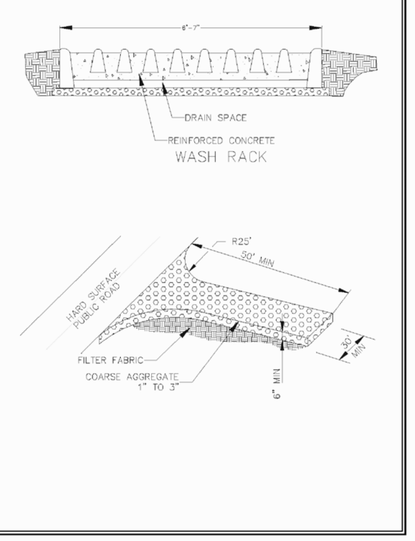
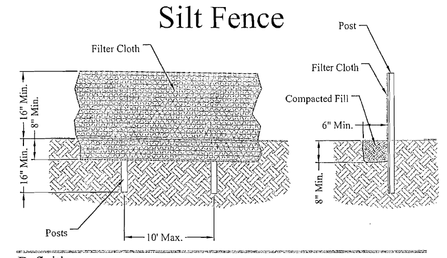
Stabilized Construction Entrance/Exit (continued)



Silt Fence



Definition
A temporary barrier of Geotextile Class "F" used to intercept sediment laden runoff from small drainage areas.

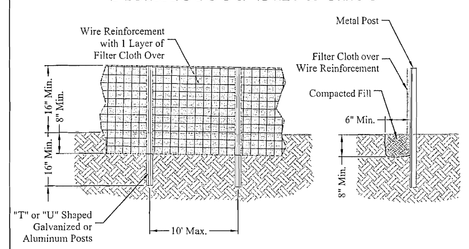
Purpose
The purpose of silt fence is to reduce runoff where velocity and allow the deposition of transported sediment to occur. Limits imposed by ultraviolet light on the stability of the fabric will dictate the maximum period that the silt fence may be used.
1. Silt fence provides a barrier that can collect and hold debris and soil, preventing the material from entering critical areas, streams, streets, etc.
2. Silt fence can be used where the installation of a dike would destroy sensitive areas; woods, wetlands, etc.

Conditions where the Practice Applies
Silt Fence is limited to intercepting sheet flow runoff from limited distances according to slope. It provides filtering and velocity dissipation to promote gravity settling of sediment.

Design Criteria
Wood or Steel Posts may be used in certain instances. Silt fence should be placed as close to the contour as possible. No section of silt fence should exceed a grade of 5 percent for a distance more than 50 feet. Where ends of the geotextile fabric come together, the ends shall be overlapped, folded, and stapled to prevent sediment bypass.
* If wood post are to be used they must meet the following specifications:
1 ½" X 1 ½" minimum square posts, or 1 ½" minimum diameter round post
* If metal posts are to be used they must be standard "T" or "U" post weighing not less than 1 lb. per linear foot.
The length of the flow contributing to silt fence shall conform to the following limitations.

Slope (%)	Slope Steepness	Slope Length (Ft.) (Maximum)	Silt Fence Length (Ft.) (Maximum)
2	0-50:1	Unlimited	Unlimited
2-10	50:1-10:1	125	1,000
10-20	10:1-5:1	100	750
20-33	5:1-3:1	60	500
33-50	3:1-2:1	40	250
50 +	> 2:1	20	125

Reinforced Silt Fence



Definition
A temporary barrier of Geotextile Class "F" over wire reinforcement used to intercept sediment laden runoff from small drainage areas.

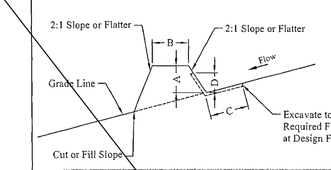
Purpose
The purpose of silt fence is to reduce runoff where velocity and allow the deposition of transported sediment to occur. Limits imposed by ultraviolet light on the stability of the fabric will dictate the maximum period that the silt fence may be used.
1. Silt fence provides a barrier that can collect and hold debris and soil, preventing the material from entering critical areas, streams, streets, etc.
2. Silt fence can be used where the installation of a dike would destroy sensitive areas; woods, wetlands, etc.

Conditions where the Practice Applies
Silt Fence is limited to intercepting sheet flow runoff from limited distances according to slope. It provides filtering and velocity dissipation to promote gravity settling of sediment.

Design Criteria
Steel posts must be used. Silt fence should be placed as close to the contour as possible. No section of silt fence should exceed a grade of 5 percent for a distance more than 50 feet. Where ends of the geotextile fabric come together, the ends shall be overlapped, folded, and stapled to prevent sediment bypass. The length of the flow contributing to silt fence shall conform to the following limitations.

Slope (%)	Slope Steepness	Slope Length (Ft.) (Maximum)	Silt Fence Length (Ft.) (Maximum)
0-10	0-10:1	Unlimited	Unlimited
10-20	10:1-5:1	300	1,500
20-33	5:1-3:1	100	1,000
33-50	3:1-2:1	100	500
50 +	2:1 +	50	250

Earth Dike



	Dike A	Dike B
A-Dike Height	18"	30"
B-Dike Width	24"	36"
C-Flow Width	4'	6'
D-Flow Depth	12"	24"

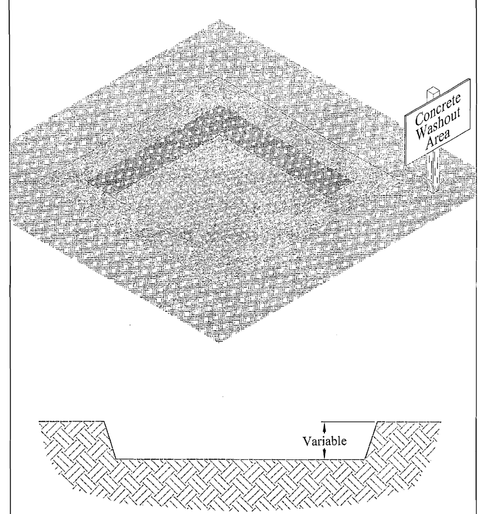
Definition
A temporary berm or dike of soil, compacted, stabilized, and located in such a manner as to direct storm water to a desired location.

Purpose
The purpose of the earth dike is to direct runoff to a sediment trapping device which reduces the potential for erosion and sediment pollution. Earth dikes can also be used for diverting clean water away from disturbed areas.

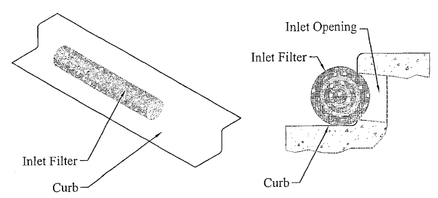
Conditions where the Practice Applies
Earth dikes are often constructed across disturbed areas and around construction sites such as parking lots and subdivisions. The dikes shall remain in place until the disturbed area are permanently stabilized.
Earth dikes are constructed:
1. To divert sediment laden runoff from a disturbed area to a sediment trapping device.
2. Across disturbed areas to shorten overland flow distances.
3. To direct sediment laden water along the base of slopes to a trapping device.
4. To divert clear water from an undisturbed area to a stabilized outlet. Runoff shall be discharged at a non-erosive velocity.

Design Criteria
The basis for the engineering design shall be the 2-year 24-hour duration storm using NRCS criteria, assuming the worst soil cover conditions to prevail in the contributing drainage area over the life of the earth dike. Manning's Equation shall be used to determine earth dike flow channel velocities associated with the developed discharges. The Manning's Roughness coefficients to be used in the equation are 0.025 for seed and mulch, 0.03 for soil stabilization matting or sod, and 4"-7" stone use 0.045 for flow depths up to 1' (Dike A) and 0.038 for flow depths between 1 and 2 feet (Dike B). Allowable flow channel velocities shall be less than 4 fps for seed and mulch, less than 6 fps for stabilization matting or sod, and less than 8 fps for 4"-7" stone.

Concrete Washout Area



Curb Storm Drain Inlet Filter



Cross-Section

Definition
A filter constructed around a storm drain inlet.

Purpose
Storm drain inlet protection is used to filter sediment laden runoff before it enters the storm drain system.

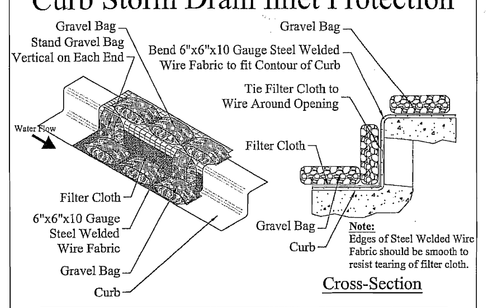
Conditions where the Practice Applies
Storm drain inlet protection is a secondary sediment control device and is not to be used in place of a sediment trapping device unless approved by the appropriated approval authority.

Design Criteria
Storm drain inlet protection shall be used when the drainage area to an inlet is disturbed and the following conditions prevail:

1. It is not possible to temporarily divert the storm drain outfall into a sediment trapping device.
2. Watertight blocking of the inlets is not advisable.
3. Drainage area is less than 1/4 acre for curb or standard inlet protections and 1 acre for elevated or yard inlets. For yard inlets, the total for inlets in series must be 1 acre or less and the contributing drainage area must have slopes flatter than 5 percent. **Maintenance requirements for storm drain inlet protection are intense, due to the susceptibility to clogging. When the structure does not drain completely within 24 hours after a storm event, it is clogged. When this occurs, accumulated sediment must be removed and the geotextile fabric or filtering device must be cleaned and replaced.**

Several methods of covering inlets have been developed recently.
It is important to use methods that have been proven effective.
Follow local ordinances. Some communities do not allow covering of storm inlets due to the possibility of increased flooding. Several other important design considerations include traffic safety, elimination of seepage at the ends and underneath the filter cloth, and prevention of the filter entering the inlet.

Curb Storm Drain Inlet Protection



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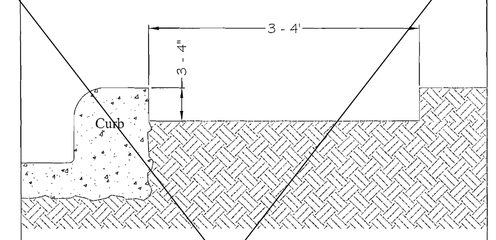
Cut Back Curb



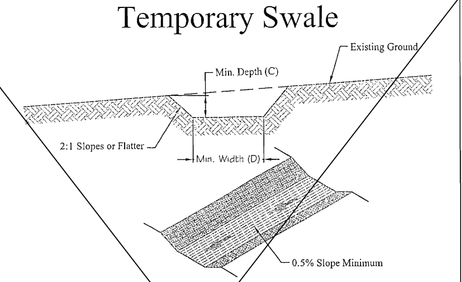
Definition
A temporary sediment trap formed by excavation behind the curb.

Purpose
The purpose is to intercept sediment laden runoff from the lot during construction and retain sediment on the lot.

Conditions where the Practice Applies
A cutback curb is installed when discharge from the lot runs over the curb.

Design Criteria
1. Cut back soil from behind curb 3 - 4" deep to form a temporary sediment trap.
2. Installing the sidewalk will form a two stage sediment trap that will be more effective.

Temporary Swale



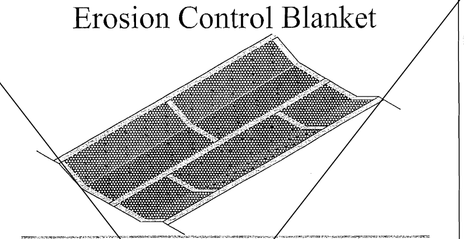
Definition
A temporary swale is a temporary, excavated drainage way constructed and located to convey runoff to a desired location.

Purpose
The purpose of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet to intercept sediment laden water and divert it to a sediment trapping device.

Conditions Where Practice Applies
Temporary swales are constructed:
1. To divert sediment laden runoff from a disturbed area to a sediment trapping device.
2. Across disturbed areas to shorten overland flow distances.
3. To direct sediment laden water along the base of slopes to a trapping device.
4. To divert clear water from an undisturbed area to a stabilized outlet. Runoff shall be discharged at non-erosive velocities.

Design Criteria
The basis for engineering design shall be the 2-year, 24-hour duration storm using N.R.C.S. criteria, assuming the worst soil cover conditions to prevail in the contributing drainage area over the life of the earth dike. Manning's Equation shall be used to determine earth dike flow channel velocities associated with the developed discharges. The Manning's Roughness coefficients to be used in the equation are 0.025 for seed and mulch, 0.03 for soil stabilization matting or sod, and 4"-7" stone use 0.045 for flow depths up to 1 foot (Dike A) and 0.038 for flow depths between 1 and 2 feet (Dike B, See earth Dike). Allowable flow channel velocities shall be less than 4 fps for seed and mulch, less than 6 fps for stabilization matting or sod, and less than 8 fps for 4"-7" stone.

Erosion Control Blanket



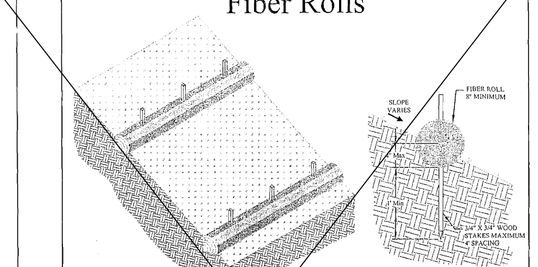
Definition
Application of a protective layer of straw, either plant residues, stone, or synthetic materials to the soil surface.

Purpose
To protect the soil surface from the forces of raindrop impact and overland flow. Blankets foster the growth of vegetation, reduces evaporation, insulates the soil, and suppresses weed growth. They are frequently used to accent landscape plantings.

Conditions where the Practice Applies
Mulch temporary or permanent seedings immediately after planting. Mulch around plantings of trees, shrubs, or ground covers to stabilize the solid between plants. Areas that cannot be seeded because of the season should be mulched to provide temporary protection of the soil surface. Use an organic mulch in this case that can be incorporated into the soil during seedbed preparation.

Design Criteria
1. A surface mulch is the most effective, practical means of controlling runoff and erosion on disturbed land prior to vegetation establishment. Mulch reduces soil moisture loss by evaporation, prevents crusting, and sealing of the soil surface, moderates soil temperatures, provides a suitable microclimate for seed germination, and may increase the infiltration rate of the soil.
2. Organic mulches such as straw, wood chips, and shredded bark have been found to be the most effective soil materials. Materials containing weed and grass seeds which may compete with establishing vegetation should not be used. Also, decomposition of some wood products can tie up significant amounts of soil nitrogen, making it necessary to modify fertilization rates or add fertilizer with the mulch.
3. A variety of erosion control blankets have been developed in recent years for use as mulch, particularly in critical areas such as waterways and channels. Various types of netting materials are also available to anchor organic mulches.
4. Chemical soil stabilizers or soil binders, when used alone, are less effective than other types of mulches. These products are primarily useful for tacking wood fiber or straw mulches.
5. The choice of materials for mulching should be based on soil conditions, season, type of vegetation, and size of the area. A properly applied and tacked mulch is always beneficial. It is especially important when conditions of germination are not optimum, such as midsummer and early winter, and on difficult sites such as cut slopes and drought soils.

Fiber Rolls



Definition
Tubes of straw or fiber used for erosion control, sediment control, and stormwater runoff control. Plastic netting or burlap contain the straw or fiber.

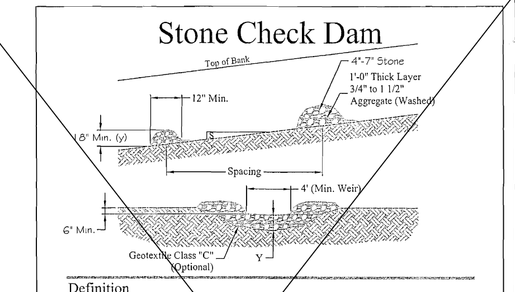
Purpose
Fiber rolls allow water to pass through while decreasing runoff velocity, increasing infiltration rates, and trapping sediments. Also known as sediment logs or wattles, they can provide temporary or permanent controls and biodegrade with time.

Conditions where the Practice Applies
* Along the face of slopes to reduce the slope length.
* At grade breaks where slopes transition from shallow to steep.
* In drainage swales.
* Along streambanks.
* On flat ground such as urban development projects.

Limitations
* Applicable where surface flows do not exceed 1 cfs and on slopes of less than 20:1V
* Fiber rolls are not to be used at the base of slopes in place of linear sediment barriers such as silt fences.
* Not recommended in concentrated flow areas.

Standards and Specifications
* Fiber rolls are either prefabricated rolls or rolled tubes of erosion control blankets 8-9" in diameter.
* Remove debris and larger stones from the sloped area before installing the fiber roll.
* Slope ends slightly down slope to prevent ponding in middle.
* Must be installed in shallow trenches.

Stone Check Dam



Definition
Stone check dams are stone weirs in series in swales and ditches.

Purpose
Stone check dams are constructed to reduce runoff velocities to non-erosive rates and to prevent channel erosion in drainage courses.

Design Criteria
1. Stone check dams shall be located so as to provide maximum velocity reduction. This may be achieved by considering the volume of runoff, the drainage area and the slope. The check dams should be placed in reasonably straight ditch sections to minimize the potential for erosion in the channel bend. All stone check dams should be keyed into the sides and bottom of the channel. **This is not to be used as a sediment trapping device. Sediment laden runoff must pass through a sediment trapping device prior to being discharged from the site.**
2. The distance between the stone check dams will vary with the longitudinal ditch slope. Stone check dams shall be constructed using 4"-7" stone (See Materials Specifications, Stone Size), or recycled concrete equivalent and shall be placed to form a weir. The outlet crest or top of the stone weir must be approximately 6 feet lower than the outer edges. The inside or upstream side of the weir should be lined with a 1 foot thick layer of washed (3/4" to 1 1/2") crushed aggregate. Geotextiles Class "E" (See Materials Specifications, Geotextiles) or better under the bottom and sides of the dam prior to placement of stone is optional.
3. The height of the stone outlet weir should not exceed 1/2 the ditch or swale. Additionally, the maximum height of the weir must not exceed 2 feet to prevent scour of the toe of the dam. If the check dam exceeds this, these provisions do not apply and an engineering analysis should be conducted. The stone check dam should be wide enough to reach from bank to bank of the ditch or swale with the weir section length in the center of the dam.
4. The number of check dams will depend on the length and slope of the ditch or swale. The required spacing is determined as:

$x = y/S$ where
x = Check dam spacing in Feet
y = Check dam height in Feet
S = Natural Channel Slope Ft./Ft.
The spacing is most sensitive to channel slope and height of dam.

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REGISTERED PROFESSIONAL ENGINEER

5/18/14

EROSION CONTROL NOTES

1)All perimeter BMP measures for sediment control shall be installed before any earth disturbing activity. If it's not practical to install BMP's due to thick vegetation then the contractor shall grub a perimeter line and install BMP's immediately therafter.

2)All erosion control installations shall meet the storm water management standards and manufacturers guidelines.

3)Sediment collected behind BMP's shall be removed when sediment reaches one half the height of the barrier.

4) BMP's shall be inspected and maintained per NPDES regulations e.g. at a minimum once every two weeks or weekly when discharges may reach an impaired waterway and after a rain event where it rains .25A in a 24 hr period.

5)BMP maintenance shall begin within 24 hours of noting the needed repairs.

6)Construction site entrance - The contractor shall place a stabilized construction track-out at each egress location.

7)Street sweeping - The contractor shall sweep the off site sediment tracking onto public right-of-ways if it is more than a stain.

8)Disturbed portions of the site that are inactive for more than 14 days must be temporarily stabilized with tackifiers if construction activity resume after 21 days or reseeded if construction activity will not resume after 21 days.

9)All areas not covered by impervious material or landscaping shall be reseeded with native grasses.

10)The contractor shall institute good housekeeping by keeping loose packaging trash and construction debris in approved solid waste containers.

11)The contractor shall control dust generated from earth work activity.

12)Temporary BMP's shall be removed following permanent stabilization.

13)All subcontractors shall be made aware of SVPPP requirements.

Project:_____

Date:_____

_____

Sheet No. _____

Inspections Plus Inc. Dave and Busters
Erosion Control Plan
Standard Details