

5.12 MATERIALS FOR ROADSIDE IMPROVEMENTS

5.12.01 GENERAL

This section covers the inspection, sampling and testing of materials used for roadside improvements, including safety rest areas.

Where reference is made to regular sampling and testing procedures or regular inspection procedures, the intent is that the material receives such testing or inspection as is prescribed in the Standard Specifications or in this manual. Reports should be issued for these materials.

Individual material items that do not require regular testing should be judged on the basis of visual inspection and, where indicated, approved catalog cuts. Reports of these inspections are not generally required.

Visual inspection reports of completed bid items should be based on the use of accepted materials in the construction of such items as indicated by tests, approved catalog cuts or visual inspection of the materials as indicated above. Specific reference to the individual tests or inspections need not be made. On visual inspection reports of completed bid items, only a general statement need be made to the effect that all materials used were acceptable.

5.12.02 PLANTS

- (a) Source of Material.

Plants used in roadside improvements are either nursery grown or collected from their natural growing site.

- (b) Basis of Acceptance.

See Standard Specifications Manual Subsection 2102.

- (c) Methods of Inspection.

Preliminary inspection may be made at the nursery or collecting field when deemed desirable by the Inspector. Final inspection and acceptance or rejection is made at the planting site in accordance with the Standard Specifications.

5.12.03 SEEDS

- (a) Source of Material.

Seed used for highway projects is field grown, usually in Kansas or neighboring states. Contractors may procure seed from the grower or from individuals or companies engaged in buying and selling seed. Seed intended or offered for sale for planting must be processed and handled in accordance with the Kansas Seed Law and applicable rules and regulations of the Kansas State Board of Agriculture.

(b) Basis of Acceptance.

See Standard Specifications Manual Subsection 2103.

The appearance of the seed must not indicate improper storage or handling resulting in damage by rodents, excess humidity, free moisture, overheating or other cause.

(1) Labels - Untreated Seed: The labels must be in the English language and must contain the following information:

- a. The commonly accepted name of the kind and the variety, of each agricultural seed component in excess of five percent (5%) of the whole, and the percentage by weight of each in the order of its predominance. Where more than one component is required to be named, the word "mixture" or the word "mixed" shall be shown conspicuously on the label.
- b. The percentage by weight of pure seed.
- c. The percentage by weight of all weed seeds.
- d. The percentage by weight of inert matter.
- e. For each named agricultural seed:
 1. The percentage of germination, exclusive of hard seed.
 2. The percentage of hard seeds, if present.
 3. Total germination percentage including hard seed may be shown.
 4. The calendar month and year the test was completed to determine such percentages. (Seeds which have not been planted within 20 months after testing should be resampled and retested.)
- f. The percentage by weight of agricultural seeds (which may be designated as "crop seeds") other than those required to be named on the label.
- g. The lot number or other lot identification.
- h. The origin: i.e., the state where grown, except grass seeds in quantities of less than 5 kg (10 pounds) for lawn seeding purposes, or a declaration that origin of seed is unknown to seller.
- i. The name and rate of occurrence per unit weight of each kind of "restricted noxious weed seeds" present, which shall not be more than the number per pound of restricted noxious weed seed in agricultural seed.
- j. The name and address of the person responsible for such statement.

(2) Labels - Treated Seed: Agricultural seed which has been treated with chemicals for insect or disease control, shall be labeled to show the following:

- a. A word or statement indicating that the seed has been treated.
- b. The commonly accepted, coined, chemical or abbreviated chemical (generic) name of the applied substance.
- c. If the substance in the amount applied is harmful to human or other vertebrate animals, a caution statement, such as: "Do not use for food, feed or oil purposes." The caution for mercurials and similarly toxic substances must include in a contrasting color the word "poison" along with a skull and crossbones.
- d. A separate label may be used to show this information, or it may be a component part of the main label.

(c) Sampling.

Sampling of seed by Department personnel will seldom be required; however, should such sampling become necessary, it should be accomplished in a manner which will produce a representative sample in accordance with the Rules and Regulations of the Kansas State Board of Agriculture.

5.12.04 NITROGEN FIXING BACTERIA

(a) General.

Media for the inoculation of legume seed with nitrogen fixing bacteria are produced by only a few specialists in this field.

Legume plants, when properly inoculated, form nodules on the root systems which contain millions of bacteria which are fed by the host plant and in turn produce nitrogen from the air. This nitrogen is then available to the legume plant to aid in its growth and making it independent of the supply of nitrogen in the soil.

The bacteria are microscopic unicellular plants called rhizobia which produce no seeds or spores. They multiply by simple cell division. Food is absorbed through the cell wall. Moisture is very necessary for feeding and growth. These bacteria are very sensitive to high temperatures and to drying. This is one of the greatest obstacles to effective inoculation.

(b) Basis of Acceptance.

See Standard Specifications Manual Subsection 2104.

Observe the contractor's handling and storage of the inoculating material. Heat and drying must be avoided as either will cause extremely rapid death of the rhizobia. The treating of the seed must be done in strict accordance with the supplier's directions and must result in heavy coating of the seed. Leguminous seed must be planted as soon as possible after inoculation. The maximum number of live bacteria will be on the seed at the time of inoculation after which the live bacteria decrease at a rate

dependent on storage conditions. Exposure of the inoculated seeds to sunlight, high temperatures or drying conditions will increase the death rate of the bacteria.

No sampling of Nitrogen Fixing Bacteria is required.

5.12.05 **AGRICULTURAL LIMESTONE**

- (a) Source of Material.

Ground limestone for agricultural purposes is almost always produced as a by-product of commercial quarrying and crushing limestone for other purposes such as highway and building construction.

- (b) Basis of Acceptance.

See Standard Specifications Manual Subsection 2105.

- (c) Methods of Inspecting and Sampling.

Sources supplying this material shall have been qualified by the State Board of Agriculture.

5.12.06 **FERTILIZERS**

- (a) General.

Commercial mixed fertilizers are blended or formulated of ingredients which will furnish the desired amounts of nitrogen, phosphorus and potassium together with an inert material such as ground limestone which serves as a carrier or filler.

Usually this item will be listed in the contract proposal as "Fertilizer (xx-xx-xx)." The first number in parenthesis denotes the minimum percentage of nitrogen required, the second number indicates the minimum percentage of available phosphorus required and the third number indicates the minimum percentage of water soluble potassium required. The particular fertilizer required for a contract is chosen by the Landscape Architect to best supply the needs of the crop being planted and the soil conditions on the project.

- (b) Basis of Acceptance.

See Standard Specifications Manual Subsection 2106.

5.12.07

SUMMARY OF INSPECTION, TESTING AND REPORTING REQUIREMENTS

Many roadside improvement projects contain a number of items not directly related to seeds or plants. These occur in rather variable quantities or numbers and often the Inspector is uncertain of the required inspection. The following gives the requirements for a number of such items.

AGRICULTURAL LIMESTONE - By receipt of proper certification.

AUTOMATIC WATERING SYSTEM - Use regular sampling and testing or inspection procedures on concrete, concrete reinforcing bars, cast iron pipe, steel pipe and corrugated metal pipe used for casing under roadways. Use regular procedure for plastic pipe if plans or specifications require conformance with an ASTM or other specifications. Other items are to be visually inspected. Issue a visual inspection report on the entire completed system.

BERMUDA GRASS SOD RETARDS - Issue visual inspection report.

BURLAP BAG SOD RETARDS - Issue visual inspection report.

CHARCOAL GRILL - Issue visual inspection report.

CHARCOAL GRILL BASE - Use regular sampling and testing or inspection procedures for concrete and reinforcing steel. Issue visual inspection report for completed base.

COMBINATION TOOL SHED AND COMFORT STATION - Use regular sampling and testing or inspection procedures for concrete, concrete masonry units and reinforcing steel. Issue visual inspection report for completed shelter.

CONCRETE SHELTER WITH WINDBREAK - Use regular sampling and testing or inspection procedures for concrete, curing material and concrete reinforcing steel. Issue visual inspection report for completed shelter and windbreak.

ELECTRIC LIGHTING SYSTEM - Use regular sampling and testing or inspection procedures for anchor bolts, concrete, conduit and conduit fittings. Issue visual inspection report on completed system.

FERTILIZER - Use regular inspection system.

FIREPLACE - Use regular sampling and testing or inspection procedures for concrete and reinforcing steel. Issue visual inspection report for completed fireplace.

GLASS FIBER MAT (DITCH LINING, RIPRAP, WEED CONTROL) - Use regular procedures for glass fiber mat and subsidiary items such as seed, fertilizer, cover material, etc. Issue visual inspection report for completed work.

GRILL - Use regular sampling and testing or inspection procedures for concrete and reinforcing steel. Issue visual inspection report for completed grill.

JUTE MESH EROSION CONTROL MATERIALS - Use regular sampling and testing procedure. Issue visual inspection report for completed erosion control.

MANURE - Issue visual inspection report.

MULCHING - Issue visual inspection report.

PEAT MOSS - Use regular sampling and testing procedure.

PIPE UNDERDRAIN - Use regular sampling and testing procedures for clay tile and underdrain aggregate.

SANITARY SEWER - Use regular sampling and testing or inspection procedures for pipe and materials for sealing and filing pipe joints.

SEEDS AND REQUIRED NITROGEN FIXING BACTERIA - Use regular inspection procedures.

SOD - Issue visual inspection report for completed item.

TABLE (WOOD WITH OR WITHOUT BASE: CONCRETE WITH BASE) - Use regular sampling and testing or inspection procedures for concrete and reinforcing steel. Issue visual inspection report for completed table.

TABLE SHADE - Issue visual inspection report for completed shade.

TOPSOIL - Issue visual inspection report.

TREES, SHRUBS, ETC. - Issue visual inspection report.

WATERING SYSTEM - Use regular sampling and testing or inspection procedures for concrete, reinforcing steel and pipe. Issue visual inspection report for completed system.

WATER WELL PUMP - Use regular sampling and testing or inspection procedures for concrete and reinforcing steel. Issue visual inspection report for complete pump.