HANES GEO COMPONENTS
A Leggett & Platt COMPANY

Wire Backed Silt Fence

SF-90 w 36" 2x4 14ga welded wire

Silt Fence Fabric is a preassembled silt fence with 36" TerraTex SF-90 woven geotextile attached to 36" 14 gauge 2x4 welded wire. The TerraTex SF-90 is made up of polypropylene filaments. These filaments are woven to form a stable and durable network such that the filaments retain their relative position. It is non-biodegradable and resistant to most soil chemicals, acids, and alkali with a pH range of 3 to 12. TerraTex SF-90 is manufactured to meet or exceed the following minimum average roll values:

Property	Test Method	Minimum Average Roll Value English	Minimum Average Roll Value Metric
Grab Tensile	ASTM D-4632	100 x 100 lb	0.445 x 0.445 kN
Elongation	ASTM D-4632	15% x 20%	15% x 20%
Mullen Burst	ASTM D-3786	250 psi	1723 kPa
Puncture	ASTM D-4833	50 lb	0.223 kN
Trap Tear	ASTM D-4533	50 lb	0.223 kN
UV Resistance	ASTM D-4355	80% @ 500 hr	80% @ 500 hr
AOS	ASTM D-4751	20 - 50 US Sieve	0.85 - 0.300 mm
Permittivity	ASTM D-4491	0.10 sec-1	0.10 sec-1
Flow Rate	ASTM D-4491	8 gal/min/ft^2	325.6 l/min/m^2

11/2009

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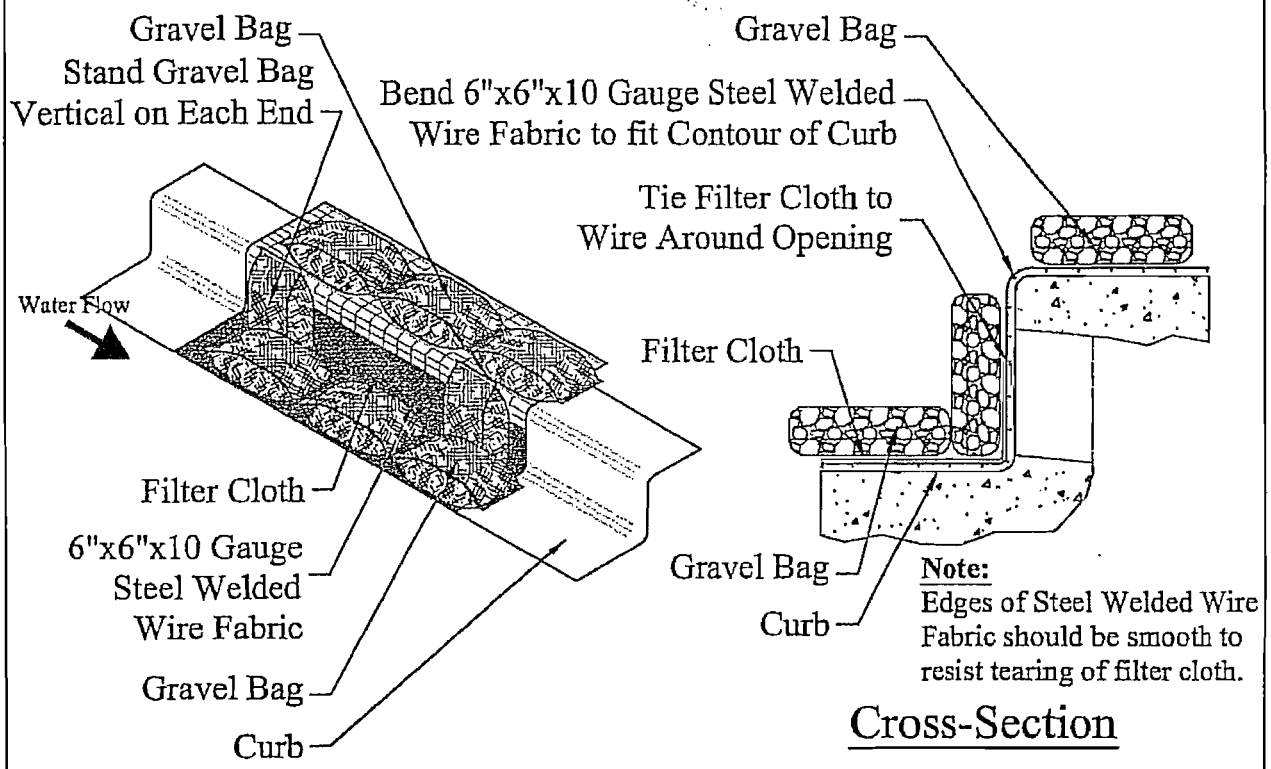
Curb Storm Drain Inlet Protection



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. **Maintenence 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.**

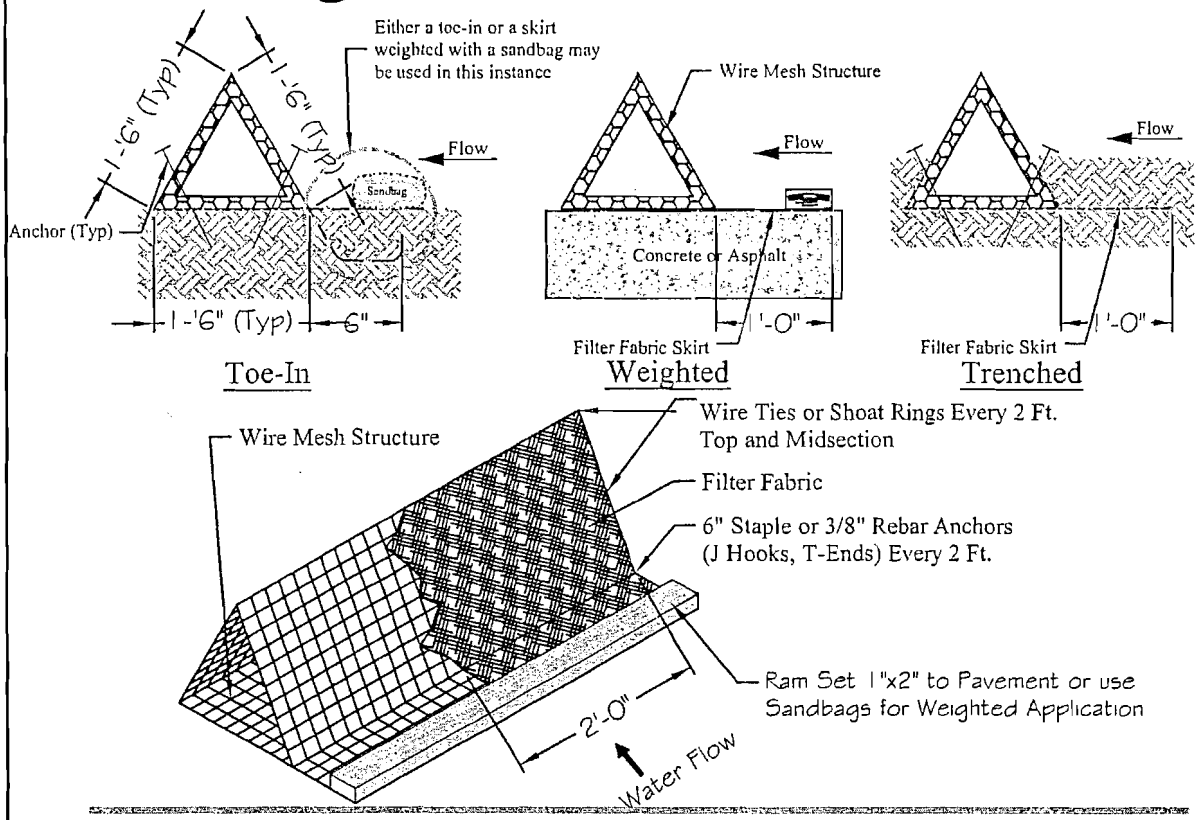
Several methods of covering inlets have been developed recently. It is important to use methods that have been proven effective. Follow local ordinances. Some communities do not allow covering of storm inlets due to the possibility of increased flooding. Several other important design considerations 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

Construction Specifications

1. Bend a continuous piece of 6" X 6" 10 gauge welded wire fabric to form a "Z" shape as shown on the drawing. The width of the wire should extend at least 6 inches past the left and right sides of the drain opening.
2. Attach a continuous piece of approved Geotextile fabric the same width as the wire mesh. Fold the fabric along the top for added tie strength.
3. The Geotextile should extend out from the curb the same distance as the wire fabric and should extend up the wire fabric so that approximately 2/3 of the drain opening is covered. This allows for sediment storage and overflow during periods of high rainfall. **Note: The Geotextile opening size should be selected based on the filtered soil gradation testing.**
4. Place the assembly against the inlet throat. The top of wire fabric is held in place by sand/gravel bags. Place gravel bags against the curb and the fabric to prevent seepage between the curb and the filter cloth. Place small gravel bags around the opening to prevent seepage under the filter cloth and also to form a sediment trap. Graded gravel is preferable for primary filtering. The infiltration rate through the bag should permit the allowable flow rate. **Caution: Gravel bags should be placed off the street surface unless a suitable reflector is used for traffic safety.**

Triangular Filter Fabric Fence



Definition

A temporary sediment barrier used where laden runoff from small drainage areas occurs.

Purpose

The purpose is to reduce runoff velocity and filter sediment from construction areas.

Conditions where the Practice Applies

A triangular filter fabric fence is effective on all sites with concrete or asphalt surfaces where runoff will flow onto adjacent properties from parking lots or similar areas.

Design Criteria

1. Dikes are to be installed along a line of constant elevation (along a contour line).
2. Maximum slope perpendicular to the dike is 1:1.
3. Maximum drainage flow to the dike shall be 11 CFS per 100 linear feet of dike.
4. Maximum distance of flow to dike should be 200 feet or less.
5. Maximum concentrated flow to dike shall be 1 CFS.
6. If 50% or less of soil, by weight, passes the U.S. Standard sieve #200, select the equivalent opening size (E.O.S.) to retain 85% of the soil.
7. Maximum equivalent opening size shall be 70 (#70 Sieve).
8. Minimum equivalent opening size shall be 100 (#100 Sieve).
9. If 85% or more of soil, by weight, passes the U.S. Standard sieve #200, triangular sediment dike shall not be used due to clogging.
10. Sufficient room for the operation of sediment removal equipment shall be provided between the dike and other obstructions in order to properly remove sediment.
11. The ends of the dike shall be turned upgrade to prevent bypass of stormwater.

TRIANGULAR FILTER FABRIC FENCE

Limitations

Ponding will likely occur directly adjacent to the dike, which may possibly cause flooding.

Triangular sediment filter dikes are not effective for conditions, which include substantial concentrated flows or when they are not constructed along a contour line due to the potential for flow concentration and overtopping.

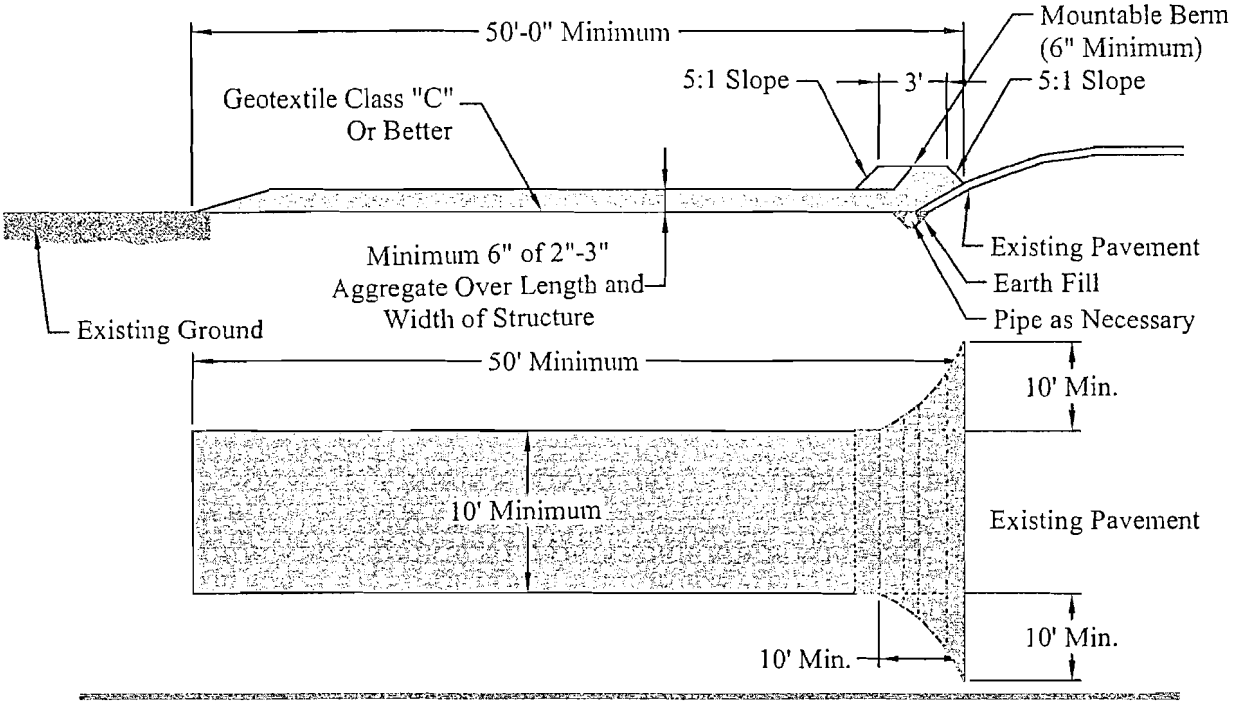
Maintenance Requirements

Inspection should be made on a regular basis, especially after large (>0.5") storm events. If the fabric becomes clogged, it should be cleaned or if necessary, replaced.

Sediment should be removed when it reaches approximately 6" in depth. In addition, inspections should be made on a regular basis to check the structural integrity of the dike. If structural deficiencies are found, the dike should become immediately repaired or replaced.

As with silt fence, integrity of the filter fabric is important to the effectiveness of the dike. Overlap between dike sections must be checked on a regular basis and repaired if deficient.

Stabilized Construction Entrance



Definition

A stabilized layer of aggregate that is underlain with Geotextile Class "C" (See Standards for Geotextile). Stabilized entrances are located at any point where traffic enters or leaves a construction site.

Purpose

The purpose of the stabilized construction entrance is to reduce tracking of sediment onto streets or public rights-of-way and provide a stable area for entrance or exit from the construction site.

Conditions where the Practice Applies

1. Stabilized construction entrances shall be located at points of construction ingress and egress.
2. For single family residences, the entrance should be located at the permanent driveway.
3. Stabilized construction entrances should not be used on existing pavement.

Design Criteria

1. Length - Minimum of 50'-0" (30'-0" for single residence lot).
2. Width - Minimum of 10'-0", should be flared at the existing road to provide a turning radius.
3. Geotextile Class "C" shall be placed over the exiting ground prior to placing stone. The Plan approval authority may not require geotextile fabric for single family residence.
4. Stone-crushed aggregate 2"-3" (See Standards for Geotextile and Rock). Recycled concrete equivalent may be used also. The rock should be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - All the surface water flowing to or diverted toward construction entrances shall be piped under the entrance to maintain positive drainage. Pipe installed under the construction entrance shall be protected with a mountable berm. The pipe shall be sized according to the drainage, with the minimum diameter being 6".
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

STABILIZED CONSTRUCTION ENTRANCE

Construction Specifications

1. Length - minimum of 50' (30' for single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single-family residences to use geotextile.

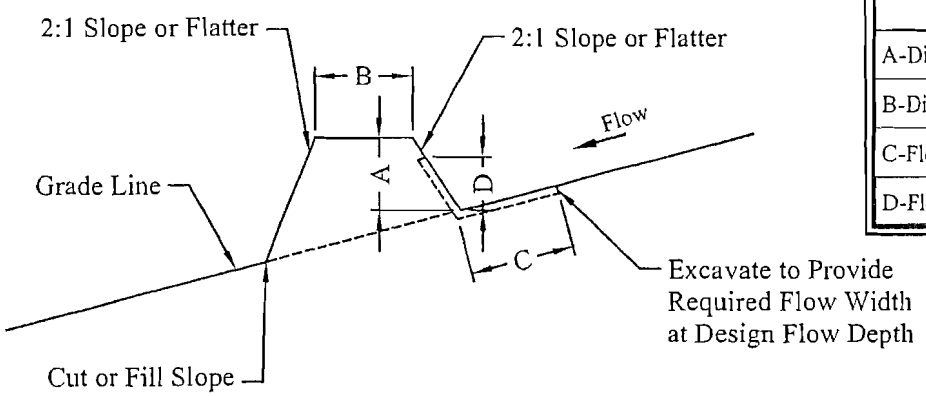
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the stabilized construction entrance is located at the high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

Location

A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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 ridge 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 sedimentation. 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 ares 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.

EARTH DIKE

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Earth dikes having longitudinal slopes flatter than 1% should have spot elevations along the flow line.

2. Diverted runoff from the disturbed areas shall be directed to a sediment trapping devices.

3. Diverted runoff from undisturbed areas shall outlet directly onto an undisturbed, stabilized area at a non-erosive velocity (<4 fps for grass).

4. All trees, brush, stumps, and obstructions shall be removed and disposed of so as not to interfere with the proper functioning of the earth dike berm and flow channel.

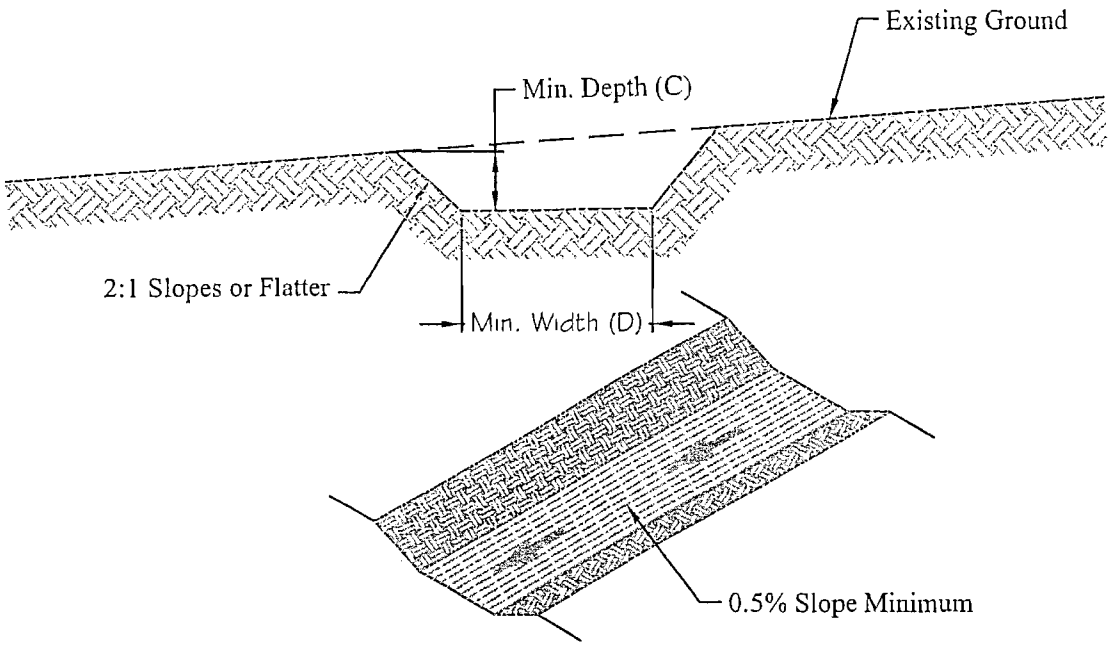
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities, which will impede normal flow.

6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the earth dike berm and flow channel.

8. Inspection and maintenance must be provided periodically and after each rain event.

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 or 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, a ssuming 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.

TEMPORARY SWALE

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2, Standards and Specifications for Temporary Swale.

2. The check dam shall be constructed of 4" to 7" stone. The stone shall be placed so that it completely covers the width of the channel and keyed into the channel banks.

3. The top of the check dam shall be constructed so that the center is approximately 6 inches lower than the outer edges, forming a weir that water can flow across.

4. The maximum height of the check dam at the center shall not exceed 2'.

5. The upstream side of the check dam shall be lined with approximately 1' of 0.75" – 1.5" aggregate.

6. Accumulated sediment shall be removed when it has built up to half of the original height of the weir crest.

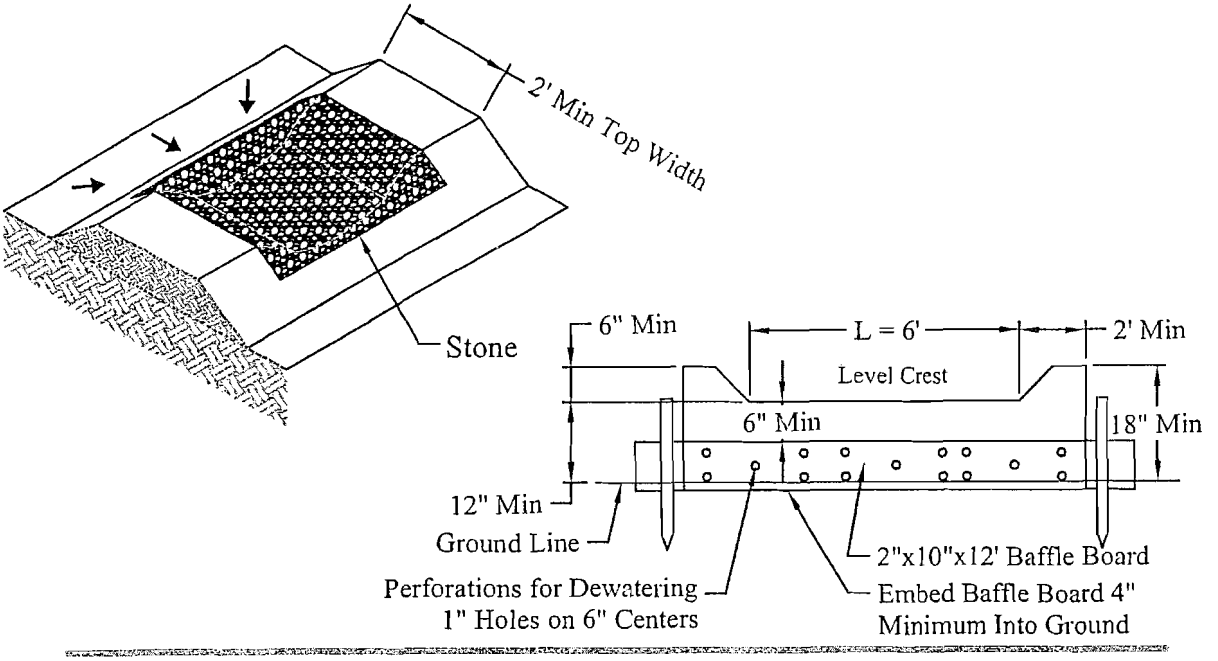
Sediment Removal

While this practice is not intended to be used for sediment trapping, some sediment will accumulate behind the check dam. Check dams should be checked periodically and after each significant rainfall. Accumulated sediment should be removed when it has reached half of the original height of the weir crest.

Check Dam Removal

In temporary swales and channels, check dams should be removed and the ditch filled in when it is no longer needed. In permanent channel structures, check dams may be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dams may be removed when the grass has matured sufficiently to protect the swale or channel. The area beneath the check dams should be seeded and mulched immediately after they are removed.

Stone Outlet Structure



Definition

A temporary stone dike installed in conjunction with and as a part of an earth dike.

Purpose

The purpose of the Stone Outlet Structure is to filter sediment laden runoff, provide a protected outlet for an earth dike, provide for diffusion of concentrated flow, and allow the area behind the dike to dewater.

Conditions where the Practice Applies

Stone outlet structures apply to any point of discharge where there is a need to dispose of runoff at a protected outlet or to diffuse concentrated flow for the duration of the period of construction.

The drainage area to this practice shall be 1/2 acre or less.

Outlet

The stone outlet structure shall be located so as to discharge onto an already stabilized area or into a stable watercourse. Stabilization shall consist of complete vegetative cover, paving, etc., sufficiently established to be erosion resistant.

Design Criteria

1. Refer to Material Specifications, Stone. Stone 2" to 3" diameter or recycled concrete equivalent is preferred but clean gravel may be used if stone is not available.
2. The crest of the stone dike shall be at least 6" lower than the lowest elevation of the top of the earth dike and shall be level.
3. The stone outlet structure shall be embedded into the soil a minimum of 4"
4. The minimum legth of the crest of the stone outlet structure shall be 6'.
5. The baffle board shall extend 1' into the dike and 4" into the ground and be staked in place.
6. The drainage area to this structure shall be less than 1/2 acre.

STONE OUTLET STRUCTURE

Construction Specifications

1. 2" to 3" stone or recycled concrete equivalent is preferred but clean gravel may be used if stone is not available.

2. The crest of the stone dike shall be at least 6" lower that the lowest elevation of the top of the earth dike and shall be level.

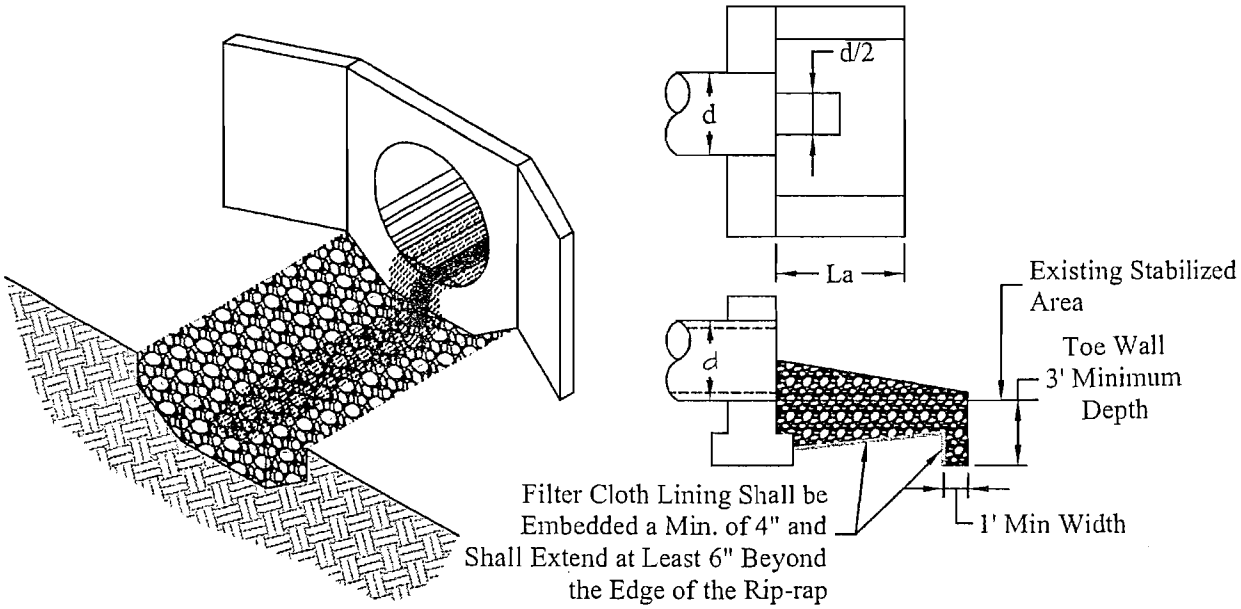
3. The stone outlet structure shall be embedded into the soil a minimum of 4".

4. The minimum length of the crest of the stone outlet structure shall be 6'.

5. The baffle board shall extend 1' into the dike and 4" into the ground and be staked in place.

6. The drainage area to this structure shall be less that 0.5 acre.

Rock Outlet Protection



Definition

Rock placed at the outfall of channels or culverts.

Purpose

The purpose of rock outlet protection is to reduce the velocity of flow to non-erosive rates in the receiving channel.

Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts are sufficient to erode the next downstream reach. This applies to outlets of all types such as sediment basins, storm water management ponds, and road culverts.

Design Criteria

The design method applies to sizing rock rip-rap and gabions to protect a downstream area. It does not apply to rock lining of channels or streams. Many counties and state agencies have regulations and design procedures established for dimensions, type, and size of materials, and locations where outlet protection is required.

Design Procedures

1. Investigate the downstream channel to assure that non-erosive velocities can be maintained.
2. Determine the tailwater condition at the outlet.
3. Using the discharge velocity and depth of flow, determine the rip-rap size and apron length required.
4. Calculate apron width at the downstream end if a flared section is to be used.

There are three classifications of rock outlet protection: (1.) Discharge to semi-confined section (maximum tailwater condition); (2.) Discharge to a confined channel section; (3.) Discharge to a flat area with no tailwater influence.

The outlet protection may be done using rock rip-rap, or gabions. Rip-rap thickness is 19", 32", and 46" for Class I, II, and III respectively. The stone chall consist of field stone and hewn quarry stone. The filter is a layer of material placed between the rip-rap and the underlaying soil surface to prevent soil movement into and through the rip-rap. Rip-rap shall have a filter placed under it in all cases. A filter can be gravel or Geotextile Class "C". Gabion baskets may be substituted for rock rip-rap. Gabions shall be of single unit construction. Place Geotextile under all gabions and follow manufacturer's specifications.

ROCK OUTLET PROTECTION

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

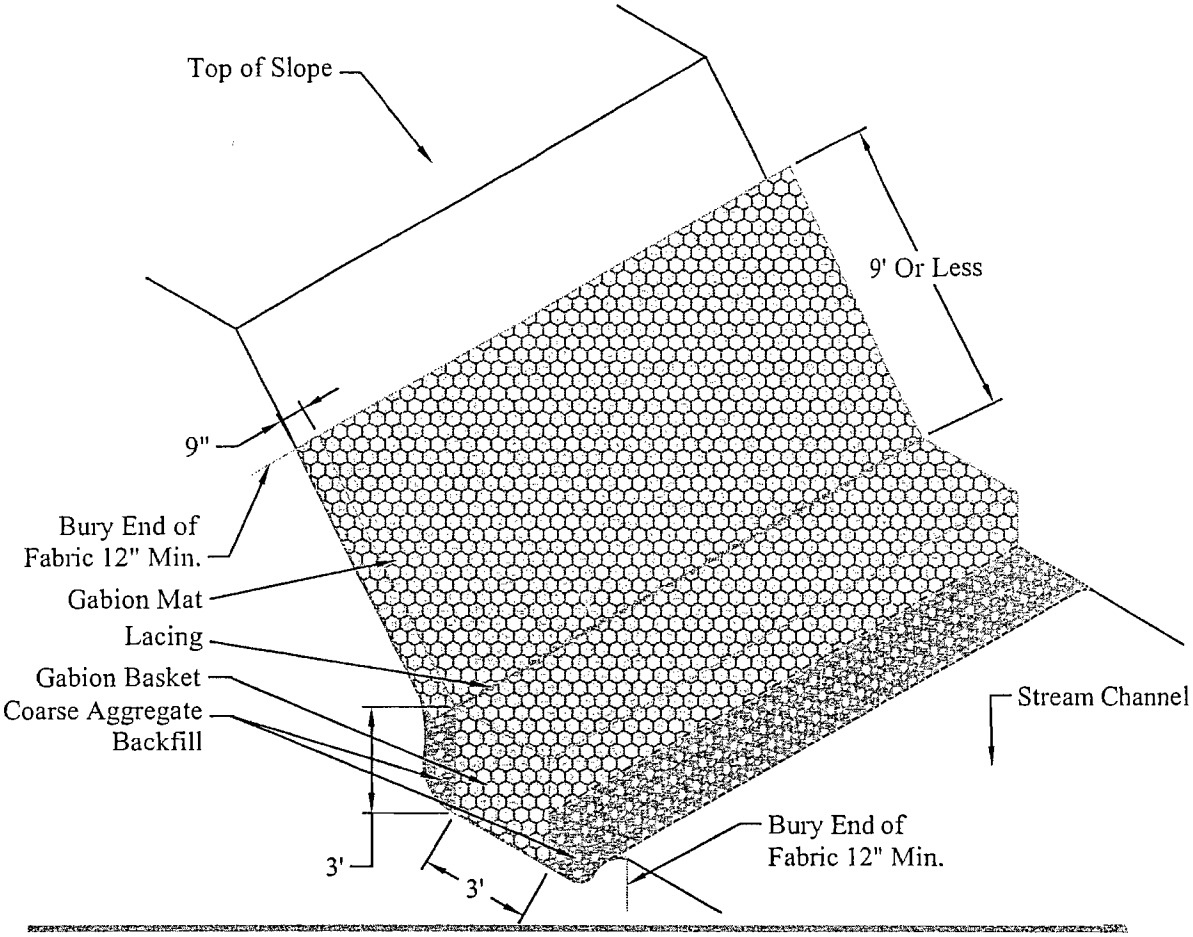
2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.

3. Geotextile Class C or better shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile fabric over the damaged part or by completely replacing the geotextile fabric. All overlaps whether for repairs or for joining two pieces of geotextile fabric shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile fabric. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

Gabion Inflow Protection



Definition

A temporary or permanent, lined drainage way installed to convey concentrated runoff into sediment traps and basins or down steep slopes as applicable. Rip-rap inflow protection consists of the installation of rock or recycled concrete equivalent in a flow channel for stabilization.

Purpose

The purpose of rip-rap inflow protection is to provide stable conveyance of concentrated runoff down steep slopes, (I.e. into temporary sediment traps and basins) thereby preventing erosion of the flow channel.

Conditions Where Practice Applies

Rip-rap inflow protection is required where the flow velocities of a drainage waycause erosion along the bottom or sides of the drainage way. Runoff may be directed to the inflow device by means of dikes or swales.

Design Criteria

Rip-rap inflow protection shall be 4"-12" rip-rap (minimum), underlain with Geotextile Class "C" (See Material Specifications, Geotextile Fabrics) and placed from the the ditch overfall elevation to the bottom of the trap or basin when the inflow slope is between 4:1 and 10:1. Slopes flatter than 10:1 shall be stabiliezed in accordance with Temporary Swale or Earth Dike criteria as applicable. For slopes steeper than 4:1, see Gabion Inflow Protection.

STONE SIZE

	SIZE RANGE	D_{50}	D_{100}	AASHTO	WEIGHT
NUMBER 57*	3/8" – 1 1/2"	1/2"	1 1/2"	M-43	N/A
NUMBER 1	2" – 3"	2 1/2"	3"	M-43	N/A
RIP-RAP**	4" – 7"	5 1/2"	7"	N/A	N/A
CLASS I	N/A	9.5"	15"	N/A	150 lb. max
CLASS II	N/A	16"	24"	N/A	700 lb max
CLASS III	N/A	23"	34"	N/A	2,000 lb max

* This classification is to be used on the inside face of stone outlets and check dams.

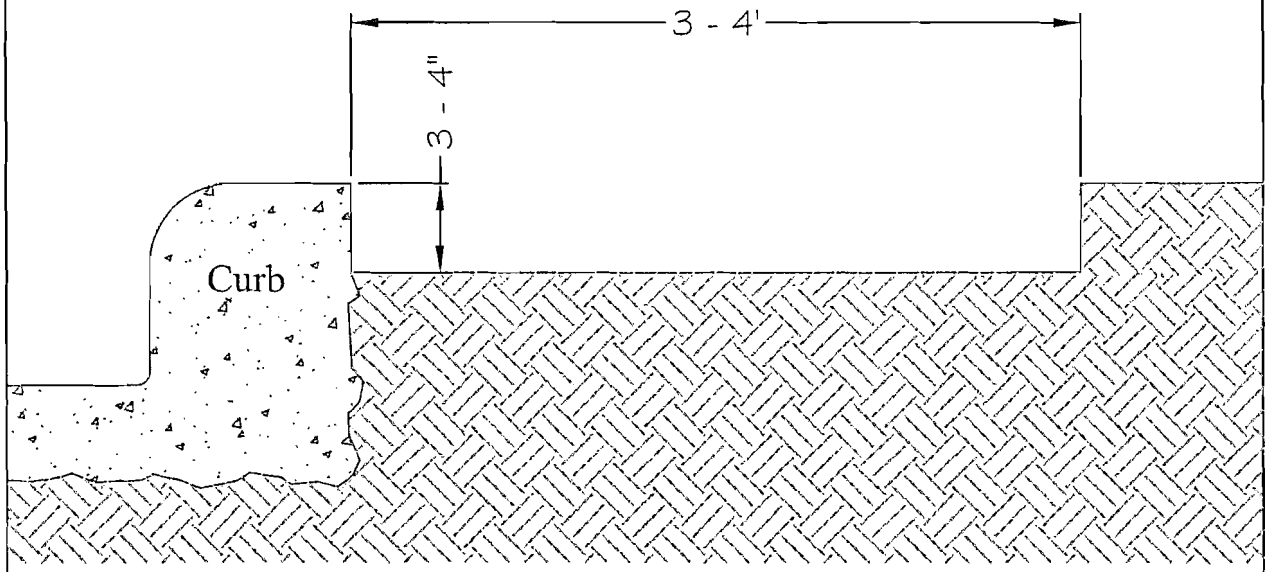
** This classification is to be used whenever small rip-rap is required. The State Highway Administration designation for this stone is Stone For Gabions (§905.01.04).

STONE FOR GABION BASKETS

BASKET THICKNESS		SIZE OF INDIVIDUAL STONES	
INCHES	MM	INCHES	MM
6	150	3 – 5	75 – 125
9	225	4 – 7	100 – 175
12	300	4 – 7	100 – 175
18	460	4 – 7	100 – 175
36	910	4 – 12	100 - 300

NOTE: Recycled concrete equivalent may be substituted for all stone classifications. Recycled concrete equivalent shall be concrete broken into the sizes meeting the appropriate classification, shall contain no steel reinforcement, and shall have a density of 150 pounds per cubic foot.

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.

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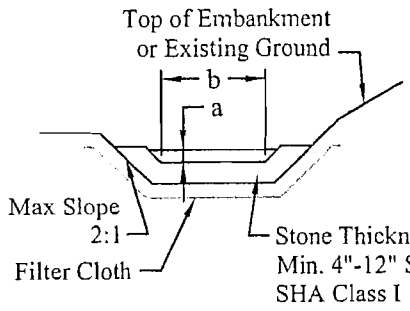
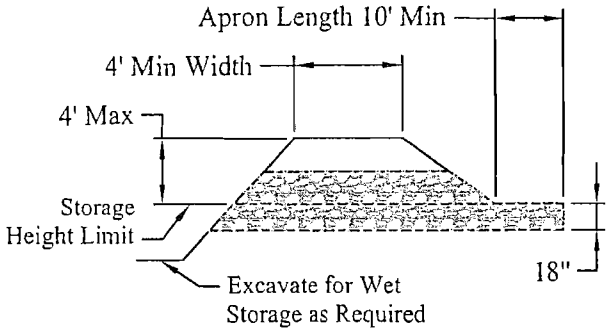
Sediment Trap



Top of Compacted Embankment Minimum 1' Above Top of Stone Lining. Maximum 4' Above Existing Ground. Bottom Width of Weir (b) Minimum Depth of Channel (a)

Cross Section



Filter Cloth Shall be Embedded at Least 6" Into the Existing Ground at Entrance to the Outlet Channel

Profile

Definition

A temporary sediment control device formed by excavated and/or an embankment with an approved outlet used to intercept sediment laden runoff and to retain the sediment.

Purpose

The purpose of a sediment trap is to intercept sediment laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way downstream, of the sediment trap from sedimentation.

Conditions where the Practice Applies

A sediment trap is installed at points of discharge from a disturbed area.

Wet and Dry Storage

The storage requirement for sediment traps and sediment basins is 3600 cubic feet per acre of contributory drainage area. The sediment traps and basins storage volume of 3600 cubic feet minimum per acre shall be divided equally into "dry" or dewatered storage and "wet" or retention storage. The basins and traps will be dewatered to the wet pool elevation corresponding to 1800 cubic feet of storage per acre of drainage.

Design Criteria

1. The maximum drainage area for each type sediment trap shall be as follows:

Practice Type	Maximum Drainage Area
Pipe Outlet	5 Acres
Stone Outlet	5 Acres
Rip-rap Outlet	10 Acres
Stone Outlet / Rip-rap	10 Acres

2. To estimate the present volume of sediment available in a trap use the following:

Volume (Cubic Feet) = 0.4 [Surface Area (sq. ft.) times the Maximum Depth (ft.)]

3. **All embankment for sediment traps shall not exceed 4 feet in height as measured at the low point of the original ground along centerline of the embankment. If any of the design criteria for traps are exceeded, standards for basins must be used.**

RIP-RAP OUTLET SEDIMENT TRAP

Construction Specifications

1. The area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.

2. The fill material for the embankment shall be free of roots or other woody vegetation as well as over-sized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed. Maximum height of embankment shall be 4', measured at centerline of embankment.

3. All cut and fill slopes shall be 2:1 or flatter.

4. Elevation of the top of any dike directing water into trap must equal or exceed the height of trap embankment.

5. Storage area provided shall be figured by computing the volume measured from top of excavation.

6. Filter cloth shall be placed over the bottom and sides of the outlet channel prior to placement of stone. Section of fabric must overlap at least 1' with section nearest the entrance placed on top. Fabric shall be embedded at least 6" into existing ground at entrance of outlet channel.

7. Stone used in the outlet channel shall be 4" – 7" placed 18" thick.

8. Outlet – An outlet shall be provided, which includes a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge end shall be provided as necessary.

9. Outlet channel must have positive drainage from the trap.

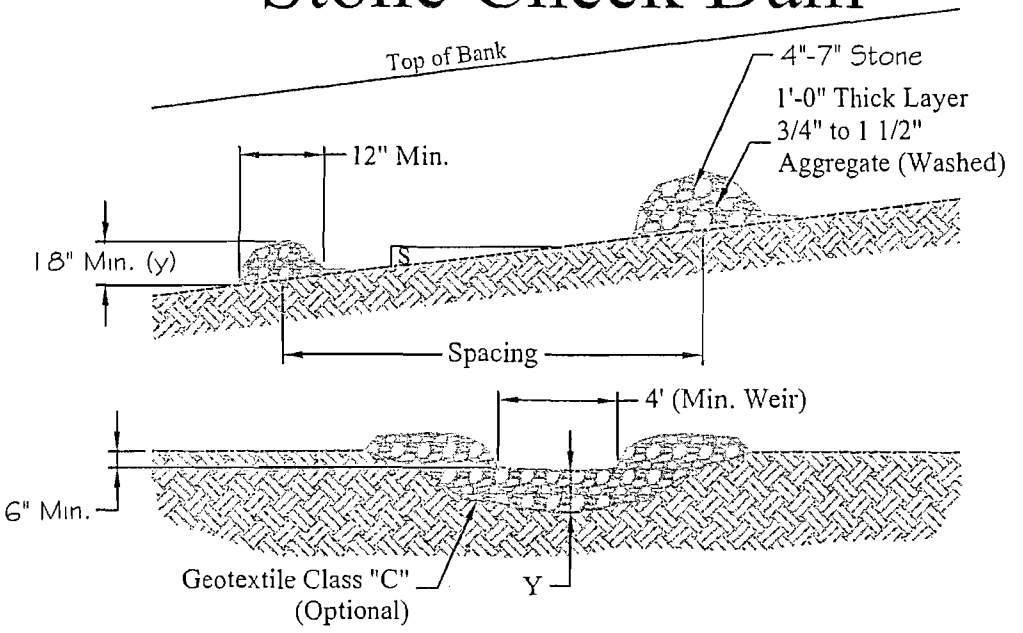
10. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to ¼ of the wet storage depth of the trap (1350 cf/ac). Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

11. The structure shall be inspected periodically after each rain and repaired as needed.

12. Construction of traps shall be carried out in such a manner that sediment pollution is abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentrated inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.

13. The structure shall be dewatered by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.

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 acheived 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 shall be approximately 6 feet lower than the outer edges. The inside or upstream side of the weir shall be lined with a 1 foot thick layer of washed (3/4" to 1 1/2") crushed aggregate. Geotextile 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.

STONE CHECK DAM

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2. Standards and Specifications for Temporary Swale.

2. The check dam shall be constructed of 4"-7" stone. The stone shall be placed so that it completely covers the width of the channel and is key into the channel banks.

3. The top of the check dam shall be constructed so the center is approximately 6" lower than the outer edges, forming a weir that water can flow across.

4. The maximum height of the check dam at the center shall not exceed 2'.

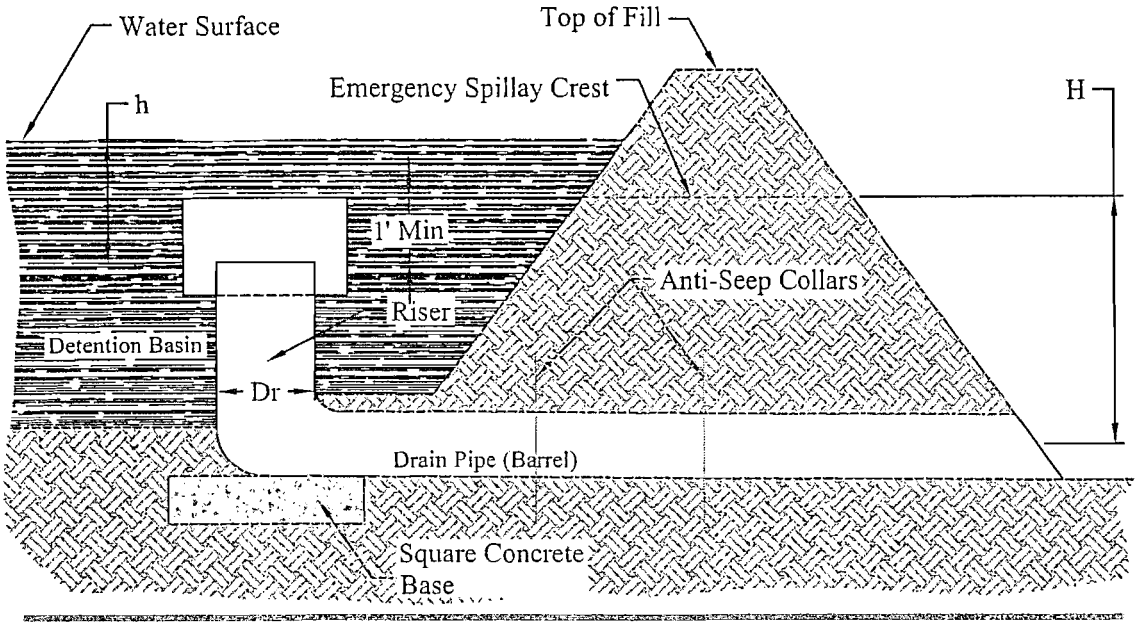
5. The upstream side of the check dam shall be lined with approximately 1' of 0.75" to 1.5" aggregate.

6. Accumulated sediment shall be removed when it has built up to half of the original height of the weir crest.

Standard Stone Check Dam Design

Slope	Spacing
2% or less	80'
2.1% to 4%	40'
4.1% to 7%	25'
7.1% to 10%	15'
Over 10%	Used lined waterway design

Sediment Basin with Riser



Definition

A temporary barrier or dam constructed across a drainage way to intercept sediment laden runoff. Excavation to build may be used to achieve the required storage.

Purpose

The purpose of a sediment basin is to protect downstream properties and drainage ways by trapping sediment and controlling the release of storm water runoff.

Wet and Dry Storage

The minimum storage volume requirement for sediment basins in 3600 cubic feet per acre of contributory drainage area. The basin storage volume of 3600 cubic feet per acre shall be divided equally into "dry" or dewatered storage and "wet" or retention storage. Basins shall be dewatered to the wet pool elevation corresponding to 1800 cubic feet of storage per acre of drainage area.

Conditions where the Practice Applies

A sediment basin is required to control runoff and sediment from large areas where sediment traps are not appropriate. Detention ponds may be used as sediment basins provided that they meet the requirements of and the construction sequence addresses converting the sediment basin to a permanent storm water detention pond.

Conditions of Use

This standard applies to the installation of temporary sediment basins on sites where: (A.) failure of the structure would not result in the loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities; (B.) the drainage area does not exceed 100 acres; (C.) the maximum embankment height does not exceed 15 feet measured from the natural ground to the embankment top along the centerline of the embankment; (D.) the basin is to be removed within 36 months after the beginning of construction of the basin. Where these criteria cannot be met, the structure shall be designed to conform with the U.S.D.A., Natural Resource Conservation Service, formerly Soil Conservation Service standard for farm ponds (378).

Design Criteria

Design and construction shall comply with the state and local safety laws, ordinances, rules, and regulations. Contact Paradigm Engineering for detailed design assistance.

SEDIMENT BASIN WITH RISER

Construction Specifications

1. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be cleared until completion of the dam embankment unless the pool area is to be used for borrow. In order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush, trees, and other objectionable materials.

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operations.

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. **The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.**

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel stub by welding the full circumference making a watertight structural connection. Concrete risers shall be poured with the principal spillway in place or precast with voids around the principal spillway filled with concrete or shrink proof grout for watertight connection. The barrel stub must be attached to the riser at the same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. **Breaching the embankment to install the barrel is unacceptable.** Pervious materials such as sand, gravel or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four inch lifts and hand compacted under and around the pipe to at least the same density as the adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. Emergency Spillway: **The emergency spillway shall be installed in undisturbed ground.** The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of ± 0.2 feet.

6. Vegetative Treatment: Stabilize the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon basin completion and monitored and maintained erosion free during the life of the basin.

7. **Safety: Local requirement concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.**

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using Dewatering methods), graded, and back filled.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed contributory drainage areas, temporary sediment basins, if initially built and certified to meet permanent standards, may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. **Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains have been flushed.**

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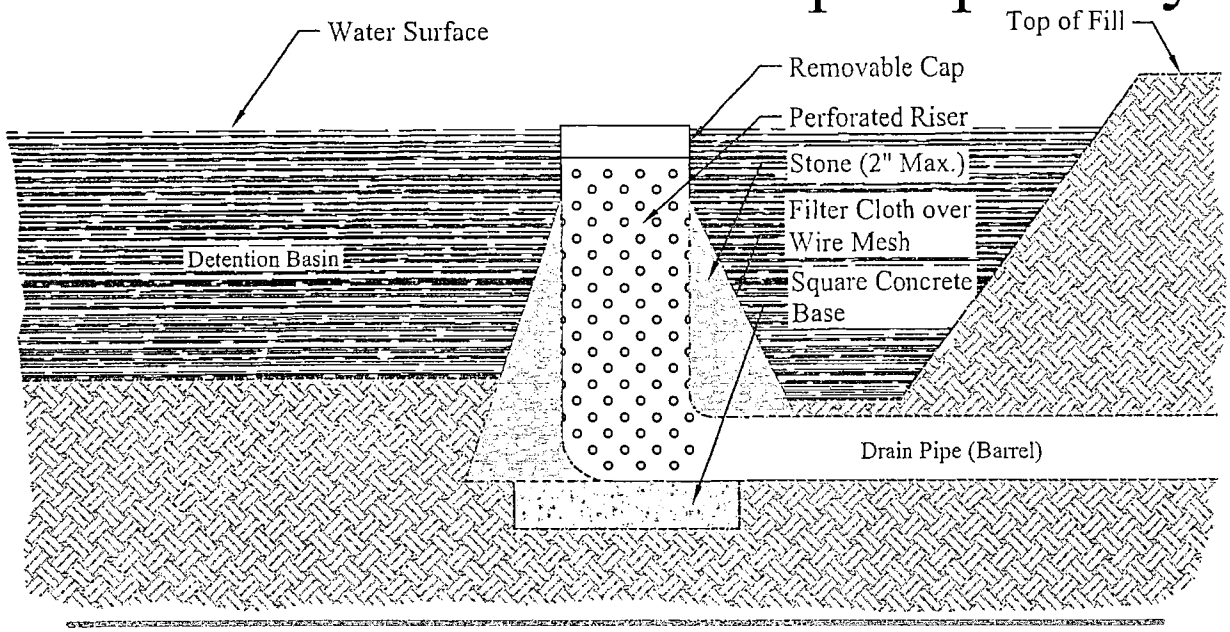
Sediment Basin with Pipe Spillway



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Design Criteria

Design and construction shall comply with the state and local safety laws, ordinances, rules, and regulations. Contact Paradigm Engineering for detailed design assistance.

SEDIMENT BASIN WITH PIPE SPILLWAY

Construction Specifications

1. The total area of the perforations must be greater than 2 times the area of the internal orifice.

2. The perforated portion of the draw-down devise shall be wrapped with 0.5" hardware cloth and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class E.

3. Provide support of draw-down device to prevent sagging and floatation. An acceptable preventative measure is to stake both sides of draw-down device with 1" steel angle, or 1' by 4" square or 2" round wooden posts set 3' minimum into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

American Excelsior Company®
Earth Science Division

Proud Participant in NTPEP and Proud Member of:

PRODUCT DATA SHEET
AEC PREMIER COCONUT™ FIBRENET™

DESCRIPTION

AEC Premier Coconut FibreNet erosion control blanket (ECB) consists of coconut fibers. The fibers are evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with 100% biodegradable jute netting. The product is 100% biodegradable when biodegradable thread is ordered. AEC Premier Coconut FibreNet shall be manufactured in the U.S.A.

AEC Premier Coconut FibreNet has a design soil loss ratio (event-based RUSLE C factor) of .05 and is typically suitable for slopes up to 1H:1V. AEC Premier Coconut is rated for channel flows up to 9.0 ft/s (2.7 m/s) and 2.25 lb/ft^2 (108 Pa) shear stress.

PHYSICAL PROPERTIES

AEC Premier Coconut FibreNet measurements at time of manufacturing:

Width	8.0 ft (2.4 m)
Length	112.5 ft (34.3 m)
Area	100.0 yd^2 (83.6 m^2)
Weight[a]	50.0 lb (22.7 kg)
Mass per Unit Area (± 10%)	0.50 lb/yd^2 (0.27 kg/m^2)
Net Openings	≈ 0.5 in x 1.0 in (12.7 mm x 25.4 mm)

TYPICAL INDEX VALUES

Index Property	Test Method	Value
Thickness	ASTM D 6525	0.294 in (7.47 mm)
Light Penetration	ASTM D 6567	19.4%
Mass per Unit Area	ASTM D 6475	0.57 lb/yd^2 (0.307 kg/m^2)
MD-Tensile Strength Max.	ASTM D 6818	356.4 lb/ft (5.20 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	169.2 lb/ft (2.47 kN/m)
MD-Elongation	ASTM D 6818	3.2%
TD-Elongation	ASTM D 6818	4.3%
Water Absorption	ASTM D 1117/ECTC	334%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 12.61 @ 2 in/hr [b,c]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 17.95 @ 4 in/hr [b,c]
Bench-Scale Rain Splash	ECTC Method 2	SLR = 25.55 @ 6 in/hr [b,c]
Bench-Scale Shear	ECTC Method 3	2.56 lb/ft^2 @ 0.5 in soil loss [c]
Germination Improvement	ECTC Method 4	496%

[a] Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of AEC Premier Coconut fibers is 20%.

[b] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. [b] Bench-scale index values should not be used for design purposes.

MADE IN THE U.S.A.

850 Avenue H East | Arlington, Texas 76011
Phone 1-800-777-SOIL | Fax 817-385-3585 | www.Curlex.com

DUST CONTROL

Definition
Controlling dust blowing and movement on construction sites and roads.

Purpose
To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage, health hazards, and improve traffic safety.

Conditions Where Practice Applies
This practice is applicable to areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications
Temporary Methods

Vegetative Cover – See standards for temporary vegetative cover.

Tillage – To roughen surface and bring clods to the surface. This is an emergency measure, which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12" apart, spring-toothed harrows, and similar plows are examples of equipment, which may produce the desired effect.

Irrigation – This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.

Barriers – Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soils blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.

Permanent Methods

1. Permanent Vegetation – See standards for permanent vegetative cover and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.

2. Topsoiling – Covering with less erosive soil materials. See standards for topsoiling.

3. Stone – Cover surface with crushed stone or coarse gravel.

References

1. Agriculture Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.

2. Agriculture Information Bulletin 354. How to Control Wind Erosion, USDA-ARS.

SOLID WASTE MANAGEMENT

Description

Large volumes of solid waste are often generated at construction sites including; packaging, pallets, wood waste, concrete waste, soil, electrical wiring, cuttings, and a variety of other materials. The solid waste management practice lists techniques to minimize the potential of storm water contamination from solid waste through appropriate storage and disposal practices.

Primary Use

The practices should be a part of all construction practices. By limiting the trash and debris on site, storm water quality is improved along with reduced clean up requirements at the completion of the projects.

Applications

The solid waste management practice for construction sites is based on proper storage and disposal practices by construction workers and supervisors. Key elements of the program are education and modification of improper disposal habits. Cooperation and vigilance is required on the part of supervisors and workers to ensure that the recommendations and procedures are followed. Following are lists describing the targeted materials and recommended procedures:

Targeted Solid Waste Materials

- Paper and cardboard containers
- Plastic packaging
- Styrofoam packing and forms
- Insulation materials (non-hazardous)
- Wood pallets
- Wood cuttings
- Pipe and electrical cuttings
- Concrete, brick, and mortar waste
- Shingle cuttings and waste
- Roofing tar
- Steel (cuttings, nails, rust residue)
- Gypsum board cuttings and waste
- Sheathing cuttings and waste
- Miscellaneous cutting and waste
- Food waste
- Demolition waste

Storage Procedures

- Wherever possible, minimize production of solid waste materials.
- Designate a foreman or supervisor to oversee and enforce proper solid waste procedures.
- Instruct construction workers in proper waste procedures.
- Segregate potentially hazardous waste from non-hazardous construction site debris.
- Keep solid waste materials under cover in either a closed dumpster or other enclosed trash container that limits contact with rain and runoff.
- Store waste materials away from drainage ditches, swales and catch basins.
- Do not allow trash containers to overflow.
- Do not allow waste materials to accumulate on the ground.
- Prohibit littering by workers and visitors.

- Police site daily for litter and debris.
- Enforce solid waste handling and storage procedures.

Disposal Procedures

- If feasible, segregate recyclable wastes from non-recyclables waste materials and dispose of properly.
- General construction debris may be hauled to a licensed construction debris landfill (typically less expensive that a sanitary landfill).
- Use waste facilities approved by local jurisdiction.
- Runoff which comes into contact with unprotected waste shall be directed into structural treatment such as silt fence to remove debris.

Education

- Educate all workers on solid waste storage and disposal procedures.
- Instruct workers in identification of solid waste and hazardous waste.
- Having regular meetings to discuss and reinforce disposal procedures (incorporate in regular safety seminars).
- Clearly mark on all solid waste containers which materials are acceptable.

Quality Control

- Foreman and/or construction supervisor shall monitor on-site solid waste storage and disposal procedures.
- Discipline workers who repeatedly violate procedures.

Requirements

- Job-site waste handling and disposal education and awareness program.
- Commitment by management to implement and enforce Solid Waste Management Program.
- Compliance by workers.
- Sufficient and appropriate waste storage containers.
- Timely removal of stored solid waste materials.
- Possible modest cost impact for additional waste storage containers.
- Small cost impact for training and monitoring.
- Minimal overall cost impact.

Limitations

Only addresses non-hazardous solid waste.
One part of a comprehensive construction site management program.

Corrugate Washout

Outpak Corrugate Washout is a Universal, "portable" washout. Good for mixer truck and wheel barrow washout containment. Dispose of after job completion.

Easy Setup

Pump Truck Washout

Outpak's largest 6'x6' corrugate washout is specifically designed to accommodate pump trucks. It has a greater capacity (1.33 cu. yds.) and a slightly lower rim to easily fit under the trap door and elbow.

PVC Washout

PVC Washouts are designed for larger volume of containment for pump trucks and mixer trucks.

The high UV resistance of the PVC Washout allows for longer job life and higher tolerance to weather conditions.

Since 1981...

We have been in the concrete construction business since 1981 specializing in foundation and flatwork. In 2008 local inspection agencies began enforcement of the Federal Clean Water Act resulting in the implementation of Best Management Practices (BMP's) for erosion control and sediment containment. The most significant change was the requirement of an onsite washout prior to footing inspection.

Many contractors and job sites began building lined pits or above ground straw bale containment. This obviously took time, money and focus away from the actual construction work. After analyzing other washout solutions, we saw the need for a universal washout that was easy to procure, store and deploy. One that also would be able to accommodate mixer trucks, pump trucks, wheelbarrows and other equipment.

So at Outpak, Inc., we created Outpak TM Washout Systems to offer a wide variety of concrete washout and other spill containment solutions. Over time contractors saw the ease and convenience of Outpak Washouts and began using them for other construction materials including paint, stucco, drywall mud and mortar. Outpak Washout – A Better Solution for Construction Site Washout.

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Info: 208-890-0383 Sales: 208-376-6967
fax: 208-562-8868 email: sales@outpak.com
www.outpak.com

Outpak® Washout

A Better Solution for Construction Site Washout

Outpak Concrete Washout® unit is designed to be a portable solution for harmful industrial concrete sediment, paint, dry wall mud, stucco and mortar. With Outpak Concrete Washouts your job site will be organized, eco-friendly and BMP compliant to avoid costly fines. They are designed for a simple and quick set-up in minutes and can remain for the duration of the project. Outpak Concrete Washout is compatible for both mixer, pump trucks and wheel barrows. Dispose of after evaporation and job completion.

AVOID COSTLY EPA FINES

The maximum fine levied by the Environmental Protection Agency per the Federal Clean Water Act, is $11,000.00 PER DAY, PER PROJECT. A large national retailer recently paid $7 million in fines. Don't be the government's next victim. Prepare for enforcement within the city or county you are working in. Purchase Outpak Washout products and begin cost-effective construction site washout today.

LIMIT YOUR ONSITE LIABILITY

Some construction companies are resorting to "kiddy" pools for their concrete washout needs. Imagine the legal problems you could face if a child ever found his or her way into a pool with a water pH balance equal to Liquid Drano. Can you say, "lawsuit?"

SAVE TIME & MONEY

There is no faster or cost-effective way to manage construction site washout.

Outpak Washouts are:

- Easy to store
- Easy to deploy
- Easy to dispose

DO THE RIGHT THING!

The president and founder is a veteran of the concrete construction business, and he's a native Idahoan. That means he appreciates what Mother Nature has provided. He values being a good steward of the land, by providing affordable and efficient eco-friendly development.

6x6 Outpak Pump Washout holds up to 1.3 cubic yards of concrete and waste water.

Other Outpak Products

Outpak Spill Kits

The Outpak Spill Kit is a universal spill kit good for hydrolic oil, fuel and radiator spills. It is compact and conveniently stores behind or under the seat of your truck.

Contents of 5 gallon kit

Contents of 25 gallon kit

5 and 25 gallon kits

Outpak Plan Bag

The Outpak plan bag protects blueprints from the elements. They are made from a durable 20oz PVC to guarantee a long life of the product. The bag has sleeves for no. 4 rebar to keep them flat in windy conditions. They also have tabs to hang from a wall.

Outpak Plan Bag

Plans slide into protected pocket

plans are completely protected

Outpak Slurry Solution

Outpak Slurry Solution is specifically designed to help you save time, money and labor at your job site.

Our innovative product makes your slurry waste cleanup easy and efficient. Just solidify the slurry waste and throw it away in any standard waste container. The material becomes EPA compliant and landfill ready.

HAZARDOUS WASTE MANAGEMENT

Description

The hazardous waste management BMP addresses the problem of the storm water polluted with hazardous waste through spill or other forms of contact. The objective of the Management Program is to minimize the potential of stormwater contamination from common construction site hazardous wastes through appropriate recognition, handling storage and disposal practices.

It is not the intent of this Management Program to supercede or replace normal site assessment and remediation procedures. Significant spills and/or contamination warrant immediate response by trained professionals. Suspected job-site contamination should be immediately reported to regulatory authorities and protective actions taken. The General Permit requires reporting of significant spills to the National Response Center (NCR) at (800) 424-8802.

Primary Use

These management practices along with applicable OSHA and EPA guidelines should be incorporated at all construction sites, which use or generate hazardous waste. Many wastes such as fuel, oil, grease, fertilizer and pesticide are present at most construction sites.

Installation, Application and Disposal Criteria

The hazardous waste management techniques presented here are based on proper recognition, handling , and disposal practices by construction workers and supervisors. Key elements of the management program are education, proper disposal practices, as well as provisions for safe storage and disposal. Following are lists describing the targeted materials and recommended procedures:

Targeted Hazardous Waste Materials

- Paints
- Solvents
- Stains
- Wood preservatives
- Cutting oils
- Greases
- Roofing tar
- Pesticides
- Fuels & lube oils
- Lead based paints (Demolition)

Storage Procedures

- Wherever possible minimize use of hazardous materials.
- Minimize generation of hazardous wastes on the job-site.
- Segregate potentially hazardous waste from non-hazardous construction site debris.
- Designate a foreman or supervisor to oversee hazardous materials handling procedures.
- Keep liquid or semi-liquid hazardous waste in appropriate containers (closed drums or similar) and under cover.
- Store waste materials away from drainage ditches, swales and catch basins.
- Use containment berms in fueling and maintenance areas and where the potential for spills is high.
- Ensure that adequate hazardous waste storage volume is available.
- Ensure that hazardous waste collection containers are conviently located.
- Do not allow potentially hazardous waste handling and disposal procedures.

- Clearly mark on all hazardous waste containers which materials are acceptable for the container.

Disposal Procedures

- Regularly schedule hazardous waste removal to minimize on-site storage.
- Use reputable, licensed hazardous waste haulers.

Education

- Instruct workers in identification of hazardous waste.
- Educate workers of potential dangers to humans and the environment from hazardous wastes
- Instruct workers on safety procedures for common construction site hazardous wastes
- Educate all workers on hazardous waste storage and disposal procedures.
- Have regular meetings to discuss and reinforce identification, handling aand disposal procedures (incorporate in regular safety seminars).
- Establish a continuing education program to indoctrinate new employees.

Quality Assurance

- Foreman and/or construction supervisor shall monitor on-site hazardous waste storage and disposal procedures.
- Educate and if necessary, discipline workers who violate procedures.
- Ensure that the hazardous waste disposal contractor is reputable and licensed.

Requirements

- Job-site hazardous waste handling and disposal education and awareness program.
- Commitment by management to implement hazardous waste management practices.
- Compliance by workers
- Sufficient and appropriate hazardous waste storage containers.
- Timely removal of stored hazardous waste materials.

Costs

- Possible modest cost impact for additional hazardous storage containers.
- Small cost impact for training and monitoring.
- Potential cost impact for hazardous waste collection and disposal by licensed hauler-actual cost depends on type of material and volume.

Limitations

This practice is not intended to address site-assessments and pre-existing contamination. Major contamination, large spills or other serious hazardous waste incidents require immediate response from specialists. Demolition activities and potential pre-existing materials, such as asbestos, are not addressed by this program. Site specific information on plans is necessary. Contaminated soils are not addressed. One part of a comprehensive construction site waste management program.