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SECTION 713 - LANDSCAPE DEVELOPMENT MATERIALS

713-01 TOPSOIL

SCOPE. This specification covers the material requirements for topsoil for use in turf and wildflower establishment, sodding or planting.

MATERIAL REQUIREMENTS. Topsoil may be naturally occurring or may be manufactured. Topsoil shall be free from refuse, material toxic or otherwise deleterious to plant growth, subsoil, woody vegetation and stumps, roots, brush, stones, clay lumps or similar objects. Manufactured topsoil shall consist of a mineral component and amendments to meet the specified organic content, pH and other requirements. Sod and herbaceous growth such as grass and weeds need not be removed but shall be thoroughly broken up and mixed with the soil during handling or manufacturing operations.

Topsoil shall meet the following requirements unless otherwise specifically stated in the contract documents:

- The pH of the material shall be between 5.5 and 7.6.
- The organic content shall be not less than 2% or more than 20%.
- Gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>50.0 mm</td>
<td>100</td>
</tr>
<tr>
<td>25.0 mm</td>
<td>85 to 100</td>
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<tr>
<td>6.3 mm</td>
<td>65 to 100</td>
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<tr>
<td>75 μm</td>
<td>20 to 80</td>
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The maximum size of objects other than stones shall be 50.0 mm.

- The Contractor may amend topsoil with approved materials and by approved methods to meet the above specifications. Materials used to amend the organic content of topsoil shall conform with the requirements of 713-15 Organic Material. Amendments shall not contain any material that is deleterious to soil structure, plant growth or seed germination.

STOCKPILING. Topsoil may be acquired from sites that are designated in the contract documents or approved by the Engineer. If no topsoil sites are designated in the contract documents, the material proposed for use as either naturally occurring topsoil or manufactured topsoil must be stockpiled, sampled and tested prior to its use. Topsoil deficient in organic content and/or pH may be used prior to amending and retesting only when used for turf and wildflower establishment or sodding.

Stockpiles shall contain not less than 150 cubic meters, or the minimum required for the contract, shall have a height of at least 1.2 meters unless otherwise approved, and shall be trimmed to uniform surfaces and slopes.

SAMPLING. Samples of naturally occurring topsoil, manufactured topsoil or amended soil mixture will be taken by a representative of the Department. Samples taken for topsoil that has been amended or manufactured with approved composted sewage sludge shall be identified as such. Topsoil containing foreign material may be rejected on the basis of a visual examination prior to testing. The topsoil sampling procedure shall be as required in the Department's "Sampling Procedures for Topsoil." Contractors may obtain copies of the procedures from the Engineer. Contractors who believe that an error was made in sampling the topsoil shall, within one work day, indicate the alleged error in writing to the Engineer.

TESTING. All material tests required by this section, except for the testing of composted sewage sludge and topsoil containing composted sewage sludge, will be done by the Department in conformance with the procedures contained in the appropriate Department publications or test methods current on the date of advertisement for bids.

Composted sewage sludge used to amend or manufacture topsoil shall conform to the applicable...
requirements of §713-15 Organic Material. Composted sewage sludge shall require a certificate, from a laboratory approved by the DEC, verifying compliance with all applicable laws, rules and regulations. The certification shall be supplied by the Contractor, at the Contractor's sole expense, and prior to the delivery of any composted sewage sludge, topsoil containing composted sewage sludge or other such regulated material to the contract site. The material shall be approved before it is used. A copy of the specifications shall be furnished to the laboratory by the Contractor.

Topsoil that has been amended with approved composted sewage sludge or other such regulated material shall be tested by an established Engineering or Agronomy firm which provides soils laboratory services. The test is to assure compliance with the pH, organic content and gradation requirements of this section. A copy of the specification and the Department's current test methods shall be furnished to the laboratory by the Contractor. The testing of topsoil amended with approved composted sewage sludge shall be done at the Contractor's sole expense. Samples shall be taken by a representative of the Department and the laboratory results shall be returned to the Regional Landscape Architect.

The Contractor shall notify the Engineer of the intended source of the material at least three weeks in advance of the scheduled use of the material to allow time for sampling, shipping of the sample and testing.

**BASIS OF ACCEPTANCE.** Acceptance of topsoil will be based upon the test results unless otherwise specified. Tested topsoil must be approved in writing by the Engineer before any material is used, except that topsoil used for establishing turf and wildflowers or sodding may be placed at the Contractor's option, prior to amending it to correct deficiencies in its organic content and/or pH. Acceptance of topsoil placed prior to correcting organic content and/or pH deficiencies will be based on retest results of samples taken after the placed topsoil has been amended.

### 713-02 LIMESTONE

**SCOPE.** This specification covers the material requirements for limestone.

**MATERIAL REQUIREMENTS.** Limestone shall be ground limestone having a minimum total neutralizing value of 88% calcium carbonate equivalence. A minimum of 90% shall pass the 0.85 mm mesh sieve and a minimum of 60% shall pass the 0.15 mm mesh sieve.

**PACKAGING.** Agricultural limestone packed in the manufacturer's standard containers shall weigh not over 45 kg each, with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container.

**DELIVERY.** Bulk shipments shall be accompanied by a certificate providing the names, weight and analysis as specified herein for packaged material.

**BASIS OF ACCEPTANCE.** The manufacturer's label or certificate indicating compliance with these specifications shall be the basis of acceptance.

### 713-03 FERTILIZER

**SCOPE.** This specification covers the material requirements for fertilizers.

**MATERIAL REQUIREMENTS.** Fertilizers may be either fluid or dry formulations of commercial carriers of available plant nutrients.

The following mixed commercial fertilizers shall contain total nitrogen, phosphoric acid and soluble potash in the ratios stated:

- Type No. 1. 1-2-1 (approximate analysis)
- Type No. 2. 1-1-1 (approximate analysis)
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The following fertilizers shall be as specified:

Type No. 3. 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5%WIN). The balance of the nitrogen shall be present as methylene urea, water soluble urea, nitrate and ammoniacal compounds.

Type No. 4. Nitrate of soda, shall contain a minimum of 16% nitrogen.

Type No. 5. Ammonium sulfate shall contain a minimum of 20.5% nitrogen.

Type No. 6. Ammonium nitrate shall contain a minimum of 33% nitrogen, one-half of which is in the ammonium form and one-half of which is in the nitrate form.

Type No. 7. A nitrogen carrier containing a minimum of 45% nitrogen such as Urea or equivalent.

Type No. 8. Bonemeal shall be commercial steamed bonemeal, finely ground with a minimum of 1.0% nitrogen and a minimum of 20% phosphoric acid.

Type No. 9. Superphosphate shall be an approximate 0-20-0 formulation with an acceptable minimum of eighteen percent (18%) available phosphoric acid.

Type No. 10. Vacant

Type No. 11. A fertilizer in standardized packets designed to control the release of their contents over a specified period of time. The minimum guaranteed analysis shall be 16-8-8.

Type No. 12. Shall be as specified in the contract documents.

PACKAGING. Fertilizers shall be in the manufacturer's standard containers. Containers shall not weigh more than 45 kg and shall include a label stating the name of the material, the net weight of the contents, the manufacturer's name, and the guaranteed analysis of the fertilizer. Labels on containers of fluid fertilizers shall state the net volume of the container.

DELIVERY. Bulk delivery of fertilizer shall be accompanied by the manufacturer's certificate stating the name of the manufacturer, the guaranteed analysis and the weight of the shipment. Certificates accompanying bulk deliveries of fluid fertilizers shall also state the net volume of the shipment.

BASIS OF ACCEPTANCE. The manufacturer's label or certificate indicating compliance with these specifications shall be the basis of acceptance. The Engineer reserves the right to reject any material that has become caked or otherwise damaged.

713-04 SEEDS

SCOPE. This specification covers the material requirements for seeds.

MATERIAL REQUIREMENTS. Each species, variety and strain of grasses, legumes, wildflowers and cereals and the minimum percentage of germination of each shall be as specified in the contract documents unless otherwise approved.

Material other than pure live seed shall comprise only nonviable seed, chaff, hulls, live seed of crop plants other than those specified, harmless inert matter and weed seeds except that weed seeds other than seeds of noxious weeds will be permitted up to 1% of the gross weight of each kind of seed. Legume seeds requiring inoculation shall be accompanied by adequate amounts of their proper inoculants unless accompanied by certification of preinoculation.

The percentage of purity shown on the label will be acceptable. The percentage of germination for each of the species, variety or strains of seeds shown on the label shall not be less than the minimum percentage specified in the contract documents. The percentage of pure live seed of each kind in each container or bag of seeds delivered will be computed by multiplying the percent germination by percent purity and dividing by 100. The percentage of pure live seed of each kind multiplied by the net weight of the container or bag will indicate the number of kilograms of pure live seed of each kind in the container or bag.
Nomenclature. The common and scientific names of grasses, legumes, wildflowers and cereals specified in the contract documents shall conform to one or more of the authorities on botanical nomenclature recognized by the American Association of Nurserymen.

Legume Inoculants. Inoculants for treating legume seeds shall be a standard culture of nitrogen fixing bacteria that is not more than one year old. Each inoculant shall be the specific culture required for each legume. It shall be supplied only from manufacturers licensed to sell legume inoculants in New York State.

Packaging. Seeds shall be furnished and delivered in labeled containers or bags that are acceptably sealed or sewn tight. When seeds are to be accepted by certification, they may be mixed prior to delivery. When sampling and testing is specified, seeds shall not be sown until written approval is issued. Approved seeds may be mixed prior to delivery.

LABELING. All seed and seed labels shall be in accordance with State and Federal Laws, Rules and Regulations, including Article 9 Section 137 of the Agriculture and Markets Law.

SAMPLING AND TESTING

A. Certification. Seeds will be accepted on the basis of certification unless otherwise specified in the contract documents. The certification shall consist of the label that shall be attached to each container of seed in accordance with the provisions of the New York State Agriculture and Markets Law. Seeds will not be accepted by certification unless the test dates shown on the seed container labels are within the same calendar year that the seeds are sown. Seeds will not be accepted if seed container labels are removed prior to the time of sowing nor will seeds be accepted if container labels have been altered, are obliterated or are otherwise illegible.

B. Sampling and Testing. Seeds will be subject to sampling and testing when specified in the contract documents and/or whenever the Engineer determines that seed damage or deterioration may have occurred as a result of handling, transit or storage. Seeds specified for sampling and testing, and other seeds to be sampled and tested as determined by the Engineer, shall not be sown until test results are received and written approval is issued. Sampling shall be done by a representative of the New York State Department of Transportation. Testing shall be done by the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, New York, and the test results obtained will be considered final. Tolerances established by the Agricultural Experiment Station will be used to determine if the seeds conform to the specifications.

BASIS OF ACCEPTANCE. The seeds shall meet the minimum specified requirements regardless of the guarantee of qualities or dates of testing and after the application of tolerances approved by the Department of Seed Investigations, New York State Agricultural Experiment Station, Geneva, New York. Seed that has become wet, moldy or otherwise damaged in transit or storage will not be acceptable. After delivery to the Contractor, seed shall be stored so that it is protected from damage or deterioration from any source. Provisional acceptance of seeds shall be obtained before the seeds are sown. Final acceptance may be subject to the results of official sampling and testing. The Contractor shall furnish the vendor with the specifications for the material.

713-05 WOOD CHIPS

SCOPE. This specification covers the material requirements for wood chips used as mulch, landscape bedding or erosion control.
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MATERIAL REQUIREMENT. Wood chips used for mulch, landscape bedding or erosion control may be either of the following, unless otherwise specified in the contract documents. Wood chips shall not exceed 80 mm in the greatest dimension.

A. TYPE A. This shall be derived from green hardwood or softwood. The chips shall be free from leaves, young growth, unchipped branches, twigs 50 mm or less in diameter, wood shavings, sawdust or foreign materials such as stones, nails, plastic, etc.

B. TYPE B. Shall be either Type A green wood chips or wood chips derived from unadulterated construction and/or demolition waste wood. Wood chips derived from construction and/or demolition waste wood shall not be contaminated with paint, chemicals, shingles, glass, nails, etc.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection, upon delivery, by the Engineer for compliance with the materials requirements and applicable certification of compliance with 6 NYCRR Part 360.

713-06 TREES, SHRUBS AND VINES

Nomenclature. The common and scientific names of plants shall be in conformity with the approved names by S.P.N. (Standard Plant Names) or its successor as the American Association of Nurserymen's recognized authority on botanical nomenclature.

Quality and Size. Plants, including root spread and ball size, shall be in accordance with the current edition of “American Standard for Nursery Stock,” a code of standards sponsored by the American Association of Nurserymen, or as further specified in the contract documents. All plants shall have a normal habit of growth and be typically characteristic of their respective kinds. When a minimum and maximum size is specified, an average size is required. Plants shall not be pruned before delivery and no plants shall be cut back from larger sizes to meet the sizes specified. Plants shall be free from injury, insect damage, infestation and disease. Plants shall be nursery grown unless otherwise specified and bear evidence of proper nursery care, including adequate transplanting and root pruning. Plants specified from collected sources shall be clean, sound stock, free from decayed stumps and from fire injury.

Container grown material, including container sizes and soil, shall be as specified in the Contract Documents.

The container shall be sufficiently rigid to hold the ball shape and protect the root ball during handling and shipping. Container grown plants shall have been grown in the container long enough for the new fibrous roots to have developed so that the root ball is firm and will retain its shape and hold together when removed from the container. The plants shall be in a healthy growing condition with tops which are of good quality, and shall have been adequately hardened off before shipment.

Specimen plants shall be as specified in the Contract Documents.

Digging Plants. Plants shall be dug with care and skill immediately before shipment. No cold storage plants will be accepted unless approved. Plants stored temporarily shall be properly heeled in or otherwise protected from injury. Digging shall avoid all possible injury to, or loss of, roots, but roots cut shall be cleanly cut.

Root Protection. After plants are dug, their roots shall be protected from injury such as caused by heat, sun, wind and freezing temperatures. All bare roots of trees, shrubs and vines shall be puddled at the time of digging unless otherwise approved. Puddling shall be done in a wet clay mixture, of a quality to adhere to all parts of the root system. Roots of bare root plants which have been thoroughly covered at the time of digging with an anti-desiccant as specified under §713-08 will not require puddling. Bare roots shall be further protected by wrapping in wet straw, moss, burlap or other suitable material.
Transportation. Tarpaulins or other covers shall be placed over plants transported by open trucks or by open freight cars. Doors on closed trucks shall be kept closed to prevent draughts. Shipments made in boxcars or closed trucks shall be adequately ventilated to prevent "drafts." The heads of trees shall be tied in carefully to prevent fracturing or breaking the branches. Trunks and branches shall be adequately supported and padded to avoid scraping or bruising.

Trees. Nursery grown trees shall have no cuts of limbs which are not healing and no cuts over 20 mm which have not completely calloused over, no cut back crowns or leaders and no abrasions of the bark. Trees shall have good fibrous root systems characteristic of the kind. Deciduous trees shall have normal spread of crowns unless otherwise specified.

Bare root (B.R.) trees shall not require earth adhering to the roots except as required for puddling as specified. Any trees specified as bare root will be accepted balled and burlapped at the unit price bid for bare root trees.

Balled and burlapped (B&B) trees shall be properly dug and protected to preserve the natural earth in contact with the roots. No manufactured balls will be accepted. The balls shall be of the required size, firmly wrapped and tied with approved materials. No balled plants will be acceptable if the ball is cracked or broken.

Balled and platformed trees (B&P) shall be balled as specified for balled and burlapped trees. Platforms shall be square or octagonal shaped in a size slightly larger than the diameter of the bottom of the soil mass, inserted under each ball and securely lashed to the ball by means of ties from the platform corners to the rope collar on top of the ball.

Container grown trees shall be as specified in the contract documents.

The tops of trees shall be well formed structural but they are not required to have more than reasonably straight trunks, nor better than average well balanced crowns, nor be of specimen quality unless specimen plants are specified on the plans.

Shrubs. Shrubs shall have good fibrous root systems. The quality of balled and burlapped and balled and platformed shrubs shall be as specified for B&B and B&P trees herein. Container grown shrubs shall be as specified in the contract documents.

Plants specified as sods or clumps shall be dug from good soil which has produced a fibrous root system typical of the nature of the plant. The sods shall be dug with earth and incidental vegetation adhering to the roots. If the soil or habit of the root growth is such that the roots are not adequately protected, the sods shall be wrapped in burlap or other suitable material.

Vines. Vines shall be vigorous, well-furnished plants with good vigorous root systems. Vines shall be field grown (F.G.) unless otherwise specified. Pot grown plants (P.G.) shall be vigorous, well-developed plants, well established in pots with sufficient roots to hold the earth intact after removal from containers but they shall not be rootbound.

Substitutions. No change of quantity, size, kind or quality of plants as specified will be accepted except upon written approval.

LABELING. Labeling shall be in accordance with normal large scale nursery labeling practice except that the Contractor may be required at any time to supply positive identification of any plant.

BASIS OF ACCEPTANCE. The Contractor shall furnish the vendor with a copy of the specifications for the plants. The Contractor shall be responsible for all certificates of inspection of plant materials which may be required by Federal, State or other authority to accompany shipments of plants. All plants shall be subject to inspection at any place and at any time. Inspections desired by the Contractor, if approved, shall be at the expense of the Contractor. The Contractor shall be represented at all inspections. The Engineer reserves the right and option to place Department seals on any or all materials selected. Selection and/or tagging of material shall cover the type and body quality of the plant only, but shall not constitute final acceptance nor preclude the right of rejecting plants not fully meeting the requirements of the specifications.

The Department reserves the right to identify by suitable non-injurious means such as painting, marking
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by various methods, etc. all plant material rejected upon delivery to the contract site.

713-07 JUTE MESH OR OTHER APPROVED EROSION CONTROL MATERIALS

SCOPE. This specification covers the material requirements for Erosion Control Materials.

MATERIAL REQUIREMENTS

Class I. Short term duration, light duty, organic or synthetic erosion control material (unless only 100% organic products are specified).

Type A. Products for use where the slopes do not exceed 1:4. No minimum shear stress flow is required. The product shall be capable of withstanding moderate foot traffic without tearing or puncturing.

Type B. Products for use on slopes 1:3 and flatter.

Type C. Products for use on slopes 1:3 or flatter, or in channels where the calculated shear stress flow is 70 Pa or less. Products shall be capable of withstanding shear stress flows of at least 70 Pa.

Class II. An intermediate-duration, erosion-control material.

Type A. Jute Mesh. For use on slopes 1:2 or flatter. Jute Mesh shall be of a uniform open plain weave of undyed and unbleached single jute yarn. Jute mesh shall be woven as follows:

- Approximately 55 warp ends per meter width.
- Approximately 37 weft ends per linear meter.
- Mass of jute mesh shall average 0.5 kilogram per square meter (plus or minus 5%).

Type B. Organic or non-organic products for use on slopes 1:2 or flatter, or in channels when the calculated shear stress flow is 95 Pa or less. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Type C. Products made entirely of organic materials. For use on slopes 1:2 or flatter, or in channels when the calculated shear stress flow is 95 Pa or less. Only 100% organic materials are allowed. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Class III. Permanent synthetic, ultra-violet stabilized erosion control materials.

Type A. Products for use on slopes 1:2 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 95 Pa.

Type B. Products for slopes 1:2 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 170 Pa.

Type C. Products for slopes 1:1 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 240 Pa.

Type D. Products for slopes 1:1 or flatter, or in channels. Products shall be capable of withstanding shear stress flows of at least 380 Pa.

Class IV. Soil Stabilizers - Soil stabilizers are considered a short term duration erosion control device. When used alone, they shall be used on slopes 1:3 or flatter. They shall not be used in channels.

Type A. A cementitious soil binder which is added to wood cellulose fiber mulch, or a bonded fiber matrix. They are intended to form a thick heavy bodied crust or mat like barrier that controls water and wind induced erosion. Type A may be used by itself, and is approved for use with Class III, Type A, B and C erosion mats where those mats are used on slope applications.
Type B. A polyacrylamide (PAM) and calcium solution intended to reduce the credibility of bare soils during construction activities or to enhance the performance of mulching on permanent slopes. Soil stabilizer, Type B, shall bond soil particles and shall effectively increase the soil particle size to 1.0 mm or larger. It shall reduce the movement of soil through chemical bonding, increase the particle size thus making silt fence more effective, and increase the water absorption of the soil.

Basis of Acceptance. Acceptance of Class I, II, III and IV Erosion Control Material is based upon the supplier's name and address on the product container label appearing on the Department's Approved List, and a certification of compliance with these specifications.

As an erosion control material is received on a project site, the Engineer shall remove two square meters, for quality assurance, and submit it to the Geotechnical Engineering Bureau for testing. This pertains to Classes I, II, and III only, Class IV does not require a submission. The results of the quality assurance testing will not affect the use of a material on the project for which it is supplied. It is for the purpose of monitoring any changes in manufacturing processes which may affect the original properties that were determined at the time of initial approval.

The erosion control material will be tested for mass per unit and thickness. If the results are below the minimum acceptable for approval, the product's status on the Approval List will be reevaluated. The manufacturer will be notified of the review. Possible actions range from retesting of the manufacturer's line of products to immediate removal of those products from the Approved List.

Application for addition to the Approved List can be made to the Landscape Architecture Bureau. This evaluation will be performed in accordance with procedural directives of the Landscape Architecture Bureau. A geotextile component may be included in Class III Erosion Control Material. The geotextile component will be evaluated in accordance with procedural directives of the Geotechnical Engineering Bureau. Suppliers seeking addition to the Department's Approved List should allow 6 months for the evaluation.

713-08 MATERIALS FOR PROTECTION OF PLANTS

Scope. This specification covers the material requirements for materials used in planting operations. For methods of installation, see current standard sheet, as applicable.

Material Requirements

Rodent Guards. Rodent guards shall be capable of protecting plants from girdling by rodents and shall be as specified in the contract documents or as approved by the Engineer.

Stakes for Supporting Trees

A. Above Ground Support. Stakes for supporting trees shall be of white or red cedar, or other approved material. Stakes 2.5 m to 3.0 m long shall have a minimum diameter of 50 mm to 60 mm. Stakes 3.75 m long shall have a minimum diameter of 80 mm. The maximum diameter of stakes shall not exceed 100 mm. Stakes shall be pointed at one end and shall have a maximum allowable deflection of 40 mm for every meter of length. All stakes shall be sound and free from insects and fungi.

B. Underground Support. Stakes for supporting trees shall be of approved hardwood or other approved material. Hardwood stakes shall be 50 mm by 100 mm nominal size, approximately 1.25 m long. Stakes shall be pointed at one end. All stakes shall be sound and free from insects and fungi.

Deadmen and Guy Stakes. Deadmen and guy stakes used to anchor guy wires or cables, which support trees, shall be of the quality and sizes required.

Wire. Wire for guying plants shall be new annealed steel wire (either galvanized or ungalvanized) or aluminum wire of the A.S. & W. gauge specified.
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Bracing Materials. The size and quality of cables, turnbuckles, thimbles, leg hooks, eye bolts, rods, washers and nuts shall be as specified on the plans or as approved.

Jute Burlap. Jute burlap shall be in 100 mm wide strips and weigh 265 g/m².

Hose. Hose for protecting the bark from guy wires shall be good quality braided rubber, plastic hose as approved, or reinforced materials. Hose shall be at least 20 mm outside diameter.

Twine. Twine for use in wrapping trees shall be jute twine not less than two ply for trees 80 mm or less in diameter, and three ply for trees over 80 mm in diameter.

Paper. Wrapping paper for trees shall be waterproof paper 30-30-30 krinklecraft or equal in 100 mm wide strips.

Anti-Desiccants. Anti-desiccants shall be emulsions or other materials which will provide a protective film over plant surfaces, permeable enough to permit transpiration.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.

713-09 AND 713-10 (VACANT)

713-11 WOOD FIBER MULCH

SCOPE. This specification covers the material requirements for wood fiber for use as a mulch in conjunction with turf establishment or erosion control.

MATERIAL REQUIREMENTS. Wood fiber shall be a first generation product manufactured directly from 100 percent wood which has been recovered or diverted from solid waste.

Wood fiber shall be manufactured from unadulterated wood that is not contaminated with paint, chemicals, shingles, plastic or other foreign materials. Wood fiber mulch shall not be manufactured from or include paper.

Wood fiber mulch shall be manufactured so that the wood fibers will remain uniformly suspended in water under agitation and will blend with seeds, fertilizer and other additives to form a homogeneous slurry. It shall have the characteristics which, upon hydraulic application, shall form a blotter-like ground coating with moisture absorption and percolation properties and the ability to cover and hold seeds in contact with the soil.

Wood fiber mulch shall contain no growth or germination inhibiting factors, and shall contain a non-permanent green dye. Wood fiber mulch shall be supplied in the manufacturer’s standard containers, with the name of the material, net weight of contents, the manufacturer’s name and the air dry weight of fiber (equivalent to 10% moisture) appearing on each container.

BASIS OF ACCEPTANCE. Manufacturer’s product label and certification indicating compliance with these specifications and any applicable regulatory requirements pertaining to solid waste management.

713-12 MULCH ANCHORAGE

SCOPE. This specification covers the material requirements for mulch anchorage.

MATERIAL REQUIREMENTS. Mulch anchorage shall be Type A, unless otherwise specified in the contract documents.

Type A: Shall be approved non-asphaltic commercially available products that are specifically formulated for the purpose of anchoring or tacking hay or straw mulch. Mulch anchorage shall include a non-permanent green dye. The paper content of paper-based hydraulic mulch anchorage shall be 100
percent post consumer recovered from solid waste. At least 98 percent of such paper shall be recovered newsprint. The materials shall be mixed and applied in accordance with the manufacturer's instructions.

**Type B:** Shall be either Type A or asphalt emulsion meeting the requirements of either 702-3201 Asphalt Emulsion or 702-90 Asphalt Emulsion Tack Coat. When asphalt emulsion is used it shall be uniformly applied at the rate of 0.02 L/m², unless otherwise specified in contract documents.

**Packaging.** Mulch Anchorage Type A shall be furnished in the manufacturer's standard containers with the name of the material, net weight of contents, the manufacturer's name and the dry weight of fiber (equivalent to 10% moisture) appearing on each container. The instructions for mixing and application shall also appear on each container.

Asphalt emulsion used for Mulch Anchorage Type B has no packaging requirements. The Engineer shall reject any asphalt material that is not homogenous or has separated. Asphalt separation caused by freezing unacceptable.

The Engineer shall reject any materials that have become wet, caked, frozen, separated or otherwise unfit for use.

**Basis of acceptance.** The basis of acceptance for Mulch Anchorage Type A shall be the manufacturer's product label or product literature that indicates compliance with this specification.

The basis of acceptance for asphalt emulsion used as Mulch Anchorage Type B shall be as specified under Section 702 Bituminous Materials.

### 713-13 Pesticides

**Scope.** This specification covers the material requirements for pesticides used to manage vegetation, insects, rodents and/or other target pests.

**Material Requirements.** Pesticides shall be approved commercially available products that are currently registered by the United States Environmental Protection Agency and the New York State Department of Environmental Conservation. Pesticides shall also have all required labels indicating that they are approved for the intended use.

Pesticides shall be mixed and used in strict conformance with the instructions on the label or supplemental labels.

**Packaging.** Pesticides shall be delivered and securely stored until used in the manufacturer's standard containers that have legible labels affixed in accordance with the provisions of the federal and state pesticides laws, rules and regulations in effect at the time of delivery.

Pesticides that do not meet these packaging requirements, at any time, will be rejected by the Engineer and shall be removed from the Contract site immediately.

The Engineer shall reject any pesticides that have become wet, caked or otherwise unfit for use.

**Basis of Acceptance.** The basis of acceptance shall be original, sealed, and properly labeled pesticide containers; and two copies of sample labels and supplemental labels that include instructions for the intended use of the pesticide.

The Department reserves the right to inspect the condition of pesticides and pesticide containers at any time while they are on the Contract site and to direct immediate removal of any pesticides and/or containers that do not meet these specifications.

### 713-14 Sod

**Scope.** This specification covers the material requirements for sod.
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MATERIAL REQUIREMENTS. Sod shall be commercially grown sod and shall be accompanied by a certificate indicating compliance with the regulations of the New York State Department of Agriculture and Markets.

Sources of sod shall be made known to the Engineer at least five days before cutting. Sod shall be cut into squares or rectangular portions which shall be 300 mm wide, or as approved, and may vary in length, but shall be of a size which will permit them to be lifted without breaking. The sod, when delivered to the contract site, shall be sufficiently moist so the soil will adhere firmly to the roots when it is handled. Height of the grass shall not exceed 80 mm. The sod shall be cut to a minimum thickness of 20 mm. The sod shall be reasonably free from weeds in conformance with accepted commercial practice and shall consist of a mixture of permanent grasses such as bluegrass and/or fine leaved fescues, unless otherwise specified.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.

713-15 ORGANIC MATERIAL

SCOPE. This specification covers the material requirements for organic material used in conjunction with amend or manufacturing topsoil.

GENERAL. Organic materials regulated by the New York State Department of Environmental Conservation shall meet all applicable regulatory requirements.

MATERIAL REQUIREMENTS

A. Humus or Peat. The material shall be commercially produced natural humus or peat from freshwater sources and may contain sedge peat, sphagnum peat or reed peat. The material shall be free from hard lumps, roots, stones and other objectionable materials. There shall be no admixture of refuse or material toxic to plant growth. It shall be in a shredded or granular form able to pass through a 12.5 mm sieve. According to methods of testing of A.O.A.C. in effect on the date of the invitation of bids, the acidity shall be not less than 3.5 pH and the organic matter shall be not less than 85% as determined by loss on ignition. The minimum water holding capacity shall be 200% by weight on an oven-dry basis.

B. Peat Moss. Peat moss shall be commercially produced and shall be composed of the partly decomposed stems and leaves of any or several species of sphagnum moss. It shall be free from wood, decomposed colloidal residue and other foreign matter. It shall have an acidity range of 3.5 pH to 5.5 pH as determined in accordance with methods of testing of A.O.A.C. in effect on the date of advertisement for bids. Its water absorbing ability shall be a minimum of 1100% by weight on an oven-dry basis.

C. Source-Separated Compost. Source-separated compost shall be commercially or municipally produced and shall be an organic substance produced by the biological and biochemical decomposition of source-separated compostable material that is separated at the point of waste generation. Source-separated compostable materials may include, but are not limited to, leaves and yard trimmings, food scraps, food processing residues, manure and/or other agricultural residuals, forest residues and bark, and soiled and/or unrecyclable paper.

Source-separated compost shall be reasonably free of sticks, stones, refuse, materials deleterious to soil structure, or any material toxic or detrimental to plant germination and growth. Source-separated compost shall also meet the following additional specifications:

A) Minimum organic matter shall be 30% (dry weight basis) as determined by loss on ignition;
B) Product shall be loose and friable, not dusty, and have a moisture content of 35% - 60%;
C) Particle size shall be <12.5 mm.
D) Soluble salts content shall be < 4.0 mmhos/cm (ds/m);
E) Compost shall be stable to very stable according to the test method current on the date of
advertisement for bids.
F) pH shall be between 6.0-8.0.

D. Composted Sewage Sludge. Composted sewage sludge is regulated by the New York State Department of Environmental Conservation (DEC) and must meet all applicable regulatory requirements.

TESTING. Source separated compost will be subject to testing by the Department to assure it is stable.
Composted sewage sludge used to amend or manufacture topsoil shall have a certificate, from a laboratory approved by the DEC, verifying compliance with all applicable laws, rules and regulations. Only facilities permitted to compost sewage sludge under 6 NYCRR Part 360, Solid Waste Management Facilities, shall be allowed to furnished finished compost for use in topsoil. The certification shall be supplied by the Contractor, at the Contractor’s sole expense, and prior to the delivery of any composted sewage sludge, topsoil containing composted sewage sludge or other such regulated material to the contract site. The material shall be approved before it is used. A copy of the specifications shall be furnished to the laboratory by the Contractor.

BASIS OF ACCEPTANCE. Acceptance of humus, peat and peat moss will be based on the Producer’s label or certificate of analysis by an established laboratory indicating compliance with the material requirements.
Acceptance of source-separated compost shall be based upon the Producer’s label of certificate of analysis by an established laboratory indicating compliance with the material requirements; and a delivery inspection by the Engineer. Source-separated compost may be sampled and tested by the Department to assure compliance with the material requirements.
Acceptance of composted sewage sludge shall be based on certification by a DEC approved laboratory indicating compliance with the material requirements and all applicable regulations.

713-16 AND 713-17 (VACANT)

713-18 HAY

SCOPE. This specification covers the material requirements for hay.

MATERIAL REQUIREMENTS. Hay for mulching shall be mowings of acceptable herbaceous growth which is free from noxious weeds. Materials which are low grade and unfit for farm use such as “U.S. sample grade” will be acceptable. Weight shall be calculated on the basis of material having not more than 15% of moisture content.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with material requirements.

713-19 STRAW

SCOPE. This specification covers the materials requirements for straw.

MATERIAL REQUIREMENTS. Straw for mulching shall be stalks of oats, wheat, rye or the approved crops which are free from noxious weeds. Materials which are low grade and unfit for farm use, such as “U.S. sample grade” will be acceptable. Weight shall be calculated on the basis of the materials having not more than 15% of moisture content.

BASIS OF ACCEPTANCE. Acceptance shall be based on inspection by the Engineer for compliance with the material requirements.
§714-01

SECTION 714 - CURBING AND GUTTER

714-01 STONE CURB

SCOPE. This specification covers the material and fabrication requirements for stone curb used in highway and bridge construction.

MATERIAL REQUIREMENTS. Stone curb shall be either a bluestone, sandstone or granite. The stone shall be sound and durable, free from seams which impair its structural integrity and of a smooth splitting and machining character. Natural color variations that are characteristic of the deposit will be permitted. Any curb containing discoloration other than cleanable surface stains shall be sampled and submitted to the Materials Bureau for evaluation.

Dimensions

A. General. Curb shall be cut to conform to the shape and size shown on the standard sheets and contract plans.

B. Curbs on Straight Sections. Minimum lengths of straight segments of Economy and Sloped curbs shall be 600 mm. All other straight curb types shall have 900 mm minimum lengths.

C. Curbs on Curved Sections. No minimum length requirements are specified for curb segments on curves with radii of 60 meters or less. When directed by the Engineer, curb segments on curves with radii 31 to 60 meters shall be cut in 900 mm to 1200 mm straight lengths. With exception of Economy and Sloped curbs, segments on curves with radii of 30 meters or less shall be shaped to the required curvature and the ends cut on radial lines. Economy and Sloped curbs shall be furnished only in straight segments and on curves with radii less than 3 meters, their ends shall be cut on radial lines.

D. Transition Curb for Bridge to Roadway Curbs. A transition curb for bridge curb to roadway curb shall be furnished, if required. Where an 200 mm exposed face is desired for a roadway curb, the appropriate curb sections with a 150 mm exposed face shown on the appropriate section of the standard sheet shall be increased 50 mm in depth.

E. Curb Widths. The bottom width of the various types of curbing shall be as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>A,B,C,D,E,T2 and Economy</td>
<td>100 mm minimum for 2/3 of length</td>
</tr>
<tr>
<td>F1,G1,M and T1</td>
<td>100 mm minimum for entire length</td>
</tr>
<tr>
<td>R1 and R2</td>
<td>200 mm minimum for entire length</td>
</tr>
<tr>
<td>S</td>
<td>125 mm minimum for entire length</td>
</tr>
</tbody>
</table>

Finish

A. General. Curb surfaces shall be finished as indicated on the plans or standard sheets.

B. Top Surfaces. Top surfaces shall be finished to approximately true planes. When sawed, hammered or thermal finishes are applied, no projection or depression shall be greater than 5 mm. Saw marks normal to the sawing process will be permitted if within the 5 mm tolerance.

C. Arris Lines. Top front arris lines shall be straight and true with no variations greater than 3 mm measured from a 600 mm straightedge placed along the arris line.

Back arris lines on curb types E,F1,M,T1, and T2 curb and the lower front arris lines on types E,F1,M,R1,R2,S,T1 and T2 curbs shall be straight and true with no variations from a straight line greater than 6 mm measured in the same manner. Back arris lines are not required for types R1,R2 and S curbs.

Exposed arris lines at the joints shall not project beyond the plane of a split face and shall not fall under the plane of a split face more than 6 mm.
D. Back Surfaces. Back surfaces shall have no projection or depression which exceeds a batter of 25 mm in 75 mm for a distance of 75 mm from the top.

E. Front Exposed Faces. Front exposed faces of straight Types A, F1, and G1 curbs, when split, shall have no projection greater than 25 mm or depression greater than 13 mm measured from a vertical plane passing through the arris line at the top of the split face. For radius units the front exposed faces when split, shall have no projection greater than 30 mm. The entire face of Type G1 curb shall be considered as exposed face. Front exposed faces of types M, R1, R2, S, T1 and T2 curbs, when split, shall have no projection or depression greater than 13 mm measured from a vertical plane passing through the arris line at the top of the split face. Front faces below grade shall have no projection or depression greater than 25 mm measured in the same manner.

No projection on the exposed face of type C curb shall extend over 6 mm beyond a vertical plane extending from the intersection of the pavement grade line and the curb face. The exposed face of type C curb shall have no depression greater than 13 mm measured from the plane of the face through the top arris line.

F. Ends. Ends of curbs shall be approximately square with the planes of the exposed curb surfaces and shall be finished so that when curbs are set, no space greater than 20 mm shall show in the joints for the full length of the exposed joint. The curb ends below the pavement surface or shoulder shall break not over 200 mm from the joint plane on curb types A, B, C, D, E and T2 curbs and not more than 50 mm on types G1, R2, and T1.

Ends of types F1, G1, M, R1, R2, S and T1 curbs shall be sawed at locations called for on the contract plans.

G. Drill Holes. Drill holes will not be permitted in exposed curb surfaces.

Exceptions to Finish Requirements

A. Economy Type Curbs. Top surfaces shall be split so that no projections or depressions are greater than 13 mm. Front arris lines shall not vary from a straight line more than 13 mm. Exposed joint openings shall not exceed 40 mm. Drill holes will be permitted in top and face surfaces.

B. Sloped Type Curb. Exposed faces shall be smooth and quarry split to an approximately true plane having no projection or depression greater than 25 mm from a 600 mm straightedge placed as closely as possible to the plane of the curb face.

Drill holes not more than 75 mm long and 13 mm deep will be permitted in the face.

Arris lines at joints shall not project beyond the plane of the split face and shall not fall more than 13 mm under the plane of the split face.

Curb ends shall be approximately square with the plane of the exposed curb surfaces and finished so that when curbs are set, no space greater than 40 mm shall show in the joints for the full width of the face.

BASIS OF ACCEPTANCE. Stone curb shall be from a source appearing on the Department's Approved List and will be accepted in accordance with procedural directives of the Materials Bureau. In addition, the stone curbing will be inspected for dimensional compliance at the project site by the Engineer. Curbing not in compliance with the dimensions on the standard sheets or contract plans will be rejected by the Engineer.
§714-04

714-04 PRECAST CONCRETE CURB

SCOPE. This specification covers the material and fabrication requirements for precast concrete curb.

MATERIAL REQUIREMENTS. Materials shall meet the requirements of the following subsections:

- Portland Cement 701-01
- Coarse Aggregates 703-02
- Concrete Sand 703-07
- Epoxy Coated Bar Reinforcement, Grade 420 709-04
- Epoxy Coated Wire Fabric Reinforcement 709-08
- Admixtures 711-08
- Water 712-01

The maximum allowable total chloride content in concrete shall not exceed 0.10 percent by weight of cement. Testing shall be done in accordance with written procedural directives of the Department. Cement shall be Type 1 or Type 2. Coarse aggregate gradation shall conform to the No. 1 Size Designation in §703-02 Coarse Aggregate, Table 703-4.

Pozzolans. The manufacturer may substitute fly ash meeting the requirements of §711-10 up to a maximum of 15 percent of the minimum Portland Cement by weight.

Concrete Manufacturing. The manufacturer shall formulate a concrete mix design, with a minimum cement content of 360 kilograms per cubic meter, such that the properties of the concrete meet the following requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Content, %</td>
<td>5.0-8.0</td>
</tr>
<tr>
<td>Compressive Strength MPa, min., 28 days</td>
<td>25</td>
</tr>
</tbody>
</table>

The manufacturer shall maintain at the manufacturing site a record of material used and their sources, and a copy of the concrete mix design.

FABRICATION. Precast curb shall be fabricated to conform to the size and shape shown on the standard sheet unless otherwise shown on the plans. Reinforcement is optional. However, if the manufacturer reinforces the curb for handling, the manufacturer shall use either epoxy coated bars conforming to the requirements of §709-04 Epoxy Coated Bar Reinforcement or epoxy coated wire fabric reinforcement conforming to the requirements of §709-08. Minimum lengths shall be 1.75 meters except for radial curb and closures. Maximum lengths shall be 3.05 meters.

Curb to be set on radius of 30 meters or less shall be cast to the curve required and ends shall be formed or sawed on radial lines. Curbs on a radius of 31 meters to 60 meters shall be cast or cut in 1 or 1.25 meter, straight lengths if so directed by the Engineer. Economy and Sloped types shall be furnished in straight pieces only except when on a radius of 3.05 meters or less, they shall be cast or cut with radial joints.

The manufacturer shall produce curb sections that are uniform in appearance. The concrete mix shall be cast in steel forms unless another type of form is approved by the Regional Director or his/her representative. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both.

Tack welding or any other welding of specified steel reinforcement will not be allowed. Welding for cage stability will be permitted provided that redundant steel is added in each direction and tied to the cage. The redundant steel shall be thirty (30) bar diameters, minimum, in length and shall be positioned so that the mid-point is located at the weld.

Curing. Curing shall be accomplished in accordance with the methods set forth under §706-02, Reinforced Concrete Pipe except Controlled Atmospheric Curing shall not be allowed.
REPAIR. Curb sections that contain minor defects caused by manufacture or mishandling may be repaired. Minor defects are defined as those that are small holes or spalls that do not penetrate deeper than the steel reinforcement. Repairs shall be made using a concrete repair material conforming to the requirements of §701-04 and having a color similar to that of the curb section. The repair shall be finished to the proper shape and cured. It shall withstand a moderate blow with a 450 gram hammer.

Curb sections having honeycombing, cracks, or large spalls are not acceptable and shall not be repaired.

SAMPLING AND TESTING. Precast concrete curb sections manufactured under the requirements of this specification shall be separated into specific and identifiable “production” lots. The maximum number of units in a lot shall be in accordance with Department directives.

The properties of the concrete will be determined on a production lot basis, by the Department, in accordance with either of the following methods at the option of the Department:

A. Production Testing. Testing shall be performed by the manufacturer, subject to the approval and inspection of the Materials Bureau. It shall consist of testing the plastic concrete for compliance to the air content required by this specification and the casting and testing of concrete cylinders for compressive strength determination. Test cylinders used to determine the required compressive strength shall be cured with units they represent. The Department reserves the right to test the hardened concrete at any time, in which case the manufacturer shall drill 100 mm diameter cores at the direction of a Department representative.

B. End Product Testing. The testing of hardened concrete for both air content and compressive strength will be performed by the Materials Bureau on 100 mm diameter cores drilled by the manufacturer under the supervision of a Department representative.

BASIS OF ACCEPTANCE. Precast concrete curb shall be accepted in stock lot quantities at the manufacturing location according to the procedural directives of the Materials Bureau.

714-05 (VACANT)

714-06 ASPHALT CONCRETE CURB

SCOPE. This specification covers the material requirements for asphalt concrete curb.

MATERIAL REQUIREMENTS. The Contractor shall have the option of supplying the mix specified herein or he may elect to furnish an alternate mixture subject to prior approval by the Director, Materials Bureau. The requirements of Section 401 - Hot Mix Asphalt Production shall apply with the following modifications:

A. Automatic batching and recording equipment will not be required.

B. The asphalt concrete mix shall include a powdered, devulcanized tire rubber which is moisture free, black in color, free flowing and containing no fabric or cord material. The gradation shall conform to the following sieve analysis; percent passing of total weight:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.75 mm</td>
<td>100</td>
</tr>
<tr>
<td>2.36 mm</td>
<td>85-100</td>
</tr>
<tr>
<td>1.70 mm</td>
<td>65-100</td>
</tr>
<tr>
<td>850 µm</td>
<td>35-80</td>
</tr>
<tr>
<td>600 µm</td>
<td>15-40</td>
</tr>
</tbody>
</table>

C. The asphalt cement used in the mix shall comply with either material specification §702-0400, §702-0500, or §702-0600.

D. The aggregate gradation shall be as follows:
§714-06

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing (1)</th>
<th>Job Mix Tolerances (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5 mm</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>6.30 mm</td>
<td>90-100</td>
<td>±5</td>
</tr>
<tr>
<td>3.15 mm</td>
<td>80-100</td>
<td>±6</td>
</tr>
<tr>
<td>850 μm</td>
<td>30-70</td>
<td>±7</td>
</tr>
<tr>
<td>425 μm</td>
<td>15-45</td>
<td>±6</td>
</tr>
<tr>
<td>180 μm</td>
<td>5-23</td>
<td>±3</td>
</tr>
<tr>
<td>75 μm</td>
<td>2-10</td>
<td>±2</td>
</tr>
<tr>
<td>Asphalt Cement(2)</td>
<td>6-9</td>
<td>±0.4</td>
</tr>
<tr>
<td>Tire Rubber(2)</td>
<td>½ - 2</td>
<td>±0.1</td>
</tr>
</tbody>
</table>

(1) Based on total aggregate weight.
(2) Based on total weight of mix.

BASIS OF ACCEPTANCE. The acceptance of the asphalt concrete used in asphalt curb shall be in accordance with the Department written instructions.

714-07 PRECAST CONCRETE GUTTER

SCOPE. This specification covers the material and fabrication requirements for precast concrete gutter.

MATERIAL REQUIREMENTS. Materials shall meet the requirements of the following subsections:

- Portland Cement 701-01
- Coarse Aggregates 703-02
- Concrete Sand 703-07
- Bar Reinforcement, Grade 420 709-01
- Wire Fabric for Concrete Reinforcement 709-02
- Admixtures 711-08
- Water 712-01

The maximum allowable total chloride content in concrete shall not exceed 0.10 percent by weight of cement. Testing shall be done in accordance with written procedural directives of the Department. Cement shall be Type 1 or Type 2. Coarse aggregates shall meet one of the following optional gradations:

Option A. The coarse aggregate gradation shall conform to the No. 1 Size Designation in §703-02, Coarse Aggregates, Table 703-4.

Option B. The coarse aggregate gradation shall conform to the following limits:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.5 mm</td>
<td>100</td>
</tr>
<tr>
<td>25.0 mm</td>
<td>93-100</td>
</tr>
<tr>
<td>12.5 mm</td>
<td>27-58</td>
</tr>
<tr>
<td>6.30 mm</td>
<td>0-8</td>
</tr>
</tbody>
</table>

Pozzolans. The manufacturer may substitute fly ash meeting the requirements of §711-10 Fly Ash up to a maximum of 15 percent of the minimum Portland Cement by weight.

Concrete Manufacturing. The manufacturer shall formulate a concrete mix design meeting the requirements stated below:

Option A. Coarse Aggregate Gradation
§715-01

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement Content, kg/m³, Min.</td>
<td>360</td>
</tr>
<tr>
<td>Air Content, %</td>
<td>5.0-8.0</td>
</tr>
<tr>
<td>Compressive Strength, MPa, Min., 28 days</td>
<td>25</td>
</tr>
</tbody>
</table>

Option B. Coarse Aggregate Gradation

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement Content, kg/m³, Min.</td>
<td>340</td>
</tr>
<tr>
<td>Air Content, %</td>
<td>5.0-8.0</td>
</tr>
<tr>
<td>Compressive Strength, MPa, Min., 28 days</td>
<td>25</td>
</tr>
</tbody>
</table>

The manufacturer shall maintain at the manufacturing site a record of materials used and their sources and a copy of the concrete mix design.

FABRICATION. Precast concrete gutter shall be fabricated to conform to the size and shape shown on the standard sheet unless otherwise shown on the plans. Wire mesh reinforcement shall consist of 102 x 102 - MW26 x MW26 and shall be embedded midway between the upper and lower surfaces unless otherwise shown on the plans. Reinforcing bars of equivalent area may be substituted for the wire mesh reinforcement. Size and spacing of the reinforcing bars shall be approved by the Regional Director of his/her representative. Tack welding or any other welding of specified steel reinforcement will not be allowed. Welding for cage stability will be permitted provided that redundant steel is added in each direction and tied to the cage. The redundant steel shall be thirty (30) bar diameters, minimum, in length and shall be positioned so that the midpoint is located at the weld.

The manufacturer shall produce gutter sections that are uniform in appearance. The concrete mix shall be cast in steel forms unless another type of form is approved by the Regional Director or his/her representative. The concrete shall be thoroughly consolidated by external or internal vibrators or a combination of both.

Curing. Curing shall be accomplished in accordance with the methods set forth under §706-02, Reinforced Concrete Pipe except controlled atmospheric curing shall not be allowed.

REPAIR. The requirements of §714-04, Precast Concrete Curb shall apply.

SAMPLING AND TESTING. The requirements of §714-04, Precast Concrete Curb, shall apply except that when cores are taken, the holes shall be plugged. The material used as the plug shall be fully consolidated, finished and properly cured according to the requirements of "Repair."

BASIS OF ACCEPTANCE. Precast concrete gutter shall be accepted in production lot quantities at the manufacturing location according to the procedural directives of the Materials Bureau.

SECTION 715 - CASTINGS, FORGINGS AND METALS

715-01 STRUCTURAL STEEL

SCOPE. This specification covers structural steels used in bridge construction that have a minimum specified yield point of 345 MPa, or less. Steel ordered under this specification may be subject to stress in any direction; longitudinal, transverse and/or through-thickness.

MATERIAL REQUIREMENTS. The manufacture, testing, delivery, and requirements for mill inspection of structural steel shall comply with the requirements of the applicable ASTM Specifications except as modified herein.