

916.01

**Section 916. EROSION AND SEDIMENTATION CONTROL
MATERIALS**

916.01. Stone Used For Erosion and Sedimentation Control. Provide cobblestone, coarse aggregate 3×1, and riprap for erosion and sedimentation control on slopes, in ditches, and to construct erosion control devices, including check dams. Natural stone for cobblestone or riprap must be sound, non-stratified, durable rock. As an alternative to natural stone, the Contractor may use sound pieces of broken concrete, free of protruding reinforcement, if approved by the Engineer and allowed by permit. Do not use crushed Hot Mix Asphalt (HMA) pavement or broken brick as erosion and sedimentation control material.

A. **Cobblestone.** Cobblestone must consist of rounded or semi-rounded rock fragments with an average dimension from 3 inches to 12 inches.

B. **Coarse Aggregate 3x1.** Coarse aggregate 3×1 must meet the requirements of commercially graded material with particle sizes from ¾ inch to 3 inches.

C. **Riprap.** Riprap must be natural stone, solid precast concrete blocks of Grade P2 concrete, or sound pieces of broken concrete, free from structural defects. Riprap must not contain soil, HMA, or protruding reinforcing steel. Randomly score the face of the precast concrete blocks to provide plane of weakness joints in sections with areas from 4 square feet to 9 square feet. Lifting lugs, cast into concrete blocks, must not project above the finished concrete surface.

The Department classifies riprap as plain or heavy, based on the horizontal cross section dimensions, (the “footprint” dimension) and the in-place thickness of the individual pieces.

1. **Plain Riprap.** Natural stone and broken concrete used for plain riprap must have footprint dimensions ranging from 8 inches to 16 inches and an in-place thickness of at least 8 inches. The Contractor may use smaller pieces to fill spaces for better slope protection.

Precast concrete block used for plain riprap must be at least 6 inches thick with a surface area no greater than 15 square feet.

2. **Heavy Riprap.** The smallest footprint dimension for natural stone and broken concrete used for heavy riprap must be at least 16 inches. The maximum to minimum dimension ratio must be no greater than 3:1. The in-place thickness must be at least 8 inches.

Precast concrete block used for heavy riprap must be at least 16 inches thick with a surface area no greater than 20 square feet.

D. Requirements for Specific Erosion and Sedimentation Control Applications.

1. **Checkdams.** Checkdams for ditch grades less than 2 percent must be constructed using cobblestone or broken concrete ranging from 2 inches to 4 inches in size. Checkdams for ditch grades 2 percent or greater must be constructed using cobblestone or broken concrete ranging from 3 inches to 12 inches in size.
2. **Stone Filled Bags.** Stone for stone filled bags must meet the gradation requirements for coarse aggregate 6A, as specified in Table 902-1.
3. **Sand Filled Bags.** Sand for sand filled bags must meet the gradation requirements for Class II granular material, as specified in Table 902-3.
4. **Aggregate Cover.** Aggregate used for aggregate cover, must meet the gradation requirements specified in Table 902-1 for dense-graded aggregate 21AA, or coarse aggregate 6A, or the requirements of subsection 916.01.B for coarse aggregate 3×1. Aggregate must be natural aggregate, iron blast furnace slag, reverberatory-furnace slag, or crushed portland cement concrete. Use geotextile separator meeting the requirements of subsection 910.03.C.
5. **Gravel Access Approach.** Coarse aggregate used for gravel access approaches must meet the requirements of subsection 916.01.B for coarse aggregate 3×1, or as approved by the Engineer. Aggregate must be produced from natural aggregate, iron blast furnace slag, reverberatory-furnace slag, or crushed portland cement concrete. Use geotextile separator meeting the requirements of subsection 910.03.C.

916.02. Silt Fence. Geotextile for erosion control silt fence must meet the requirements of subsection 910.04.

Attach geotextile to machine-pointed, No. 2 common grade hardwood posts with at least five staples through wood lath at least $\frac{3}{8}$ inch thick and 2.0 feet long. Space posts no greater than 6½ feet apart.

Posts must be at least 36 inches long with a cross-sectional area of at least 2¼ square inches, and a smallest dimension of 1½ inches.

916.02

Silt fence must have at least two permanent markings or affixed labels per assembled roll, identifying the fabricator.

916.03. Temporary Plastic Sheet or Geotextile Cover. Provide plastic sheets or geotextile covers as temporary covers to prevent erosion. Mend or patch torn or punctured plastic sheets or geotextile cover with additional material of the same quality.

A. Sheeting Material. Sheeting material must be plastic sheet at least 6.0 mils thick with an ultra-violet ray inhibitor, or polyvinyl chloride (PVC) at least 10 mils thick. Use PVC material instead of plastic sheet from November 15 to April 1, or if expecting freezing conditions. Store and handle plastic sheet and PVC material in accordance with the manufacturer's recommendations. Do not expose sheeting material to heat or direct sunlight, causing diminished strength or toughness.

B. Geotextile Cover. Geotextile cover must meet the requirements of subsection 910.03.A for geotextile blanket.

916.04. Inlet Protection Fabric Drop. Fabric for inlet protection fabric drop must be geotextile silt fence fabric meeting the requirements of subsection 916.02 or geotextile blanket meeting the requirements of subsection 910.03.A. If using gravel filter berm, aggregate must meet the gradation requirements for 34R or 6A specified in Table 902-1.

916.05. Inlet Protection Geotextile and Stone and Drop Inlet Sediment Trap. Geotextile for inlet protection geotextile and drop inlet sediment traps must be geotextile blanket meeting the requirements of subsection 910.03.A. Aggregate must meet the gradation requirements for 34R or 6A as specified in Table 902-1.

916.06. Sand Fence and Dune Stabilization. Fabric for sand and dune stabilization fence must be high-density polyethylene mesh fabric with a design opening of ½ inch to 1 inch. Sand fence must be at least 4 feet high.

916.07. Turbidity Curtain. Turbidity curtain must be delivered pre-assembled and includes the geosynthetic fabric, connection, and securing mechanisms, flotation devices, stakes, and ballast chain.

A. Geosynthetic. Geosynthetic for turbidity curtain must meet the minimum physical requirements for stabilization geotextile, except permittivity must be no greater than 0.2 second⁻¹ as specified by ASTM D 4491, and trapezoidal tear strength must be least 50 pounds, in accordance with ASTM D 4533.

The Contractor may use polymer-impregnated geosynthetics in lieu of meeting permittivity and opening size requirements.

Hemmed pockets to accommodate flotation devices and bottom weights must be sewn or heat bonded. Panel ends must include metal grommets through a reinforced hem. Tie connections between panels with synthetic or wire rope to prevent water flow through the joint.

B. Flotation. Flotation devices must be closed-cell polystyrene. Determine the required buoyancy based on site conditions. Flotation devices must ensure adequate freeboard to prevent overtopping.

C. Stakes. If using stakes to maintain curtain alignment, provide hardwood or steel stakes of lengths and cross-sections capable of supporting the curtain. The Contractor may use external supports with embedment depths greater than 1½ feet. Space stakes no greater than 6½ feet apart.

D. Hardware. Hardware, including stakes, ballast chain, connection bolts, reinforcement plates, and tension cables must be galvanized, stainless steel, or aluminum, and corrosion resistant. The mass of the ballast chain must be at least 0.7 pounds per foot and be capable of maintaining the geosynthetic in a vertical position.