# APPENDIX E

# STANDARD DRAWINGS

# LIST OF DRAWINGS

**Drawing Title**

| | |
|---|---|
| EC-01 | Skimmer and Baffle Sediment Basin (6 sheets) |
| EC-02 | Sediment Trap (2 sheets) |
| EC-04 | Reinforced Silt Fence (3 sheets) |
| EC-05 | Rock Ditch Check (2 sheets) |
| EC-06 | Stabilized Construction Entrance (3 sheets) |
| EC-07 | Excavated Drop Inlet Protection (2 sheets) |
| EC-08 | Block and Gravel Drop Inlet Sediment Trap (2 sheets) |
| EC-09 | Gravel and Wire Mesh Drop Inlet Protection (2 sheets) |
| EC-10 | Block and Gravel Curb Inlet Protection |
| EC-11 | Gravel Curb Inlet Protection with Sediment Filter |
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| EC-13 | Rock Sediment Dike (3 sheets) |
| EC-14 | Pipe Slope Drain (2 sheets) |
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| EC-16 | Diversion Dike or Berm (2 sheets) |
| EC-17 | Diversion Swale (2 sheets) |
| EC-18 | Sandbags |
| EC-19 | Inlet protection socks |
| EC-20 | Sock fence |
| EC-21 | Filter Fabric |
| EC-22 | Sediment Tube Check (2 sheets) |
| EC-23 | Floating Skimmer (2 sheets) |
| EC-24 | Porous Baffles (2 sheets) |
| EC-25 | Concrete Truck Washout (2 sheets) |
| SD-01 | Anti Vortex (1 sheet) |
| SD-02 | Pipe Channel Outlet (2 sheets) |
| WQ-01 | Wet Detention Pond (2 sheets) |
| WQ-02 | Wet Extended Detention Pond (2 sheets) |
| WQ-03 | Micropool Extended Detention Pond (2 sheets) |
| WQ-04 | Storm Water Wetland (2 sheets) |

| | |
|---|---|
| WQ-05 | Shallow Wetland (2 sheets) |
| WQ-06 | Extended Detention Shallow Wetland (2 sheets) |
| WQ-07 | Pond/Wetland System (2 sheets) |
| WQ-08 | Pocket Wetland (2 sheets) |
| WQ-09 | Typical Bioretention Area (4 sheets) |
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| WQ-11 | Infiltration Trench (2 sheets) |
| WQ-12 | Enhances Dry Swale (2 sheets) |
| WQ-13 | LID Parking Lot |
| WQ-14 | BMP Standard Notes |
| WQ-15 | Dry Detention Pond (2 sheets) |

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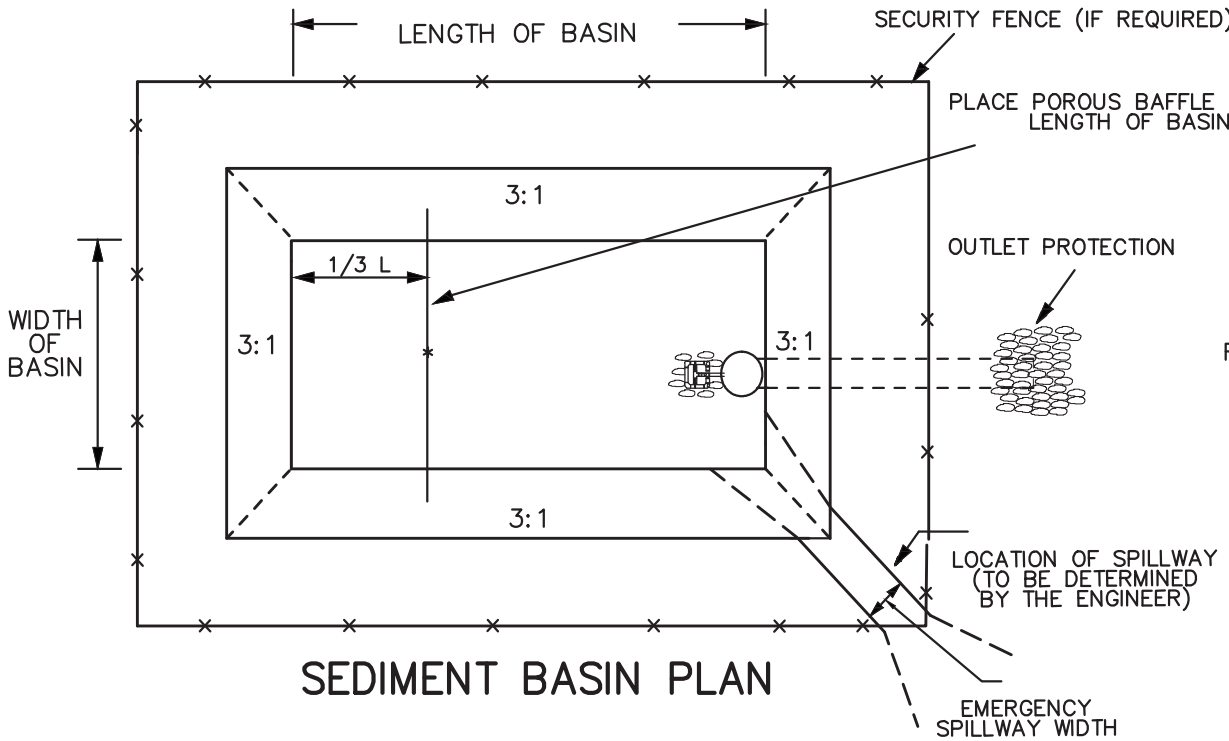
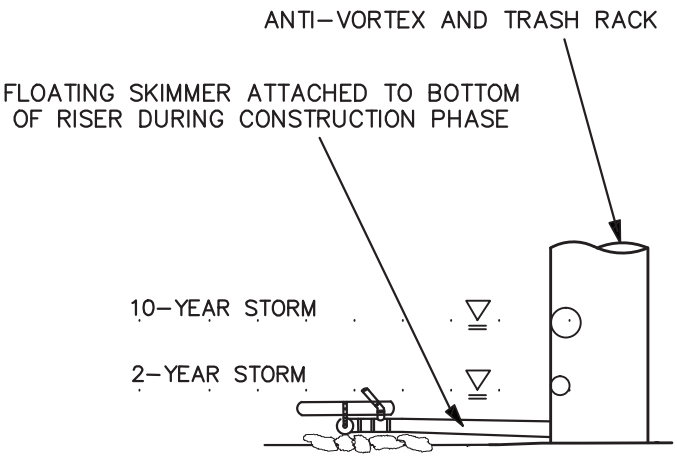
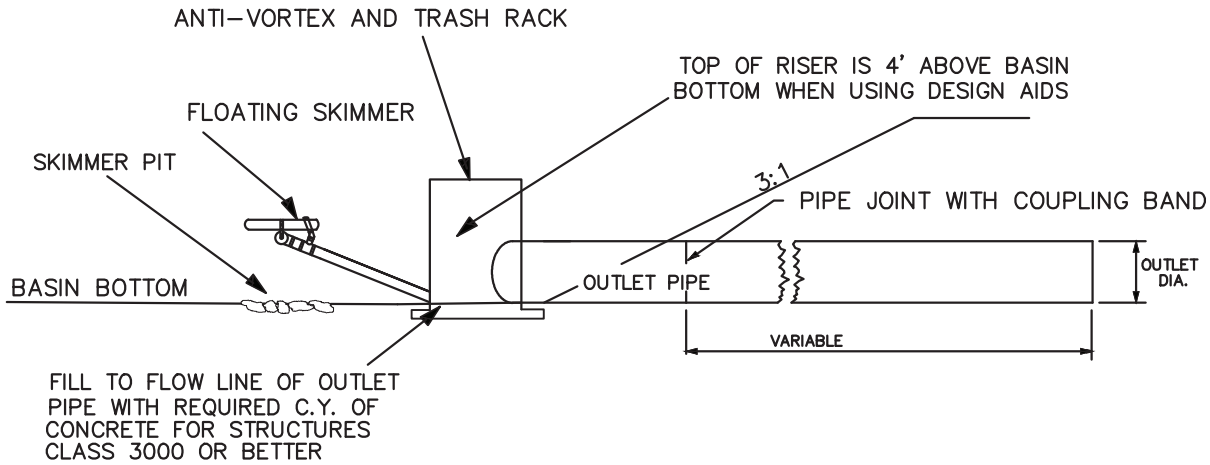



## SEDIMENT BASIN PLAN




## MULTIPURPOSE BASIN RISER




## PRIMARY RISER STRUCTURE

Fort Jackson
Land Disturbance Handbook

FLOATING SKIMMER AND BAFFLE SEDIMENT BASIN

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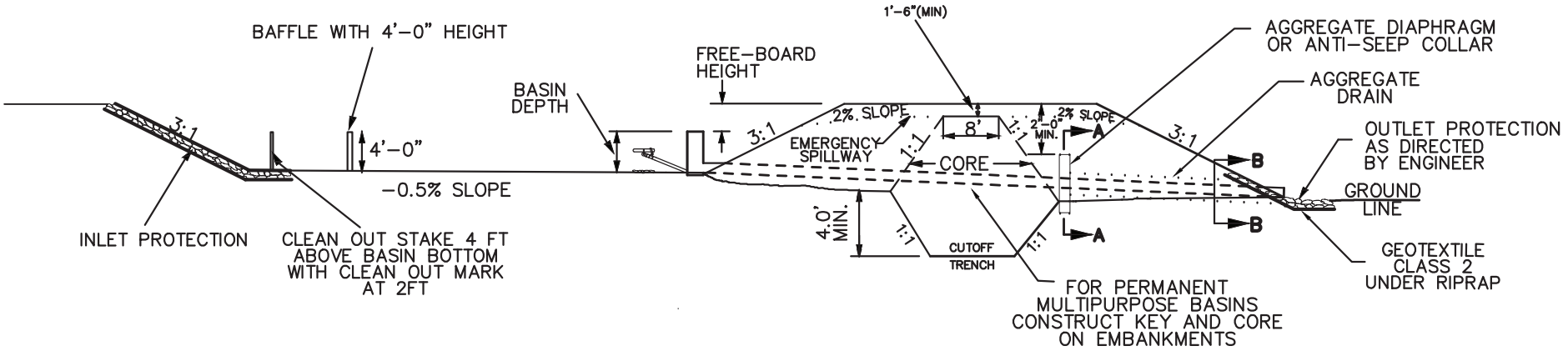
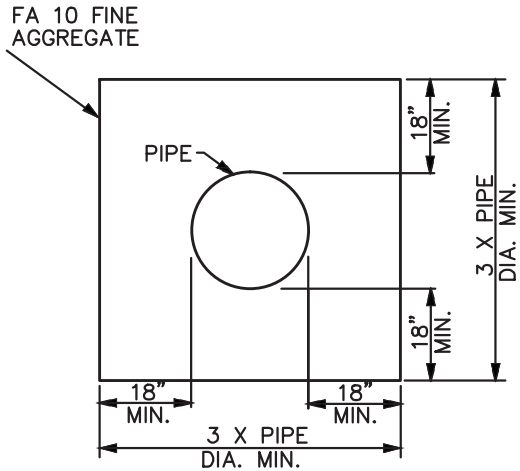
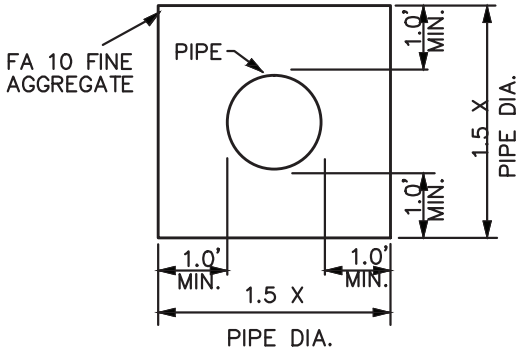



# SEDIMENT BASIN PROFILE




**SECTION A-A THRU AGGREGATE DIAPHRAGM OR ANTI-SEEP COLLAR**




**SECTION B-B THRU AGGREGATE DRAIN**

Fort Jackson
Land Disturbance Handbook

FLOATING SKIMMER AND BAFFLE SEDIMENT BASIN

# PRECAST CONCRETE RISER WITH BASE

ENSURE ALL RISER (MANHOLE) MATERIALS, MANUFACTURING, TESTING AND PRODUCT PERFORMANCE FOR PRECAST CONCRETE COMPONENTS AND ACCESSORIES ARE IN ACCORDANCE WITH AASHTO M199 AND SECTION 719 OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2007 EDITION, OR LATEST REVISION.

USER PRECAST CONCRETE COMPONENTS DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

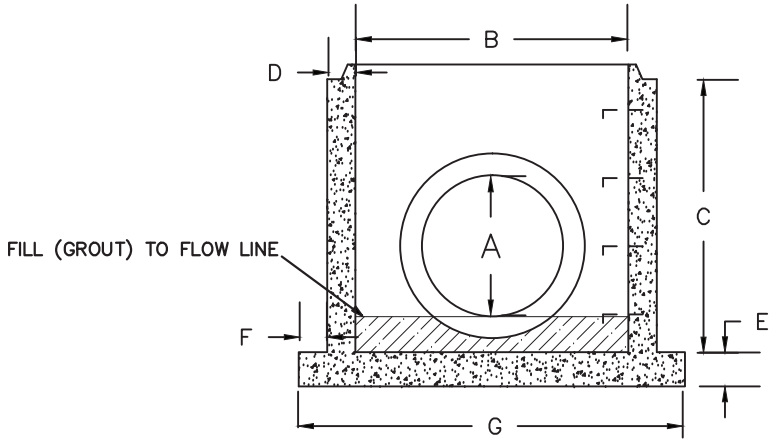
USE PRECAST CONCRETE MANHOLES WITH A HL-93 DESIGN LIVE LOADING.

USE CLASS 4000 CONCRETE (MINIMUM) FOR ALL PRECAST CONCRETE ELEMENTS.

USE REINFORCING BARS CONFORMING TO THE REQUIREMENTS OF ASTM A706, GRADE 60.

USE WELDED WIRE FABRIC MEETING THE REQUIREMENTS OF AASHTO M55 AND AASHTO M221, ASTM A185, or ASTM A497.

USE WATER TIGHT BARREL TO RISER CONNECTORS




THIS DRAWING IS NOT TO SCALE

| PIPE DIAMETER (A) inches | RISER DIAMETER (B) inches | RISER HEIGHT (C) inches | WALL THICKNESS (D) inches MIN | BASE THICKNESS (E) inches MIN | BASE EXTENTION (F) inches MIN | BASE DIAMETER (G) inches MIN |
|---|---|---|---|---|---|---|
| 24 and 30 | 48 | 48 | 5 | 6 | 6 | 70 |
| 36 | 60 | 60 | 5 | 6 | 8 | 86 |
| 42 | 72 | 72 | 6 | 8 | 8 | 110 |

SEDIMENT BASIN

Equipment

Ensure that the equipment necessary for the proper installation of the Floating Skimmer & Baffle Sediment Basin is on site, in acceptable working condition, and approved by the Engineer regarding both type and condition before the start of work under this section. Provide sufficient equipment to execute the work in accordance with the project schedule.

Installation:

Installation includes constructing the sediment basin, installing the Primary Riser Structure, installing the Riser Outlet Barrel, installing Baffles, furnishing, installation and cleanout of Floating Skimmers, providing and placing Riprap pad on bottom of Basin underneath the Floating Skimmer, providing and placing an Emergency Spillway and liner, disposing of excess materials, removing Baffles, Emergency Spillway liner and Floating Skimmer, backfilling basin area with suitable material and providing proper drainage when basin area is abandoned.

Locate and construct the Floating Skimmer & Baffle Sediment Basin before performing other earthwork on–site. Clear and grub the entire area of the Basin and Emergency Spillway in accordance with the Plans. Turn the entire area to a depth of 6 inches with a disk harrow and compact it to 95.0% compaction. Fill all holes in the foundation area of the dam with suitable material and compact to 95.0% compaction.

Locate and construct the Floating Skimmer & Baffle Sediment Basin as shown in the Plans. Construct the bottom of the Basin on a 0.5% slope. If the inflow into the Basin is from a pipe or from a ditch with a flow line higher than the bottom of the basin, place Riprap at the end of the pipe or ditch down to the bottom elevation of the Basin to prevent erosion.

Perform Temporary Stabilization by seeding and protect the temporary seeded area with a Temporary ECB on all areas of the Basin, except for the bottom of the Basin.

When grading operations are complete and the permanent grassing or stabilization is in place, restore the area occupied by the temporary Floating Skimmer & Baffle Sediment Basin as nearly as practicable to the original ground line and seed the area.

Construct the earth dam to the dimensions shown on the Plans. The maximum earth dam inside slopes is 3H:1V., and the maximum earth dam outside slopes is 3H:1V.

For Permanent Multipurpose Basins construct a key and core on all earth dam embankment areas. Construct the key and core with clay or other impervious materials. Construct the dam core to the dimensions shown on the Plans and to an elevation level with the flowline of the Emergency Spillway. Construct the core with a top width of 8 feet and 1:1 side slopes. Place fill adjacent to pipes or other structures in 4–inch layers and compact by hand or by manually directed tampers or plate vibrators. Place the fill over pipes to a minimum of 2 feet before using heavy equipment. Do not place fill around concrete structures until the concrete has cured sufficiently to support the load. As soon as final grades are reached, seed all areas.

Construct an aggregate diaphragm or anti seep collar parallel to the dam, around the outlet pipe immediately at the outlet side of the cutoff trench. Construct the aggregate diaphragm to a depth of 2 feet extending three times the pipe diameter vertically and horizontally, and a minimum of 18 inches beneath the pipe. Use FA–10 fine aggregate. Place a minimum of 2 feet of fill material over the diaphragm.

Construct an aggregate drain for the diaphragm, 1.5 times the diameter of the pipe or a minimum of 1 foot around the pipe, to the downstream edge of the dam. Use FA–10 fine aggregate for the aggregate drain. Install a Riprap pad over a fabric filter where the drain and the outlet pipe exit the fill. Extend the Riprap pad at least 2 feet outside the aggregate drain in all directions.

SEDIMENT BASIN

Installation Cont:

Construct an Emergency Spillway on original ground at the grades and locations shown on the Plans. Construct a spillway outfall channel to the main outfall channel as shown on the Plans. Protect the Spillway by:

1. Seeding the sides and bottom of the Emergency Spillway and spillway outfall channel and protecting the Spillway with an appropriate TRM as directed by the Engineer unless otherwise specified on the Plans.

2. Lining the sides and bottom of the Emergency Spillway and spillway outfall channel with a non–woven geotextile fabric and protecting the Spillway with Class B Riprap, as directed by the Engineer, or as shown on the Plans.

Temporary Floating Skimmer & Baffle Sediment Basin Primary Riser Spillways consists of a solid circular concrete monolithic base or extended base riser with no staged orifices.

Multipurpose Floating Skimmer & Baffle Sediment Basin Primary Riser Spillways consist of a riser with staged orifices/weirs.

For Temporary Floating Skimmer & Baffle Sediment Basin, install the top of the Primary Riser at a minimum elevation 4.0 feet above the Basin bottom.

Install the Primary Riser Spillway after final grading and excavating the Basin footprint is complete. Use the following instructions when installing the Primary Riser Spillway:

1. Remove all loose soil and debris in the area where the riser is installed.
2. Excavate, prepare, and compact the location of the riser with dimensions two (2) feet greater than the riser bottom diameter.
3. Place the concrete Primary Riser and level the structure with the appropriate equipment.
4. Join all Outlet Barrel Pipe sections to the Riser so that the connections are water tight.
5. Fill the riser bottom to the flow line of the Outlet Barrel Pipe as required.
6. Join all Outlet Barrel Pipe so that the connections are water tight.

For Temporary Floating Skimmer & Baffle Sediment Basin, use either polyethylene Type C or corrugated steel pipe or reinforced concrete pipe for the Outlet Barrel, and use reinforced concrete pipe or corrugated metal pipe for the Primary Riser. Use the pipe sizes shown on the Plans.

For Multipurpose Basins, construct a Primary Riser consisting of reinforced concrete pipe. Install a trash rack and antivortex device. Place a stub out de–watering orifice at the same flow line as the Outlet Barrel as shown on the Plans. Use either reinforced concrete or aluminum alloy pipe for the Outlet Barrel. Join all pipe sections so that the connections are watertight.

Place a trash rack and anti–vortex device over the top of the Primary Riser as shown on the Plans. Use the diameter indicated on the Plans for the Primary Riser and the Outlet Barrel.

Place the Outlet Barrel on a 0.5% slope.

Provide outlet protection to prevent erosion and scouring using Riprap, TRM, or similar erosion prevention at the barrel outlet of the Basin. Ensure outlet velocities do not exceed the capability of the BMP selected.

Line the outflow channel with Class B Riprap or install a stilling basin as indicated on the Plans. Use a non–woven geotextile under the Riprap.

## SEDIMENT BASIN

Installation Cont:

Install an appropriate Floating Skimmer attached to the bottom of the Primary Riser structure.

Excavate a shallow pit under the Floating Skimmer to account for sediment that accumulates on the Basin bottom around the Floating Skimmer. The pit allows the Floating Skimmer to completely drain the basin. At a minimum, the pit has dimensions of 4feet x 4feet with a minimum depth of 2 feet. Fill the Skimmer Pit with Class A or Class B Riprap to the top elevation of the Skimmer Pit. Ensure the top elevation of the Skimmer Pit is lower than the invert of the outlet barrel from the riser.

Install 1 row of Porous Baffle a minimum of 4–feet in height placed at 1/3 length of the basin length.

Ensure that at least one row of Baffles is placed between the Primary Riser structure and all pipes or channels discharging to the Basin.

Baffles may consist of Porous Baffles, or Riprap Baffles.

Install Riprap Baffles a minimum of 4–feet in height consisting of Class A or B Riprap. Do not place washed stone on the face of the Riprap Baffles.

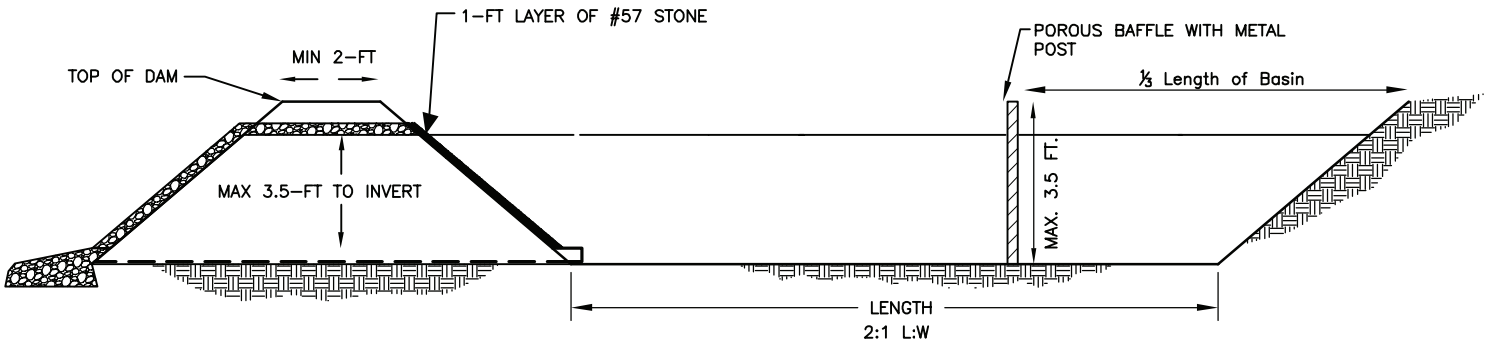
Install a metal sediment clean out stake that is 4–feet above the Basin bottom in the first Baffle cell upstream of the first Baffle. Cleanout the Surface Outlet and Baffle Sediment Basin when the sediment level reaches the 2–foot mark on the sediment cleanout stake (50% of the sediment storage volume).

Inspection and Maintenance:

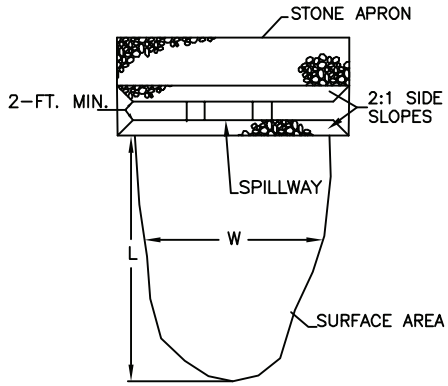
The key to a functional Floating Skimmer & Baffle Sediment Basin is continual monitoring, regular maintenance and regular sediment removal. Attention to sediment accumulations within the Basin is extremely important. Continually monitor sediment deposition in the Basin.

Inspect Floating Skimmer & Baffle Sediment Basins a minimum of once per week and make necessary repairs immediately, inspections are also recommended within 24–hours after each rainfall event that produces ½–inches or more of precipitation until final stabilization is achieved. Inspect all Floating Skimmer & Baffle Sediment Basin components including but not limited to:

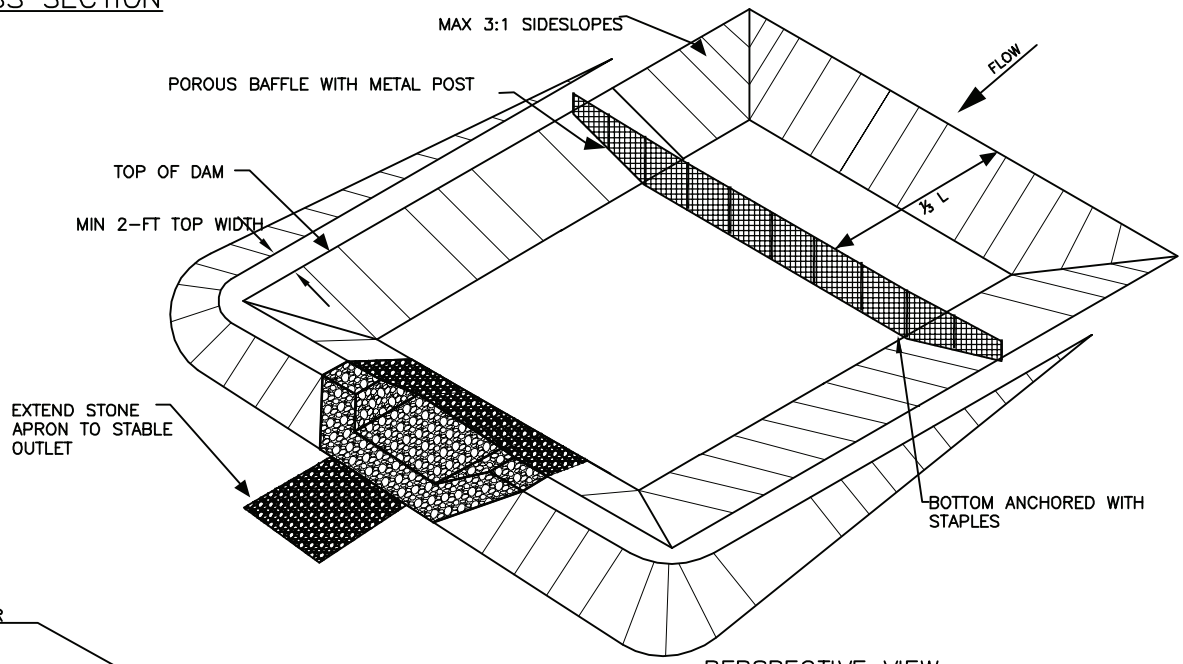
- Inlet/outlet pipes – Inspect pipes for sediment and debris blockage, maintenance is required when the pipe is 1/3 blocked or damaged to a point to restrict flow.
- Inlet /outlet protection – Inspect inlet/outlet protection and repair or replace when protection is damaged, Riprap is displaced, or covered by sediment.
- Floating Skimmer – Inspect the Floating Skimmer after each rain event to ensure that it is not clogged with sediment. Remove sediment that accumulates on the Riprap pad underneath the Floating Skimmer.
- Inspect Floating Skimmer & Baffle Sediment Basin after each significant rainfall.
- Inspect the Emergency Spillway for erosion and damage.
- Clean trapped sediment from Surface Outlet and Baffle Sediment Basin when sediment accumulations reach the 2–foot mark on the sediment clean out stake.
- Remove trapped sediment from the site, or stabilized on site.
- Repair, seed, and replace ECBs on Basin side slope areas that have eroded or have become damaged by equipment from silt cleanout.
- Inspect Baffles after each rain event for erosion damage.



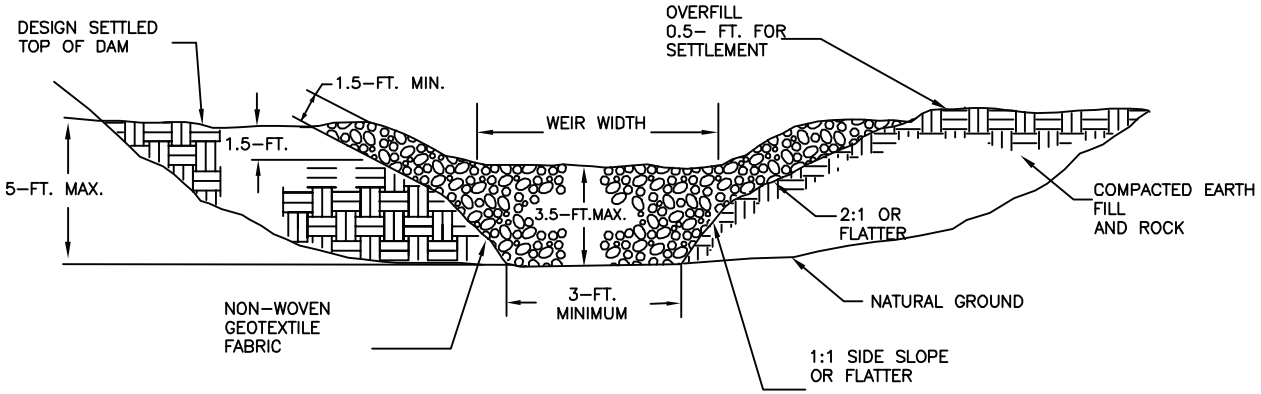

SEDIMENT TRAP CROSS SECTION




PLAN VIEW




PERSPECTIVE VIEW




EMBANKMENT AND SPILLWAY

Fort Jackson
Land Disturbance Handbook

SEDIMENT TRAP

STANDARD DRAWING NO. EC-02 Page 1 of 2

SEDIMENT TRAP

## When and Where to Use It

Sediment traps should not be placed in waters of the State or USGS blue–line streams (unless approved by Fort Jackson, State, or Federal authorities).

## Installation:

Rock Outlet Structure Requirements:

The maximum sediment trap height shall be 5–feet.
The maximum stone height of the outlet weir shall be 3.5–feet.
The minimum bottom flow width of the structure shall be 3–feet.
The minimum top flow length of the structure shall be 2–feet.

The main body of the outlet structure shall consist of 12–inch D50 class III riprap. The upstream face of the outlet structure shall consist of a 1–foot thick layer of 1–inch D50 washed stone. The maximum sideslope of the rock structure shall be 2:1.

Install a non–woven geotextile filter fabric before installing the stone for the outlet structure. Allow the stone to extend downstream past the toe of the embankment. Geotextile filter fabric shall conform to the specifictions.

All inside sediment trap slopes should be 3:1 or flatter.

Mark the sediment cleanout level of trap with a stake in the field. Seed and mulch all disturbed areas.

## Inspection and Maintenance:

The key to a functional sediment trap is continual monitoring, regular maintenance and regular sediment removal.

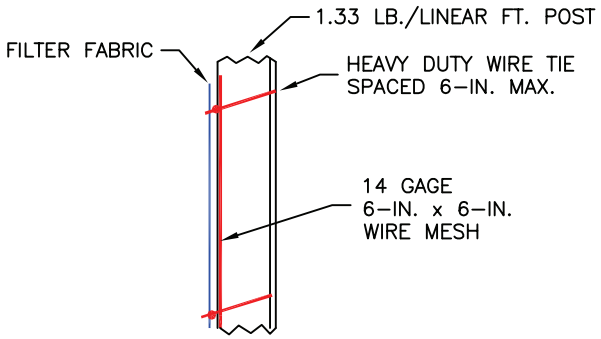
Remove sediment when it reaches 50% of storage volume or reaches the top of cleanout stake.

Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

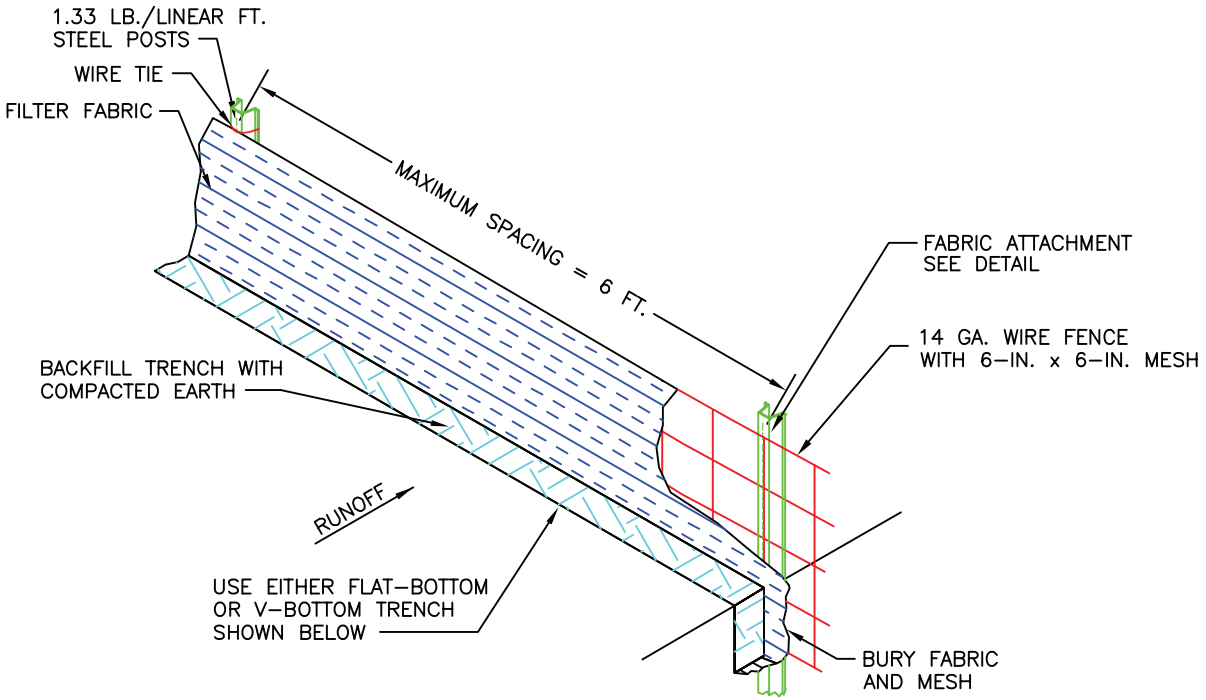
All temporary sediment traps should be removed within 30 days after final site stabilization is achieved or after it is no longer needed.

Trapped sediment should be removed from, or stabilized on site.

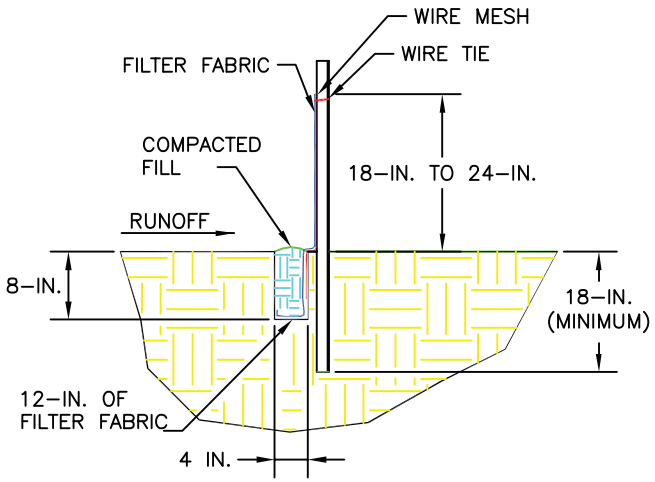
Disturbed areas resulting from the removal of the sediment trap should be permanently stabilized.



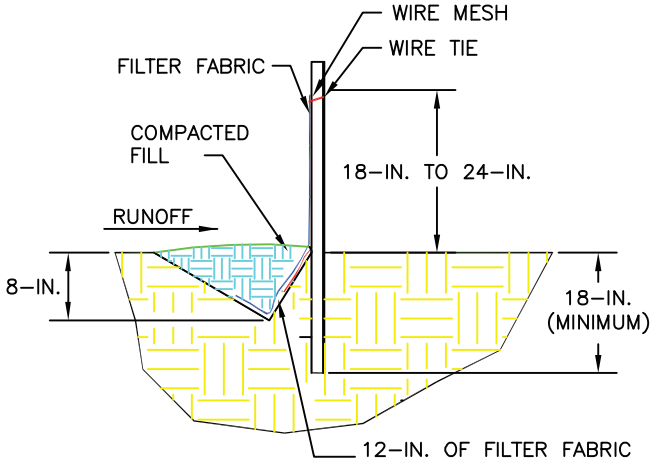

## FABRIC ATTACHMENT DETAIL




## SILT FENCE INSTALLATION




## FLAT-BOTTOM TRENCH DETAIL




## V-SHAPED TRENCH DETAIL

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Land Disturbance Handbook

# REINFORCED SILT FENCE

STANDARD DRAWING NO. EC–04 Page 1 of 3

# REINFORCED SILT FENCE

Installation:

The fence should be placed at all fill slopes and soil berms or where the distrubed area that is no more then $\frac{1}{4}$ acre per 100 feet of fabric. The fence shall run across the slope along a line of uniform elevation (perpendicular to the direction of flow). The fence should be located at least 10–feet from the toe of steep slopes to provide sediment storage and access for maintenance and cleanout.

A flat–bottom trench approximately 4–inches wide and 8–inches deep, or a V–shaped trench 8–inches deep should be excavated.

Place 12–inches of specified filter fabric into the 8–inch deep trench, extending the remaining 4–inches towards the up–slope side of the trench.

Extend the 6–inch by 6–inch 14–gage wire mesh into the trench a minimum depth of 8–inches.

Backfill the trench with soil or gravel and compact. Mechanical compaction should be performed as necessary to ensure proper functioning of the fence and posts.

On the downslope side of the trench, drive the 1.33 lb./linear foot steel posts at least 18–inches into the ground, spacing them no further than 6–feet apart.

Posts should be installed, with 1– to 2–inches of the post protruding above the top of the fabric and no more than 36–inches of the post should protrude above the ground. The minimum fence height (height of filter fabric) above grade shall be 18–inches. The maximum fence height (height of filter fabric) above grade shall be 24–inches.

Filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter fabric should be wrapped together only at a support post with both ends securely fastened to the post, with a minimum 6–inch overlap. Only those filter fabrics that meet the specifications detailed by Fort Jackson shall be used.

Heavy duty wire ties spaced a maximum of 6–inches apart, should be used to attach the fabric and wire mesh to the steel posts.

REINFORCED SILT FENCE

Inspection and Maintenance:

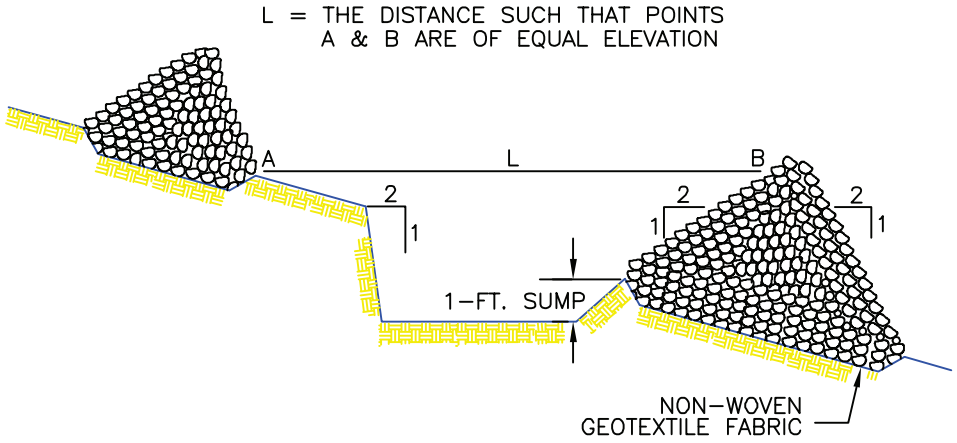
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Check for areas where runoff has eroded a channel beneath the fence, or where the fence was caused to sag or collapse by runoff overtopping the fence.

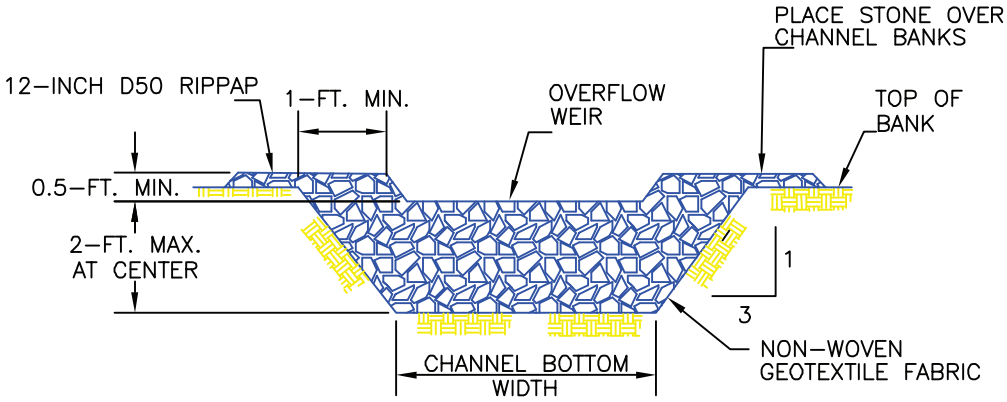
If the fence fabric tears, begins to decompose, or in any way becomes ineffective, replace the affected section of fence immediately.

Sediment must be removed when it reaches approximately 1/3 the height of the fence, especially if heavy rains are expected.

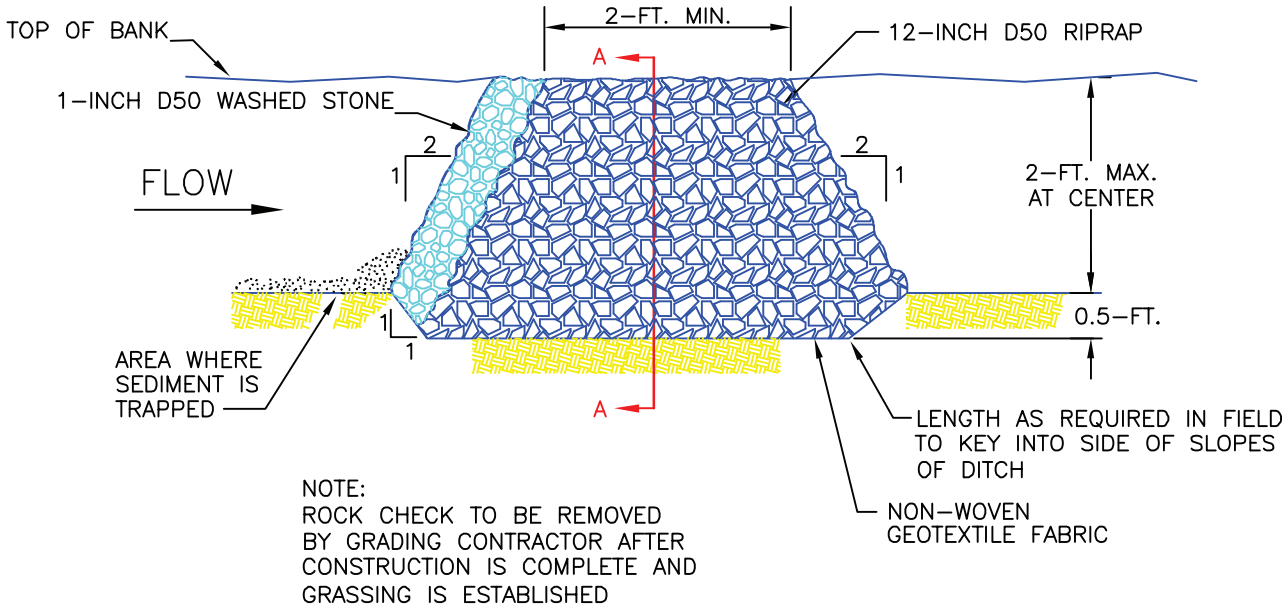
Reinforced silt fence should be removed within 30 days after final site stabilization is achieved or after temporary BMPs are no longer needed. Trapped sediment should be removed or stabilized on site. Disturbed areas resulting from fence removal shall be permanently stabilized.




SPACING BETWEEN DITCH CHECK




CROSS SECTION A-A THRU STONE DITCH CHECK




NOTE:
ROCK CHECK TO BE REMOVED BY GRADING CONTRACTOR AFTER CONSTRUCTION IS COMPLETE AND GRASSING IS ESTABLISHED

TYPICAL DITCH CHECK SECTION

Fort Jackson
Land Disturbance Handbook

ROCK DITCH CHECK

STANDARD DRAWING NO. EC–05 Page 1 of 2

# ROCK DITCH CHECK

## When and Where to Use It

A rock ditch check should be installed in steeply sloped swales, or in swales where adequate vegetation cannot be established. Rock ditch checks should be used only in small open channels. Rock ditch checks should not be placed in waters of the State or US or as designated by USGS topographical blue–line streams.

## Installation:

A non–woven geotextile fabric shall be installed over the soil surface where the rock ditch check is to be placed. The geotextile fabric shall conform to Fort Jackson specifications. The body of the rock ditch check shall be composed of 12–inch D50 Riprap.

The upstream face of the rock ditch check may be composed of 1–inch D50 washed stone.

Rock ditch checks should not exceed a height of 2–feet at the centerline of the channel.

Rock ditch checks should have a minimum top flow length of 2–feet.

Stone should be placed over the channel banks to prevent water from cutting around the ditch check.

The rock must be placed by hand or mechanical placement (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the check is lower than the edges.

The maximum spacing between the dams should be such that the toe of the upstream check is at the same elevation as the top of the downstream check.

## Inspection and Maintenance:

Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

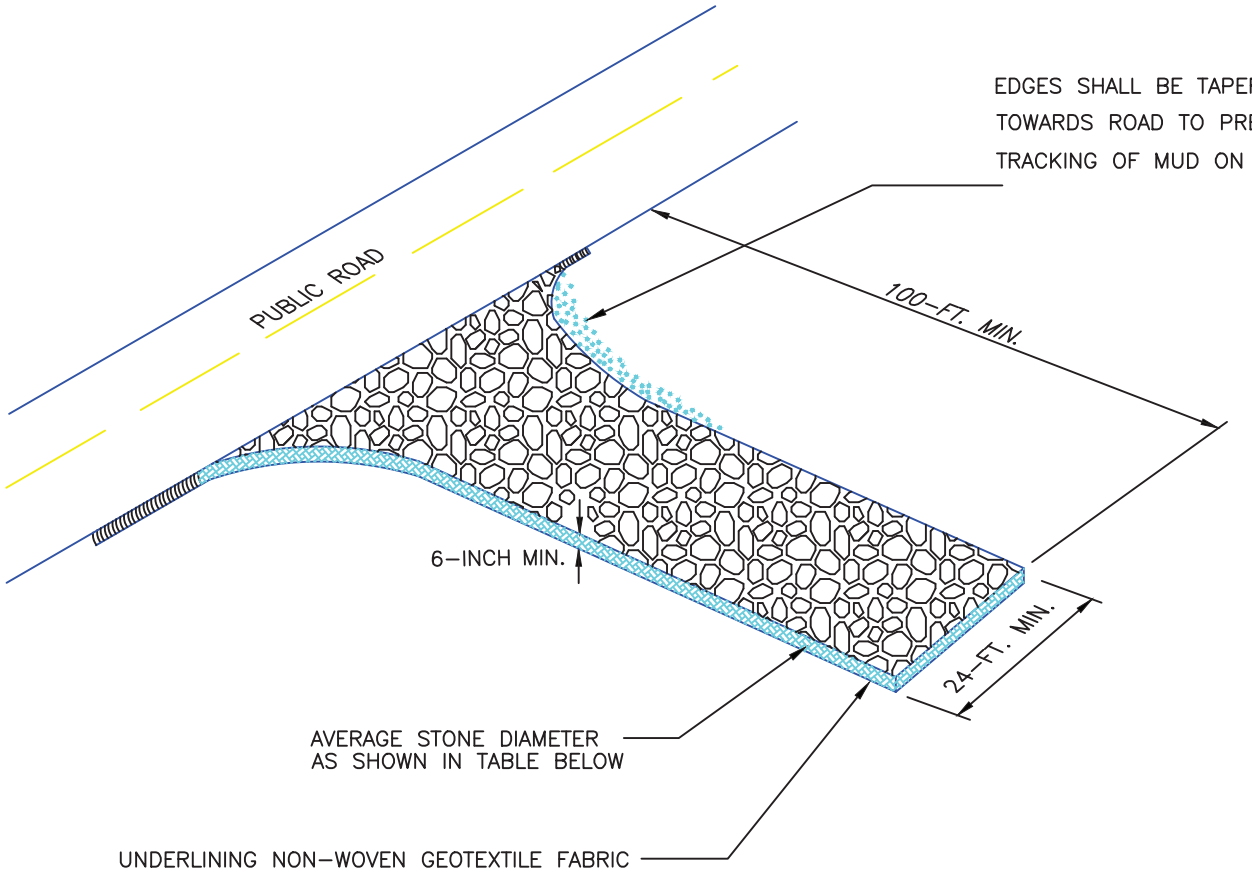
Inspect for sediment and debris accumulation. Inspect ditch check edges for erosion and repair promptly as required.

Sediment should be removed when it reaches 1/3 the original check height.

In the case of grass–lined ditches and swales, rock ditch checks should be removed when the grass has matured sufficiently to protect the ditch or swale unless the slope of the swale is greater than 4%.

After construction is complete, all stone should be removed by the grading contractor if vegetation will be used for permanent erosion control measures.

The area beneath the rock ditch checks should be seeded and mulched immediately after rock check dam removal.




INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN OR OTHER SEDIMENT TRAPPING STRUCTURE.

| Nominal Size (sieves with square openings) | Percent Passing |
|---|---|
| 3 in. | 100 |
| 1-½ in. | 35 to 100 |
| ¾ in. | 0 to 15 |

STABILIZED CONSTRUCTION ENTRANCE

## When and Where to Use It

Stabilized construction entrances should be used at all points where traffic will be leaving a construction site and moving directly onto a public road.

## Important Considerations

If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried offsite. Washdown facilities shall be required as directed by Fort Jackson personnel as needed. Washdown areas in general must be established with crushed gravel and drain into a sediment trap or sediment basin. Construction entrances should be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by vehicles.

## Installation:

Remove all vegetation and any objectionable material from the foundation area.

Divert all surface runoff and drainage from stones to a sediment trap or basin.

Install a non–woven geotextile fabric prior to placing any stone. The geotextile fabric shall conform to Fort Jackson specifications.

Install a culvert pipe across the entrance when needed to provide positive drainage.

The entrance shall consist of 1–inch to 3–inch D50 stone placed at a minimum depth of 6–inches.

Minimum dimensions of the entrance shall be 24–feet wide by 100–feet long, and may be modified as necessary to accommodate site constraints.

The edges of the entrance shall be tapered out towards the road to prevent tracking of mud at the edge of the entrance.

STABILIZED CONSTRUCTION ENTRANCE

Inspection and Maintenance:

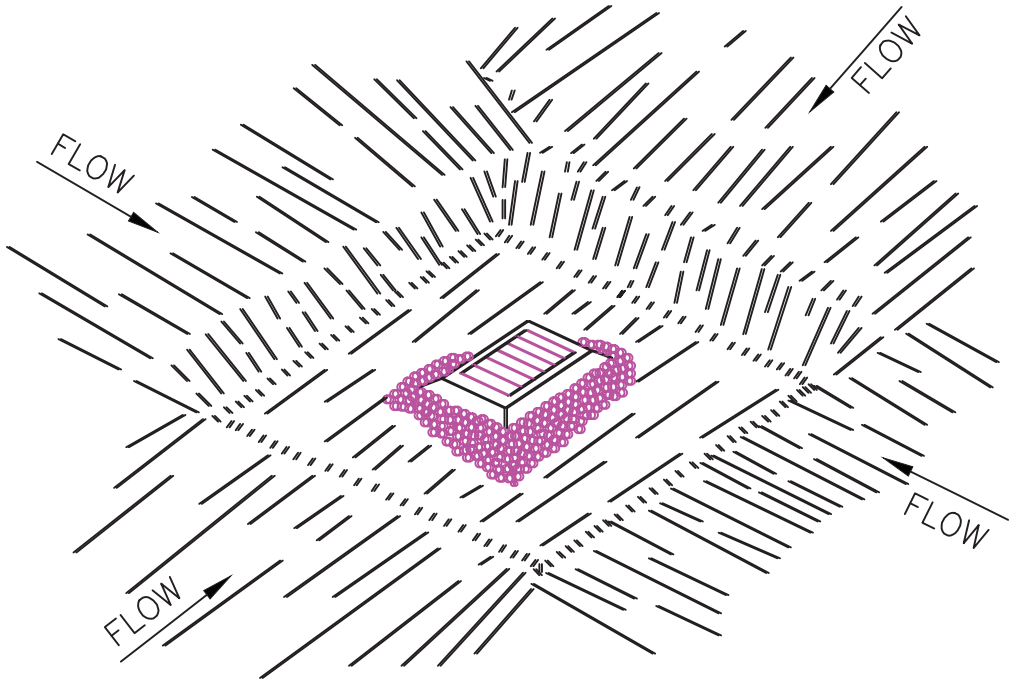
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

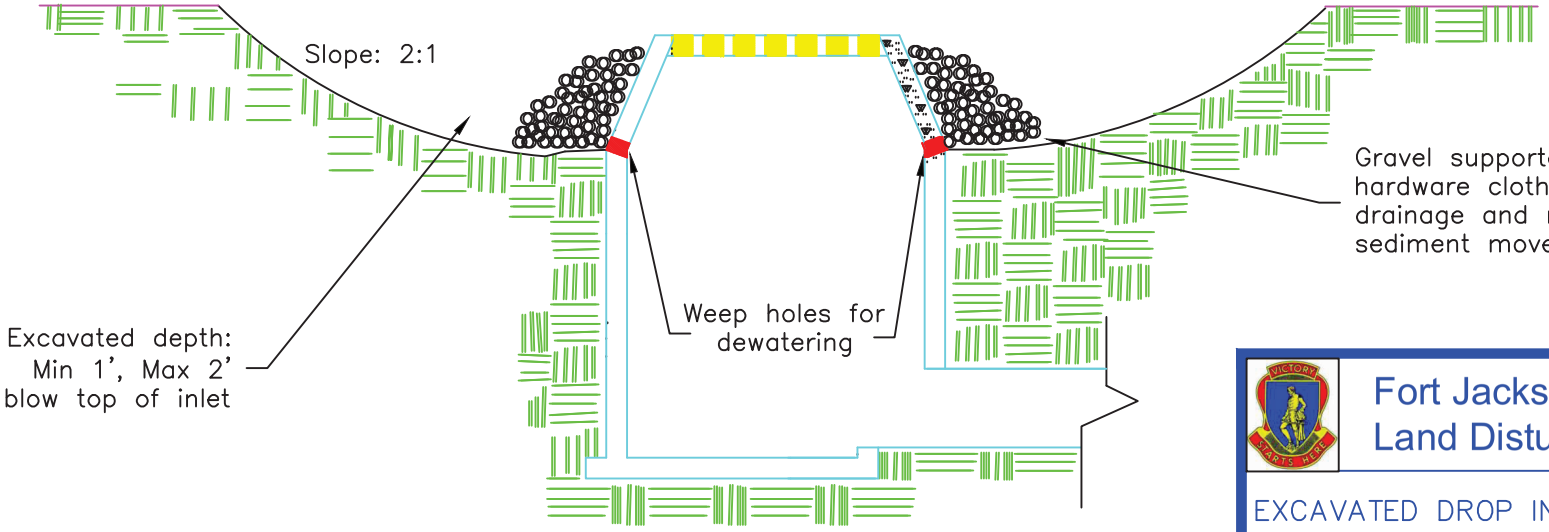
Check for mud and sediment buildup and pad integrity. Make daily inspections during periods of wet weather. Maintenance is required more frequently in wet weather conditions. Reshape the stone pad as needed for drainage and runoff control.

Wash or replace stones as needed and as directed by the inspector. The stone in the entrance should be washed or replaced whenever the entrance fails to reduce mud being carried off–site by vehicles. Frequent washing will extend the useful life of stone.

Immediately remove mud and sediment tracked or washed onto public roads by brushing or sweeping. Mud and sediment should not swept or brushed into inlets. Flushing should only be used when the water can be discharged to a sediment trap or basin.

Repair any broken pavement immediately.




Fort Jackson
Land Disturbance Handbook

EXCAVATED DROP INLET SEDIMENT TRAP

STANDARD DRAWING NO. EC–07 Page 1 of 2

## EXCAVATED DROP INLET SEDIMENT TRAP

This type of inlet protection is applicable where heavy flows are expected and where overflow capability and ease of maintenance are desired.

Installation:

Clear area prior to excavation. Grade area uniformely around the basin.

Excavate are described. Protect weep holes with gravel.

Filter fabric is used for inlet protection when storm water flows are relatively small (0.5 cfs or less) with low velocities and where the inlet drains a relatively flat area (slopes no greater than 5%). This practice cannot be used where inlets are paved or where inlets receive concentrated flows such as in streets or highway medians. The geotextile fabric shall conform to Fort Jackson specifications.

Filter fabric should be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter fabric should be wrapped together only at a support post with both ends securely fastened to the post, with a minimum 6–inch overlap.

The maximum drainage area to this type of inlet is 1 acre.

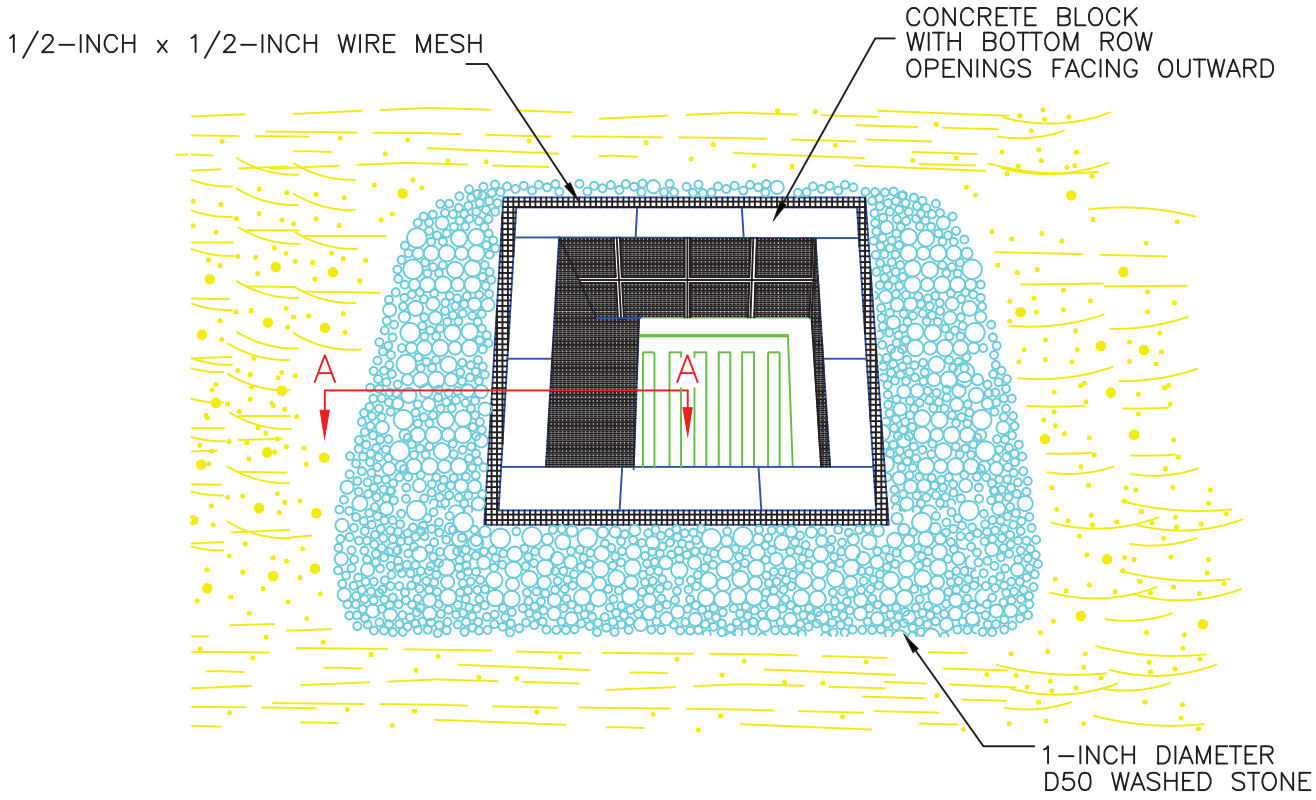
Inspection and Maintenance:

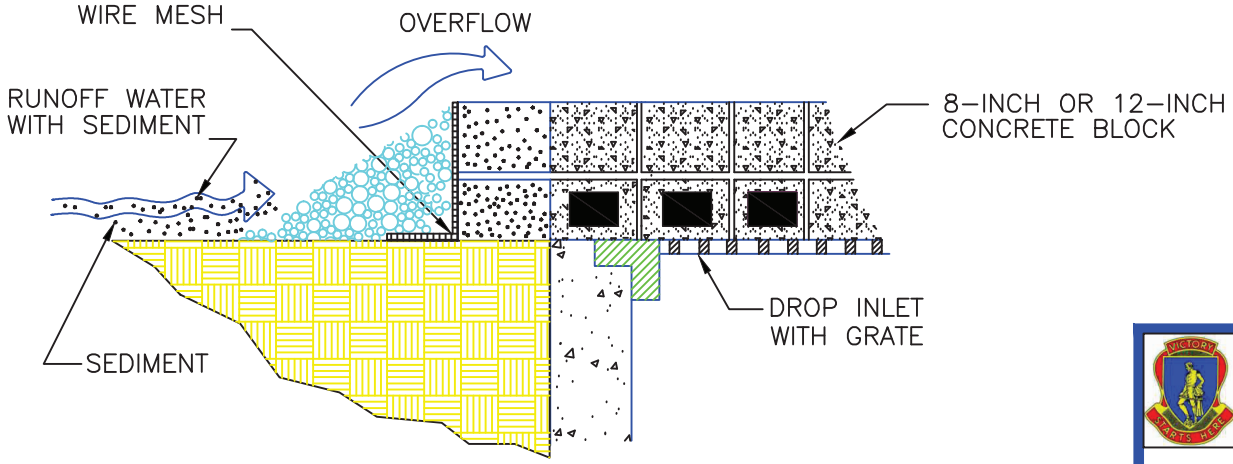
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Any needed repairs should be handled immediately.

Sediment should be removed when it reaches approximately 1/3 the depth of the hole. Maintain the pool area, always providing adequate sediment storage volume for the next storm.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Use appropriate permanent stabilization methods to stabilize bare areas around the inlet.




CROSS SECTION A-A

Fort Jackson
Land Disturbance Handbook

BLOCK AND GRAVEL DROP INLET PROTECTION

STANDARD DRAWING NO. EC–08 Page 1 of 2

# BLOCK AND GRAVEL DROP INLET PROTECTION

## Installation:

Block and gravel filters can be used where heavy flows and higher velocities are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

Gravel shall consist of 1–inch D50 Washed Stone and should extend to height equal to the elevation of the top of the blocks.

Place the bottom row of the concrete blocks lengthwise on their side so that the open end faces outward, not upward.

The height of the barrier can be varied, depending upon design needs by stacking a combination of blocks that are 8– and 12–inches wide.

Wire mesh should be placed over the outside vertical face of the concrete blocks to prevent stones from being washed through the holes in the blocks. Hardware cloth or comparable wire mesh with ½–inch x ½–inch openings should be used.

## Inspection and Maintenance:

Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Any needed repairs should be handled immediately.

Sediment should be removed when it reaches approximately 1/3 the height of the blocks. If a sump is used, sediment should be removed when it fills approximately 1/3 the depth of the hole.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.

# GRAVEL CURB INLET PROTECTION WITH SEDIMENT FILTER

## Installation:

gravel filters can be used where heavy flows and higher velocities are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

Gravel shall consist of SCDOT #4 Stone and should extend to height equal to the elevation of the top of the blocks.

Wire mesh should be placed over the top of the curb inlet. Hardware cloth or comparable wire mesh with ½–inch x ½–inch openings should be used.

## Inspection and Maintenance:

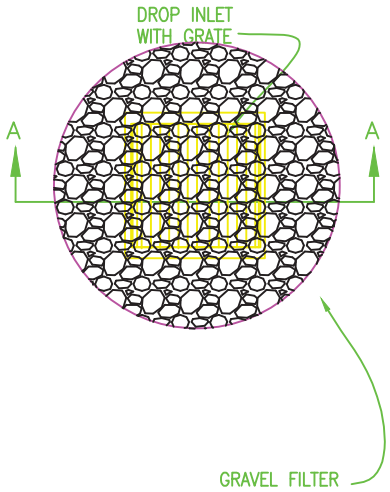
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Any needed repairs should be handled immediately.

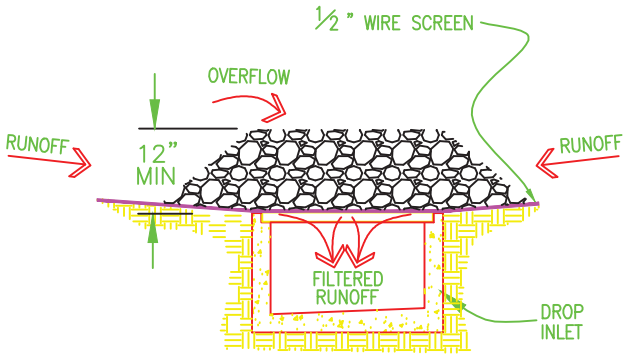
Sediment should be removed when it reaches approximately 1/3 the height of the inlet.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.




PLAN VIEW




CROSS SECTION A–A

DROP INLET BLOCK AND GRAVEL FILTER

Fort Jackson
Land Disturbance Handbook

GRAVEL CURB INLET PROTECTION WITH SEDIMENT FILTER

STANDARD DRAWING NO. EC–09 Page 1 of 1

# BLOCK AND GRAVEL CURB INLET PROTECTION

## Installation:

Block and gravel filters can be used where heavy flows and higher velocities are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

Gravel shall consist of SCDOT #4 Stone and should extend to height equal to the elevation of the top of the blocks.

Place the bottom row of the concrete blocks lengthwise on their side so that the open end faces outward, not upward.

The height of the barrier can be varied, depending upon design needs by stacking a combination of blocks that are 8– and 12–inches wide.

Wire mesh should be placed over the outside vertical face of the concrete blocks to prevent stones from being washed through the holes in the blocks. Hardware cloth or comparable wire mesh with ½–inch x ½–inch openings should be used.

## Inspection and Maintenance:

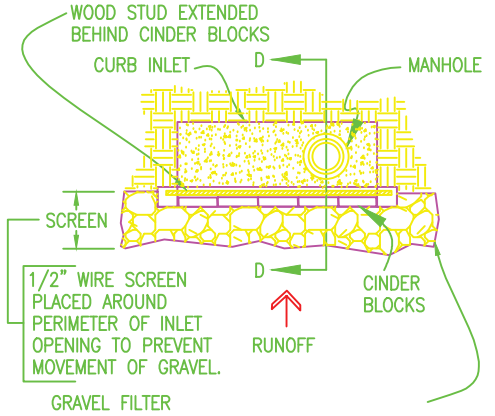
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Any needed repairs should be handled immediately.

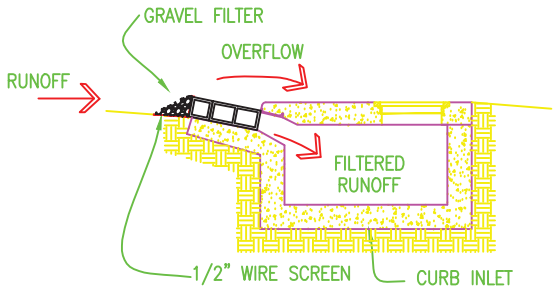
Sediment should be removed when it reaches approximately 1/3 the height of the blocks. If a sump is used, sediment should be removed when it fills approximately 1/3 the depth of the hole.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.




PLAN VIEW




CROSS SECTION D–D

CURB INLET BLOCK AND GRAVEL FILTER

(LOW VOLUME TRAFFIC AREAS ONLY)

Fort Jackson
Land Disturbance Handbook

BLOCK AND GRAVEL CURB INLET PROTECTION

STANDARD DRAWING NO. EC–10 Page 1 of 1

# GRAVEL CURB INLET PROTECTION WITH SEDIMENT FILTER

## Installation:

gravel filters can be used where heavy flows and higher velocities are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

Gravel shall consist of SCDOT #4 Stone and should extend to height equal to the elevation of the top of the blocks.

Wire mesh should be placed over the top of the curb inlet. Hardware cloth or comparable wire mesh with ½–inch x ½–inch openings should be used.

## Inspection and Maintenance:

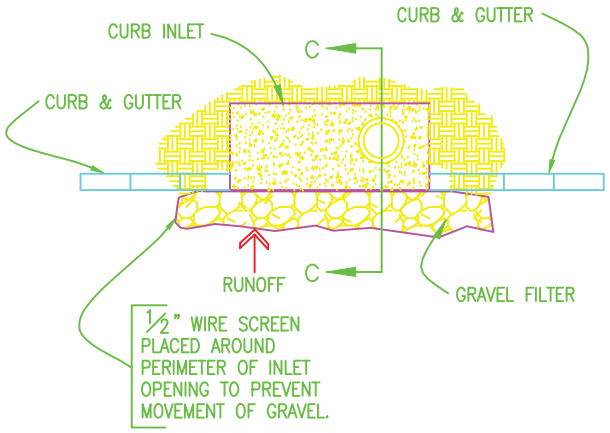
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Any needed repairs should be handled immediately.

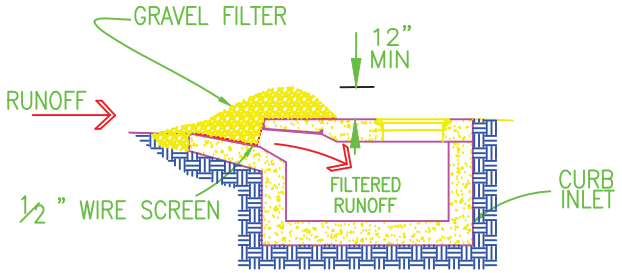
Sediment should be removed when it reaches approximately 1/3 the height of the inlet.

If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.




PLAN VIEW




CROSS SECTION C–C

CURB INLET GRAVEL AND WIRE MESH FILTER

Fort Jackson
Land Disturbance Handbook

GRAVEL CURB INLET PROTECTION WITH SEDIMENT FILTER

STANDARD DRAWING NO. EC–11 Page 1 of 1

CURB INLET PROTECTION WITH
2"X4" WOODEN WEIR

Installation:

Wooden frame shall be constructed of 2–inch x 4–inch construction grade lumber.

Filter fabric shall conform to Fort Jackson specifications.

Wire mesh across throat shall be continuous piece of 30–inch minimum width with a length 4 feet longer than throat. It shall be shaped and securely nailed to a 2" x 4" weir.

The assembly shall be securely nailed to to 2" x 4" spacers 9–inches long spaced a minimum of 6–feet apart. spacers 9–inches long spaced a minimum of 6–feet apart.

The assembly shall be placed against the inlet and secured by 2" x 4" anchors 2–feet long extending across the top of the inlet and held in place by sandbags or alternative weights.

The maximum drainage area is 1–acre.

The stone shall consist of SCDOT #4 Washed Stone, shall extend to a minimum height of 12–inches, and shall not exceed 24–inches.

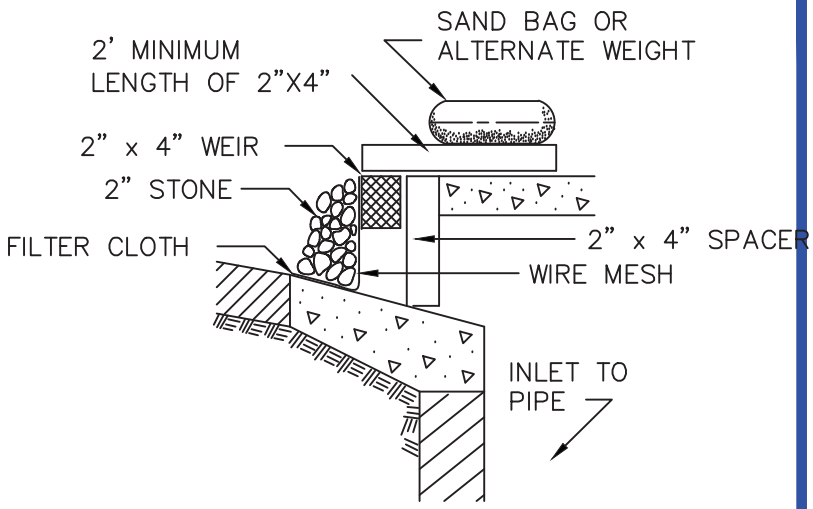
Inspection and Maintenance:

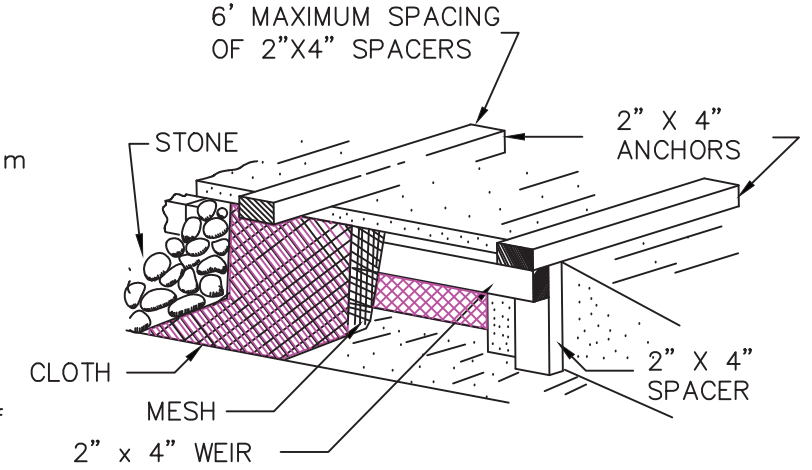
IRegular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Sediment should be removed when it reaches approximately 1/3 the height of the structure.

If the stone becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.

Storm drain inlet protection structures should be removed only after the disturbed areas are permanently stabilized. Remove all construction material and sediment, and dispose of them properly. Grade the disturbed area to the elevation of the drop inlet structure crest. Stabilize all bare areas immediately.




Fort Jackson
Land Disturbance Handbook

CURB INLET PROTECTION WITH WOODEN WEIR

STANDARD DRAWING NO. EC–12 Page 1 of 1

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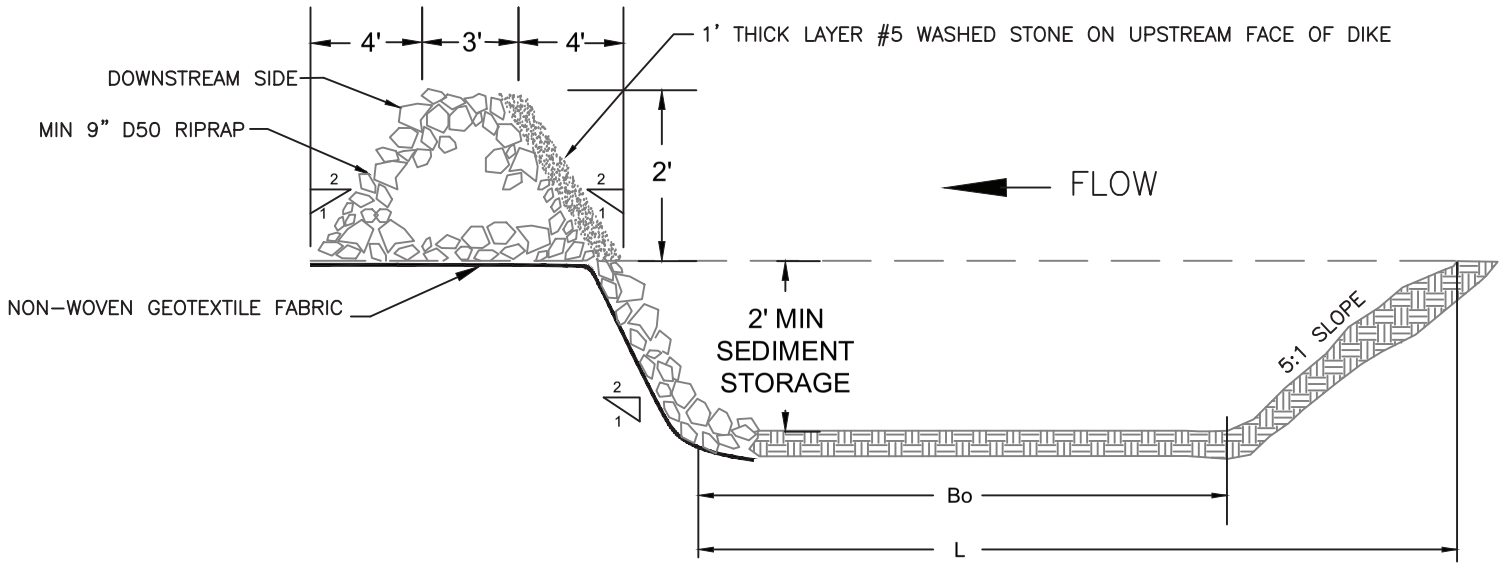
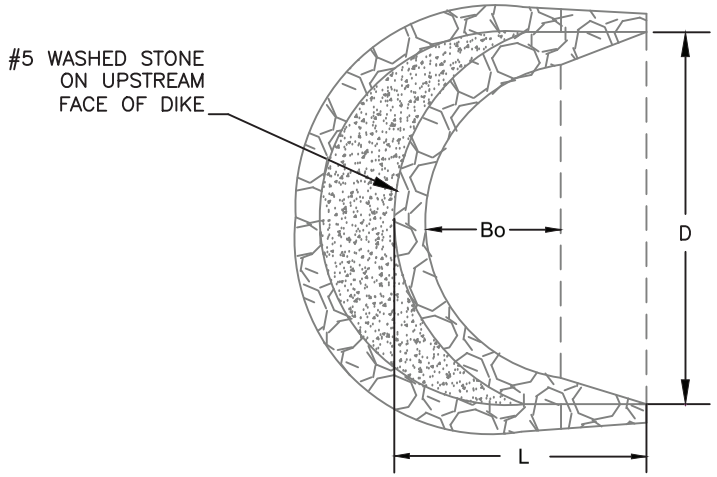



⇦ FLOW MAXIMUM 2-ACRE DRAINAGE AREA TO DIKE

## TYPICAL ROCK DIKE DIMENSIONS

| D | L | Bo | PEAK FLOW (CFS) | TOTAL STORAGE VOL. (CU. FT.) | SEDIMENT STORAGE VOLUME (CU. FT.) |
|---|---|---|---|---|---|
| 15' | 17.5' | 3.5' | 24.1 | 838 | 250 |
| 20' | 20.0' | 6.0' | 32.1 | 1263 | 406 |
| 25' | 22.5' | 8.5' | 40.1 | 1766 | 601 |
| 30' | 25.0' | 11.0' | 48.2 | 2348 | 836 |

Fort Jackson
Land Disturbance Handbook

ROCK SEDIMENT DIKE

STANDARD DRAWING NO. EC-13 Page 1 of 3

# ROCK SEDIMENT DIKE

## When and Where to Use It:

Rock sediment dikes are most effective in areas where sediment control is needed with minimal disturbance. They can be used as sediment control structures for the outfalls of diversion swales, diversion dikes, in low areas or other areas where concentrated sediment laden flow is expected. Rock sediment dikes should not be placed in Waters of the State or any other streams that have a base flow.

## Installation:

A non–woven geotextile fabric shall be installed over the soil surface where the rock sediment dike is to be placed. Filter fabric shall conform to Fort Jackson specifications.

The body of the rock sediment dike shall be composed of minimum 9–inch D50 Riprap.

The upstream face of the rock sediment dike shall be composed of a 1–foot thick layer of 3/4–inch to 1–inch D50 washed stone placed at a slope of 2H:1V.

Rock sediment dikes shall have a minimum top flow length of 3–feet (2–foot flow length through the riprap and 1–foot flow length through the washed stone).

The rock must be placed by hand or mechanical placement (no dumping of rock to form the sediment dike) to achieve the proper dimensions.

A sediment sump shall be located on the upstream side of the structure to provide sediment storage. The upstream side of the sediment sump shall have a slope of 5H:1V to inhibit erosion of the sediment storage area. The minimum depth of the sediment sump shall be 2–feet. Mark the sediment cleanout level of the sediment dike with a stake in the field.

Seed and mulch all disturbed areas.

ROCK SEDIMENT DIKE

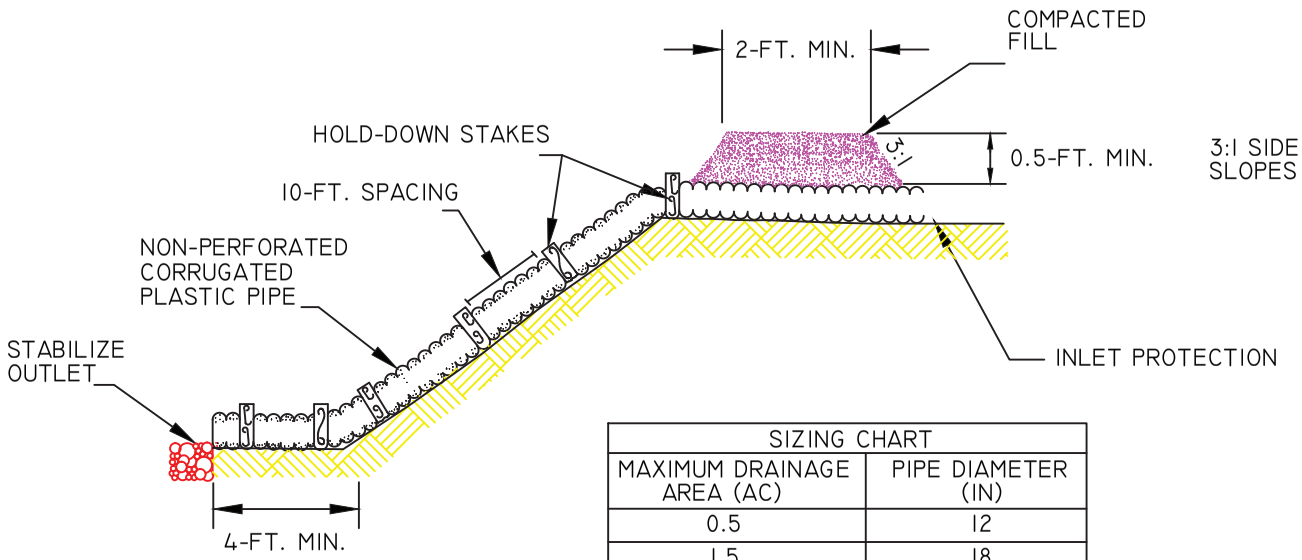
Inspection and Maintenance:

The key to a functional rock sediment dike is continual monitoring, regular maintenance and regular sediment removal.

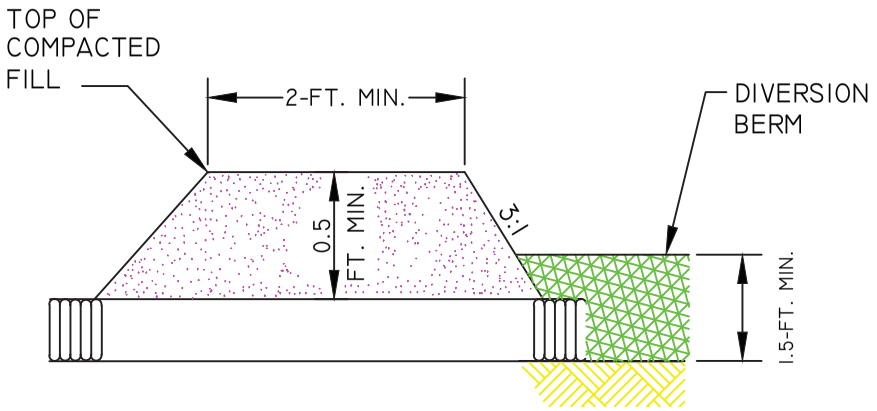
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

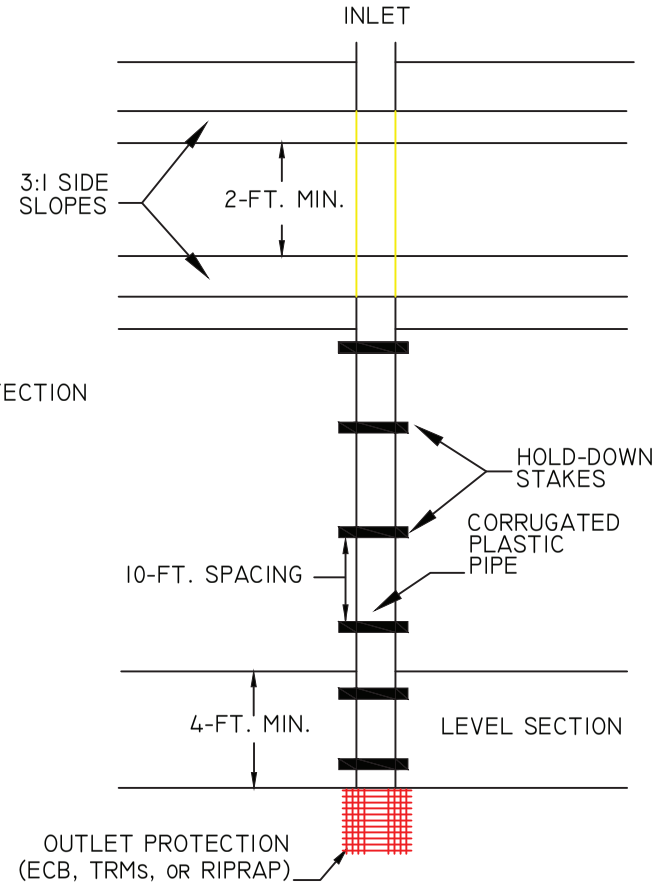
Remove sediment when it reaches 50% of the sediment storage volume or when reaches the top of cleanout stake. Removed sediment from the sump should be removed from, or stabilized on site.

All rock sediment dikes should be removed within 30 days after final site stabilization is achieved or after they are no longer needed. Disturbed areas resulting from the removal of rock sediment dikes should be permanently stabilized.




| SIZING CHART | |
|---|---|
| MAXIMUM DRAINAGE AREA (AC) | PIPE DIAMETER (IN) |
| 0.5 | 12 |
| 1.5 | 18 |
| 2.5 | 21 |
| 3.5 | 24 |
| 5.0 | 30 |




PLAN VIEW

TYPICAL PIPE SLOPE DRAIN LAYOUT

Fort Jackson
Land Disturbance Handbook

PIPE SLOPE DRAIN

STANDARD DRAWING NO. EC–14 Page 1 of 2

PIPE SLOPE DRAIN

When and Where to Use It

Pipe slope drains are used when it is necessary for water to flow down a slope without causing erosion, especially before a slope has been stabilized or before permanent drainage structures are installed.

Installation:

Typical pipe slope drains are made of non–perforated corrugated plastic pipe designed to pass the peak flow rates for the 10–year 24–hour storm event.

Slope drain sections should be securely fastened together, have gasket watertight fittings, and be securely anchored into the soil.

Diversion berms or dikes should direct runoff to slope drains. The minimum depth of these dikes or berms should be 1.5–feet. The height of the berm around the pipe inlet should be a minimum of 1.5–feet high and at least 0.5–feet higher than the top of the pipe. The berm at the pipe inlet shall be compacted around the pipe. The area around the inlet shall be properly stabilized with ECBs, TRMs, riprap or other applicable stabilization techniques.

The area below the outlet must be properly stabilized with ECBs, TRMs, riprap or other applicable stabilization technique.

If the pipe slope drain is conveying sediment–laden water, direct all flows into the sediment trapping facility.

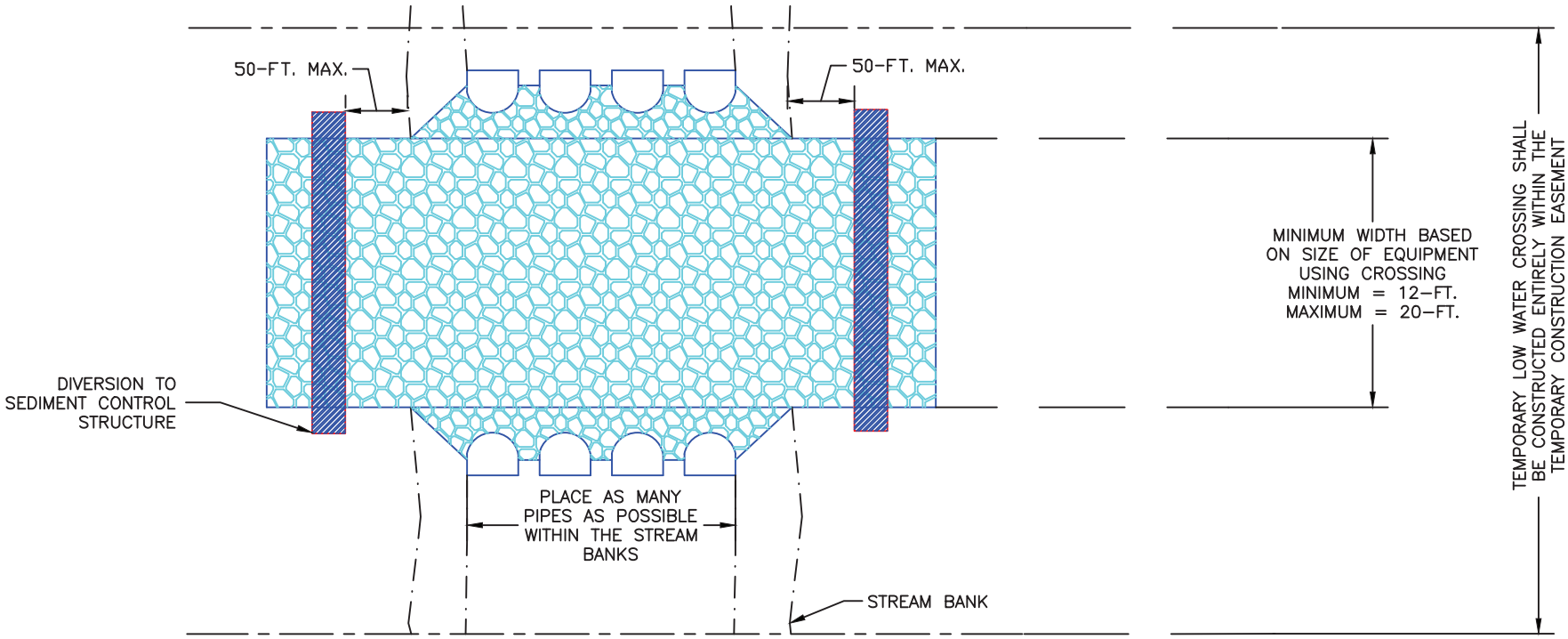
Permanent slope drains should be buried beneath the soil surface a minimum 1.5–feet.

Inspection and Maintenance:

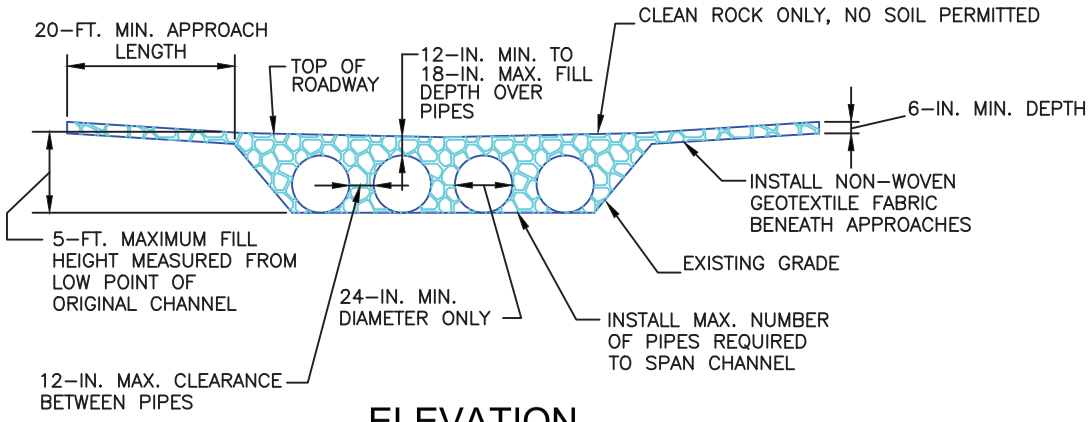
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

The inlet should be free from undercutting, and no water should be going around the point of entry. If there are problems, the headwall should be reinforced with compacted earth or sandbags. The outlet point should be free of erosion and installed with appropriate outlet protection.

All temporary pipe slope drains should be removed within 30 days after final site stabilization is achieved or after the temporary BMP is no longer needed. Disturbed soil areas resulting from removal should be permanently stabilized.




PLAN VIEW




ELEVATION

Fort Jackson
Land Disturbance Handbook

TEMPORARY STREAM
LOW WATER CROSSING

STANDARD DRAWING NO. EC-15 Page 1 of 3

## TEMPORARY STREAM LOW WATER CROSSING

Prior to constructing a temporary stream crossing, the owner/person financially responsible for the project must submit an Application for Permit to Construct Across or Along a Stream to the South Carolina Department of Health and Environmental Control (SC DHEC). Temporary stream crossings require a Section 404 Permit from the Corps of Engineers. If the crossing creates more than 200 linear feet of fill or more than 1/3 acre of fill, a 401 permit may be necessary.

Installation:

Crossings shall be installed prior to any other activities.

Pump–around diversions shall be installed and maintained prior to any excavation and during the installation of the crossing.

Crossings shall be placed in temporary construction easements only.

The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location. However every effort shall be taken to install the crossing perpendicular to the stream. All fill materials associated with the roadway approach shall be limited to a maximum height of 2–feet above the existing flood plain elevation.

A water diverting structure such as a dike or swale shall be constructed (across the roadway on both roadway approaches) 50–feet (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50–feet is measured from the top of the waterway bank. The flow captured in these dikes and swales shall be directed to a sediment trapping structure. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.

Streambank clearing shall be kept to a minimum. Do not excavate rock bottom streambeds to install the crossing. Lay the culvert pipes on the streambed "as is" when applicable. Place as many pipes as possible within the low area of the stream. Place remaining pipes required to cross the stream on the existing stream bottom.

The maximum number of pipes as possible should be placed within the stream banks with a maximum spacing of 12–inches between pipes. The minimum sized pipe culvert that may be used is 24–inches.

The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes. The slope of the culvert shall be at least 0.25 feet per foot.

Coarse aggregate of clean limestone riprap with a 6–inch D50 stone or greater will be used to form the crossing. The depth of stone cover over the culvert shall be equal to ½ the diameter of the culvert or 12–inches, whichever is greater but no greater than 18–inches.

# TEMPORARY STREAM LOW WATER CROSSING

## Installation:

All fill materials associated with the roadway approach shall be limited to a maximum height of 2–feet above the existing flood plain elevation.

The approaches to the structure shall consist of clean stone or concrete fill only with a minimum thickness of 6–inches. The minimum approach length shall be 20–feet and the width shall be equal to the width of the structure.

## Inspection and Maintenance:

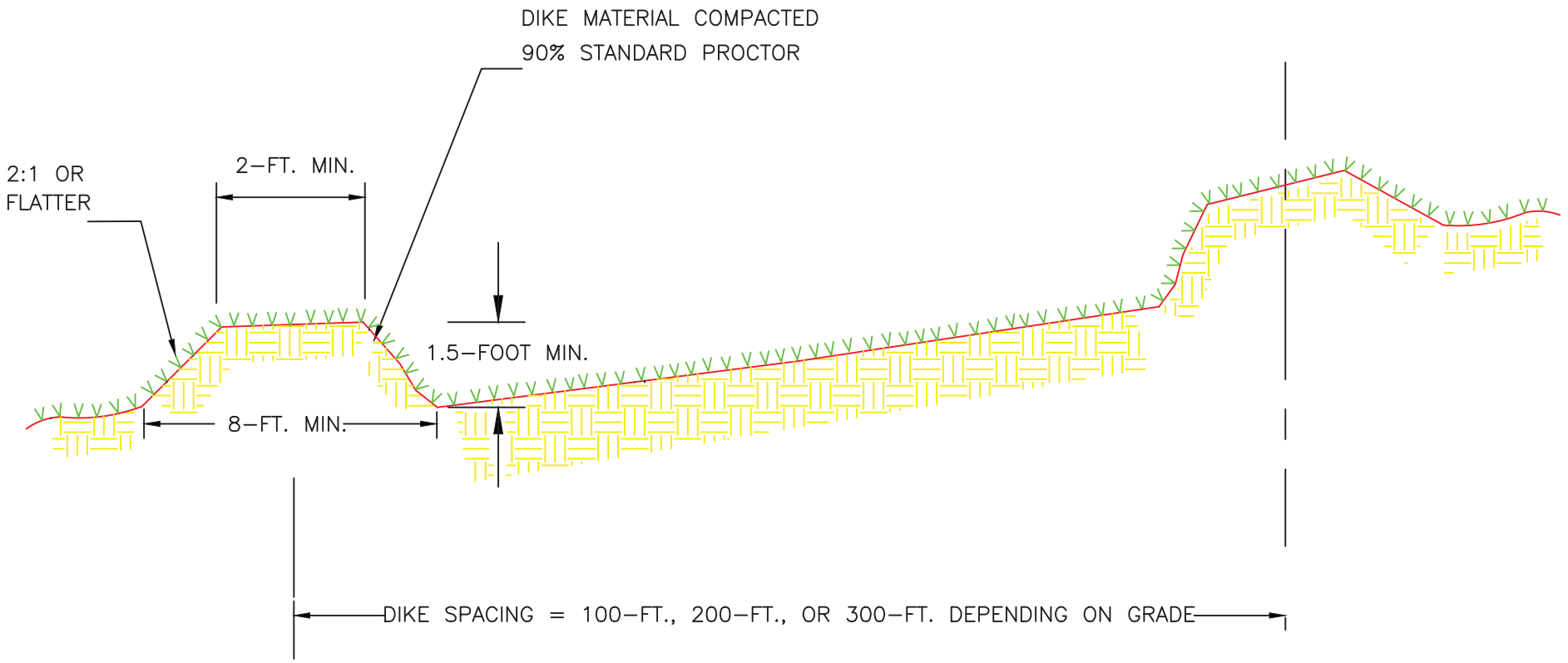
Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Check the structure integrity and for excessive sediment deposition and replace fill stone as needed.

Clean mud and/or sediment from the roadway and do not allow it to enter the stream.

The structure shall be removed when it is no longer required to provide access to the construction area. During removal, leave stone and geotextile fabric for approaches in place. Place fill over the approaches as part of the stream bank restoration operation.

A temporary culvert crossing should be in place no longer than 24–months.

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# DIVERSION DIKE OR BERM

STANDARD DRAWING NO. EC–16 Page 1 of 2

# DIVERSION DIKES AND BERMS

## Installation

The top width should be a minimum of 2–feet, and the height should be at least 1.5–feet from the upslope toe.

The side slopes should be 2H:1V or flatter.

Grades should be between 0.5% and 1.0%.

Slopes shall be stabilized immediately using vegetation, sod, and erosion control blankets or turf reinforcement mats to prevent erosion.

The upslope side of the dike should provide positive drainage so no erosion occurs at the outlet. Provide energy dissipation measures as necessary. Sediment–laden runoff must be released through a sediment trapping facility.

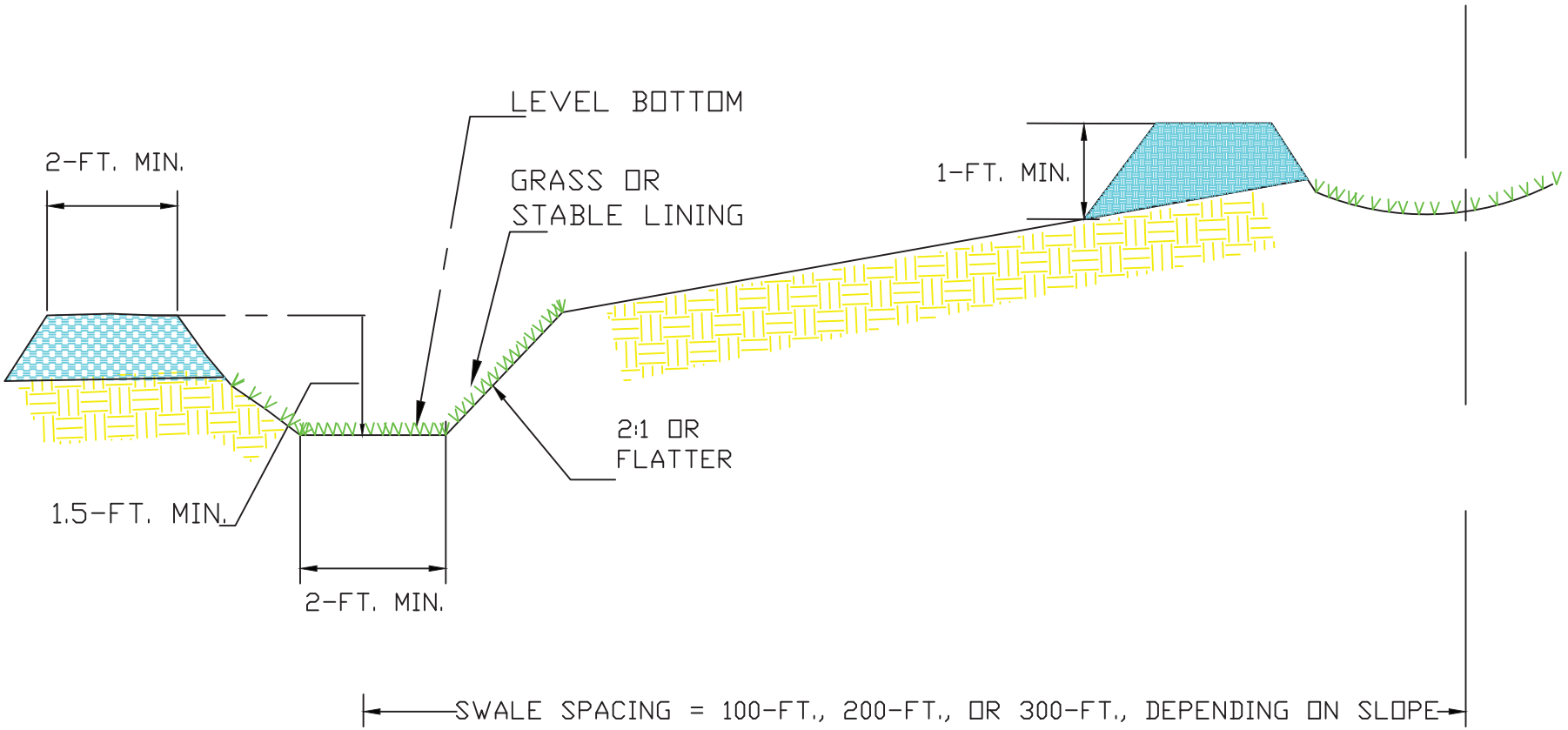
Sediment–laden runoff shall be directed to a sediment trapping facility.

Minimize construction traffic over diversion dikes and berms.

## Inspection and Maintenance:

Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Damage caused by construction traffic or other activity must be repaired before the end of each working day.

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# DIVERSION SWALE

STANDARD DRAWING NO. EC-17 Page 1 of 2

# DIVERSION SWALE

## Installation

The bottom width should be a minimum of 2–feet, and the bottom should be level.

The depth should be a minimum of 1.5–feet and the side slopes should be 2H:1V or flatter.

The maximum grade shall be 5%, with positive drainage to a suitable outlet.

Slopes shall be stabilized immediately using vegetation, sod, and erosion control blankets or turf reinforcement mats to prevent erosion.

The upslope side of the swale should provide positive drainage so no erosion occurs at the outlet. Provide energy dissipation measures as necessary.

Sediment–laden runoff shall be directed to a sediment trapping facility.

## Inspection and Maintenance:

Regular inspections must be conducted a minimum of once every calendar week until final stabilization is achieved. Inspections are recommended within 24hrs after each rainfall event that produces ½ inch or more precipitation.

Damage caused by construction traffic or other activity must be repaired before the end of each working day.