

700 MATERIAL DETAILS

Materials shall conform to the stated requirements and/or the requirements of the referenced specifications including modifications as noted.

Copies of all Supplemental Specifications referenced in this section are on file with the City of Columbus Transportation Division.

712 – MISCELLANEOUS

712.01 Expansion Shield Anchors. *Provide anchors conforming to the dimension requirements of the project plans and the following.*

1. *Type A. Federal Specification FF-S-325, Group II, Type 4 Class 1, and Group VIII, Type 1.*
2. *Type B. Federal Specification FF-S-325, Group III, Type 1 (a) or (c).*

The supplier or producer of the anchors shall provide a certification showing certified test results of the proof load required in Federal Specification FF-S-325.

712.02 Calcium Chloride. *Provide calcium chloride conforming to ASTM D 98.*

712.03 Sodium Chloride. *Provide calcium chloride conforming to ASTM D 632, Type I, Grade 1, with the following modifications:*

Total Chlorides (NaCl, CaCl₂, and MgCl₂ as NaCl based on dry weight) not less than 97 percent.

712.04 Lime.

- (a) *Provide lime for masonry purposes conforming to ASTM C 207 Type S.*
- (b) *Provide hydrated or quick lime for Item 205 and 206 conforming to ASTM C 977, with the following modification:*
 - (1) *For quicklime, 100 percent of the material shall pass the No. 4 (4.75 mm) sieve.*

712.06 Preservative Treatment for Structural Timber, Lumber, Piling, Posts, Braces and Blocks.

1. **General.** *Provide structural timber, lumber and piling conforming to 711.26, and posts, braces and blocks conforming to 710.14, except that moisture may be removed from the untreated lumber at the time of*

preservative treatment. *Ensure that* structural timber, lumber, piling, posts and braces conform to the current AWWPA standards and *this section*. The minimum retention for blocks is 0.40 pounds per cubic foot (6.4 kg/m³).

2. **Materials.** *Provide* timber preservatives conforming to AASHTO M 133 including creosote, creosote coal-tar solution, ammoniacal copper arsenite (ACA), chromated copper arsenate (CCA), Types A, B or C, and pentachlorophenol.
3. **Preparation for Treatment.** *Sorting.* Sort the material into one kind or designated group of kinds of wood and into pieces of approximately equal size and moisture and sapwood content. Separate *material* to insure contact of treating medium with all surfaces.
4. **Framing.** *Conduct* all adzing, boring, chamfering, framing, graining, mortising, and surfacing, *before* treatment.
5. **Incising.** *Incise* lumber 3 inches (75 mm) or more thick on all four sides. *Incise* lumber less than 3 inches (75 mm) thick on the wide faces only, except *as shown* on the plans.

Incise Douglas fir with a minimum dimension of 2 inches (50 mm) using a suitable power-driven machine before treatment. Do not incise Douglas fir rails and rail posts.

Use the spacing and shape of the cutting teeth and the method of incising necessary to produce a uniform penetration. The minimum required depth of the incisions are as follows:

<u>Size* inch (mm)</u>	<u>Minimum Depth of Incision, inch. (mm)</u>
2x12 (50x300).....	3/8 (9)
3x12 (75x300).....	7/16 (11)
4x12 (10x300).....	1/2 (13)
8x10 (20x254).....	9/16 (14)
10x12 (254x350).....	5/8 (16)
12x12 (300x300).....	3/4 (19)

*Intermediate sizes in proportion.

6. **Amount of Preservative.** The *required* net retention in any charge is no less than 90 percent of the quantity of preservative specified, but the average retention by the material treated under any contract or order and the average retention of any 5 consecutive charges *are required* to be at least 100 percent of the quantity specified. *Ensure that* the minimum amounts of preservative retained conform to AASHTO M 133 and the *requirements* set forth in the referenced American Wood-Preservers'

Association Standard. *Treat* all species of structural timber, lumber, piling, posts and blocks according to the current AWWA standards

7. **Acceptance.** Accept only structural timber, lumber, piling, posts, braces, and blocks meeting the certification requirements of Supplement 1072.

712.09 Geotextile Fabrics. *Provide* the fabric composed of strong rot-proof polymeric fibers formed into a woven or non-woven fabric *conforming to* the following requirements:

A. **Type A: Underdrains and Slope Drains.**

Minimum Tensile Strength 1 80 lbs. (355 N)
Minimum Puncture Strength 2 25 lbs. (110 N)
Minimum Tear Strength 3 25 lbs. (110 N)
Apparent Opening Size 54
Soil Type-1: Soils with 50% or less passing
US No. 200 (75 μ m) sieve AOS < 0.6 mm.
Soil Type-2: Soils with 50%-80% passing
US No. 200 (75 μ m) sieve AOS < 0.3 mm.
Minimum Permeability 6 1 x 10²cm/sec.

B. **Type B: Filter Blankets for Rock Channel Protection.**

Minimum Tensile Strength 1 200 lbs. (890 N)
Minimum Puncture Strength 2 80 lbs. (355 N)
Minimum Tear Strength 3 50 lbs. (220 N)
Minimum Elongation 1 15%
Apparent Opening Size 5 AOS < 0.6 mm.
Minimum Permeability 6 1 x 10⁻³ cm/sec.

C. **Type C: Sediment Fences.**

Minimum Tensile Strength 1 120 lbs. (535 N)
Maximum Elongation at 60 lbs. (265 N) 150%
Minimum Puncture Strength 2 50 lbs. (220 N)
Minimum Tear Strength 3 40 lbs. (180 N)
Apparent Opening Size 4 AOS < 0.84 mm
Minimum Permittivity 5 1x10⁻²sec.⁻¹
Ultraviolet Exposure Strength Retention 6 70%

D. **Type D: Subgrade, Base Separation or Stabilization.**

Minimum Tensile Strength 1 180 lbs. (800 N)
Maximum Elongation at 170 lbs. (755 N) 35%
Minimum Tear Strength 3 70 lbs. (310 N)
Minimum Puncture Strength 2 70 lbs. (310 N)
Apparent Opening Size 4 Same as Type A
Permeability 5 1X10⁻³ cm/sec.

E. **Type E. Pavement Reinforcement Fabric. AASHTO M 288, Section 9, Table 7.**

1. ASTM D 4632.
2. ASTM D 4833.
3. ASTM D 4533.
4. ASTM D 4751.
5. ASTM D 4491.
6. ASTM D 4355.

All minimum strengths shown are average roll minimum values in the weakest principal direction.

Ensure that the fabric is free of any treatment that might significantly alter its physical properties. During shipment and storage, wrap the fabric in a heavy-duty protective covering to protect it from direct sunlight, dirt, dust, and other debris.

For all fabric types, the manufacturer shall submit a certification with each shipment of material stating that it meets the specification requirements.

712.10 Prefabricated Edge Drain. *Provide prefabricated edge drain consisting of a polymeric core with a minimum thickness of 1 inch (25 mm) wrapped in fabric conforming to 712.09 Type A. Ensure that the drain is flexible, rectangular in shape, and of hollow construction. Use core material that is resistant to petroleum-based chemicals, naturally occurring soil chemicals, and road de-icing agents. The core material shall have sufficient flexibility to withstand bending and handling during installation without damage. The core shall provide a minimum of 100 square inches (0.064m²) unobstructed (one side only) drainage area per 1 foot (0.3 m) of width. Side walls of the core shall have at least 5 percent open area to permit unobstructed flow through the filter and wall to the core. The required minimum compressive strength of the prefabricated edge drain is 6000 pounds per square foot (290 kPa) with a maximum 20 percent compression in a parallel plate compression test (ASTM D 695). The minimum (single side) core flow capacity is 10 gallons per minute per foot of width for a 0.1 gradient at 10 pounds per square inch bladder load according to ASTM D 4716. Furnish the manufacturer's certified test results as specified 101.061.*

712.11 Temporary Erosion Control Mats Materials. *Unless specifically itemized, furnish any of the type mats listed below. The manufacturer shall submit certified test data for each shipment of material.*

A. *Furnish temporary erosion control mat Type A conforming to the following:*

1. *A machine-produced mat consisting of 100 percent agricultural straw covered on the top with a polypropylene netting having an approximate 1/4 ´ 1/4 inch to 1/2 ´ 1/2 inch (6 ´ 6 mm to 13 ´ 13 mm) mesh, and sewn together with biodegradable or photodegradable thread.*
2. *A consistent thickness with the straw evenly distributed over the entire area of the mat.*
3. *A minimum mat width of 6.5 feet (2 m).*
4. *An average mat weight of 0.5 pound per square yard (270 g/m²) ± 10 percent.*
5. *A netting weight of approximately 1 pound per 1000 square feet (5 kg/1000 m²).*

B. *Furnish temporary erosion control mat Type B conforming to the following:*

1. *A machine-produced mat consisting of 100 percent agricultural straw covered on the top with a photodegradable polypropylene netting having an approximate 1/2 ´ 1/2 inch to 5/8 ´ 5/8 inch (13 ´ 13 mm to 16 ´ 16 mm) mesh and on the bottom with a photodegradable polypropylene netting having an approximate 1/4 ´ 1/4 inch to 1/2 ´ 1/2 inch (6 ´ 6 mm to 13 ´ 13 mm) mesh, sewn together with biodegradable or photodegradable thread.*
2. *A consistent thickness with the straw evenly distributed over the entire area of the mat.*
3. *A minimum mat width of 6.5 feet (2 m).*
4. *An average mat weight of 0.5 pound per square yard (270 g/m²) ± 10 percent.*
5. *A top netting weight of approximately 3 pounds per 1000 square feet (15 kg/1000 m²) and a bottom netting weight of approximately 1 pound per 1000 square feet (5 kg/1000 m²).*

C. *Furnish temporary erosion control mat Type C conforming to the following:*

1. *A machine-produced mat consisting of 70 percent agricultural straw and 30 percent coconut fiber covered on the top with a photodegradable polypropylene netting having an approximate 5/8*

5/8 inch (16 × 16 mm) mesh and on the bottom with a photodegradable polypropylene netting having an approximate 1/4 × 1/4 inch (6 × 6 mm) mesh, sewn together with cotton thread.

2. *A consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat.*
3. *A minimum mat width of 6.5 feet (2 m).*
4. *An average mat weight of 0.5 pound per square yard (270 g/m²) ± 10 percent.*
5. *A top netting weight of approximately 3 pounds per 1000 square feet (15 kg/1000 m²) and a bottom netting weight of approximately 1 pound per 1000 square feet (5 kg/1000 m²).*

D. *Furnish temporary erosion control mat Type D conforming to the following:*

1. *A machine-produced mat consisting of 70 percent agricultural straw and 30 percent coconut fiber with a biodegradable tissue upon which seeds are placed, and sewn together with cotton thread.*
2. *Covered on the top of the mat with a photodegradable polypropylene netting having an approximate 5/8 × 5/8 inch (16 × 16 mm) mesh.*
3. *Covered on the bottom of the mat with a biodegradable tissue paper upon which Kentucky 31 fescue grass seed is placed at a rate of 90 pounds per acre (10 g/m²) and Rye grass at a rate of 45 pounds per acre (5 g/m²).*
4. *Covered on the bottom of the mat and tissue paper with a photodegradable polypropylene netting having an approximate 1/4 × 1/4 inch (6 × 6 mm) mesh.*
5. *A consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat.*
6. *A minimum mat width of 6.5 feet (2 m).*
7. *An average mat weight of 0.5 pound per square yard (270 g/m²) ± 10 percent.*
8. *A top netting weight of approximately 3 pounds per 1000 square feet (15kg/1000 m²) and a bottom netting weight of approximately 1 pound per 1000 square feet (5 kg/1000 m²).*

- E. *Furnish temporary erosion control mat Type E conforming to the following:*
1. *A machine-produced mat consisting of 100 percent coconut fiber covered on the top and bottom with an ultraviolet stabilized polypropylene netting having an approximate 5/8 ´ 5/8 inch (16 ´ 16 mm) mesh, and sewn together with polyester thread.*
 2. *A consistent thickness with the coconut fiber evenly distributed over the entire area of the mat.*
 3. *A minimum mat width of 6.5 feet (2 m).*
 4. *An average mat weight of 0.5 pound per square yard (270 g/m²) ± 10 percent.*
 5. *An ultraviolet stabilized polypropylene netting with a weight of approximately 3 pounds per 1000 square feet (15 kg/1000 m²).*
- F. *Furnish temporary erosion control mat Type F conforming to the following:*
1. *A uniform open plain weave of undyed and unbleached single jute yarn.*
 2. *Loosely twisted yarn not varying in thickness by more than 1/2 its normal diameter.*
 3. *Furnish mats in rolled strips with:*
 - (a) *A minimum length of 50 yards (46 m).*
 - (b) *A width of 48 inches ± 1 inch (1.2 m ± 25 mm).*
 - (c) *Warp ends width 81 ± 3.*
 - (d) *Welt ends per yard (meter) 41 ± 3 (49 ± 3).*
 - (e) *An average weight of 1.22 pounds per linear yard (0.6 kg/m) ± 10 percent.*
- G. *Furnish temporary erosion control mat Type G conforming to the following:*
1. *A machine-produced mat consisting of wood excelsior, 80 percent of which is at least 8 inches (200 mm) in length.*
 2. *Excelsior cut from wood that is properly cured to achieve adequately curled and barbed fibers.*

3. *A consistent thickness with the fiber evenly distributed over the entire area of the mat.*
 4. *For use in ditches or channels, cover the top and bottom of the excelsior with lightweight netting entwined with the excelsior for maximum strength and ease of handling, or cover the top only with heavyweight netting machine sewn on maximum 2 inch (51 mm) centers along the longitudinal axis of the material. For all other applications, cover the top with lightweight netting entwined with the excelsior for maximum strength and ease of handling.*
 5. *Regardless of application, lightweight netting consists of either netting having a maximum 3 ´ 1 inch (75 ´ 25 mm) weave, twisted kraft paper yarn having a high web strength or biodegradable plastic.*
 6. *Mat widths of 24, 36, 48, or 78 inches (0.6, 0.9, 1.2, or 2 m) or greater, ± 1 inch (± 25 mm).*
 7. *Mat rolls of more than 90 feet (27.5 m) in length.*
 8. *A mat weight of not less than 0.72 pound per square yard (390 g/m²) constant weight, air dry.*
- H. *Furnish temporary erosion control tat Type H conforming to the following:*
- (1) *Layers of silt and expanded biodegradable paper fabricated into a mat sewn together with cotton thread.*
 - (2) *A consistent thickness with sufficient open areas for grass growth through the mat.*
 - (3) *An average mat weight of 0.55 pounds per square yard (300 g/m²) ± 10 percent.*
 - (4) *Rolls packaged in plastic bags to prevent damage from weather conditions and handling.*
- I. *Furnish temporary erosion control mat Type I conforming to the following:*
- (1) *Extruded polymeric plastic net having a mesh opening of approximately 3/4 ´ 3/4 inch (20 ´ 20 mm).*

- (2) *A netting with an average weight of 3 pounds per 1000 square feet (15 kg/1000 m²) ± 10 percent and a minimum tensile strength of 15 pounds over a 3 inch width (67 N over a 77 mm width) in the weakest principal direction.*