SECTION 106

CONTROL OF MATERIALS

106.1 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

a. Sources of Supply.

(1) Use sources of supply that will generate materials that meet quality requirements. Sources of supply include quarries, pits, borrow areas, fabrication plants, right-of-way, and other sources from which the Contractor may obtain material.

(2) Notify the Engineer, in writing, of proposed sources of supply or changes in existing sources of supply unless the Contract Documents designate the source of supply. Provide this notice at least 10 business days before either producing material from that source or delivering material to the Project. When applicable, include the land ties of the sources. Assume all costs of acquiring sources of supply, including any exploration and development costs.

(3) The Engineer or Inspector will inspect, test, and then approve or reject Contractor-furnished sources of supply that KDOT has not previously approved. Do not use a Contractor-furnished source of supply without the Engineer's written approval.

(4) If an approved source of supply fails to yield acceptable material:

(a) stop producing material from that source until the Engineer approves the source again;

(b) provide material from another approved source; or

(c) perform a combination of **subsections 106.1a.(4)(a)** and **(b)**

(5) If an approved source of supply that KDOT required in the Contract Documents fails to yield acceptable material, the Engineer will compensate the Contractor for extra work under **subsection 104.6**.

(6) Inspection, testing, and approval of Contractor-furnished sources of supply are for KDOT's benefit, not to ensure Contractor quality control (QC) results. This inspection, testing, and approval is not a substitute for the Contractor's obligation to provide acceptable sources of supply.

b. Quality Materials.

(1) Use only materials that meet the Contract Documents' requirements. Unless specified otherwise, use new materials.

(2) The Engineer or Inspector will inspect materials. The Engineer, Inspector, or Contractor will test the materials. See **subsection 106.3**.

- After inspection and testing, the Engineer or Inspector will approve or reject the materials at the source of supply, at the Project site, or both;
- The Engineer or Inspector may reject materials at the Project site even if the Engineer or Inspector previously approved the materials at the source of supply;
- The Engineer or Inspector may reject the materials if, at any time, the Engineer determines the materials do not meet the Contract Documents; and
- The Engineer or Inspector may reject materials during or after incorporation into the work if the material does not meet the Contract Documents requirements.

(3) If material that has not been inspected, tested, and accepted is used, the Engineer may decide the work is unacceptable, reasonably acceptable, or unauthorized and require the removal and replacement of the material, or accept a price reduction for the material. See **subsection 105.5**.

(4) Inspection, testing, and approval of Contractor-furnished materials are for KDOT's benefit, not to ensure Contractor QC results. This inspection, testing, and approval is not a substitute for the Contractor's obligation to provide acceptable material.

c. "Buy America" Materials.

(1) Current federal regulations require the use of domestic iron and steel on federal-aid projects with limited exceptions. On federal-aid projects, use only iron and steel that have been manufactured, produced and processed in the United States. This includes any federally non-participating items.

If an iron or steel product meets at least one of the following conditions:

- It is specifically listed below

- It is used in pavements, bridges, tunnels or other structures
- It is at least 90% steel or iron by weight
- It is not identified as a miscellaneous component or subcomponent

then the product is subject to Buy America.

A list of products that are subject to Buy America coverage (regardless of % steel or iron content) include, but are not limited to, the following:

- Steel or iron products used in pavements, bridges, tunnels or other structures, which include, but are not limited to, the following: fabricated structural steel, reinforcing steel, piling, high strength bolts, anchor bolts, dowel bars, permanently incorporated sheet piling, bridge bearings, cable wire/strand, prestressing/post-tensioning wire, motor/machinery brakes and other equipment for moveable structures;
- Guardrail, guardrail posts, end sections, terminals, cable guardrail;
- Steel fencing material, fence posts;
- Steel or iron pipe, conduit, grates, manhole covers, risers;
- Mast arms, poles, standards, trusses, or supporting structural members for signs, luminaires, or traffic control systems; and
- Steel or iron components of precast concrete products, such as reinforcing steel, wire mesh and pre-stressing or post-tensioning strands or cables.

The miscellaneous steel or iron components, subcomponents and hardware necessary to encase, assemble and construct manufactured products are not subject to Buy America coverage. These include, but are not limited to, cabinets, covers, shelves, clamps, fittings, sleeves, washers, bolts, nuts, screws, tie wire, spacers, chairs, lifting hooks, faucets, door hinges, etc.

(2) On all federal-aid projects, all iron or steel shall have been manufactured, produced, and processed in the United States. Manufacturing processes include any process which modifies the chemical content, the physical size or shape, or the final finish of the iron or steel. These processes include initial melting, mixing, rolling, machining, extruding, bending, grinding, drilling, and coatings applied to iron or steel (including epoxy coatings, galvanizing, painting, and any other coating that protects or enhances the value of the iron or steel used).

(3) Obtain the Engineer's written approval before using any iron or steel that has not been manufactured, produced, and processed in the United States as permitted in this **subsection 106.1c.(3)**. With the Engineer's written permission, foreign iron and steel may be used if:

(a)The combined total cost of all the foreign iron used, steel used, or the cost of both iron and steel used when both are required does not exceed 0.1% of the total cost of the Project or $2,500.00 dollars, whichever is greater. The cost of the foreign iron used, steel used, or both includes material costs, manufacturing costs, assembly costs, transporting costs, and testing costs associated with the foreign iron, steel, or both.

(b) The Federal Highway Administration has waived specific products or processes according to 23 CFR 635.410, for the duration of that waiver.

The Contractor:

- Assumes the risk of including any foreign iron or steel in the Contractor's bid.
- Incurs any costs needed to remove and replace with domestic iron and steel the amount of foreign iron, steel, or both that exceeds 0.1% of the total Project costs or $2,500.00, whichever is greater.
- Has the obligation to remove and replace foreign iron and steel that exceeds 0.1% of the total Project costs or $2,500.00 whichever is greater. The obligation is regulatory and is not excused by:
  - Errors the Contractor, subcontractors, suppliers, fabricators, or other third parties make in determining the costs of foreign iron and steel as defined above.
  - The Engineer's approval under **subsection 106.1c.(3)**. The Contractor shall make no claim for contract adjustment (additional time, money, or both) because of the use of foreign iron or steel.

(4) Companies providing iron or steel or performing any manufacturing processes on the iron or steel shall include a "Buy America" statement on test reports and material certifications submitted to KDOT, the Contractor, or both. The "Buy America" statement shall identify the source of the iron or steel and the location(s) of the

manufacturing processes. The statement shall certify that the company issuing the test report or material certification complies with all provisions of the Buy America Act.

(5) This **subsection 106.1c. and "Buy America"** requirements do not apply to temporary items (Example: temporary sheet piling, steel scaffolding, and falsework) on the contract, even if these items are left in place with the Engineer's approval.

(6) After work is completed on the Project, submit to the Engineer a certification stating the dollar amount of foreign iron used, steel used, or both. Include material costs, manufacturing costs, assembly costs, transporting costs, and testing costs in the dollar amount. Identify a zero dollar amount if no foreign iron or steel was used on the Project.

(7) This **subsection 106.1c.** and Buy America requirements do not apply to 100% state funded projects.

106.2 MATERIAL SOURCES

a. Contractor-Furnished Materials. Provide all materials and acquire all sources of supply required to complete the contract except for those materials and sources of supply that KDOT provides under the Contract Documents (or by contract adjustment). Provide test reports or product certifications for all Contractor-furnished materials. Obtain the Engineer's written approval to use all Contractor-furnished proposed sources of supply such as borrow sites and aggregate sources among others.

b. KDOT-Furnished Materials. At its own expense, KDOT may provide materials, sources of supply, or both for the Contractor's use in performing the work. In the Contract Documents, KDOT may designate materials, sources of supply, or both that the Contractor may use in performing the work. When designated, these materials and sources are acceptable for the Contractor's use. KDOT assumes responsibility for the quality of these materials and sources of supply unless the Contractor's acts or omissions affect the quality or source of supply. These materials become the Contractor's property once the Contractor takes control. From a designated source of supply, determine the amount of equipment and work required to produce a material that meets the contract requirements. Expect variations in material quality and do not assume the entire deposit is acceptable. The Engineer may order procurement of material from any portion of a deposit. The Engineer may reject portions of the deposit as unacceptable.

c. Site Selection and Restoration. Obtain the Engineer's approval to use KDOT designated sources of supply for plant sites, stockpiles, and haul roads. Obtain the Engineer's approval to use the Project right-of-way, other KDOT right-of-way, or other KDOT property (mixing strips) for plant sites, stockpiles, and haul roads.

Where practical, do not store equipment or materials (including soil stockpiles) within 50 feet of rivers, streams or other surface waters. Where such storage is necessary, obtain the Engineer's written approval and include in the Project SWPPP appropriate best management practices for the storage area.

Locate borrow areas, gravel pits, and quarry sites so they are not visible from the highway, unless the Engineer approves otherwise.

Before using private property to obtain material, store material, operate a plant site, or perform other construction activity, enter into a written agreement with the landowner. When using private property for borrow, obtain all permits and clearances required for compliance as shown in **subsection 107.2**, (which most commonly includes wildlife and archaeological clearances).

When requested, provide a copy of the Contractor's agreement with the landowner. Submit a reclamation plan to the Engineer for the Engineer's approval. After ceasing to use private property, reclaim the site(s) according to the approved reclamation plan(s). Leave sites in a neat condition. Provide a copy of the landowner's release of the Contractor from further obligation.

d. Rights In and Use of Materials Found on the Work. When approved by the Engineer, the Contractor may use on the Project such stone, gravel, sand or other material determined suitable by the Engineer which may be found in the excavation. The Engineer will pay for both the excavation of such materials at the corresponding contract unit price and for the contract pay item for which the excavated material is used.

No charge for the materials used shall be made against the Contractor.

Do not excavate or remove any material from within the highway location which is not within the grading limits, as indicated in the Contract Documents without written approval from the Engineer.

Replace any excavated material removed for use in embankments, backfills, approaches, etc. with acceptable material at own expense.

106.3 SAMPLING, TESTING, AND CITED SPECIFICATIONS

The Engineer, Inspector, or both may inspect, test, and approve or reject all materials before, during, and after incorporation into the work.

The Engineer or Inspector will take or direct the Contractor to take all samples, except the Contractor's process control and QC samples. Sample and test the process control and QC samples. Upon request, KDOT will provide copies of test results KDOT performed. When the Contract Documents refer to an undated specification, standard, or test method that AASHTO, ASTM, GSA, or another recognized national technical association has adopted, the reference means the most recent published (including interim or tentative) specification, standard, or test method in effect on the Letting date.

The Secretary will pay the cost of all inspection and testing the Engineer or Inspectors undertake.

The Contractor shall:

- pay the cost of all materials that KDOT or the Contractor uses for sample testing;
- pay the cost of all testing the Contractor performs on quality control/quality assurance (QC/QA) projects;
- include such costs in the QC/QA bid item; and
- pay the costs of testing KDOT performs on materials that exceed contract quantities and testing that is requested but the Engineer or Inspector deems unnecessary.

If the Contract Documents specify one manufacturer's product, the Contractor may request the use of a product of another manufacturer unless the Contract Documents prohibit substitution. Submit the request to the Engineer and include:

- a complete description of the item;
- an explanation of how the alternate product meets the same standards as the product the Contract Documents specify;
- copies of shop drawings, catalog cuts, or both; and
- test reports or other descriptive literature, completely illustrating such items.

The Engineer alone determines whether the alternate product is acceptable.

Provide the Engineer required test reports or certifications for all materials incorporated into the work.

The Engineer may waive the testing requirements of small quantities of materials if the material is incidental to the work, a recognized commercial brand, or obtained from sources having a history of adequate QC.

On projects where Buy America requirements apply, note on shop drawings and catalog cuts that steel and iron used meets Buy America, unless otherwise specified.

106.4 CONTRACTOR QUALITY CONTROL REQUIREMENTS FOR QUALITY CONTROL/QUALITY ASSURANCE (QC/QA) PROJECTS

This **subsection 106.4** outlines general requirements for all types of QC/QA projects. Consult the particular section or subsection to obtain detailed process and QC requirements for a particular type of construction.

a. General.

(1) Provide personnel and equipment that meet Part V QC testing procedures.

(2) Provide the Engineer all reports, records, and diaries developed during construction activities. These documents are KDOT's property.

b. Quality Control Plan.

(1) At the pre-construction conference, submit in writing a Quality Control Plan (QC Plan) that meets Part V testing procedures (partially detailed below) for the Engineer's review and approval.

(a) List the names and phone numbers of all individuals and alternates responsible for QC administration and inspection. For each particular type of construction, supply one or more individuals who have complied with the technical certification requirements detailed in "KDOT Policy and Procedure Manual for The Certified Inspection and Testing Training (CIT) Program Manual". Only certified technicians may perform testing used for materials acceptance.

- The certification requirement applies whether the personnel belong to the Contractor's QC organization or private testing firms.

- Obtain the "KDOT Certified Technician Manual" from the KDOT Bureau of Materials and Research.

(b) On the organizational chart, show the specified lines of authority for both mix design and QC operations during production.

(2) The Engineer's review and approval of the Contractor's QC Plan are for KDOT's benefit, not to ensure QC results. This review and approval is not a substitute for the Contractor's obligation to control quality.

c. Testing Facilities.

(1) Locate the QC testing facility either at the plant site or adjacent to the Project site and in a place that is readily accessible to the Project. Before beginning mixture production, obtain the Engineer's approval of the testing facility, including the facility's location and the testing equipment. Obtain the District Materials Engineer's approval to put the testing facility in a location other than the plant site or adjacent to the Project site. Provide the QC personnel the space and testing equipment needed to meet Part V.

(2) Calibrate and correlate the testing equipment with prescribed procedures and conduct tests according to Part V testing procedures.

(3) To facilitate communication between the Contractor and the Engineer, equip the QC testing facility with the following:

(a) A telephone with a private line for the QC personnel's exclusive use.

(b) A copying machine for the Contractor's, Engineer's, and Inspector's use.

(4) In the testing facility, post a copy of the organizational chart from the QC Plan.

(5) Allow the Engineer access to the testing facility to observe testing procedures, calculations, test documentation, and plotting of test results among other items.

(6) If the Contract Documents require one, locate the Field Office and Laboratory (Lab) near the Contractor's testing facility. See **SECTION 803**.

d. Testing, Recording, and Data Presentation Requirements.

(1) Take all test samples at random locations, at the frequencies designated in the approved QC Plan, and at the rates specified in the KDOT Sampling and Testing Frequency Chart, Part V. Provide the Inspector with the random locations or frequencies before going to the job site to sample or test. The Engineer reserves the right to generate the random locations, frequencies, or both. If KDOT generates the random locations or frequencies, KDOT will provide notification prior to the sampling time.

(2) Record all original documentation in a bound field book or other KDOT approved bound record and turn over to KDOT at the end of the Project. Record and document all test results and calculations on data sheets KDOT has approved. Record specific test results on a daily summary sheet KDOT has approved. Base moving averages on 4 consecutive test results. Include in the Daily Quality Control Summary Sheet a description of quality control actions taken. Post and keep current QC charts showing both individual test results and moving average values. As a minimum, plot the single test values and the 4-test moving average values, as applicable, on KDOT-approved control charts. Keep control charts current on an ongoing basis. Plot results and limits as follows:

- individual test results for each test point in black. Connect those points with a solid black line;
- moving average for each test variable in red. Starting with the fourth test, connect those points with a dashed red line;
- KDOT verification test results with green asterisks; and
- specification working range limits for single test results with a green ink dotted line and for the 4-point moving average results with a green ink solid line.

(3) Store and retain all QC and verification samples for 7 business days.

(4) Provide test data as specified in the appropriate QC/QA construction specification.

e. Inspection by KDOT.

(1) The Engineer and Inspector reserve the right to run any test at any time to determine contract compliance.

(2) The Engineer or Inspector will inspect aggregates at the point of production for approved deposits, ledges, and beds. Do not produce aggregates from non-approved deposits, ledges, or beds. Immediately remove from the stockpile aggregates obtained from non-approved deposits, ledges, or beds.

(3) The Engineer or Inspector may test aggregates for acceptance at the point of usage. Remove and replace, repair, or otherwise correct, at the Contractor's expense, work incorporating aggregates from non-approved sources.

106.5 CONTRACTOR'S PROCESS CONTROL FOR NON-QC/QA PROJECTS

a. General.

(1) Provide and maintain an adequate process control system.

- Perform all inspections and tests necessary to meet the Contract Documents; and
- Provide materials and formulate design mixes that meet the Contract Documents.

(2) Assume responsibility for the process control of all aggregate and aggregate combinations during production, handling, stockpiling, blending, mixing, and placing operations.

(3) Perform all tests by personnel certified under the Certified Inspection and Testing Training (CIT_2) Program. Personnel may be certified by another program with approval of the Engineering Technician Training Coordinator.

b. Process Control Plan.

(1) Before beginning material production, submit in writing a Process Control Plan for the Engineer's review and approval. In the Process Control Plan, include the following:

- Sampling and testing frequencies, sampling locations, sampling and testing methods, and other inspections required to maintain the Process Control Plan. Upon request, KDOT will provide a recommended process control sampling and testing frequencies chart;
- Procedures to determine gradation, plasticity index, and deleterious substance content of all aggregates the Contractor may use;
- Procedures for inspecting stockpiles for separation, contamination, or segregation;
- For cold feed bins, include calibration procedures for setting cold feeds including observation of cold feed operation for uniformity;
- For hot bins, include procedures to determine the gradation of aggregate in each bin. Determine the theoretical combined grading and calibrate the hot feed settings to provide the required material;
- For batch plants, determine the percent or weight to be used from each bin to assure compliance with the Approved HMA Mix Design or Approved Concrete Mix Design; and
- For continuous flow plants, establish a gate calibration chart for each bin. Determine gate settings for each bin to assure compliance with the Approved HMA Mix Design or Approved Concrete Mix Design.

(2) KDOT considers the guidelines set forth in s**ubsection 106.5b.(1)** as customary activities necessary to control the production of materials or mixes at an acceptable quality level. The activity KDOT requires depends on the type of process or materials the Contractor is producing. The frequency of these activities also varies with the process and the materials.

(3) The Engineer's review and approval of the Contractor's Process Control Plan are for KDOT's benefit, not to ensure Contractor quality processes. This review and approval is not a substitute for the Contractor's obligation to control processes.

c. Sampling and Testing. Use the same process control sampling, testing methods, and procedures that KDOT uses. Consult Part V for the Kansas Test (KT) Methods and for a Sampling and Testing Frequency Chart that the Contractor or producer may use as a material acceptance guide when developing the Process Control Plan. Advise producers supplying material for non-QC/QA projects to find the minimum required sampling and testing frequencies in Part V.

d. Test Reports. Maintain a file of all process control tests and provide this file to the Engineer at the Engineer's request.

e. Inspection by KDOT.

(1) The Engineer and Inspector reserve the right to run any test at any time to determine contract compliance.

(2) The Engineer or Inspector will inspect aggregates at the point of production for approved deposits, ledges, and beds. Do not produce aggregates from non-approved deposits, ledges, or beds. Immediately remove from the stockpile aggregates obtained from non-approved deposits, ledges, or beds.

(3) The Engineer or Inspector will test aggregates for acceptance at the point of usage. Remove and replace, repair, or otherwise correct, at the Contractor's expense, work incorporating aggregates from non-approved sources.

106.6 PLANT INSPECTION

a. When materials are inspected at the point of manufacture, the following apply:

(1) Cooperate with and assist the Engineer or Inspector and make sure the material producer cooperates with and assists the Engineer or Inspector.

(2) The Engineer or Inspector has full right of entry at all times to areas of the plant concerning the manufacture or production of the materials being provided;

(3) Provide and maintain adequate safety measures; and

(4) KDOT may retest materials delivered to the plant that were tested and approved at the source of supply. KDOT may reject materials that do not meet the Contract Documents requirements upon re-testing.

b. The Engineer may accept non-complying, plant-inspected material if all of the following conditions are met:

(1) The Engineer has satisfactory test results of both prior and subsequent material tests using the same source or sources as the non-complying material.

(2) The Engineer finds the incidence and degree of nonconformance with the specification requirements are within reasonable and practical limits.

(3) Demonstrates diligent, exercised material controls consistent with standard industry practices.

(4) The Engineer determines the non-complying material will not adversely affect the value or serviceability of the completed work.

106.7 STORAGE OF MATERIALS

Provide all space required to store stockpiled materials. Locate stored materials to facilitate prompt inspection. Do not use private property to store materials without the owner's or lessee's written approval. Provide copies of such written approval at the Engineer's request. The Engineer may approve portions of the right-of-way for storing materials. Restore all storage sites to their original condition at the Contractor's expense.

Store materials to preserve the materials' quality. The Engineer or Inspector may re-inspect and reject stored materials, even if the Engineer or Inspector previously approved the materials before storage.

106.8 APPROVED MATERIAL SIGNS

a. Provide, install, and maintain "Approved Material" signs at each major material stockpile site that contains both non-KDOT tested and KDOT-approved materials. Sites include the Contractor's or commercial batching areas, plant sites, and major stockpile sites.

b. Install and construct the signs using the material specified below and conforming reasonably to the details shown in **FIGURE 106-1**. Keep the signs clean and in good condition at all times.

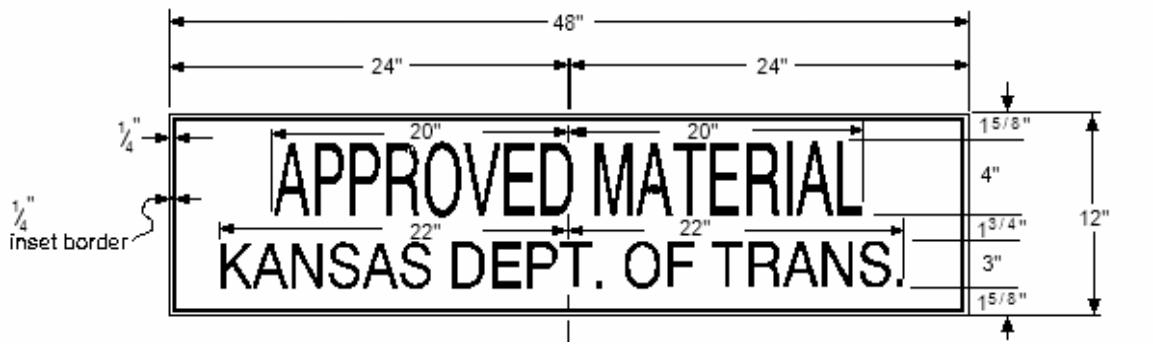
(1) Sign Face Details.

- Top Line 4-inch Standard Alphabet Series "B" Legend;
- Second Line 3-inch Standard Alphabet Series "B" Legend;
- I.D. Signs 2-inch Standard Alphabet Series "B" Legend; and
- Plain painted white background with black legend direct applied copy with ¼ inch inset border.

(2) Materials. Manufacture the signs from backing material composed of either metal (14 gauge steel or 0.100 inch thick flat sheet aluminum) or ¾ inch thick exterior type fir plywood and mounted on a suitable post.

(3) Sign Locations. Install the signs at stockpile locations the Engineer approves. Erect signs approximately 5 feet high measured from the bottom of the sign and visible to anyone observing the stockpile from a normal working area.

FIGURE 106-1: Details for Approved Material Signs.



c. If the Engineer requires, install identification signs for individual aggregate types and mixes (example SSG-1 for SM-12.5A) in locations where similar stockpile materials are being stored. Make these signs using "I.D. Signs 2 inch Standard Alphabet Series "B" Legend." Attach these signs to the "Approved Material" sign post.

d. Include in the Contractor's bid the cost of providing, erecting, and maintaining required materials signs.

106.9 HANDLING MATERIALS

Handle all materials to preserve their quality. Transport aggregates from the storage site to the work in tight vehicles, constructed to prevent loss, degradation, or segregation of materials during all operations.

106.10 DISPOSITION OF UNACCEPTABLE MATERIALS

Remove from the work site all unacceptable and rejected materials, unless the Engineer allows the Contractor to make the materials acceptable. Do not incorporate into the work previously rejected materials, until corrected and until the Engineer approves their incorporation into the work.

106.11 MATERIAL PROVIDED BY KDOT

When KDOT provides material, KDOT will deliver the material or make the material available at locations the Contract Documents specify. Coordinate delivery with KDOT. Pay any demurrage charges associated with the delivery of KDOT provided materials.

After KDOT delivers the material or the Contractor obtains the material, the Contractor assumes responsibility for the material as if the Contractor had provided the material. KDOT assumes responsibility for the quality of these materials unless the Contractor's, independent Contractor's, or subcontractor's acts or omissions affect the quality of the material.