner

Since different owners can achieve varying results with the same source and since new owners often change equipment and manufacturing processes, a change in ownership may necessitate that a new evaluation of the source be made.

D. Relocated Sources

If a sand pit or quarry is relocated or if mining operations are extended into a new area, even if such extension or relocation is in the same general area, a new inspection may be required.

E. Significant Change in Material

If a significant change in the character of the material occurs, a new study may be required. Early detection and investigation of a change often works to the Producer's advantage by allowing applicable changes in the design mixtures at an early date.

IV. Source Approval Procedures—Qualified Products Lists 1 and 2

A. Sections A (Standard), B (Temporary) and C (Vendors)

A Producer desiring consideration for placement on one of these lists should direct a request in writing to the State Materials and Research Engineer or visit the Office of Materials and Testing website at http://pitquarry.dot.ga.gov/PitQuarry/ to apply online.

After a formal request for source approval has been received, a thorough evaluation will be conducted. This will include an evaluation of the geology of the deposit as well as an evaluation of production facilities and finished products. Provided basic quality and production capabilities are determined acceptable for inclusion to Sections A or B of the Qualified Products Lists, an acceptable Quality Control Program must be established prior to source approval. Those sources that lack the capability to consistently produce specification aggregates through the plant operations will not be placed under Section A or B of the Qualified Products List.

Source approval will not be granted as long as test results indicate marginal material is being produced. Material is considered marginal if test results are consistently at or very near the specification limits. The significance of marginal material is dependent upon the material characteristic in question and will be considered on a case-by-case basis.

In the case of Section C - "Vendor Sources", evaluations will focus primarily on off-loading, stockpiling and shipping procedures as they relate to the character of material involved and intended uses. Once acceptable facilities and procedures have been determined, an acceptable Quality Control Program must be established prior to approval.

B. Section D (Stockpile Basis Only)

Sources that do not meet the criteria for being listed under Sections A or B of the Qualified Products Lists may be listed as a Stockpile Basis Only Source. This may be done provided the Producer has the potential to produce some specification aggregates through selective quarrying, selective stockpiling and/or mixing on the yard.

Approval to ship materials must be obtained from a Departmental representative on a stockpile basis at the source prior to shipping. Stockpile size will be restricted to 2500 tons. This will ensure that representative samples are obtained when sampled by standard sampling procedures. Shipping documentation for the specific product(s) must be supplied for Departmental construction.

Acceptance testing of materials delivered to the project or plant site shall be performed by Testing Management at the prescribed frequencies shown in the "Sampling, Testing, and Inspection Manual." In addition, acceptability must be confirmed prior to the materials being incorporated into the work. The exceptions would be base, stabilizer and backfill materials. These materials may be placed but not covered up or otherwise rendered inaccessible for removal prior to completion of tests.

V. Establishing and Maintaining an Acceptable Quality Control Program

After a source of fine or coarse aggregate has been thoroughly investigated and found to meet basic quality and uniformity requirements, an acceptable Quality Control Program is established by the Department with input from the producer prior to approval. Sources listed under Section A, B and C of the Qualified Products Lists will be allowed to certify their aggregates at the source, thereby eliminating the necessity of pretesting on the project, unless non-uniform or non-specification material is suspected. To qualify for an approved quality control program, the following control requirements must be met:

A. Quality System

1. General

   An acceptable Quality Control Program must be in effect based upon plant and deposit characteristics, type of materials to be certified, as well as any available history. The items listed in the following subsections reflect standard policies of the Department. These policies are not all inclusive. There may be other handling procedures that are either permissible or non-permissible but are not specifically addressed herein. The Department will initiate and implement additional policies as necessary to insure adequate quality control.

2. Production

   Production control will generally be at the producer's discretion. However, the Department may specify production control measures for specific problems that are detected or anticipated due to characteristics of the deposit, recycled raw material, and/or production processes. This may be required as a prerequisite to source approval, or as an amendment necessary to maintain status of a source already on the Qualified Products List.

   Special production requirements for recycled concrete base produced from unknown sources of concrete demolition waste.

   Environmental requirements are as follows:

   - The Producer must have a Georgia Solid Waste Handling Permit (or the equivalent State permit if the material is produced from an adjacent state), and a copy must be on file at the producer's facility.

- All raw material must be screened and tested using Environmental Protection Agency test procedures for the presence of hazardous materials and asbestos, and final product(s) must be certified as non-hazardous prior to shipment.

Recommended production procedures are as follows:

- Ensure that the stockpile of raw material being processed is of sufficient size to allow spreading of material from a single source over a large area thereby avoiding pockets of similar material. Stockpiles of raw material should not be less than 25 feet in height.
- Ensure that stockpiles of raw material are not constructed by dumping incoming material directly over the side, ends or loading face; by pushing incoming material directly over the side or ends prior to placing a quantity sufficient to represent the total product; or by pushing over the loading face where material is actively being reclaimed for processing.
- Ensure that production controls are in place to remove steel reinforcement, wood, clay balls, soils, epoxy expansion material and non-construction material and to ensure that brick, asphalt and weathered rock do not exceed specification limits.
- The use of a telescoping radial stacker is required to ensure that the finished product is stockpiled in such a way to evenly distribute or dilute any contaminants or variations in material.

3. Certified Aggregate

a. Certification of aggregate by testing

Aggregate products will be considered certified when test results are within specification limits and the producer is in compliance with Departmental policies related to certified personnel and laboratory facilities. (See Section V.B "Approved Laboratory", V.C "Certified Personnel, and V.D "Producer Testing").

b. Certification of aggregate as it relates to product handling and shipping

In order to ensure aggregate products of consistent quality, proper handling and shipping procedures must be followed. **Certified personnel must be present and actively performing quality control duties when aggregate is being shipped to Departmental projects or approved concrete or asphalt plants.**

1) Shipment from bins

Production and load out must be accomplished in such a manner that consistency in quality and specification compliance can be expected. Bins shall be maintained at least ¼ full during active load out. Bins shall be inspected daily for contamination. Contaminated materials are not to be shipped.

2) Shipment from stockpiles

a) Stockpiles under stationary conveyors

Coarse aggregate for asphaltic concrete may be supplied directly from a stockpile under a conveyor provided:

i. The height of the stockpile is controlled to minimize segregation.
ii. The producer informs the customer and the customer agrees to and accomplishes proper restocking prior to use.
iii. Gradation control problems are not experienced at the asphalt plant.

Problems experienced with any of the above listed items will result in discontinued use of this practice by the producer. No other aggregate products are to be supplied from stockpiles situated underneath a conveyor belt.

b) Stockpiles that were placed by Non-Telescoping Radial Stackers and have not been restocked

Graded aggregate base shall not be loaded out from these type stockpiles. It will generally be acceptable to load out other aggregate products from these type stockpiles provided:

i. The height of the stockpile is adequately controlled to minimize segregation.
ii. Load out is accomplished from the ends only and not from front to back or back to front and not from current production.
iii. Gradation control problems are not experienced.

Problems experienced with any of the above listed items will result in discontinued use of this practice.

c) Stockpiles that were placed by telescoping radial stackers and have not been restocked

All materials may be loaded out from the ends of stockpiles that have been placed in multiple arcs and lifts. The height of such stockpiles may be restricted for aggregate with specific gradations and cleanliness requirements to control segregation.

d) Stockpiles of aggregate with specific cleanliness and gradation Specifications

These materials shall not be loaded out from stockpiles that have sporadic pockets, lenses or strata of non-specification materials, such as occurs from contamination and degradation that results from ramping onto crushed stone products.

e) Stockpiles of graded aggregate base and fine aggregate for asphaltic concrete

Load out shall <u>not</u> be from stockpiles that are being or were constructed by:

i. Dumping production directly over the side, ends or loading face.
ii. Pushing production over the sides or ends prior to placing a quantity sufficient to represent the total product.
iii. Pushing over a loading face during active load out.
iv. Using materials that do not meet Specifications during the production process.
v. Placing in a single lift only or in heights of less than 12 feet (applicable only to graded aggregate base)
vi. Are being added to when the existing inventory is less than 2000 tons (0.9 Mg).
vii. Consists of less than 2000 tons (0.9 Mg) prior to commencing shipment.

Correct handling and load out of materials, including cleanliness of haul units and accurate identification of product, are recognized as the Producer's responsibility, and are considered an integral part of the Quality Control Program. **Refer to the Appendix, "Correct Stockpiling and Material Handling Procedures."**

Marginal quality materials are not to be certified. (See Section IV.A for a definition of marginal material.)

B. Approved Laboratory

Laboratory equipment and facilities must be certified to meet the minimum requirements as set forth by the Department of Transportation. A certification document must be posted in the laboratory, and recertification must be made on a yearly basis or as indicated by need. Minimum laboratory requirements are listed below. Those requirements that pertain only to coarse versus fine aggregate sources are so indicated. All other requirements pertain to both.

- Capability to maintain a minimum temperature of 70ºF (21ºC).
- Scales having a maximum capacity of not less than 50 lbs. graduated to 0.1 lb. or less and calibrated to an accuracy of ±0.1 lb. (Coarse aggregate sources)
- Scales having a maximum capacity of not less than 5,000 grams, graduated to 0.1 gram or less and calibrated to an accuracy of ±0.5 grams.
- Coarse Aggregate splitter. (Coarse aggregate sources)
- Fine Aggregate splitter.
- Adequate drying device.
- Sink and running water.
- Sand Equivalent kit.
- Gilson-type, coarse aggregate, sieving device in good working condition. (Coarse aggregate sources)
- Coarse aggregate sieves in good condition (no enlarged openings or loose mesh). Sizes: 1½", 1", ¾", ½", ⅜", No. 4, No. 8, and No. 10. (Coarse aggregate sources)
- Fine aggregate sieves in good condition (no enlarged openings, holes or sagging mesh). Sizes: ⅜", No. 4, No. 8, No. 10, No. 16, No. 30, No. 50, No. 60, No. 100, No. 200, pan, and a 12" No. 200 sieve for washing material.
- Electronic or hand dial calipers. (Coarse aggregate sources)
- Fine aggregate shaker or approved alternate.
- An orderly filing system.
- An area free from vibrations for Sand Equivalent testing.

- Sand Equivalent solution jug placed 36" – 46" above working surface where graduated cylinders are placed.
- Lab certificate
- A computer with the Site Manager/AASHTOWare software and an internet service provider (ISP) connection. The minimum/preferred computer requirements are listed below.
    - Computer: IBM PC or compatible
    - Software: Windows 98 – Preferred: Windows 2000 or Windows XP
    - Processor: Intel Pentium III or better (above 500 Hz) – Preferred: 2.5 GHz.
    - RAM: 256 MB – Preferred: 512 MB or better
    - Hard Drive: 10 GB or better with 500 MB of free space.
    - Pointing Device: Mouse or other Windows-compatible pointing device.
    - Floppy Disk Drive: 3.5-inch 1.44 MB Floppy disk drive.
    - Multimedia: CD-ROM drive.
    - Display: Super VGA (1024 X 768 pixels.
    - Printer: Windows-compatible laser or ink jet printer.
    - Internet: Dial up okay for uploads, but slow for download installation – Preferred: DSL or Cable.
- Additional lab equipment may be required based on testing need. This may include but is not limited to: L.A. Abrasion Machine, Specific Gravity Tank (Coarse aggregate sources) and Color Testing Equipment (Fine aggregate sources).

In addition, the building itself shall have a minimum of 240 square feet of floor space. This area is to be separated into two parts, one for testing and the other for clerical and office type activities. The testing area shall have adequate table or counter space for preparing samples, as well as adequate cabinet space for equipment storage. The other area shall be environmentally acceptable for clerical and office type work. It shall contain a desk and adequate filing space.

Note: Any modifications to the above must be approved by Area Aggregate Engineer.

C. Certified Personnel

The producer's sampling and testing personnel must be certified to sample aggregate and to perform the various tests required by the Office of Materials and Testing. The individuals certified will be issued a certification which will be subject for review and revocation for cause.

1. **Certification of Quality Control Technicians**

   The certification of quality control technicians will be administered by the Pit and Quarry Branch. The certification process will consist of a written examination (depending upon type of aggregate source) given at the Office of Materials and Testing in Forest Park, Georgia and a laboratory examination (or "hands on" examination) conducted by Pit and Quarry personnel in the laboratory of the aggregate source where the technician is employed.

   After passage of the written (if required) and laboratory examinations, a quality control technician will be assigned a technician number and issued a certification card. The certification card will list the tests the technician is certified to perform. The technician's certification will be valid for three years.

   a. **Written Examination**

      Because of the various types of aggregate sources on Qualified Products Lists 1 and 2, the type of written examination will depend on the aggregate source where the technician is employed. Examinations will be tailored specifically for technicians working at the following types of aggregate sources.

      - Standard coarse aggregate sources and coarse aggregate vending yards
      - Temporary, coarse and fine, crushed stone sources
      - Natural sand sources (standard and temporary)

      Written examinations are performed by the Quick Start Program, which is part of the Technical College System of Georgia. The examination will be open book, and a score of 75 or above will be required to pass. In the event that a person does not pass the examination, it may be taken again after a minimum period of 30 days. If the technician does not pass the examination on the second attempt, it may be retaken after a minimum period of 90 days. If the technician does not pass the examination on the third attempt, it may be taken annually thereafter at intervals of not less than one year between examinations.

Technicians conducting testing at temporary sources of recycled or excavated project material and at fine aggregate vending yards will be required to take the laboratory examination only.

b. **Laboratory Examination**

For the laboratory examination, the technician will perform the tests that he/she will be required to perform to certify their aggregate. The types of tests performed may vary, depending upon the type of aggregate source or its geologic characteristics.

2. **Recertification of Quality Control Technicians**

A technician's certification will expire three years from the date of issuance of the certification card. Technicians may renew their certification by retaking and passing the written and laboratory examinations prior to expiration of their certification. It will be the technician's responsibility to track his/her training and credit hours. Training may be substituted for retaking the written examination. A minimum of 12 credit hours of training is required (Table 1). Any combination of the following training may be counted toward the 12-hour total. Specific training will be required for recertification only where indicated. Any of the listed training may be repeated annually. **Credit for training other than that listed below will be considered on a case-by-case basis.**

- Attendance of industry conferences, meetings, and symposia (such as those sponsored by the Georgia Construction Aggregate Association, the Portland Cement Association, the American Concrete Pavement Association, the Georgia Highway Contractors Association, or the Georgia Partnership for Transportation Quality, etc.). (4 hours)
- Attainment of a regional or national certification, such as the American Concrete Institute certification. (6 hours)
- Attendance of industry-sponsored training given by outside consultants or internal training personnel (6 hours if comparable to the GDOT training class). The training must be approved by the State Materials and Research Engineer. The producer must inform the GDOT as to the date and location of the training at least one week prior to the training, and the GDOT reserves the right to attend the training.
- Attainment of another State's certification. (2 to 4 hours, depending on requirements).
- Attendance of quality control/sampling training ("winter training") conducted by the Pit and Quarry Branch for Testing Management Branch personnel. (1 to 4 hours, depending upon content). This training is usually conducted at a local quarry.

Training may not be substituted for the laboratory examination.

The requirement for recertification of technicians at natural sand sources (producers of products 10NS and 20NS), at temporary sources of recycled or excavated project material, at Type 2 temporary sources, and at fine aggregate vending yards will consist of the laboratory examination only. See Table 1.

Table 1
CERTIFICATION AND RECERTIFICATION
REQUIREMENTS BY SOURCE TYPE*

SOURCE TYPE	INITIAL CERTIFICATION	RECERTIFICATION
Standard "C" Sources	Standard Examination Laboratory Examination	Standard Examination OR 12 hours training PLUS Laboratory Examination
Vendor Sources (Coarse aggregate products)	Standard Examination Laboratory Examination	Standard Examination OR 12 hours training PLUS Laboratory Examination
Vendor Sources (Fine aggregate products)	Laboratory Examination	Laboratory Examination
Temporary Sources – Type 1 (Crushed stone sources not able to certify sized stone for concrete or asphalt, but do certify all other products)	Standard Examination Laboratory Examination	Standard Examination OR 12 hours training PLUS Laboratory Examination
Temporary Sources – Type 2 (Mainly out-of-state, fine and coarse, crushed stone sources supplying precast or prestressed concrete plants)	Temporary Source Examination Laboratory Examination	Laboratory Examination
Natural Sand Sources (Standard, Blend, and Temporary)	Natural Sand Examination Laboratory Examination	Laboratory Examination
Temporary Sources of Material Excavated or Produced (Recycled) on a Project	Laboratory Examination	Laboratory Examination

***Certification and recertification requirements for personnel employed by private testing laboratories will be considered on a case-by-case basis.**

3. **Revocation and Reinstatement of Certification**

   An individual's certification may be revoked for misconduct in regard to quality control activities. Indisputable, willful falsification of test results will be grounds for permanent revocation of certification. Suspension of certification for all other misconduct will be for at least 60 days. After 60 days, certification may be reinstated after written appeal to the State Materials and Testing Engineer.

D. Producer Testing

The Producer will sample and test at a specified frequency for each type of material being certified. Producer certification will be in the format of DOT forms 640 and 641. Test data will be reviewed during regular inspections by Pit & Quarry Control personnel. The certification data will be electronically transferred to the Office of Materials and Testing at a frequency of not less than once per two weeks.

E. Frequency of Producer Tests

The Minimum Testing Frequencies established for each type material in accordance with Item "D" will remain in effect until evidence of unacceptable material or proof of uniformly acceptable material warrants an increase or decrease, respectively, in the testing frequency.

F. Comparison Tests

To insure uniformity of testing between the Department and the Producer, comparison tests will be run at least annually by the Producer and the Department.

G. Product Certification Restrictions

Sources listed on Qualified Products List 2 - Section A, B or C, may be restricted from certifying a certain product or products. This may be due to deposit characteristics, production capabilities, inadequate Quality Control, lack of testing capability for a specific material or substandard product ratings. In these instances, use of such products may be allowed under stockpile basis or other stipulations as deemed necessary by the Department for adequate control. In the case of substandard product ratings, specific guidelines are outlined in the aggregate rating procedure for resuming certification of the product.

H. Separation of Sizes and/or Type Materials

Since different materials require different combinations for production of asphaltic concrete, Portland cement concrete, graded aggregate and other mixtures, material of different sizes and/or types must be kept separated and properly identified.

VI. Policy for Departmental Testing, Acceptance, and Use of Certified Aggregates

A. Use of Certified Aggregate

The eligibility of a source to certify material is defined under each section of the Qualified Products Lists. Aggregate delivered from a source with an approved quality control program will be certified by the Producer to comply with the Specifications. Use of materials delivered from these sources will not be delayed pending completion of agency testing unless non-uniform or non-specification material is suspected.

B. Agency Testing and Inspections

To verify the quality of materials actually incorporated into the work and to evaluate the Quality Control Program, certain materials evaluation procedures will be followed. These are listed below:

1. Periodic Inspection by Geologists

   Thorough inspections will be made periodically by a geologist of the Pit and Quarry Control Branch. Generally, this will occur annually. The primary purpose of these inspections is to:

   a. Evaluate the condition of existing aggregate inventories which may be shipped for departmental use.

   b. Determine changes in material character and production processes which have occurred since the last inspection.

   c. To forecast problems so that control provisions can be established at an early date.

2. Independent Verification Testing

   Personnel from the Pit and Quarry Control Branch will sample and test at an unspecified frequency at the source and as needed on the project. These tests will be used to assist in verification of compliance to Specifications and Quality Control Programs.

3. Acceptance Sampling and Testing

Project control or acceptance samples will be routinely taken by Testing Management personnel on the project or at the plant. Specific lots or shipments will not be tested for acceptance except as provided for in the "Sampling, Testing, and Inspection Manual."

4. Independent Assurance Program

   Independent Assurance (IA) provides an independent verification of the reliability of the acceptance (or verification) data obtained by the agency and the data obtained by the contractor. The results of IA testing are not to be used as a basis of acceptance. IA provides information for quality system management.

C. Review of Test Results

The Pit & Quarry Control Branch of the Office of Materials and Testing will review and evaluate all test reports from all parties to assess the effectiveness of the Quality Control Program. It will be the responsibility of the Pit & Quarry Control Branch to determine the need for further evaluation or changes in the Quality Control Programs and/or the approved status of sources. In addition, the Quarry Certification Samples will be used to compute "ratings" for those sources listed on QPL 2, Section A, B and C.

VII. Removal and Reinstatement to Qualified Products List, Sections A, B, and C

A. Removal

1. Inadequate Quality Control

   Producers having inadequate Quality Control will be removed from Sections A, B or C of the Qualified Products List, whichever is applicable. In this instance, provided the Producer desires to supply materials for Departmental use, the source may be placed under Section D - "Stockpile Basis Only" of the Qualified Products List.

2. Change in Deposit or Specification

   Whenever a source is removed from Section A of the Qualified Products List due to reasons beyond the Producer's control rather than failure of the Quality Control Program, the Producer, at his request, will be considered for placement under Section B - "Temporary Sources." This would be in lieu of placement on the "Stockpile Basis Only" list and would allow for producer certification of specific items that meet applicable Specifications.

3. Non Use

   It is the policy of the Department to remove sources from the Qualified Products List when materials are not received for a Departmental project for a period of twelve (12) months.

B. Reinstatement

After being removed from Section A, B or C of the Qualified Products List, a source may be reinstated after meeting applicable requirements as outlined under Section IV and reestablishing an acceptable Quality Control Program as outlined under Section V of this Standard Operating Procedure.

VIII. Assistance to Producers

In an effort to stimulate and promote the aggregate industry and to foster a competitive atmosphere in the production of high quality materials, a number of services are extended to producers. The services available are as follows:

A. Unofficial Samples and Evaluation of Results

A limited number of unofficial or preliminary samples of aggregate or cores supplied by owners of prospective sites or from pits or quarries currently being mined, will be subjected to quality tests in the Laboratory. The number of tests provided will only be those which can be accommodated by the personnel and facilities available after the normal workload is accomplished.

The Department will offer an informal interpretation of test results as to how the data may relate to specification aggregate production. These evaluations are advisory only and are not binding on any future action by the Department of Transportation. The Department also does not accept responsibility for the accuracy of any information provided.

B. Producer Quality Problems

The Pit and Quarry Control Branch will offer limited assistance in determining effective methods of controlling gradation or other quality problems that arise due to the production process, handling procedures or deposit characteristics. Early cooperation between the Producer and the Department can serve to prevent shortages of specification materials and construction delays at a later date.

IX. Samples for Complete Analysis

Samples for complete analysis will be secured from each source by Pit and Quarry Control personnel on a regular basis. This data will be used to monitor compliance with the quality requirements of the Specifications. It will also be used to provide test data for annual publication of the Qualified Products Lists as well as to monitor consistency of characteristics that affect designs, batching and other construction applications.

A. Source of Samples

Samples will generally be taken from current production at the source. With consideration to economics, samples from out of state or other long distance sources may sometimes be taken from a project or plant site rather than at the source of origin.

B. Frequency of Complete Analysis Testing

In order to maximize efficient use of manpower, samples submitted for complete analysis will not be subjected to the full range of specification tests unless specifically requested. Specific Gravity tests will be performed on all samples for complete analysis. The frequency of other tests such as abrasion and soundness will be monthly, quarterly, biannually or annually based on the history and consistency of the deposit.

C. Sample Size

Samples submitted shall be representative of the quality of the material being sampled. Coarse aggregate samples should have a minimum weight of 75 pounds (35 kg). Fine aggregate samples should have a minimum weight of 15 pounds (10 kg). However, with consideration to handling and lifting safety, no single bag or container should weigh in excess of 40 pounds (20 kg).

X. Department Of Transportation Materials Producer Files

A file on each Aggregate Producer will be maintained at the Office of Materials and Testing. These files contain source evaluations, geological reports and test results. Files will also include copies of Department of Transportation correspondence concerning the source. The Pit and Quarry Control Branch may also keep additional files as necessary to fulfill the responsibilities of the Branch.

A. Producer Review of Files

Producers may consult files for their respective source(s) upon notification to the Pit and Quarry Control Branch Chief. Appropriate personnel will be made available to assist in locating desired information and producing any copies needed.

B. Confidentiality of Producer Files

Data published on the Qualified Products List will be made available to the public in general. Any other information in the Producers' files will not be released to Non-Departmental or Non-Company employed personnel without written consent of an appropriate company representative.

State Materials and Research Engineer

Director of Construction

STANDARD OPERATING PROCEDURE 1

APPENDIX

CORRECT STOCKPILING AND MATERIAL HANDLING PROCEDURES

These procedures were developed in cooperation with the Georgia crushed stone industry, February 2000.

STOCKPILING TECHNIQUES FOR CLEAN STONE

DON'T CONE UP

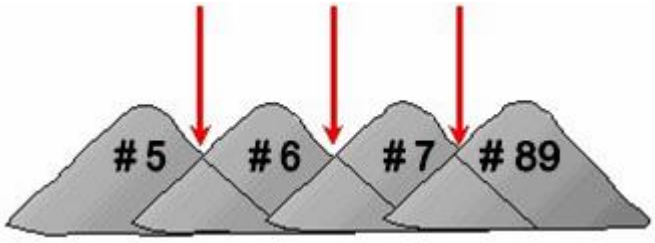
DO DUMP TIGHTLY IN SINGLE PILES

DON'T DUMP OVER THE END

DO STACK AS HIGH AS LOADER WILL REACH

DON'T OVERLAP SIZES

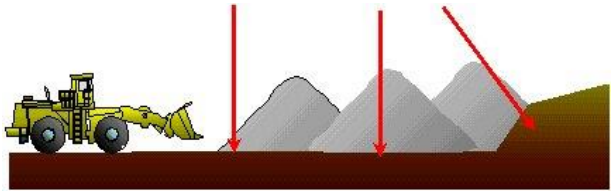
CONTAMINATION



DO SEPARATE DIFFERENT SIZES

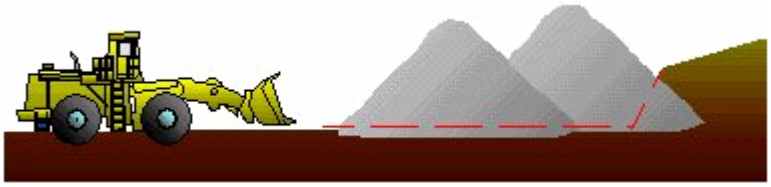
STOCKPILING TECHNIQUES FOR CLEAN STONE

DON'T DIG UP THE MAT

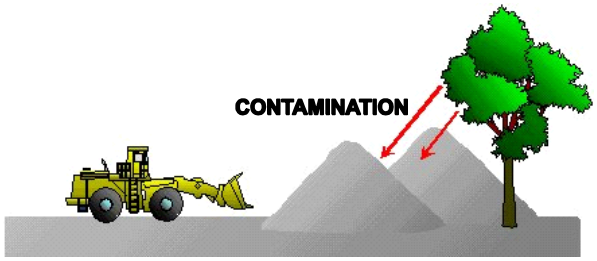


CONTAMINATION

DO KEEP THE BUCKET UP



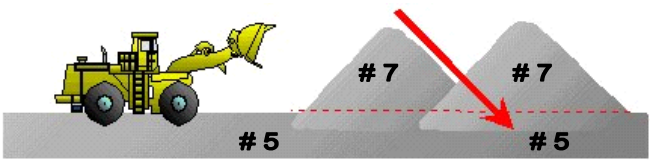
DON'T STOCKPILE
NEAR CONTAMINANTS



DO REMOVE CONTAMINANTS

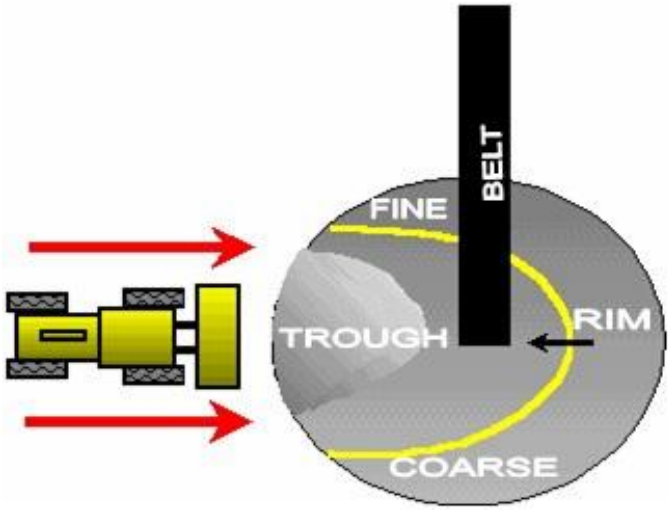
DON'T STOCKPILE OVER
LARGER SIZES

OVERSIZE



DO STOCKPILE OVER
SAME SIZE OR SMALLER

TO SHIP FROM PRODUCTION CONE

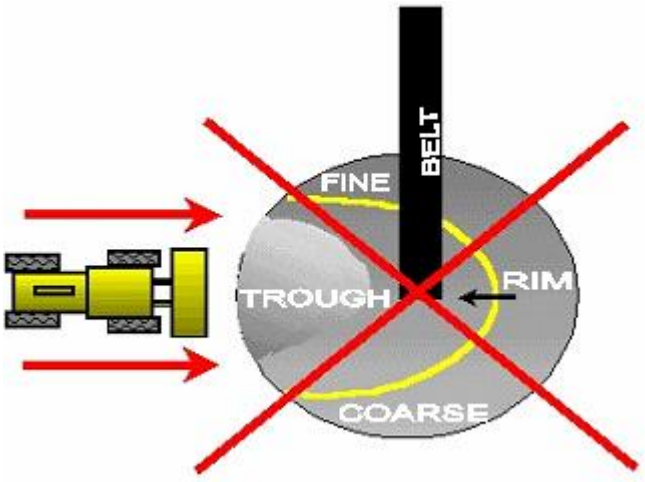


TO SHIP FROM THE PRODUCTION CONE
THE LOADOUT MUST BE EQUAL TO PRODUCTION

REALISTICALLY THIS DOESN'T HAPPEN

THEREFORE

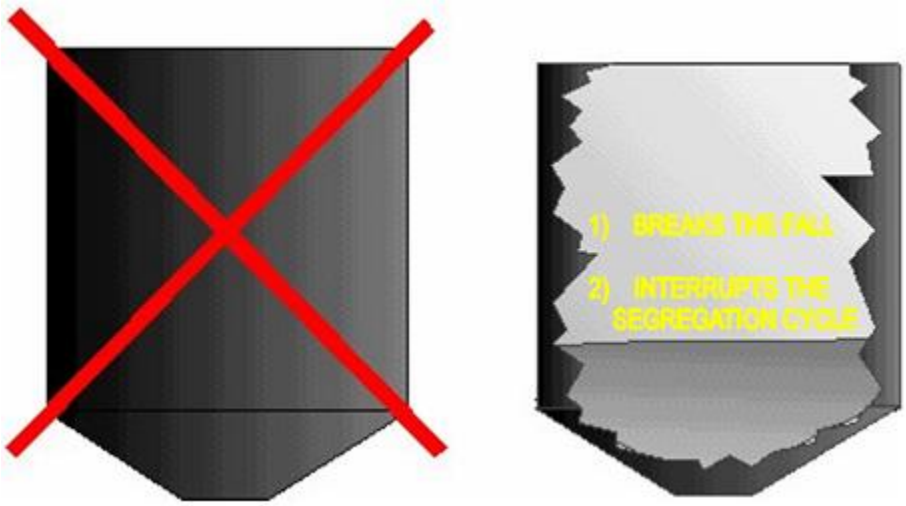
NO SHIPPING
FROM UNDER CONVEYORS



THIS INCLUDES NOT SHIPPING FOR PRIVATE JOBS IF SOME MATERIAL IS BEING RESTOCKED FOR D.O.T. USE.

BIN SEGREGATION AND DEGRADATION SOLUTION

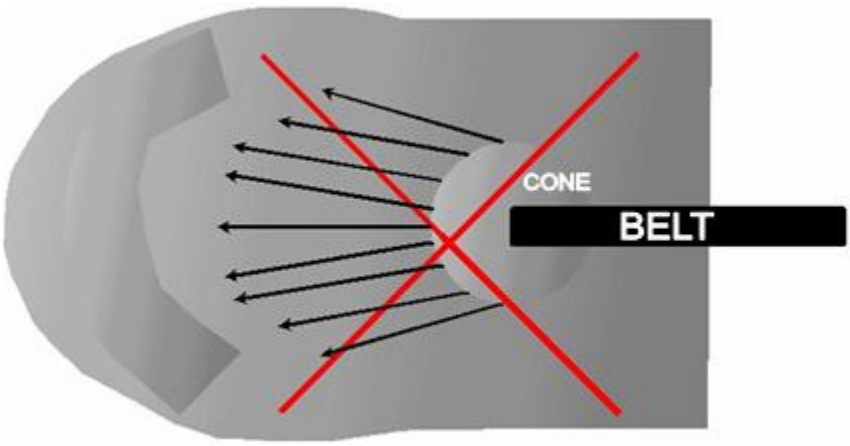
DON'T EMPTY THE BIN WHILE IN THE PROCESS OF SHIPPING. LEAVING MATERIAL IN THE BIN BREAKS THE FALL. ROCK ON ROCK DOESN'T BREAK AS BAD AS ROCK ON METAL. IT ALSO INTERRUPTS AND DISTORTS THE SEGREGATION CYCLE.



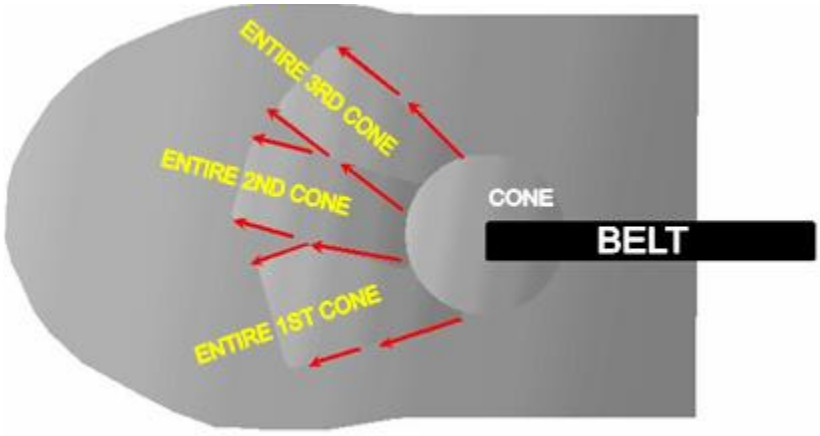
DO LEAVE THE BIN 1 / 4 OR MORE FULL, PREFERABLY 1 / 3

DON'T EMPTY IT!

G.A.B. STOCKPILE PUSHING METHODS



DON'T FAN OUT WHILE PUSHING A G.A.B. CONE

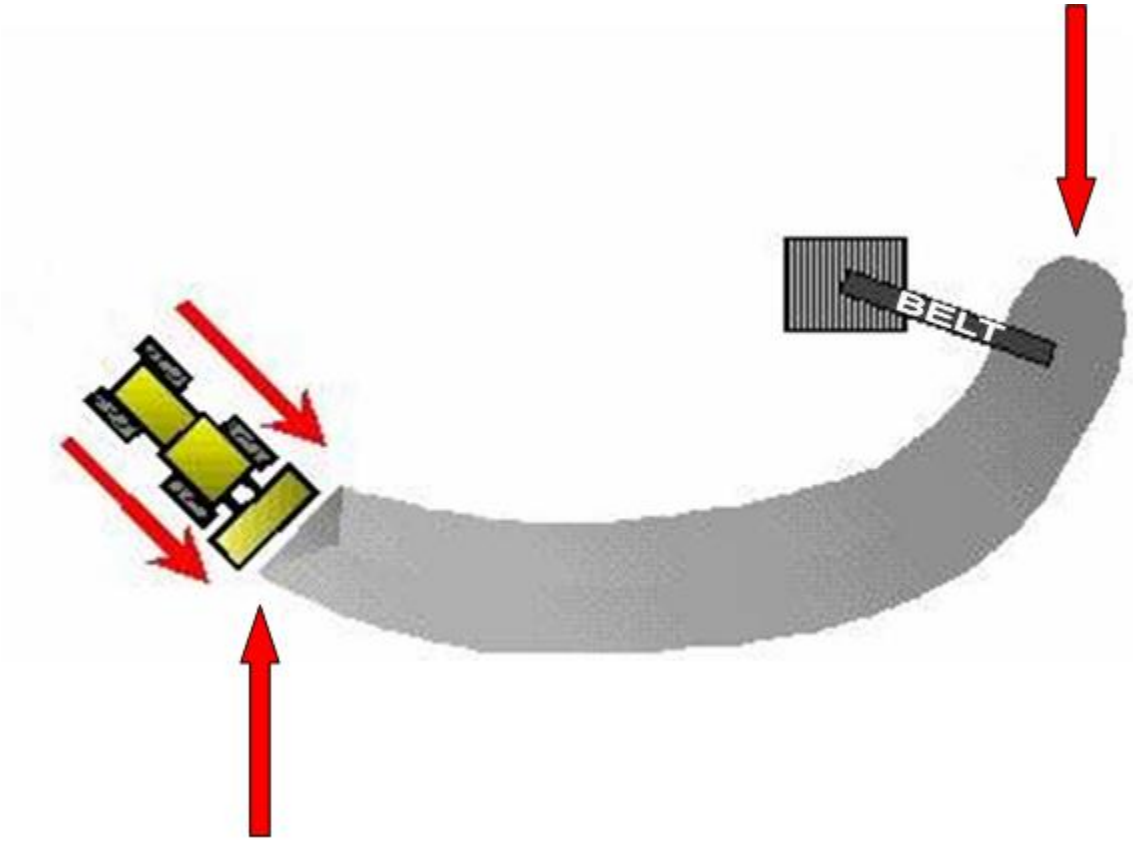


DO PUSH THE ENTIRE G.A.B. CONE IN ONE DIRECTION ONLY

RADIAL STACKER LOADOUT AND RESTOCKING

IT IS GENERALLY ACCEPTABLE TO LOAD OUT MATERIALS (OTHER THAN G.A.B.) FROM THE ENDS OF RADIAL STACKER STOCKPILES. THIS IS PROVIDED THE HEIGHT OF THE STOCKPILE IS CONTROLLED. A MAXIMUM HEIGHT OF 15 FEET IS USUALLY ACCEPTABLE.

DON'T LOAD OUT OR RESTOCK FROM HERE.
NEVER LOAD FROM CURRENT PRODUCTION.

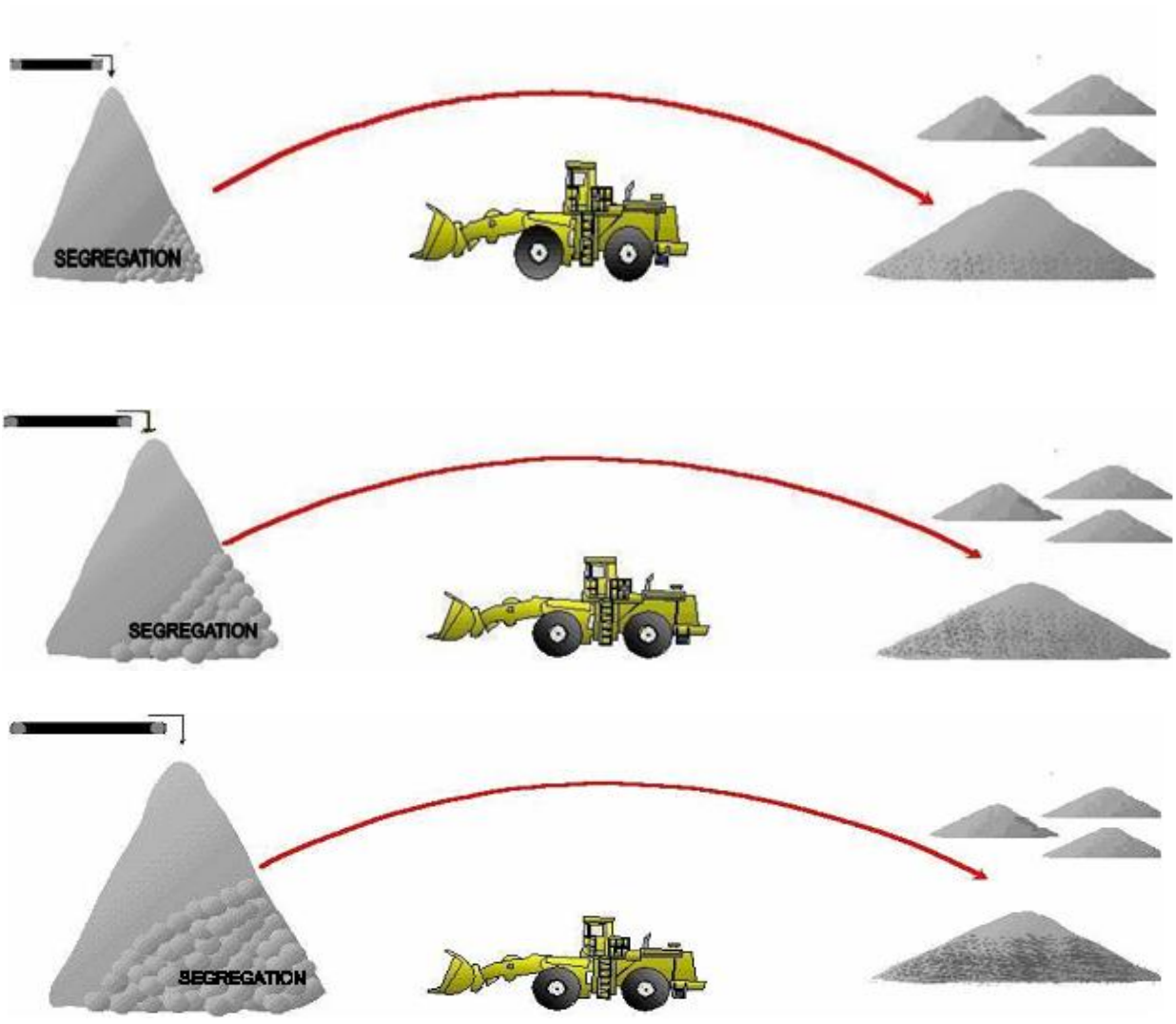


DO LOAD OUT OR RESTOCK FROM HERE, THE INACTIVE END

RESTOCKING TIP

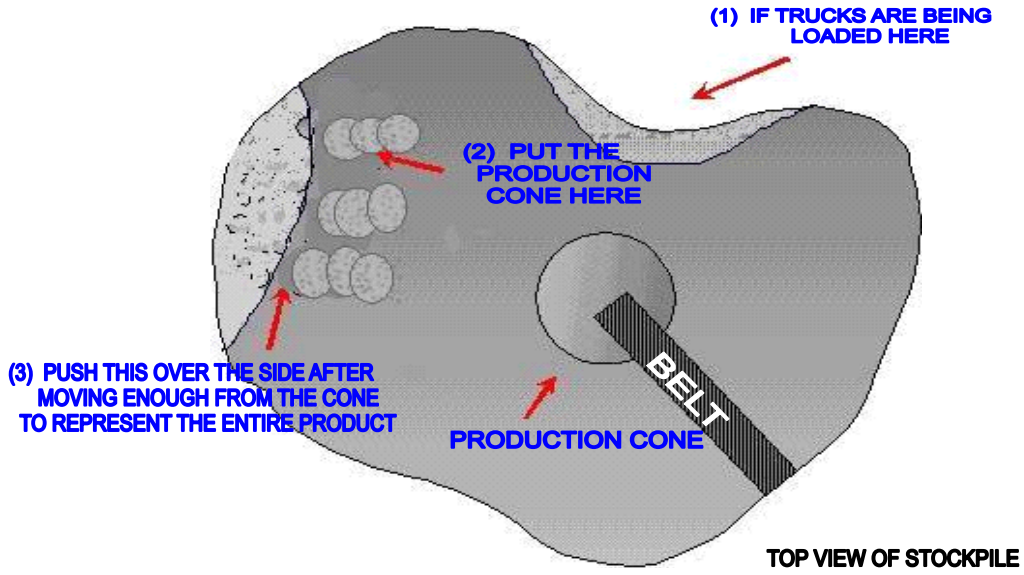
MOVE THE CONE FREQUENTLY AND CONTINUOUSLY

THE SMALLER THIS IS **THE BETTER THIS IS**

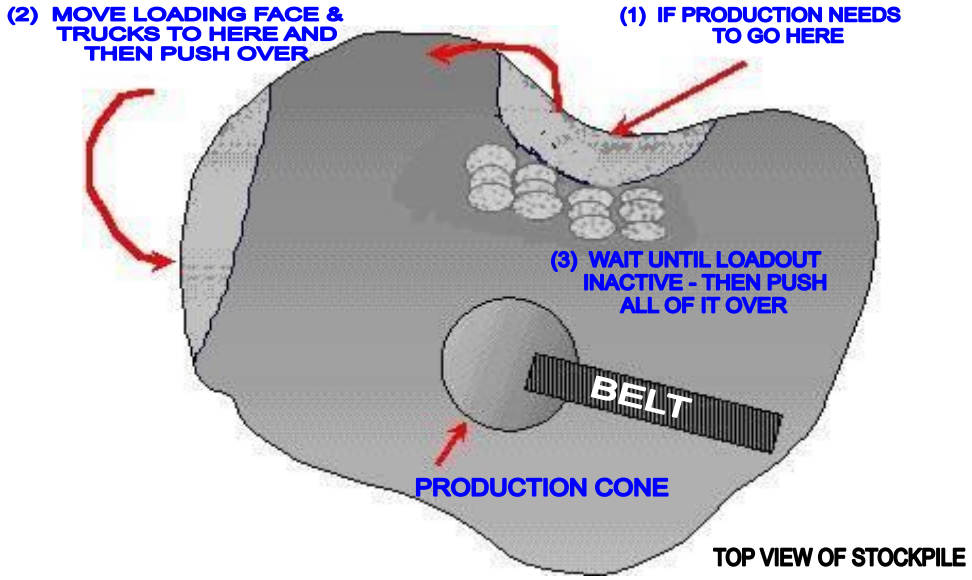


THE CONE CAN BECOME SO SEGREGATED THAT IT SIMPLY CANNOT BE RECLAIMED WITHIN SPECIFICATIONS. THIS IS PARTICULARLY TRUE WITH CLEAN STONE BECAUSE YOU CAN'T RAMP ON THE MATERIAL TO MIX LAYERS. IF YOU STOCKPILE FIVE LOADS THAT FAIL (TOO COARSE), YOU WILL SHIP FIVE LOADS THAT FAIL (TOO COARSE).

SIMULTANEOUS CONSTRUCTION AND LOADOUT OF STOCKPILES



OR

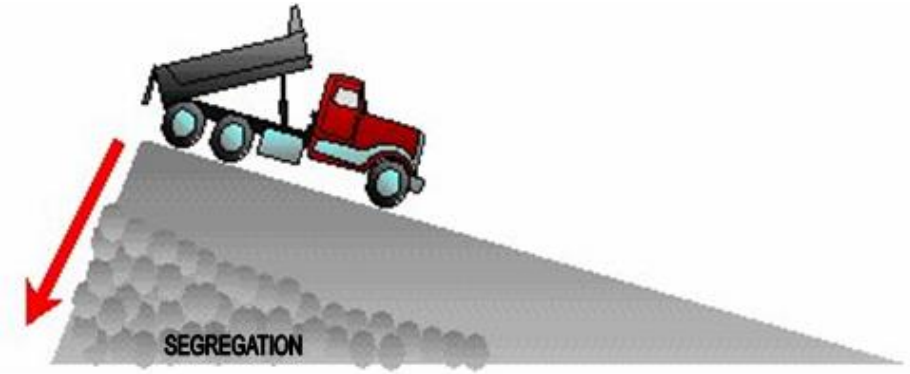


IMPROPER STOCKPILE CONSTRUCTION

IF AN ENTIRE STOCKPILE IS ALLOWED TO BE BUILT BY RAMPING ONTO IT AND DUMPING EACH LOAD OVER THE END…

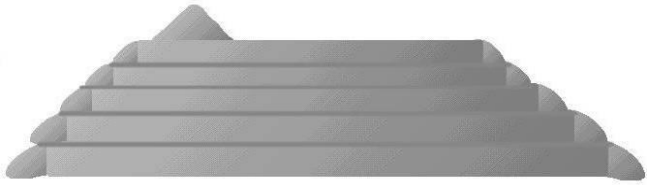
IT WILL SEGREGATE TO ITS FULLEST EXTENT…

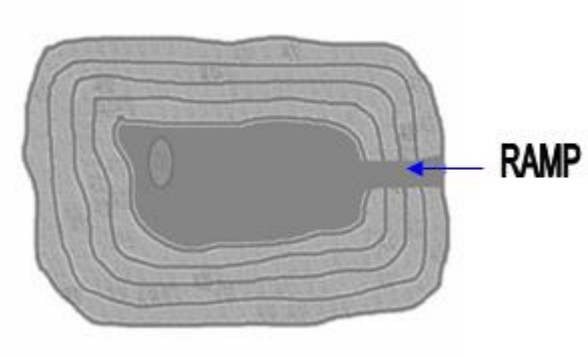
THE LARGER THE STOCKPILE BECOMES, THE WORSE THE PROBLEM IS.



G.A.B. AND ASPHALTIC MATERIALS

AFTER PLACING EACH LIFT, FLATTEN THE TOP SO THAT THE NEXT LIFT CAN BE CARRIED ONTO THE STOCKPILE. THE RAMP SHOULD BE NO LONGER THAN NECESSARY TO GET ONTO THE STOCKPILE. DURING THE PLACEMENT OF EACH LIFT, CARE SHOULD BE TAKEN NOT TO DUMP OR PUSH MATERIAL OVER THE EDGE OF THE UNDERLYING LIFT. ALWAYS STOP JUST SHORT OF THE EDGE.





SIDE VIEW OF STOCKPILE **TOP VIEW OF STOCKPILE**

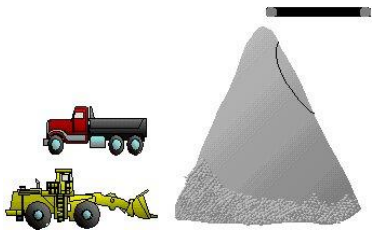
DO LEAVE TERRACES; DON'T LET ROCK ROLL OVER EDGES OF UNDERLYING LAYERS.

EACH LAYER SHOULD BE THE SAME THICKNESS ALL ACROSS THE STOCKPILE. THE COMPLETED STOCKPILE SHOULD BE RELATIVELY FLAT, NOT WEDGE-SHAPED IN APPEARANCE.

IMPROPER LOADOUT METHODS

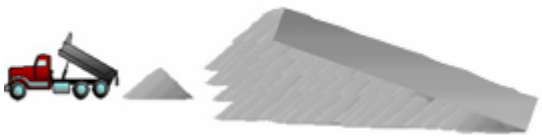
DON'T PULL THE BIN EMPTY

DON'T LOAD FROM UNDER THE BELT



DON'T DUMP OVER THE SIDE OR THE END OF A STOCKPILE

DON'T DUMP PRODUCTION IN FRONT OF THE LOADING FACE

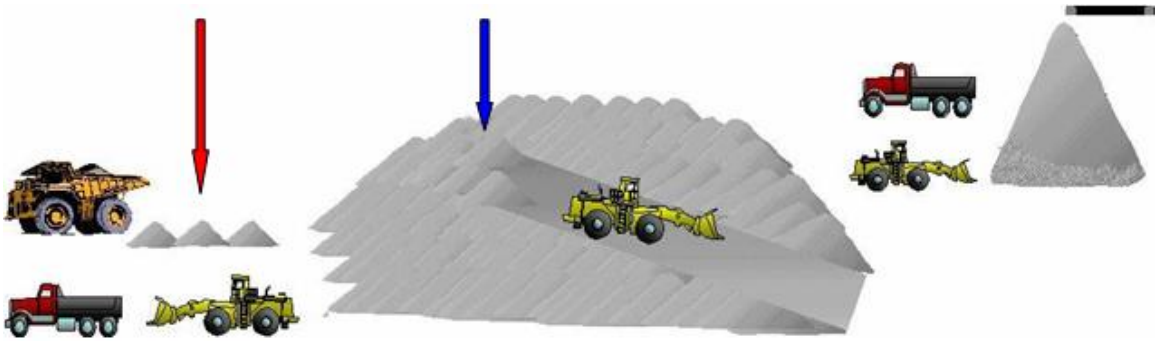


DON'T PUSH OVER THE LOADING FACE DURING ACTIVE USE

WHERE TO PUT PRODUCTION

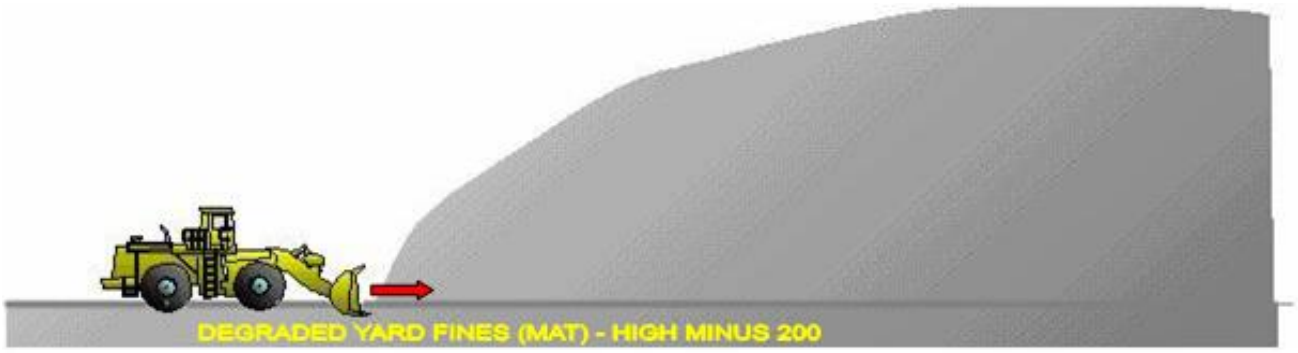
DUMPING PRODUCTION IN FRONT OF THE LOADING FACE IS NO DIFFERENT THAN LOADING FROM UNDER THE BELT.

NOT HERE **HERE**

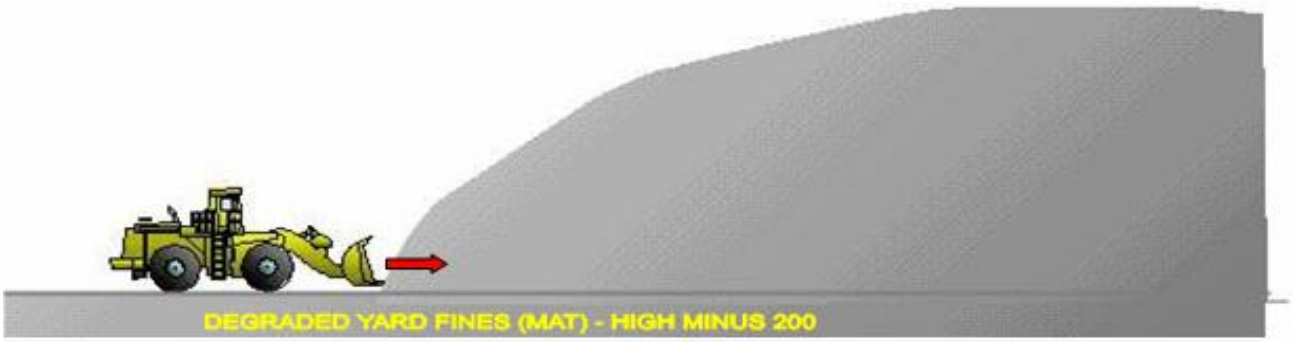


LOAD OUT FROM STOCKPILES

DON'T CONTAMINATE YOUR MATERIAL
BY DIGGING INTO THE MAT WHILE LOADING.



DO KEEP THE BUCKET UP AND MAKE SURE
THE BUCKET IS CLEANED OUT WHEN SWAPPING
FROM ONE SIZE TO ANOTHER.

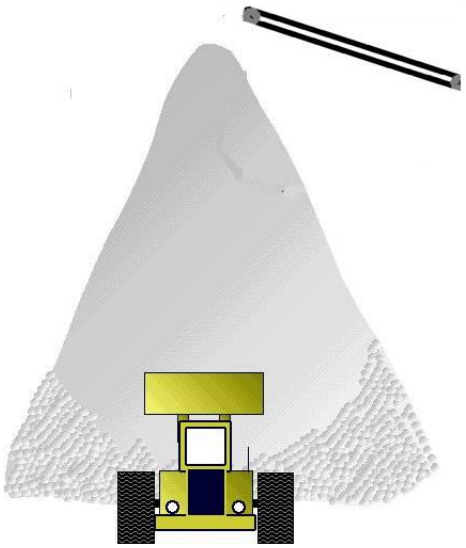


DO CHECK THE TRUCK BEDS -
IT ISN'T YOUR FAULT IF THE BED IS HALF FULL OF DIRT,
BUT WHO WILL SUFFER THE CONSEQUENCES AFTER IT
IS DELIVERED? IS YOUR CUSTOMER GOING TO PAY FOR IT?
IS THE TRUCK DRIVER?

RADIAL STACKER STOCKPILE LOADOUT TIPS

DON'T LOAD FROM CURRENT PRODUCTION

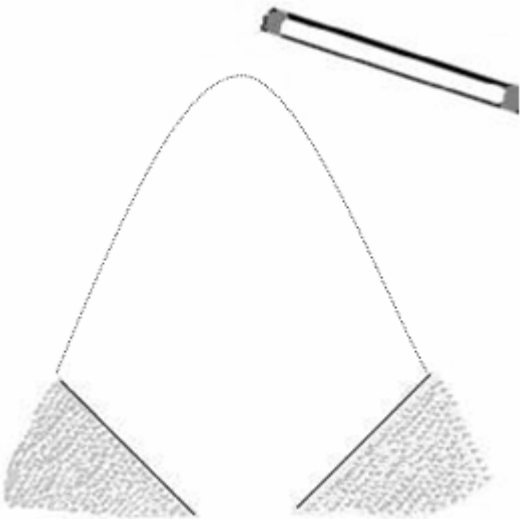
DO LOAD FROM THE INACTIVE END ONLY



DON'T LOAD FROM A STOCKPILE THAT IS TOO HIGH—MAXIMUM HEIGHT = 15 FEET

DO KEEP THE STOCKPILE SMALL ENOUGH THAT A REPRESENTATIVE PORTION OF ALL OF IT CAN BE PUT ON EACH LOAD

DON'T LEAVE THE TOES TO BE LOADED OUT BY THEMSELVES



DO KEEP THEM CLEANED UP AS YOU GO

STOCKPILING CLEAN STONE WITH A LOADER

DON'T STOCKPILE ON A MAT OF LARGER SIZE STONE OR DIRTY MATERIAL

DO STOCKPILE ON A CLEAN MAT, PREFERABLY OF THE SAME SIZE MATERIAL

DON'T LET MATERIAL ROLL FROM THE TOP TO THE BOTTOM OF THE STOCKPILE

DO LEAVE A SLIGHT TERRACE AT THE END TO STOP MATERIAL FROM ROLLING

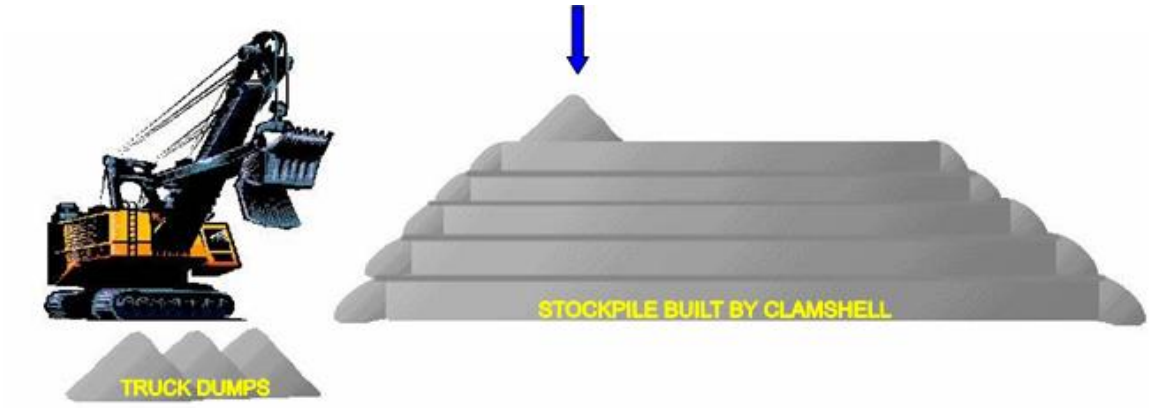
DO PLACE FIRST PILE ON BOTTOM AND SECOND ON TOP, AND STACK AS HIGH AS THE LOADER CAN REACH WITHOUT TRAVELING OVER THE STOCKPILE

DON'T CONE THE STOCKPILE UP

CONSTRUCTING LARGE STOCKPILES OF CLEAN AGGREGATES

DO CONSTRUCT THE STOCKPILE USING MULTIPLE LIFTS OF RELATIVELY UNIFORM THICKNESS, STOPPING JUST SHORT OF THE EDGE OF THE PREVIOUS LIFT.

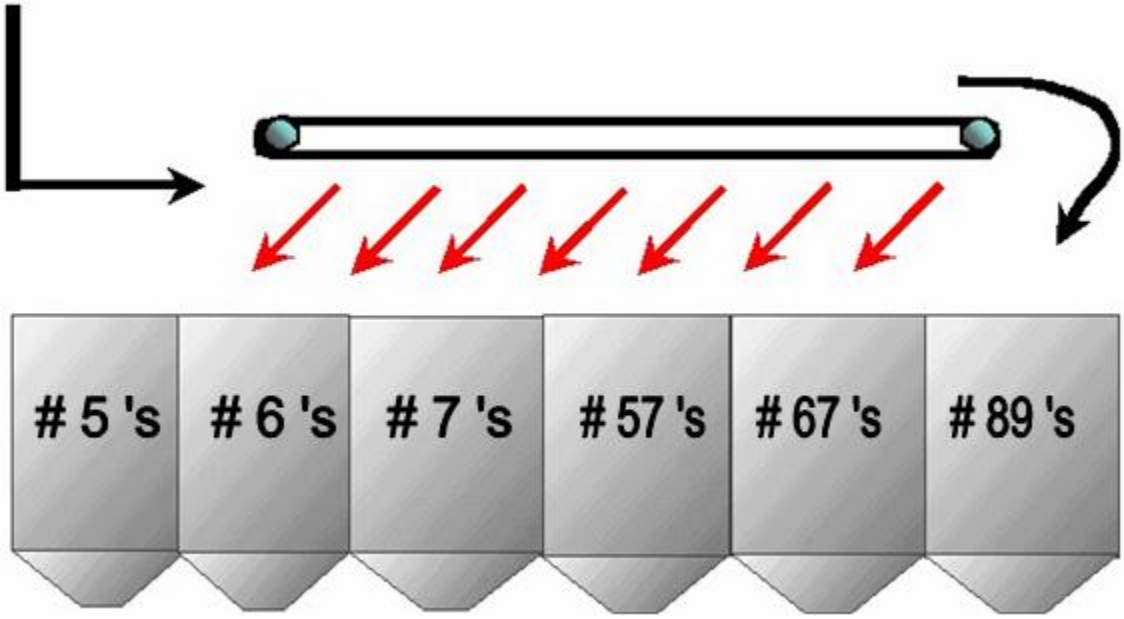
DO THIS



BIN CONTAMINATION

THE MOST COMMON CONTAMINATIONS THAT OCCUR IN BINS ARE:

A) OVERSIZE THAT HANGS IN THE BINS
B) OVERSIZE THAT HANGS IN THE CHUTES
C) OVERSIZE THAT BOUNCES FROM SCREENS OR CONVEYORS
D) FINES AND DIRTY WATER THAT STICK TO CONVEYORS AND DRIBBLES OFF ONTO OTHER AGGREGATES



- **CONTAMINATION FROM FINES IS TYPICALLY INSIGNIFICANT WHEN MATERIALS ARE STEADILY BEING LOADED OUT.**
- **CONTAMINATION BECOMES A PROBLEM WHEN A PARTICULAR BIN IS SUBJECTED TO IT FOR TOO LONG – INSPECT DAILY FOR FINES AND OVERSIZE.**
- **BE SURE TO INFORM THE SUPERVISOR OF WHAT YOU ARE OBSERVING – THERE MAY BE SOMETHING HE/SHE CAN DO TO MINIMIZE THIS TYPE OF CONTAMINATION.**
- **THERE IS NOTHING UNIQUE ABOUT THIS; IT HAPPENS ALL THE TIME. THE MAIN POINT HERE IS TO LOOK AT IT.**
- **BIN OPERATORS SHOULD ALSO CHECK TRUCK BEDS FOR CONTAMINATION PRIOR TO LOADING.**