

SECTION 734 EROSION CONTROL AND WATER POLLUTION CONTROL

734.1 DESCRIPTION

This work consists of permanent and temporary measures to control erosion and water pollution.

734.2 MATERIALS

A. Water Pollution Control: Materials used in water pollution control work shall conform to the requirements set forth in the contract. When work is ordered for which no provisions are contained in the contract, material requirements shall be set forth in the agreement covering the additional work.

B. Temporary Erosion Control:

1. **Silt Fence:** Silt fence shall consist of a temporary vertical barrier of fabric attached to and supported by woven wire and wood or steel posts and entrenched into the ground. The silt fence shall conform to Section 831.
 - a. **Woven Wire:** Woven wire shall be 32" (810 mm) wide, 14½ gage (1.93 mm) and have eight horizontal wires with six inch or 12 inch (150 mm or 300 mm) spacing of vertical stay wires.
 - b. **Posts:** The posts used shall be steel T line posts with five foot (1.5 m) minimum length or wood posts with five foot (1.5 m) minimum length and three inch (75 mm) minimum diameter.
2. **Erosion Bales:** Erosion bales shall consist of hay or straw bales substantially free of weeds.
3. **Erosion Bale Anchors:** The erosion bale anchors shall be as detailed in the plans.

C. Permanent Erosion Control:

1. **Erosion Control Blanket:** When called for in the plans, erosion control blanket shall be used to prevent erosion in ditches and on roadway slopes. The blanket shall be installed in accordance with the plans. Only designated erosion control blanket on the approved products list shall be allowed.
 - a. **Staples:** Staples shall be U shaped and shall be approximately six inches (150 mm) long and one inch (25 mm) wide. Staples shall be 11 gage (3.05 mm) or heavier ungalvanized steel wire. Where 11 gage (3.05 mm) staples cannot be driven without bending, 9 gage (3.76 mm) or heavier ungalvanized steel wire staples will be required.
 - b. **T Pins:** T pins shall be No. 6 (4.88 mm) bright wire T pins consisting of a 12 inch (300 mm) long top bar and a minimum 9 inch (225 mm) leg. The top bar

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may be welded to the top leg or the T pins may be machine bent to the proper configuration.

734.3 CONSTRUCTION REQUIREMENTS

Erosion control and water pollution control devices shall be inspected by the Contractor and the Engineer once a month and after every rainfall greater than ½ inch (13 mm). The Engineer shall document these inspections in the project diary.

A. Water Pollution Control: These temporary pollution control provisions shall be coordinated with the permanent erosion control features specified elsewhere in the contract to the extent practical to assure economical effective and continuous erosion control throughout the construction and post-construction period.

The Contractor will be required to perform water pollution control measures in the sequence and manner outlined in the contract. Additional water pollution control measures found necessary after award of the contract, shall be performed at such times and in the sequence ordered.

The Contractor shall submit for approval, at the preconstruction conference, a proposed schedule and method of operation for performance of temporary and permanent water pollution control measures.

The Engineer has the authority to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment. Such work may involve the construction of temporary structures, berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, mats, seeding or other control devices or methods as necessary to control erosion.

Pollutants used during construction shall be stored or disposed of where runoff will not carry them into streams or lakes. Pollutants shall not be disposed of in streams or lakes.

Contractor equipment yards and service areas shall be located or bermed so runoff from the areas and pollutants do not reach waterways or impoundments of water.

If conflicts between these requirements and pollution control laws, rules, or regulation of other Federal or State or local agencies occur, the more restrictive laws, rules or regulations shall apply.

B. Temporary Erosion Control: On two-lane construction, the Contractor shall not begin earth moving operations in a third mile (fifth kilometer) until erosion control measures have begun in the first mile (1.6 kilometer).

On four-lane construction, the Contractor shall not begin earth moving operations, in the third mile (fifth kilometer) until erosion control measures have begun in the first mile (1.6 kilometer).

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Erosion control measures shall be continued in an orderly and progressive manner.

1. **Silt Fence:** Silt fence shall be in place at locations designated on the plans or at locations selected by the Engineer before earth disturbing activities have begun. Exceptions are at those areas where it is impractical to do so because of interference with construction activities. These exceptions must be approved by the Engineer. When a trench cannot be dug, 30 to 40 pound (14 to 18 kg) sand bags may be used to prevent underflow at the bottom of the silt fence. Silt fence shall be constructed according to the plans. The apparent opening size (AOS) is a designation that determines the permeability of the fabric, as the AOS increases the opening size decreases.
 2. **Mucking Silt Fence:** Mucking silt fence is the removal of muck trapped by the silt fence. The muck shall be removed before it reaches 1/3 the height of the barrier.
 3. **Repair Silt Fence:** Repair of silt fence will be as directed by the Engineer. This item shall consist of repairing silt fence to meet installation requirements specified in the plans.
 4. **Floating Silt Curtain:** Floating silt curtain shall be placed at locations designated in the plans. The placement shall be prior to earth disturbing activities, including clearing and grubbing, upstream or adjacent to the location of the floating silt curtain.
 5. **Erosion Bales:** Erosion bales shall be installed as shown on the plans or as directed by the Engineer.
 6. **Erosion Bale Anchors:** The erosion bale anchors shall be as detailed in the plans.
- C. **Permanent Erosion Control:** This work shall be done as soon as possible after finish grading and topsoil placement is completed, and if practical, prior to seeding, fertilizing, and mulching of adjacent areas.

Seasonal limitations on the installing of erosion treatment material shall be as provided in Section 730.3.

1. **Preparation of Areas to be Treated:**
 - a. **Shaping:** Ditches and medians shall be reshaped to their typical section or to the ditch section specified for ditch liner material. Material shall be laid in ditches and medians to the widths specified.

When watercourses leading out of ditches are shallow or not well defined, special channels shall be constructed and undercut to allow for placement of topsoil.

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The material shall be placed below edges of channels and excavated material drifted back away from the edges of the material to direct flow directly into the treated waterway.

- b. Topsoiling:** Topsoil shall be spread to the depths specified over reshaped areas in accordance with Section 230.
 - c. Condition of Finished Surface:** Rocks and clods, over 1½ inches (38 mm) in diameter, and other foreign material shall be removed prior to placing material.
2. **Seeding and Fertilizing:** Immediately after the area to be treated has been shaped and smoothed and prior to placing, the areas to be treated shall be seeded and fertilized as prescribed in Sections 730 and 731.

Broadcasting, raking, or dragging in of seed and fertilizer will be permitted on areas where a drill cannot operate satisfactorily.

3. **Application of Erosion Control Blanket:**
- a. Manner of Application:** Material shall be applied beginning at the top of the slope or ditch grade and rolling downward, parallel to and in the same direction as the flow of water. The center strip shall be placed first and centered in the low point of the ditch or channel throughout the length of treatment.
 - b. Overlap:** Where more than one width of material is required, edges shall overlap approximately **four inches** (100 mm), and ends shall overlap approximately **six inches** (150 mm), with the upslope section of material on top.
 - c. Trench:** **The top or upslope end shall be buried in a trench 6" deep by 6" wide (150 mm deep by 150 mm wide) and stapled. The trench shall be backfilled to grade and compacted.**
 - d. Anchoring:** Prior to anchoring, adjust erosion treatment material laterally in ditches and channels to bring both edges to the same elevation. Material shall be held in place with T pins and U shaped wire staples driven vertically through the mesh into the soil. A line of T pins shall be placed one meter apart down the center of the mesh in the low point of the ditch or channel, with heads perpendicular to the centerline of the ditch. A row of T pins shall be placed head to head across the width of material and every 25 feet (7.5 meters) along the length of the treatment.

At all other points U shaped wire staples shall be placed one meter apart in a staggered or diagonal pattern along the edges and in the center of the strips.

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Material shall not be drawn taut in stapling. Material which bridges over surface depressions shall be secured with extra staples or T pins to ensure good contact with the soil.

- e. **Maintenance and Repair:** The Contractor shall maintain the areas where material has been used until work in the project has been completed and accepted. Prior to acceptance of work damaged areas shall be repaired.

734.4 METHOD OF MEASUREMENT

- A. **Silt Fence** will be measured to the nearest linear foot (0.1 meter).
- B. **Mucking Silt Fence** will be measured to the nearest cubic yard (cubic meter).
- C. **Repair Silt Fence** will be measured to the nearest linear foot (0.1 meter).
- D. **Remove Silt Fence** will be measured to the nearest linear foot (0.1 meter).
- E. **Floating Silt Curtain** will be measured to the nearest linear foot (0.1 meter). Silt curtain damaged from causes beyond the control of the Contractor shall be replaced and the replacement quantity added to the original contract amount.
- F. **Erosion Bales** will be measured by the actual count of bales placed.
- G. **Erosion Control Blanket** will be measured to the nearest square yard (square meter). Measurement of the overlap and top and bottom folds will not be made. Erosion control blanket damaged from causes beyond the control of the Contractor shall be replaced and the replacement quantity added to the original quantities used.

734.5 BASIS OF PAYMENT

- A. **Silt Fence** will be paid for at the contract unit price per linear foot (meter). Payment shall be full compensation for furnishing, installing, labor, equipment and incidentals.
- B. **Mucking Silt Fence** will be paid for at the contract unit price per cubic yard (cubic meter). Payment will be full compensation for labor, equipment and incidentals required to remove, spread this material evenly over the adjacent area as determined by the Engineer, and seed.
- C. **Repair Silt Fence** will be paid for at the contract unit price per linear foot (meter). Payment shall be full compensation for repair and inspection of the silt fence.
- D. **Remove Silt Fence** will be paid for at the contract unit price per linear foot (meter). Payment shall be full compensation for labor, equipment and incidentals.
- E. **Floating Silt Curtain** will be paid for at the contract unit price per linear foot (meter). Payment will be full compensation for materials, labor and equipment necessary to install

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and remove the floating silt curtain.

- F. Erosion Bales** will be paid for at the contract unit price for each bale. Payment shall be full compensation for furnishing, installing, all labor, equipment, and incidentals.
- G. Erosion Control Blanket** will be paid for at the contract unit price per square yard (square meter). Payment will be full compensation for shaping and finishing ditches and channels, which are not specifically addressed with the item "ditch shaping", installing material and the furnishing of labor, equipment, staples, material, and incidentals necessary.
- I. Erosion Bales** will be paid for at the contract unit price for each bale. Payment shall be full compensation for furnishing, installing, all labor, equipment, and incidentals.
- J. Topsoil** will be paid for as provided in Section 230.
- K. Seed and fertilizer** will be paid for as provided in Sections 730 and 731.