

**EROSION AND SEDIMENT CONTROL**

# **FIELD GUIDE**

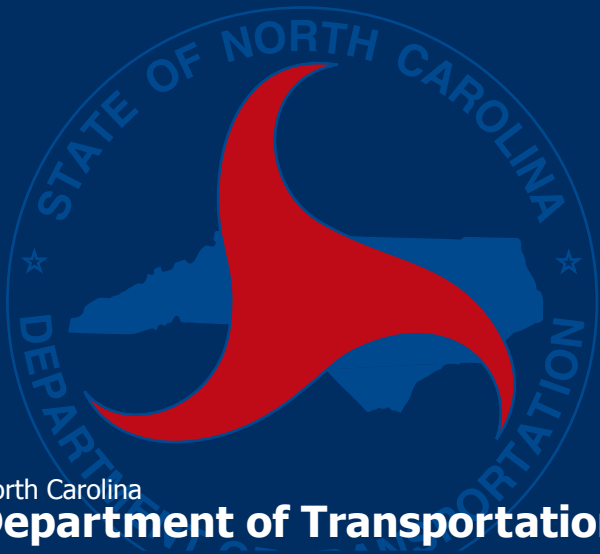
## **2013**



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











North Carolina

**Department of Transportation**

**Roadside Environmental Unit**

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## Temporary Silt Fence

1605.01

# IS

A fabric fence which reduces water flow and retains sediment in order to prevent off-site sediment.

# USE

At the toe of a fill section where sediment runoff can be contained and stored within project limits. **Do not install across a stream, ditch, waterway or any area of concentrated flow.**

# CONSTRUCT

Metal posts to be 5 ft. in height (3 ft. above ground) and space them 8 ft. apart with wire or 6 ft. apart without wire. Bury fabric a minimum of 8 in. deep and 4 in. along the base of the trench. An 18 in. overlap is required when splicing.



## **Special Sediment Control Fence**

1606.01

### **IS**

A hardware cloth device with sediment control stone at the base of the hardware cloth. It reduces water flow and retains sediment.

### **USE**

At the toe of fill sections or other areas where silt fence will not function adequately to control sediment. Use in environmentally sensitive areas and in areas of inadequate right-of-way in place of silt ditch.

### **CONSTRUCT**

Using a 4 ft. wire mesh (24 ga., 1/4 in.) folded 2 ft. vertical and 2 ft. along the ground surface with sediment control stone on top to a minimum depth of 1 ft. Posts to be 5 ft. in height, (3 ft. above ground) spaced 3 ft. apart.



## Temporary Silt Ditch

1630.03

### IS

A small ditch or channel that intercepts water flow from slopes and directs the runoff into a basin, sediment dam and/or rock silt check.

### USE

At the toe of a fill slope where vertical fill height exceeds 3 ft. or along a stream bank to divert water flow into a controlled outlet.

### CONSTRUCT

The ditch to be 1 ft. min. depth with a 2:1 side slope. Stabilize waste material/berm with seed and mulch.



## Temporary Diversion

1630.05

### IS

An excavated channel with a berm on its lower side that directs runoff into a basin, through a sediment dam or through rock silt checks.

### USE

At the perimeter of a project site and below a slope during clearing and grubbing to temporarily control water flow patterns and to divert runoff into a sediment control structure.

**Maintain structure in place until the installation of final drainageways.**

### CONSTRUCT

To 1 ft. – 6 in. deep min. with 2:1 side slopes. Stabilize waste material/berm with seed and mulch.



## Temporary Slope Drain with Earthen Berm

# IS

1622.01

A berm with a flexible pipe that carries concentrated runoff down a cut or fill slope without causing erosion. The earthen berm channels runoff into the slope drain, while a riprap pad or silt basin at the outlet dissipates the energy.

# USE

Above cut or fill slopes where runoff flowing over the slope would cause erosion if left unchecked.

# CONSTRUCT

With a minimum 12 in. diameter flexible pipe, installing stakes alongside on a 10 ft. max. spacing. A standard T-section may be installed for multi-direction flow and elbows at inlets for single-direction flow.





## Riser Basin

1630.01

### IS

An earthen embankment which captures runoff leaving a drainage turnout that serves a large project site drainage area. A riser pipe drains the basin and an overflow spillway controls any runoff that might exceed riser capacity.

### USE

At a site with concentrated water flow where other erosion control devices are inadequate.  
**Do not use in a perennial stream.**

### CONSTRUCT

To a sediment storage volume of at least 3600 cubic ft. per acre of disturbed area (for drainage areas less than 100 acres).



## **Silt Basin, Type B**

1630.02

# IS

A defined pit or basin which collects sediment flowing through a drainageway (often built in conjunction with temporary rock silt checks in order to slow water velocity).

# USE

In a drainage ditch with temporary rock silt checks or adjacent to a drainage inlet with stone inlet protection. **Maintain until vegetation becomes established.**

# CONSTRUCT

Basin width variable to the size of the drainageway, so that the basin's length equals twice its width, and its depth is a minimum of 2 ft. Storage capacity is 3600 cubic ft. per disturbed acre. **Clean basin regularly.**



## **Temporary Rock Silt Check, Type A**

1633.01

### **IS**

A small dam with a weir outlet that uses a naturally-formed storage area to trap sediment (rather than an excavated pit).

### **USE**

At the outlet of a temporary diversion, temporary slope drain, temporary silt ditch, drainage ditch or channel that outlets off the project site.

### **CONSTRUCT**

Of Class B stone lined with sediment control stone. Install a weir at the center of the dam that is approximately 2/3 of the channel width. The weir should be at least 4 ft. long for a drainage area of 1 acre or less.



## Temporary Rock Silt Check, Type B

1633.02

### IS

A small dam with a centered weir that limits erosion in a drainage ditch and helps to reduce the water velocity.

### USE

During construction in a channel, roadside ditch outlet, temporary silt ditch or temporary diversion ditch where grade meets and/or exceeds 2.5%.

### CONSTRUCT

Of Class B stone, with a preferred spacing so that the elevation at the top of the lower dam is the same as the toe elevation of the upper dam.



## **Temporary Rock Sediment Dam, Type A**

1634.01

### **IS**

A large dam structure with a weir outlet that traps sediment at drainage turnouts just prior to the point where runoff leaves the project site.

### **USE**

Along the perimeter of a construction site, at drainage turnouts serving large areas or at natural drainage turnouts forming small valleys.

### **CONSTRUCT**

With Class I riprap lined with sediment control stone on the upstream side (minimum 2:1 side slope upstream, 3:1 min. downstream). The dam must not be higher than 8 ft. with the weir 1 ft. below top of dam. Apron length (below weir) should be approximately equal to the height of the dam.





## Temporary Rock Sediment Dam, Type B

1634.02

### IS

A small dam with a weir outlet and built-in sediment basin.

### USE

At the outlet of a temporary diversion, temporary slope drain, temporary silt ditch, drainage ditch or channel to trap sediment before runoff leaves the project site. **Do not use in a live stream.**

### CONSTRUCT

Of Class B stone lined with sediment control stone. Basin should be 3600 cubic ft. per disturbed acre, and dam weir length variable to the drainage area (minimum 4 ft. for 1 acre or less). Apron length should be approximately equal to the height of the dam, with minimum 2:1 side slope.



## **Rock Pipe Inlet Sediment Trap, Type A**

1635.01

### **IS**

A horseshoe-shaped device which prevents sediment from entering a pipe structure.

### **USE**

At a pipe inlet that receives flow from one or more directions and is **at least 30 ft. from a vehicular travel lane.**

### **CONSTRUCT**

Of Class B stone lined with sediment control stone. Surround the structure with a sediment storage area built to 3600 cubic ft. per disturbed acre. The dam must be a minimum 18 in. high.



## **Rock Pipe Inlet Sediment Trap, Type B**

# IS

1635.02

A horseshoe-shaped device that prevents sediment from entering a pipe structure.

# USE

At a pipe inlet no greater than 24 inches in diameter that receives flow from one or more directions, and in areas where a Rock Pipe Inlet Sediment Trap, Type A would be unsafe due to adjacent traffic.

# CONSTRUCT

Of Class A stone lined with sediment control stone. Surround the structure with a sediment storage area built to 3600 cubic ft. per disturbed acre. The dam must be a minimum 18 in. high.





## Skimmer Basin

### IS

A temporary basin with a trapezoidal spillway lined with filter fabric and equipped with a floating skimmer.

### USE

In sensitive watershed areas and in locations where the drainage area is too large for standard rock weir outlet.

### CONSTRUCT

Basin with a Faircloth Skimmer at the outlet, a trapezoidal emergency spillway lined with filter fabric, and 3 coir fiber baffles. Storage capacity is 1800 cubic ft. per disturbed acre and surface area must accommodate the 10-year storm runoff. Limit the dam height to 5 ft.





## Stilling Basin

1630.04

# IS

An earthen basin that settles sediment in water being pumped.

# USE

At a construction site where there is a diverted stream or whenever sediment-laden water must be settled before being returned to a natural stream. **Never pump sediment-laden water directly into a stream.**

# CONSTRUCT

Basin to  $\frac{1}{2}$  the volume of the site to be pumped. The basin length (min.) should be 2 times the width with 3 coir fiber baffles dividing the basin length into quarters.



## Rock Inlet Sediment Trap, Type A

1632.01

### IS

A doughnut-shaped dam at a drop inlet which serves a large drainage area.

### USE

At a drop inlet that receives heavy water flow and is **at least 30 ft. from a vehicular travel lane**. The structure can be modified to accommodate a drop inlet receiving water from only one direction.

### CONSTRUCT

Of Class B stone lined with sediment control stone offset from the box 1 ft.-6 in. The dam must be a minimum 2 ft. high. Install a sediment storage area around the structure's perimeter built to 3600 cubic ft. per disturbed acre.



## **Rock Inlet Sediment Trap, Type B**

1632.02

### **IS**

A doughnut-shaped stone dam at a drop inlet that serves a small drainage area.

### **USE**

At a drop inlet that receives moderate to heavy flow, and in areas where a Rock Inlet Sediment Trap, Type A would be unsafe due to adjacent traffic.

### **CONSTRUCT**

Of Class A stone lined with sediment control stone offset from the inlet box 1 ft. 6 in. Surround the structure with a sediment storage area built to 3600 cubic ft. per disturbed acre. The dam must be a minimum 18 in. high.



## Rock Inlet Sediment Trap, Type C

1632.03

### IS

A wire-mesh hardware cloth, drop inlet protective structure with a small doughnut-shaped stone installation at the base of the wire.

### USE

To surround a catch basin in a curb and gutter section or a drop inlet receiving light to moderate flow.

### CONSTRUCT

Using a 4 ft. wire mesh (24 ga., 1/4 in.) folded 2 ft. vertical and 2 ft. along the ground surface with sediment control stone on top to a minimum depth of 1 ft. Posts to be 5 ft. in height, (3 ft. above ground) spaced 4 ft. max. apart, offset 1 ft. - 6 in. from box.



## Coir Fiber Baffle

### IS

A porous barrier used to reduce the velocity of runoff, within a basin or sediment trap, which allows the settling of sediment before being discharged off site.

### USE

In all sediment dams, silt basins, and skimmer basins at drainage outlets.

### CONSTRUCT

Of coir fiber mat attached to steel T-posts to be 5 ft. in height (3 ft. above ground) in the basin or storage area. Install 3 baffles in the erosion control device at a spacing of  $\frac{1}{4}$  the basin length, but if basin length is less than 20 ft., only 2 baffles need to be installed at a spacing of  $\frac{1}{3}$  the basin length.



## **Gravel Construction Entrance**

1607.01

# IS

A stone pad where vehicles enter and leave a construction site.

# USE

At all points of ingress and egress from the work area to clean vehicle tires.

# CONSTRUCT

Using Class A stone, or other coarse aggregate approved by the Engineer to a depth of 8 in. Minimum dimensions are 50 ft. long by 12 ft. wide with a sufficient radius to accommodate large trucks. For safety, pad may be moved back 20 ft. with ABC stone placed adjacent to public road with Engineer's approval.



## **Special Stilling Basin**

1630.06

### **IS**

A water permeable fabric bag that traps sand, silt, and fines as sediment laden water is pumped from a construction site.

### **USE**

As a portable stilling basin at sites with limited right-of-way or where topography restricts the installation of a conventional stilling basin.

### **CONSTRUCT**

Using a minimum size of 10 ft. x 15 ft. bag with a maximum 8 in. spout for receiving pump discharge. Place on a rock pad lined with filter fabric and 8 in. of sediment control stone.





## Temporary Stream Crossing

### IS

A temporary structure that allows construction equipment to cross a stream without harming or eroding the banks.

### USE

At a stream where the construction equipment must cross.

### CONSTRUCT

By laying a temporary pipe in the stream in which the pipe size is determined in the field. Backfill with Class B rip rap to a minimum height of 12 in. above top of pipe. Underlay temporary pipe and rip rap with Type II filter fabric. Place #57 stone to a minimum depth of 6 in. on top of Class B rip rap. Construct the approaches to the stream crossing at a 10:1 grade.



## Wattle with Polyacrylamide (PAM)

### IS

A tubular device that consists of excelsior or coir (coconut) fibers encased in all natural or synthetic netting.

### USE

In temporary and permanent ditches to reduce runoff velocity and incorporate PAM in the form of powder into the runoff.

### CONSTRUCT

Using a minimum size diameter wattle of 12 in. Install wattles using 2 ft. stakes and 12 in. staples on top of a 9 ft. section of erosion control matting. Wattles can be used with or without PAM.



## **Silt Check Type A with Excelsior Matting and Polyacrylamide (PAM)**

### **IS**

A small stone dam with a centered weir and Excelsior Matting and PAM.

### **USE**

In temporary and permanent ditches to reduce runoff velocity and incorporate PAM in the form of powder into the runoff.

### **CONSTRUCT**

Of Class B stone lined with sediment control stone. Construct a weir at the center of the dam that is approximately  $\frac{2}{3}$  of the channel width. Install Excelsior Matting over sediment control stone and anchor the corners with Class B stone. Place PAM over top of matting at the weir section.

North Carolina

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## **Roadside Environmental Unit**



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