

- (c) **Acceptance.** A type D certification in accordance with Subsection 106.04 shall be required.

733.09. SLURRY GROUT.

- (a) **Description.** This item covers a slurry type grout for stabilizing and undersealing portland cement concrete pavements by pressure grouting method.
- (b) **Materials.** The grout shall consist of a mixture of portland cement, fly ash and water proportioned as approved by the Engineer.

Portland cement, fly ash, water and approved admixtures shall meet the following requirements of the Subsections:

Portland Cement	701.02
Admixtures	701.03
Water	701.04
Fly Ash	702

- (c) **Mix Designs and Tests.** Submit in advance to the Materials Engineer a proposal for materials to be used in the grout mixture. Also submit job mix test results of the grout from an independent laboratory, showing the following: 7 day strengths (ASTM C 942); flow cone rate (Corps of Engineers Method) (ASTM C 939); shrinkage and expansion (ASTM C 940 or C 827); and time of initial set (ASTM C 403 or AASHTO T 197). The 7 day strength shall not be less than 800 psi (5.52 Mpa), and the flow cone rate shall be 10-16 seconds.

**SECTION 735
MATERIAL FOR ROADSIDE
DEVELOPMENT AND EROSION CONTROL**

735.01. DESCRIPTION.

These Specifications establish the material requirements for roadside development and erosion control.

735.02. SODDING AND SPRIGGING MATERIALS.

- (a) **General.** Bermudagrass sod or sprigs to be used as source material shall be a thick stand of common bermudagrass growing on fertile topsoil. Types of bermudagrass other than "Common" may not be used unless specified or approved by the Engineer. The vegetative parts (rhizomes, stolons, and roots) of bermudagrass shall be viable as indicated by a dense, deep-rooted stand.

The source for sod and sprigs shall be free of reproducing parts of weeds classified as "Prohibited Noxious" and shall be as free of other legally "Restricted Noxious" plant materials as required by the Oklahoma Department of Agriculture Seed Law. The proposed source of sod or sprigs will be approved by the Engineer before the beginning of sodding or sprigging operations. Prior to approval, the area shall not be tilled or mowed. After approval, all vegetative growth exceeding 3 inches (75 mm) in height shall be mowed and the residue removed prior to harvesting the sod or sprigs.

The sod or sprigs shall be moist when excavated from the source and shall be kept moist until planted. Watering of the sod source, if to be measured for payment, shall be performed when and as directed by the Engineer. Sod in storage which becomes dry, shall not be remoistened and used, but shall be discarded.

- (b) **Sodding.** This material shall consist of vegetative parts (rhizomes, stolons, and roots) of bermudagrass with an appreciable quantity of adhering soil.
1. **Solid Slab Sod** shall be rectangular slabs of bermudagrass having minimum dimensions designated on the standard detail. Bermudagrass vegetative parts shall exist throughout the slab and shall be obtained from soils with a minimum Plasticity Index of 3. The slab must have a dense vegetative growth and be capable of being transported in a condition closely resembling its original state.
 2. **Mulch Sod** shall consist of fertile topsoil that contains bermudagrass vegetative parts which have not been harvested within the previous 12 months. Before excavation, disk the sod in different directions to the depth of planned excavation. Each disking shall be at right angles to the preceding disking until the bermudagrass vegetative parts have been cut into small pieces. Limit the depth of excavation to 6 inches (150 mm) unless otherwise determined by the Engineer. Excavate immediately after disking. The sod may be windrowed or otherwise stored for short periods and shall be kept in a moist condition in a manner approved by the Engineer.
- (c) **Sprigging.** This material shall consist of vegetative parts (rhizomes, stolons, and roots) of the bermudagrass which has been separated from a majority of the adhering soil.
- The sprigs for row sprigging and broadcast sprigging shall be removed from the soil with an approved automatic sprig harvester which digs, cleans, and loads the sprigs in one continuous operation. The vehicle in which the sprigs are loaded for transportation shall not have open sides.
- As soon as the vehicle is loaded, the sprigs shall be wet thoroughly with water and covered with a heavy canvas or other approved cover to reduce moisture loss. They shall be kept moist and covered until planted, and they shall be planted within 48 hours after removal from the soil.

735.03. PLANTING MATERIALS.

- (a) **Plant Materials.** The grading tolerances, quality definitions, balling and burlapping Specifications, container and bare-root requirements of plant materials shall meet the requirements of ANSI Specification Z-60.1, Nursery Stock, except as modified by these Specifications, the Plans, or in the Proposal.
- All plant materials shall be nursery grown stock unless collected plant materials are specified or permitted by the Engineer.
- Plant material shall be well grown, healthy, representative samples of their normal species or variety, with a vigorous and well developed root system. Trees shall have reasonably straight stems and shall be well branched and symmetrical in accordance with their natural habits of growth. The branch system shall be free from disfiguring knots, sun scald injuries, abrasions of the bark, dead or dry wood, broken terminal growth, or other objectionable disfigurements.
- Nursery grown stock are those plants which have been grown by proper cultural treatment and have been transplanted or root pruned two or more times according to approved nursery practices. All evergreens shall be either balled and burlapped (B & B) or containerized. Deciduous plants may be bare-rooted (BR), B & B, or containerized. B & B plant materials shall have solid, firm balls, which have been dug from firm soil that contains a minimum amount of sand.
- When nursery- grown plants of the species, size, and grade specified are not available, collected plant material meeting the Specifications may be substituted if approved in writing by the Engineer. Collected plant material shall be dug by an approved nursery doing the collecting. Notify the Engineer in writing at least 2 weeks in advance of the time and place of digging collected plant materials so that an inspection of the work and material can be made.

NOTE: Any additional cost for materials, equipment, labor and incidentals required to acquire and use the substitute collected material shall be at the Contractor's expense.

The spread of roots and minimum ball size for collected plant material shall be at least 33 percent greater than that for nursery- grown plant material, as specified in ANSI Specification Z-60.1.

Plant materials shall be packed to insure adequate protection against climatic, seasonal, or other injuries during transit. Bare rooted (BR) plants shall have their roots kept in a moist healthy condition, with a suitable material.

Plant materials may be inspected for provisional approval, at any time during the life of the contract. Plant materials not meeting Specifications shall be rejected, and if on the project, removed immediately and replaced at the Contractor's expense.

At the time of delivery, all plant materials shall be accurately and legibly tagged with their names and sizes. Furnish the Engineer a written statement, giving the origin of each shipment, plus an invoice showing quantities, sizes, varieties, and inspection certificates, as required by Federal and State laws, certifying the plant materials to be free from plant diseases and insect pests.

- (b) **Planting Soil Mix.** The planting soil mix shall contain one part sand*, three parts sandy loam*, and one part peat moss by volume. These materials shall meet the following requirements:

Sand. Sand is defined as soil material that contains 85 percent or more of sand. The percentage of silt, plus 1-1/2 times the percentage of clay, shall not exceed 15 percent. Included are coarse sand, fine sand, and very fine sand.

Sandy Loam. Sandy loam shall meet one of the following definitions:

1. Soil material that contains 20 percent clay or less, and the percentage of silt plus twice the percentage of clay exceeds 30 and contains 52 percent or more sand.
2. Soil material that contains less than 7 percent clay, less than 50 percent silt, and between 43 and 50 percent sand.

Peat Moss. Peat moss shall consist of at least 75 percent of partially decomposed stems and leaves of sphagnum, hypnum, polytrichum, and other mosses in which the fibrous and cellular structure is still recognizable. It shall be brown to black in color. Humus peat shall not be acceptable. Peat moss shall have the following characteristics:

Moisture content shall not exceed 60 percent by mass.

Ash content shall not exceed 20 percent, based on the oven dry mass of the material.

The pH value shall be between 3.2 and 7.0 at 77°F (25°C).

Water holding capacity shall be not less than 400 percent, by mass, on an oven dry basis.

Furnish the Engineer with a certificate stating the type of peat moss, the brand name, and the place of origin. The certificate shall also contain the cubic feet (cubic meter) of compressed material, the compression ratio, and the approximate weight per cubic foot (mass per cubic meter). A certificate will not be required if this information is marked on the bales.

(*Textures as determined by U.S. Department of Agriculture Soil Classifications and defined in the OHD Manuals of Engineering Classification of Geological Material, R&D Division. The materials shall be well blended until homogenous in texture and composition).

The planting soil mix shall be free from subsoil roots, brush, refuse, and other offensive or deleterious materials that would interfere with proper planting procedures or with future maintenance. It shall be free from harmful quantities of toxic salts or other material that might retard establishment or interfere with the future growth of the specified plant. The mix shall be free from the seeds, roots, and other reproducing parts of weeds classified as "Prohibited Noxious" and shall

be free of other legally "Restricted Noxious" plant materials as required by Oklahoma Department of Agriculture regulations.

Stockpile and mix the planting soil materials at a predetermined location approved by the Engineer.

- (c) **Vegetable Compost.** The material shall consist of cotton seed hulls, peat moss, chopped peanut hulls, partially decayed and chopped cotton burrs, or any combination of these, and shall be free from seeds or other reproducing parts of noxious or objectionable weeds.

735.04. SEEDING MATERIALS.

The kind and quantity of seeds to be planted per acre will be indicated on the Plans or in the Proposal. A list of seeds and the Specifications for them are given in table of seed Specifications.

Furnish the seed in sealed bags, with each "lot" in separate bags, even though mixtures may be called for on the Plans. All labeling required by law shall be intact and legible.

Furnish the Engineer two (2) legible copies of the invoices and seed tags. The invoice shall describe each species by name, variety, if any, and treatment (hulled, scarified, etc.), if any.

Each "lot" of seed furnished shall have been officially sampled and tested by the Oklahoma State Board of Agriculture, and 2 copies of the report shall be supplied to the Engineer by the Contractor. Each seed test shall have been completed not more than 9 months prior to delivery of the seed.

The information furnished in the seed report for a particular "lot number" shall agree with information appearing on the seed tags having the same "lot number", or the seed of that "lot" will be rejected.

The seed and tags shall not be removed from the original tagged and sealed bag until approved by the Engineer. After approval, the seed may be mixed, sacked, and batched as required to facilitate planting, but it shall be tagged for identification and mass. The mixing or sacking into batches shall be performed under supervision of the Engineer.

TABLE OF SEED SPECIFICATIONS

Kind of Seed: Common and Botanical Name	P.L.S. Index ^a , Minimum	Purity, percent, minimum	Germination, percent, minimum	Weed Seeds ^d , percent, maximum
Bermudagrass, common (Cynodon dactylon)unhulled	80			0.2
Bermudagrass, common (Cynodon dactylon)hulled	82			0.2
Bermudagrass, Guymon variety (Cynodon dactylon)unhulled	80			2.0
Bermudagrass, Guymon variety (Cynodon dactylon) hulled	82			2.0
Bluestem ^b , big (Andropogon gerardi)	20			
Bluestem, Caucasian (Andropogon caucasicus)	15			

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735.04

Kind of Seed: Common and Botanical Name	P.L.S. Index ^a , Minimum	Purity, percent, minimum	Germination, percent, minimum	Weed Seeds ^d , percent, maximum
Bluestem ^b , little (<i>Andropogon scoparius</i>)	15			
Bluestem, Plains (<i>Bothriochloa ischaemum</i>)	30			1.0
Bluestem ^c sand (<i>Andropogon halli</i>)	20			
Bluestem, yellow (<i>Andropogon ischaemum</i>)	18			
Brome, smooth (<i>Bromus inermis</i>)	70			2.0
Buffalograss ^{b,c} (<i>Buchloe dactyloides</i>)	55			
Burclover (<i>Medicago hispida, arabica or rigidula</i>)		98	85	1.0
Clover, crimson (<i>Trifolium incarnatum</i>)		95	85	0.5
Clover ^e , large hop (<i>Trifolium procumbens</i>)		95	85	0.5
Clover ^e , small hop (<i>Trifolium dubium</i>)		95	85	0.5
Dropseed, sand (<i>Sporobolus cryptandrus</i>)	70			2.0
Fescue,tall(<i>Festuca arundinacea</i>)	80			0.5
Gramma ^b , blue (<i>Bouteloua gracilis</i>)	25			
Gramma ^b , side-oats (<i>Bouteloua curtipendula</i>)	30			
Indiangrass ^b (<i>Sorghastrum nutans</i>)	35			2.0
Lespedeza, common (<i>Lespedeza striata</i>)		97	90	0.5
Lespedeza ^e , Korean (<i>Lespedeza stipulacea</i>)		97	90	0.5
Lespedeza, roundhead (<i>Lespedeza capitata</i>)		97	90	0.5
Lespedeza ^e , sericea (<i>Lespedeza cuneata</i>)		98	90	0.5
Lovegrass ^b , sand (<i>Eragrostis trichodes</i>)	65			0.5
Lovegrass, weeping (<i>Eragrostis curvula</i>)	80			0.3

Kind of Seed: Common and Botanical Name	P.L.S. Index ^a , Minimum	Purity, percent, minimum	Germination, percent, minimum	Weed Seeds ^d , percent, maximum
Millet, German foxtail (<i>Setaria italica</i>)		98	80	0.5
Native grasses ^b (Predominately little bluestem)	15			
Oats (<i>Avena sativa</i>)		95	80	0.5
Rye (<i>Secale cereale</i>)		90	70	0.3
Ryegrass, annual (<i>Lolium multiflorum</i>)	85			0.2
Ryegrass, perennial (<i>Lolium perenne</i>)	85			0.2
Sudangrass (<i>Sorghum vulgare sudanense</i>)		98	80	0.5
Switchgrass(<i>Panicum virgatum</i>)	60			2.0
Wheat (<i>Triticum aestivum</i>)		96	80	0.1
Wheatgrass ^b , western (<i>Agropyron smithii</i>)	56			1.0

^a The P.L.S. Index (Pure Live Seed Index) shall be calculated from information given on the seed tag, as follows:

$$\text{P.L.S. Index} = \% \text{Purity} \times (\% \text{Germination} + \% \text{Firm Seed}) / 100$$

The pounds (kg) of seed shown on the Plans are stated as pounds (kg) of bulk seed. If the P.L.S. index of any "seed lot" furnished exceeds the minimum P.L.S. index specified by 25 percent or more, the pounds (kg) of bulk seed to be planted will be adjusted by using the following formula:

$$P = (S \times C) / F$$

where:

P= pounds (kg) of bulk seed to be planted

S= P.L.S. Index specified

C= pounds (kg) of bulk seed specified

F= P.L.S. Index furnished

^b The seed source shall be Oklahoma, Texas, Kansas, or New Mexico.

^c The seed shall have been prechilled and treated with potassium nitrate in accordance with the Hays Treatment Technique.

^d The seed shall contain no Johnson grass seed. (This note applies to all seed).

^e The seed shall be treated with an approved nitrogen fixing inoculant, such as manufactured by commercial laboratories suitable for the particular legume. The inoculant shall be stored and handled in accordance with the manufacturer's directions.

735.05. MULCHING MATERIALS.

- (a) **Vegetative Mulch.** This material shall consist of straw or hay as specified below. It shall be free from mold or rot and shall be in a good state of preservation when used. It shall be primarily long, heavy- stemmed material. The material shall be delivered dry, in bales, and shall be kept dry until applied. The mulch shall contain no seeds which are classified as “Prohibited Noxious” and shall be as free of “Restricted Noxious” as is legally allowed by the Oklahoma Department of Agriculture.
1. Straw shall be the mature stems of barley, oats, rye, or wheat from which the grain has been harvested.
 2. Hay shall consist of mature weeping lovegrass, caucasian bluestem, K.R. bluestem or pure stands of the other bluestem hays. The hay shall be free from appreciable quantities of annual grass, short grass or immature tall grass.
- (b) **Asphalt Mulch.** Asphalt mulch shall be MS-2 emulsified asphalt conforming to Subsection 708.03. Before application, the mulching asphalt shall be diluted with water, in the proportion of one gallon (l) of emulsified asphalt to 3 gallons (l) of water.
- (c) **Excelsior Mat.** This material shall consist of a machine- produced mat of wood excelsior, with the excelsior fibers interlocking to form a continuous web. At least 80 percent of the fibers shall be 8 inches (200 mm) or longer in length. The web of fibers shall be distributed uniformly throughout the mat, resulting in uniform thickness and density. The mat shall be covered on one side with extruded plastic netting which shall not exceed a mesh size of 1 inch x 2 inch (25 x 50 mm). The dimension of the mat shall be as follows:
- Length: not less than 130 feet (45 m)
 - Width: 48 inches or 60 inches±1 inch (1220 or 1525 ± 25 mm)
 - Dry mass per unit area: 0.8 lb/yd² (0.43 kg/m²)
- The mat shall be smolder resistant. The smolder resistant treatment shall be nonleaching, and it shall be noninjurious to vegetation, as well as to animals and humans. The leaching resistance test shall be in accordance with Federal Test Method 191, Method 5830. The smolder resistance test shall be conducted after the leaching test and on the air-dried sample. Furnish a type D certification for excelsior mat material.
- Fasteners meeting the requirements of Subsection 735.06(b) shall be used for anchoring the mat.
- (d) **Jute Mesh.** This material shall be a uniform, open, plain weave of new and unused single jute yarn. The yarn shall be loosely twisted and shall not vary in thickness by more than one half its normal diameter. Jute mesh shall be furnished in strips as follows:
- Length: not less than 150 feet (45 m)
 - 78 Warp ends per width approximately.
 - 41 Weft ends per yard (m) approximately.
 - Mass per Unit Area: not less than 0.9 lb/yd² (0.49 kg/m²)
- Fasteners meeting the requirements of Subsection 735.06(b) shall be used for anchoring the mat.
- (e) **Excelsior Mulch.** The material shall consist of wood fibers cut from sound green timber. The cut shall be made at a slight angle to the natural grain of the wood, so as to cause splintering of the fiber when weathered.
- The excelsior mulch shall have the following properties:
 - Burred wood fibers; major portion shall be approximately 4 inches (100 mm) long. The fiber size shall be 0.024 x 0.031 inches (0.61 x 0.79 mm) ± 20 percent.

The total volatile content (moisture, etc.) at the time of manufacture shall not exceed 45 percent, as expressed by the following formula:

$$V = (a-b) \times 100/a$$

where: V = Percent volatile content
a = Mass of original sample
b = Mass of dry sample

The material shall be delivered in bales. Each bale shall be 80-90 pounds (36-41 kg) and shall be tagged with the mass at the time of manufacture. Density of the baled material shall be 11-15 lbs/ft³ (175 - 240 kg/m³)

- (f) **Wood Cellulose Fiber.** The material shall be composed of natural wood fiber produced from wood by-products. It shall contain no growth or germination inhibiting factors and shall contain a water soluble, nontoxic coloring agent.
- (g) **Nylon Erosion Control Mat.** Nylon erosion control mat shall consist of a bulky structure of entangled nylon monofilaments, melt-bonded at their intersections, forming a stable mat of suitable mass and configuration. The mat shall be resilient, permeable, and highly resistant to environmental deterioration and ultraviolet degradation. The color of the mat shall be black. The material shall comply with the following physical properties:

1. *Material Type.* Nylon 6 plus a minimum content of 0.5% by mass of carbon black.

- 1.1. *Dimensions:*

Filament diameter, inches (mm)	0.0157 (0.40)
Mass per Unit Area, lb/yd ² (Kg/m ²)	0.747 (0.41)
Thickness of mat, inches (mm)	0.71 (18)
Width, inches (mm)	38.2 (970)
Roll length, yard (m)	109±3.3 (100 ± 3)

- 1.2. *Tensile Properties:*

STRENGTH	
Length dimension, lb/yd (N/M), minimum	282 (1372)
Width dimension, lb/yd (N/M), minimum	161 (783)
ELONGATION	
Length direction, %, minimum	50
Width direction, %, minimum	50

NOTE: ASTM D 1682 strip test procedure modified to obtain filament bond strength used to indicate tensile properties.

- 1.3. *Resiliency:* Compression load cycling of 100 psi (689.4 kPa) on a 2 x 2 inches (50.8 x 50.8 mm) sample size, crosshead speed of 2 inch (50.8 mm) per minute.
30 minute recovery (3 cycles) 80% min.
2. *Certification.* The manufacturer shall furnish a type D certification with each shipment of the mat material.
3. *Mat Fasteners.* Mat fasteners meeting the requirements of Subsection 735.06(b) shall be used for anchoring the mat.
4. *Seed.* Common bermudagrass seed, unhulled, shall meet the Specification requirements of Section 735.04 of the Standard Specifications.

- (h) **Inspection of Materials.** Prior to delivery of mulching materials, notify the Engineer of the intended sources of materials and quantities to be obtained from each source. Also, furnish the Engineer with representative samples of the materials proposed for use. The Engineer may use the samples for provisional approval prior to delivery. Evidence of wetting, caking, or other deterioration at any time before use shall be cause for rejection.

If, during application or after placement, the character or action of any mulching material indicates that the material cannot be applied or fastened in accordance with Specifications, it will be rejected and shall be promptly removed from project.

735.06. MULCH FASTENING MATERIALS.

- (a) **Adhesive Fastener.** The adhesive fastener shall conform to Specifications for emulsified asphalt, SS-1, Section 708.
- (b) **Mat Fasteners.** The mat fasteners shall meet the requirements for the type specified on the standard drawings.

735.07. FERTILIZER AND AGRICULTURE LIMING MATERIALS.

- (a) **Fertilizer.** This material shall be a commercial fertilizer composed of the standard materials and conforming to the grade specified. The term "grade" shall mean the percentages of "total nitrogen," "available phosphoric acid," and "soluble potash," respectively, in accordance with the requirements of Oklahoma Department of Agriculture.

Fertilizer furnished in standard, factory-sealed containers shall have all labeling required by the Oklahoma Department of Agriculture. The label shall be intact and legible until the contents are used.

Each vehicle load of fertilizer furnished in bulk form shall be accompanied by two (2) legible copies of the purchase receipt, which shall be given to the Engineer upon delivery of the fertilizer. Each receipt shall show the mass, brand name, grade of the fertilizer, and the guaranteed analysis showing the minimum percentage of plant food in the fertilizer. The name and address of the person, firm, or corporation registering or guaranteeing the fertilizer with the Oklahoma Department of Agriculture shall also be shown.

The fertilizer to be broadcast dry shall be in a pelleted or other approved granular form, and the material to be applied by power spray shall be soluble in water and uniform in suspension.

A fertilizer with an identical NPK ratio but of a higher grade than specified may be furnished, provided the application rate is adjusted to the equivalent number of kilograms of each plant food element per unit of area as would have been applied with the specified grade.

In the event such a substitution is made, the following formula shall be used in determining the new application rate:

$$a = (bxc)/d$$

- where:
- a=New application rate
 - b=Grade of specified fertilizer (N.P.K.)
(converted from percent to decimal)
 - c=Specified application rate.
 - d=Grade of new fertilizer (N.P.K.)
(converted from percent to decimal)

- (b) **Agricultural Liming Material.** This material shall consist of either agricultural limestone or hydrated lime and shall meet the requirements of Section 706. When agricultural limestone is called for, 70 pounds (kg) of hydrated lime may be substituted for 100 pounds (kg) of agriculture limestone. Agriculture limestone shall not be substituted for hydrated lime.

Liming material furnished in standard factory-sealed containers shall have all labeling required by the Oklahoma Agricultural Liming Materials Act intact and legible until the contents are used.

Each vehicle load of liming material furnished in bulk form shall be accompanied by two legible copies of the purchase receipt. This receipt shall be given to the Engineer upon delivery of the liming material. Each receipt shall include the following: the name of the liming material, the brand or trade name, the net mass, the percent ECCE (Effective Calcium Carbonate Equivalent), and the name and address of the manufacturer, producer, or distributor.

The Engineer will obtain a one quart (liter) sample from each vehicle load of bulk material to be submitted to the Materials Laboratory for testing.

735.08. TEMPORARY SILT DIKE MATERIALS.

Temporary silt dike shall be triangular shaped, having a height of at least 8-10 inches (200-250 mm) in the center with equal sides and a 16-20 inch (400-500 mm) base. The outer cover shall be a woven geotextile fabric placed around the inner material and allowed to extend beyond both sides of the triangle 24-36 inches (600-900 mm). The geotextile fabric shall be mildew resistant, rot-proof and resistant and ultraviolet radiation meeting the requirements for temporary silt fence in AASHTO M288-97. The edges shall be treated to prevent unraveling. Seams and stress points shall be reinforced. The fabric cover and apron shall be a continuous wrapping of the fabric: the apron shall be a continuous extension of the upstream face. The urethane foam used as the inner layer of the silt dike shall meet the requirements for ASTM D3574.

SECTION 736 PAVEMENT MARKERS

736.01. CLASS A REFLECTIVE PAVEMENT MARKERS.

- (a) **Design and Shape.** The prismatic reflectorized marker shall conform to the shape and dimensions shown on the Plans and shall be so constructed that moisture and road grime will not penetrate or damage the element. Reflector units shall be smooth throughout and made of methylmethacrylate conforming to the requirements of Standard Specifications for Methacrylate Molding and Extrusion Compounds ASTM D 788. Grade 8 shall be used unless otherwise specified. The reflector shall show no change in shape or color when subjected to the requirements of Test Method OHD-L-24 at a temperature of 140°F (60°C) with the marker in the vertical position.

The marker shall be molded of methylmethacrylate conforming to Federal Specification L-P-380a, Type 1, Class 3. Filler shall be a potting compound selected for strength, resilience, and adhesion adequate to pass the necessary physical requirements. The marker shall withstand a load of 9000 pounds (40.0 kN) without breaking or being significantly deformed when tested according to Test Method OHD-L-23.