

Plate 6.60d Roughening with Tracked Machinery
Source: Erosion Draw

6.65 TEMPORARY SEEDING (ES BMP 1.65)

Definition

The establishment of a temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing annual plants.

Purposes

- To reduce erosion and sedimentation by stabilizing disturbed areas that will not be brought to final grade for a 30days or more.
- To reduce problems associated with mud and dust production from bare soil surfaces during construction.

Conditions Where Practice Applies

Where exposed soil surfaces are not to be fine graded for periods from 30 days or more. Such areas include denuded areas, soil stockpiles, dikes, dams, sides of sediment basins, temporary roadbanks, etc.

Specifications

Prior to seeding, install necessary erosion control practices such as dikes, waterways, and basins.

Plant Selection

Select plants appropriate to the season, region, and site conditions. Consult with your local Agricultural Extension agent, county, FDER, WMD, or FDOT office, or Table 1.65a of The Florida Development Manual.

Seedbed Preparation

To control erosion on bare soil surfaces, plants must be able to germinate and grow. Seedbed preparation is essential. A soil test should be taken to determine liming and fertilization requirements. In the absence of a soil test the following guidelines should be followed:

- Liming:** Where soils are known to be highly acid (pH 6.0 and lower), lime should be applied at the rate of two tons of pulverized agricultural limestone per acre.
- Fertilizer:** Shall be applied as 450 lbs./acre of 10-20-20 (10 lbs./ 1,000 sq. ft.)(504 kgha) or equivalent. Lime and fertilizer shall be incorporated into the top 2 to 4 inches (5 to 10 cm) of the soil.
- Surface Roughening:** If the area has been recently loosened or disturbed, no

further roughening is required. When the area is compacted, crusted, or hardened, the soil surface shall be loosened by disking, raking, harrowing, or other acceptable means. See SURFACE ROUGHENING - Section 6.60 (ES BMP 1.60).

- Tracking:** Tracking with bulldozer cleats is most effective on sandy soils. This practice often causes undue compaction of the soil surface, especially in clayey soils, and does not aid plant growth as effectively as other methods of surface roughening.

Seeding

Seed shall be evenly applied with a cyclone seeder, drill, cultipacker seeder or hydroseeder. Small grains shall be planted no more than one inch deep. Grasses and legumes shall be planted no more than 1/4 inch (6 mm) deep.

Mulching

- Mulching should usually be used to reduce damage from water runoff or wind erosion, and to improve moisture conditions for seedlings. Mulching without seeding should be considered for very short term protection. The use of mulch is a judgment decision based on time of seeding and conditions of individual sites. When used, mulch shall be applied according to MULCHING - Section 6.75 (ES BMP 1.75).
- Seedings made on slopes in excess of 3:1, or on adverse soil conditions, or during excessively hot or dry weather, shall be mulched according to MULCHING - Section 6.75 (ES BMP 1.75).
- Seedings made during optimum spring and summer seeding dates, with favorable soil and site conditions, may not require mulch.

Re-seeding

Areas which fail to establish vegetative cover adequate to prevent hill erosion will be filled in with proper topsoil and re-seeded as soon as such areas are identified.

6.66 PERMANENT SEEDING (ES BMP 1.66)

Definition

The establishment of perennial vegetative cover on disturbed areas by planting seed.

Purposes

- To reduce erosion and decrease sediment yield from disturbed areas.
- To permanently stabilize disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant materials.

Conditions Where Practice Applies

- Disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil.
- Rough-graded areas which will not be brought to final grade for a year or more.

Specifications

Selection of Plant Materials

- Selection of plant materials is based on climate, topography, soils, land use, and planting season. To determine which plant materials are best adapted to a specific site, use Tables 1.66b and 1.66c of The Florida Development Manual which describe plant characteristics and list recommended varieties.
- Appropriate seeding mixtures for various site conditions in Florida are given in Table 1.66a of The Florida Development Manual. These mixtures are designed for general use, and are known to perform well on the sites described. Adhere to these mixtures whenever feasible. Check Tables 1.66b and 1.66c for recommended varieties.

Seedbed Requirements

Vegetation should not be established on slopes that are unsuitable due to inappropriate soil texture, poor internal structure or internal drainage, volume of overland flow, or excessive steepness, until measures have been taken to correct these problems.

To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil must have these criteria:

- Enough fine-grained material to maintain adequate moisture and nutrient supply.
- Sufficient pore space to permit root penetration. A bulk density of 1.2 to 1.5

indicates that sufficient pore space is present. A fine granular or crumb-like structure is also favorable.

- Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans shall be 12 inches (30 cm) or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.

- A favorable pH range for plant growth. If the soil is so acid that a pH range of 6.0 - 7.0 cannot be attained by addition of pH-modifying materials, then the soil is considered an unsuitable environment for plant roots.

- Freedom from toxic amounts of materials harmful to plant growth.
- Freedom from excessive quantities of roots, branches, large stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydroseeded.

If any of the above criteria cannot be met, i.e., if the existing soil is too coarse, dense, shallow, acid, or contaminated to foster vegetation, then topsoil should be applied in accordance with TOPSOILING - Section 6.61 (ES BMP 1.61).

Necessary mechanical erosion and sediment control practices will be installed prior to seeding. Grading will be carried out according to the approved plan.

Surfaces will be roughened in accordance with SURFACE ROUGHENING - Section 6.60 (ES BMP 1.60).

Soil Conditions

In order to modify the texture, structure, or drainage characteristics of a soil, the following materials may be added to the soil:

- Peat** shall be sphagnum moss peat, hyprnum moss peat, reed-sedge peat or peat humus, from fresh-water sources. Peat shall be shredded and conditioned in storage piles for at least six months after excavation.
- Sand** shall be clean and free of toxic materials.
- Vermiculite** shall be horizontal grade and free of toxic substances.
- Rotted manure** shall be stable or cattle manure not containing undue amounts of straw or other bedding materials or toxic chemicals.
- Thoroughly rotted sawdust** shall be 6 lbs. of nitrogen added to each cubic yard (3.5 kg/m³) and shall be free of stones, sticks, and toxic substances.
- Where local ordinances permit, treated sewage sludge may be used in accordance with local, state, and federal regulations.

Lime and Fertilizer

Lime and fertilizer needs should be determined by soil tests. Soil tests may be performed by the Cooperative Extension Service Soil Testing Laboratory of the U.F., or by a reputable commercial laboratory. Information concerning the State Soil Testing Laboratory is available from county extension agents. Under unusual conditions where it is not possible to obtain a soil test, the following soil amendments will be applied:

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|--------------------|---|
| LIME: | 2 tons/acre finely ground agricultural or dolomitic limestone (80 lbs./1000 ft ²)(4.48 t/ha) |
| FERTILIZER: | Mixed grasses and legumes: 1000 lbs./acre 5-20-10 (25 lbs./1000 ft ²)(1.12 t/ha) |
| | Legume stands only: 1000 lbs./acre 5-20-10 (25 lbs./1000 ft ²)(1.12 t/ha) |
| | Grass stands only: 1000 lbs./acre 5-20-10 (1.12 t/ha) and 300 lbs. of 58-0-0 in sprays (7 lbs./1000 ft ²)(336 kgha) |
| | 1000 lbs./acre 10-20-10 (1.12 t/ha) and 300 lbs. of 38-0-0 in fall (7 lbs./1000 ft ²)(336 kgha) |

Other fertilizer formulations may be used, provided they can supply the same amounts and proportions of plant nutrients.

Incorporation - Lime and fertilizer shall be incorporated into the top 4 - 6 inches (10 - 15 cm) of the soil by disking or other means. When applying lime and fertilizer with a hydroseeder, apply to a rough, loose surface.

Seeding

- Certified seed** should be used for all permanent seeding whenever possible.
- Legume seed** - Legume seed should be inoculated with the inoculant appropriate to the species. Seed of lespedeza, crown vetch, and clovers should be scarified to promote uniform germination.
- Apply seed uniformly** with a cyclone seeder, drill, cultipacker seeder, or hydroseeder on a firm, friable seedbed. Maximum seeding depth should be 1/4 inch.
- Hydroseeding** - To avoid seed damage, it is recommended that if a machinery breakdown of 30 minutes to 2 hours occurs, 50% more seed be added to the tank, based on the proportion of the slurry remaining in the tank. Beyond 2 hours, a full rate of new seed may be necessary.

Often hydroseeding contractors prefer not to apply lime in their rigs as it is abrasive. In inaccessible areas, lime may have to be applied in pelletized or liquid form, separately. Rates of wood fiber should be at least 2000 lbs. per acre (2.24 t/ha). Surface roughening is particularly important when hydroseeding, as a roughened slope will provide some natural coverage of lime, fertilizer, and seed.

- Legume inoculants** should be used by the date indicated on the container. When dry seeding use four times the manufacturer's recommended rate and use ten times the recommended rate of inoculant when hydroseeding.

4.08 STORM DRAIN INLET PROTECTION (ES BMP 1.08)

Definition

A sediment filter or an excavated impounding area around a storm drain drop inlet or curb inlet.

Purpose

To prevent sediment from entering storm water conveyance systems prior to permanent stabilization of the disturbed area.

Condition Where Practice Applies

Where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. Different types of structures are applicable to different conditions (see Plates 4.08a through 4.08h).

Planning Considerations

Storm sewers which are made operational before their drainage area is stabilized can convey large amounts of sediment to receiving waters. In case of extreme sediment loading, the storm sewer itself may clog and lose most of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

This section contains several types of inlet filters and traps which have different applications dependent upon site conditions and type of inlet. Other innovative techniques for accomplishing the same purpose are encouraged, but only after specific plans and details are submitted to and approved by the stormwater permitting agency.

Note that these various inlet protection devices are for drainage areas of less than one acre (0.4 ha). Runoff from large disturbed areas should be routed through a TEMPORARY SEDIMENT TRAP - Section 4.25 (ES BMP 1.25).

Design Criteria

- The drainage area shall be no greater than 1 acre (0.4 ha).
- The inlet protection device shall be constructed to facilitate clean out and disposal of trapped sediment and to minimize interference with construction activities.
- The inlet protection devices shall be constructed so that any resultant ponding or stormwater will not cause excessive inconvenience or damage to adjacent areas or structures.
- Design criteria more specific to each particular inlet protection devices will be found on Plates 4.08a-h.

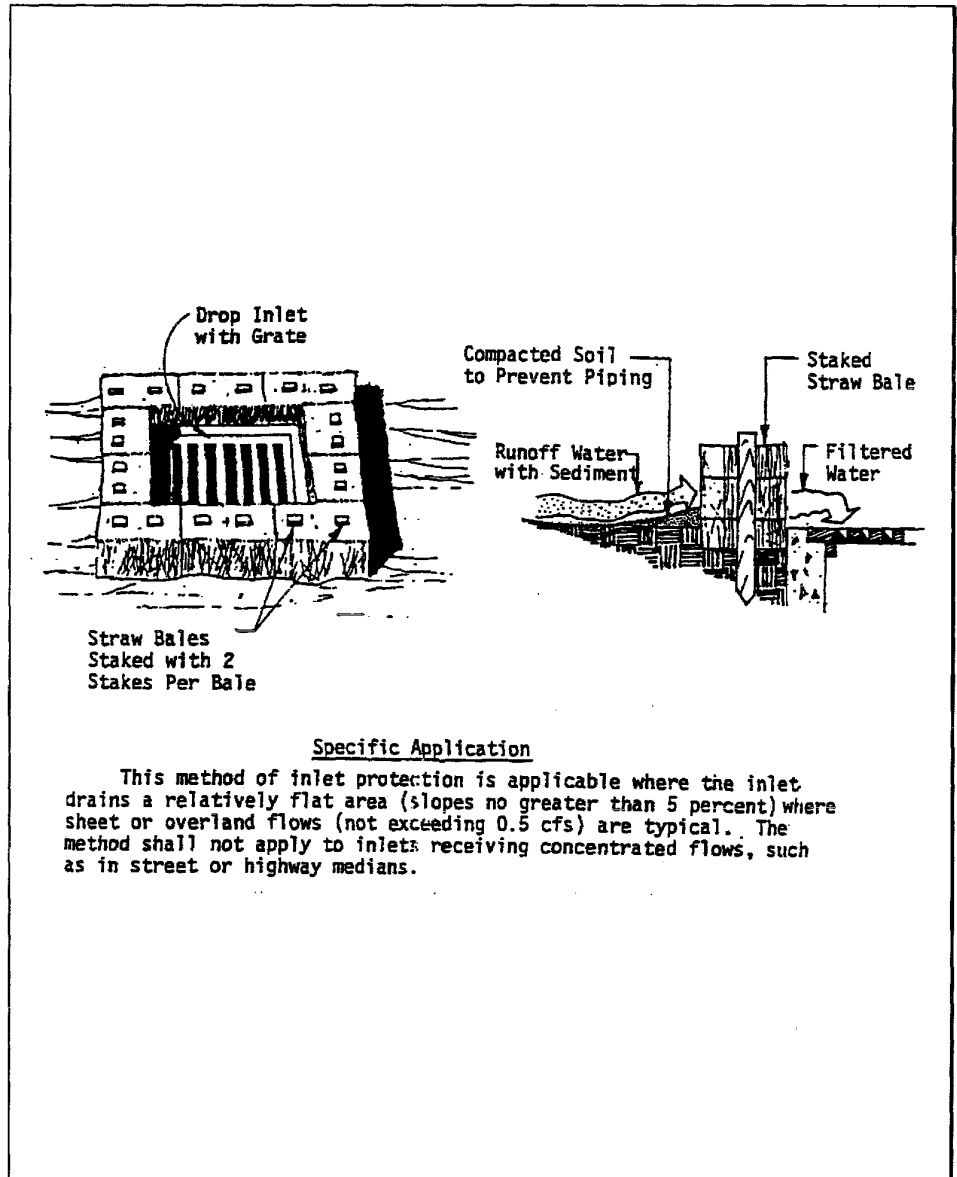


Plate 4.08a Straw Bale Drop Inlet Sediment Filter
Source: Michigan Soil Erosion and Sedimentation Control Guidebook

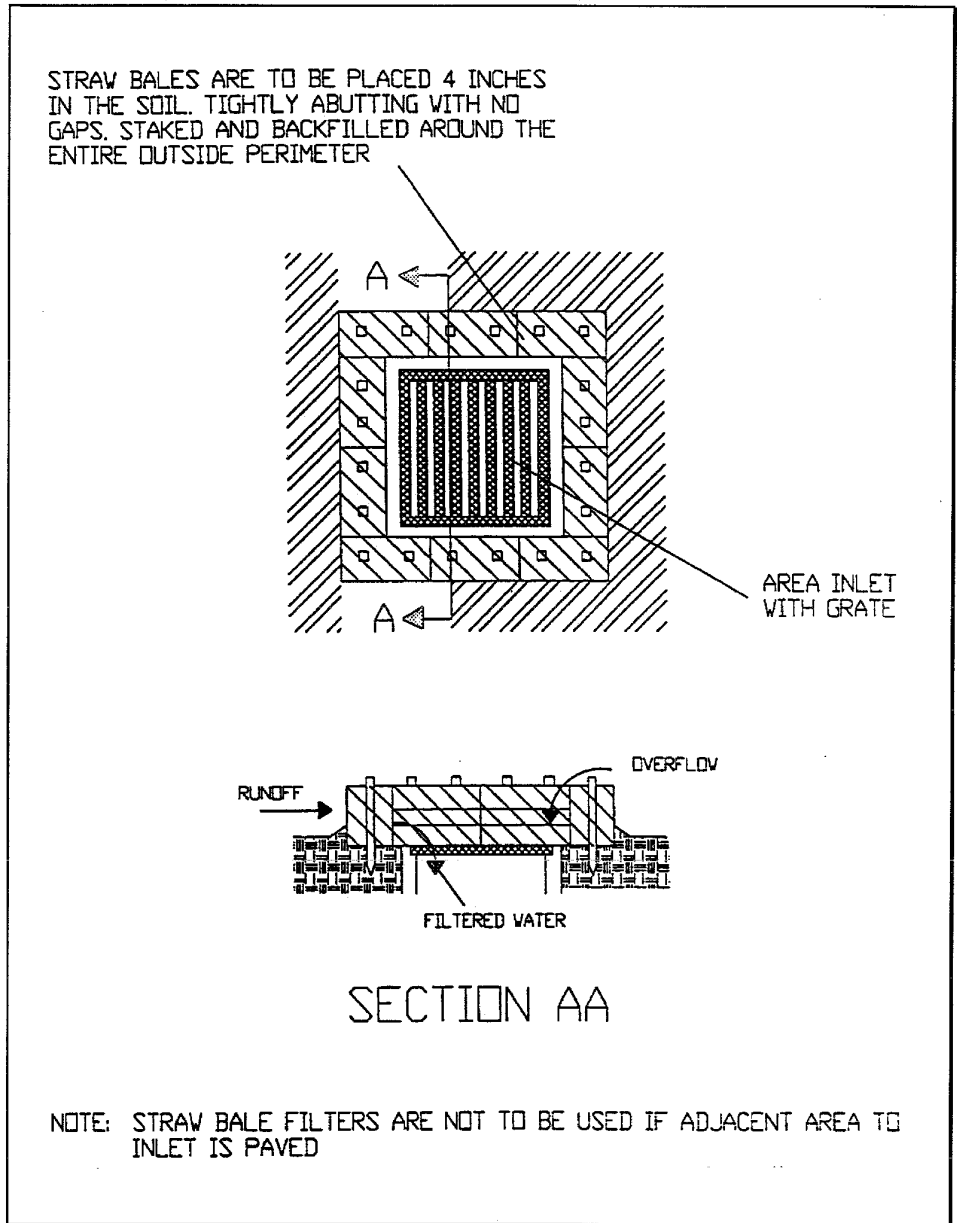


Plate 4.08b Straw Bale Filter for Area Inlet
Source: HydroDynamics, Inc.

Construction Specifications

Straw bale drop inlet filter

- Bales shall be either wire-bound or string-tied with the bindings oriented around the sides rather than over and under the bales.
- Bales shall be placed lengthwise in a single row surrounding the inlet, with the ends of adjacent bales pressed together. (See Plate 4.08a)
- The filter barrier shall be entrenched and backfilled. A trench shall be excavated around the inlet the width of a bale to a minimum depth of 4 inches (10 cm). After the bales are staked, the excavated soil shall be backfilled and compacted against the filter barrier. (See Plate 4.08b)
- Each bale shall be securely anchored and held in place by at least two stakes or rebars (See p. 4-17) driven through the bale.
- Loose straw should be wedged between bales to prevent water from entering between bales.
- Gravel may be spread around the bales to improve stability. (See Plate 4.08c)

Fabric drop inlet sediment filter

- Fabric shall be cut from a continuous roll to avoid joints.
- Stakes shall be 2" x 4" (5 cm x 10 cm) wood (preferred) or equivalent metal with a minimum length of 3 feet (90 cm). (See Plate 4.08d)
- Staples shall be of heavy duty wire at least 1/2-inch (13 mm) long.
- Stakes shall be spaced around the perimeter of the inlet a maximum of 3 feet (90 cm) apart and securely driven into the ground minimum of 8 inches (20 cm). A frame of 2" x 4" (5 cm x 10 cm) wood shall be constructed around the top of the stakes for proper stability.
- A trench shall be excavated approximately 4 inches (10 cm) wide and 4 inches (10 cm) deep around the outside perimeter of the stakes. (See Plate 4.08e)
- The burlap shall be stapled to the wooden stakes, and 8 inches (20 cm) of the fabric shall be extended into the trench. The height of the filter barrier shall be a minimum of 15 inches (38 cm) and shall not exceed 18 inches (45 cm).
- The trench shall be backfilled and the soil compacted over the burlap.

Prefabricated drop inlet external filter (Suntree Isles Grate Inlet Protector)

- Place the device over the inlet. If the inlet has a grate, the device shall be secured to the grate by means of a long toggle bolt. If the grate is not present, the device shall be bolted directly to the concrete.
- Sediments shall be removed when they have accumulated to within one foot (30 cm) of the top of the device. The filter fabric elements shall be cleaned or replaced at that time.

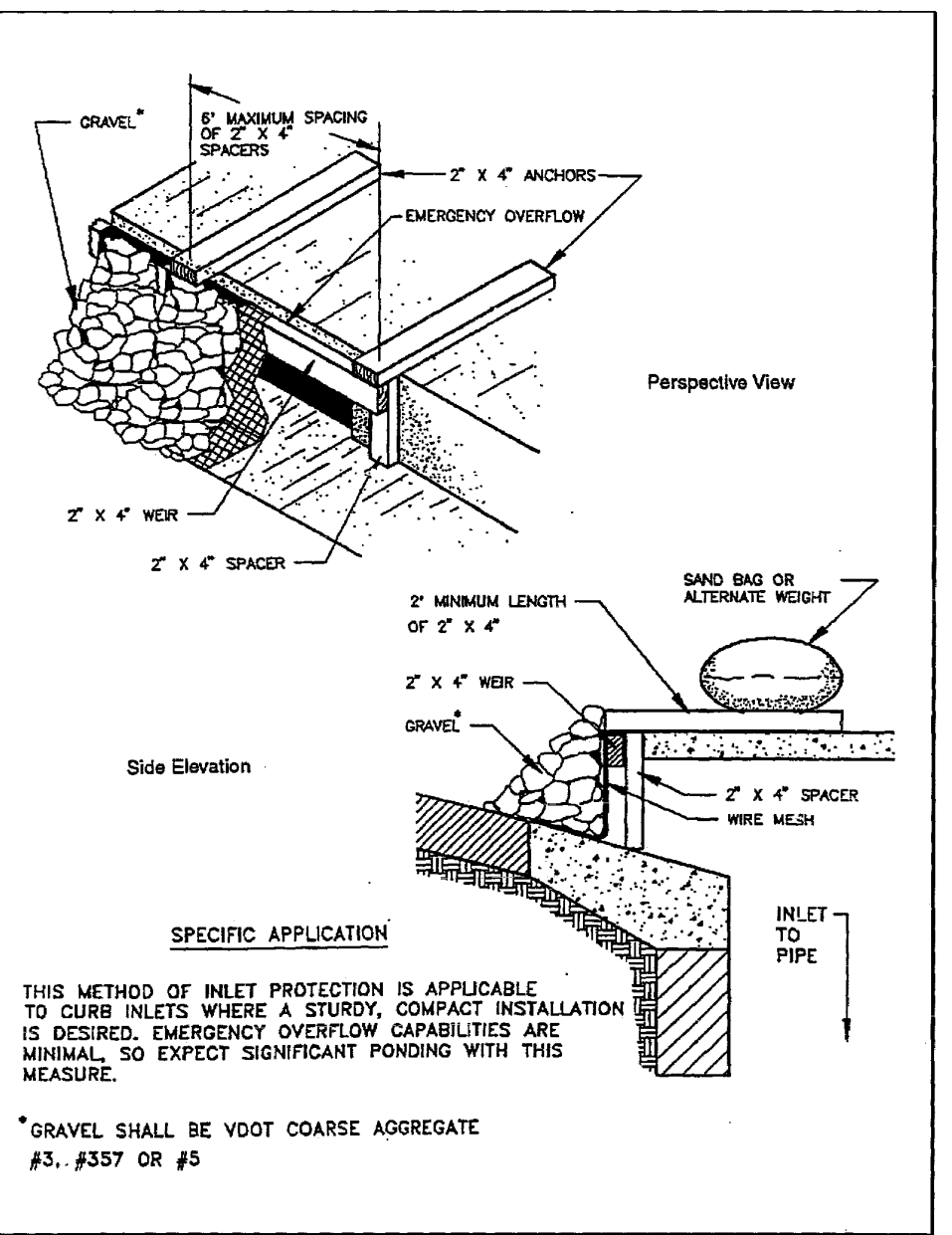
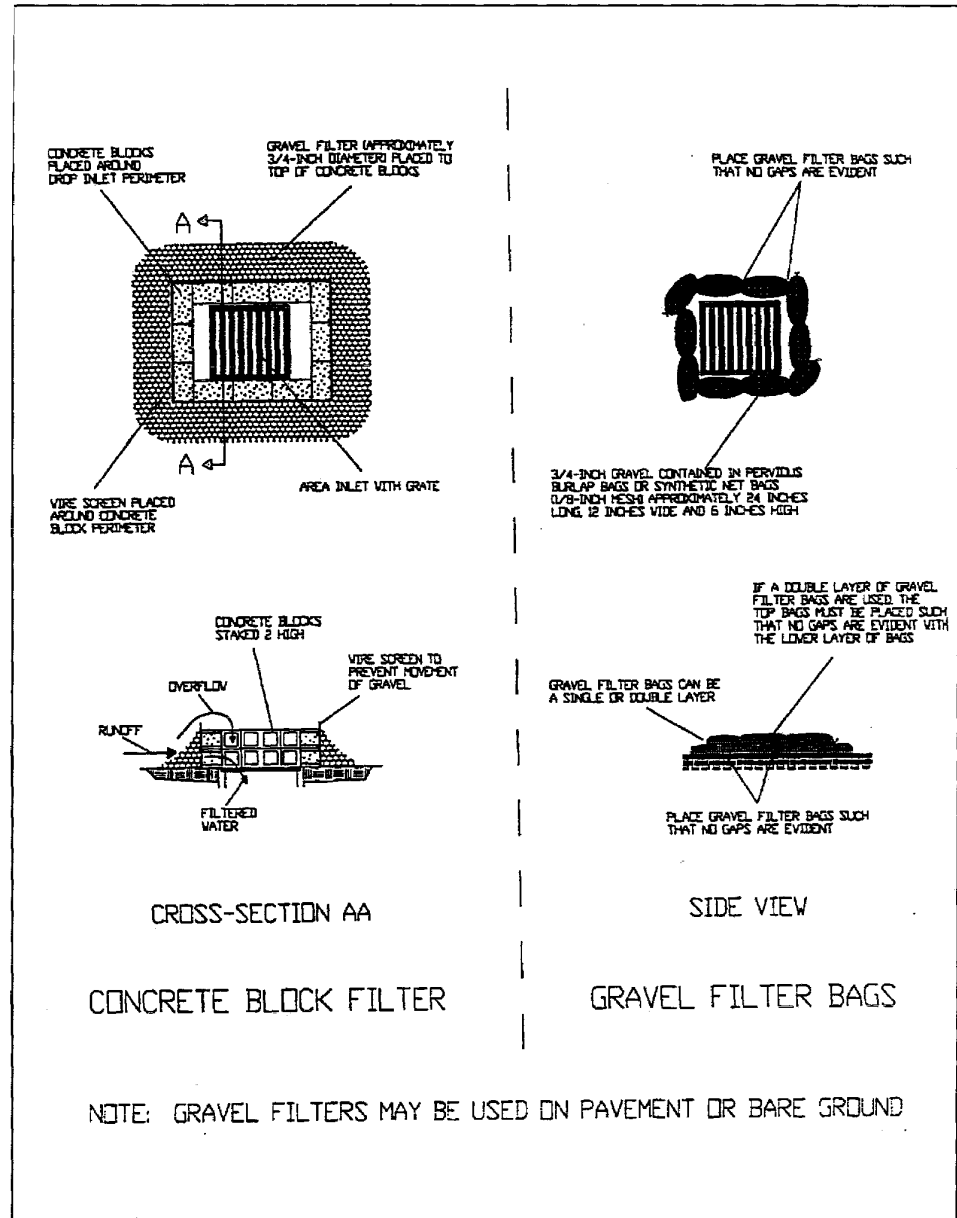
NOTE: This segment does not constitute a product endorsement.

Gravel curb inlet sediment filter

- Hardware cloth or comparable wire mesh with 1/2 inch (13 mm) openings shall be placed over the curb inlet opening so that at least 12 inches (30 cm) of wire extends across the top of the inlet cover and at least 12 inches (30 cm) of wire extends across the concrete gutter from the inlet opening. (See Plate 4.08k)
- Stone shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely. FDOT No. 1 Coarse Aggregate shall be used.
- An overflow weir can be constructed of 2" x 4" (5 x 10 cm) boards to lessen ponding from this practice. (See Plate 4.08L)
- If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the block, cleaned and replaced.

Block and gravel curb inlet sediment filter

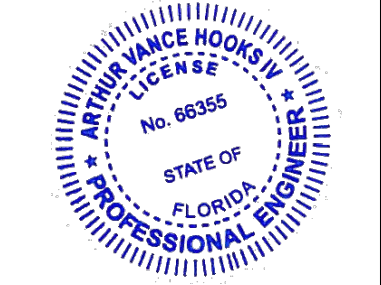
- Two concrete blocks shall be placed on their sides abutting the curb at either side of the inlet opening.
- A 2" x 4" (5 x 10 cm) board shall be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.
- Concrete blocks shall be placed on their sides across the front of the inlet and abutting the spacer blocks. (See Plate 4.08m)
- Wire mesh shall be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Hardware cloth with 1/2 inch (13 mm) openings shall be used.
- FDOT No. 1 Coarse Aggregate shall be piled against the wire to the top of the barrier.



* GRAVEL SHALL BE FDOT COARSE AGGREGATE #3, #57 OR #5



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