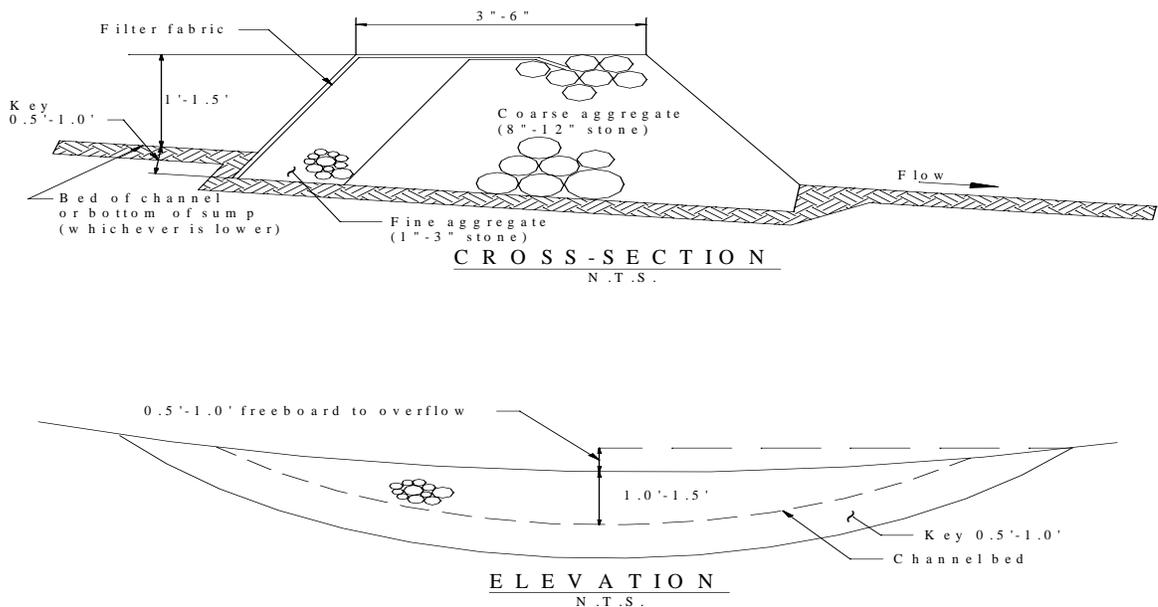


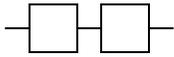
	New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)	SMP-01
PLANNING CONSIDERATIONS: Design Life: 6 mo – 1 year Acreage Needed: Minimal Estimated Unit Cost: Approx: \$100/dam Monthly Maintenance: 60% of Installation	Activity: Check Dams 	
	Target Pollutants	
	<div style="display: flex; justify-content: space-around;"> Significant ♦ Partial ♦ Low or Unknown ♦ </div>	
	<div style="display: flex; justify-content: space-between;"> Sediment ♦ Heavy Metals ♦ Nutrients ♦ Oxygen Demanding Substances ♦ Toxic Materials ♦ </div> <div style="display: flex; justify-content: space-between;"> Oil & Grease ♦ Bacteria & Viruses ♦ Floatable Materials ♦ Construction Waste ♦ </div>	
Description Suitable Applications Approach	<p>To reduce the velocity of concentrated stormwater flows, small temporary constructions such as dams are built across swale or drainage ditch. This construction reduces erosion and promotion of sedimentation behind the dam.</p> <ul style="list-style-type: none"> ➤ Reduction of velocity flow in small intermittent channels and swales. ➤ Weekly collection of sediment materials to avoid scour and re-suspension. ➤ Used in conjunction with filter fabric on upstream end. ➤ Areas which equal 10 acres or less. ➤ To protect against erosion and reduce stormwater run-off in steep channel areas. ➤ During the establishment of grass lining in drainage ditches or channels Installation of erosion-resistant lining is not allowed for short length of service for temporary ditches or channels. ➤ Not for use in streams or rivers. <ul style="list-style-type: none"> ➤ Log check dams ➤ Rock check dams ➤ Sand bags (filled with pea gravel) 	

Activity: Check Dams**Installation Procedures**

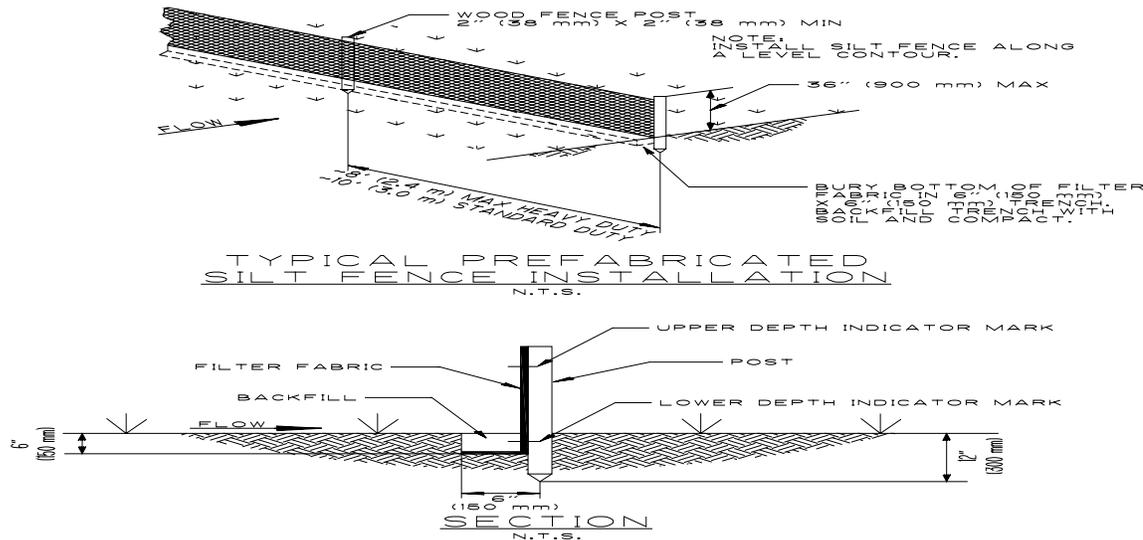
Check dams should be properly constructed to reduce chances of flooding or washout. These dams can be constructed of rock or logs or other sturdy material available on the worksite and should be properly maintained. Material such as straw bales, silt fences or like porous materials should never be used to construct check dams.

- Pools 1 to 2 ft deep should be able to form between each check dam.
- Rock check dams should be placed by hand or mechanically and should be constructed with 1"-3" rock.
- Backwater from a downstream check dam should reach but not exceed the toe of the upstream check dam.
- Check dams should be keyed into, or inset into, the swale/channel bottom.
- Filter fabric should be placed on the upstream face. Major floods (2-year storm or larger) should safely flow over the check dam without an increase in upstream flooding or destruction of the check dam.
- Primarily used in small, steep channels where velocities exceeding 2 ft/s need to be reduced.
- A sump may be provided immediately upstream of the check dam to capture sediment.
- Check dams may be built of stone or logs, which are secured against damage during significant floods.
- Rock shall be individually placed by hand or by mechanical methods (no dumping of rock) to achieve complete ditch or swale coverage.
- If grass is planted to stabilize the ditch or swale, the check dam should be removed when the grass has matured (unless the slope of the swale/ditch is greater than 4 percent).

Activity: Check Dams	SMP-01
<p data-bbox="277 331 428 363">Maintenance</p> <ul data-bbox="472 331 1393 533" style="list-style-type: none"><li data-bbox="472 331 1260 363">➤ Inspection of sediment and erosion behind check dam after each rain.<li data-bbox="472 401 1393 468">➤ Lift filter fabric and shovel or backhoe silt whenever sediment reaches one-half the sump depth of the dam.<li data-bbox="472 499 1365 533">➤ Check area once a week on active sites and every two weeks on in-active sites. <p data-bbox="277 573 402 636">Inspection Checklist</p> <ul data-bbox="485 583 1295 835" style="list-style-type: none"><li data-bbox="485 583 1049 615"><input type="checkbox"/> Diameters of 1" to 3" should use crushed stone.<li data-bbox="485 625 1068 657"><input type="checkbox"/> Check dam spans the entire width of the channel.<li data-bbox="485 667 740 699"><input type="checkbox"/> Sump is 12" deep.<li data-bbox="485 709 1084 741"><input type="checkbox"/> Filter fabric on upstream face is keyed into the bed.<li data-bbox="485 751 1011 783"><input type="checkbox"/> Check dams can be removed when needed.<li data-bbox="485 793 1295 825"><input type="checkbox"/> Sites with rain accumulation of 0.5" should be checked within 24 hours.	

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p> <p>Activity: Silt Fence</p>	<p>SMP-02</p>										
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: 6 months</p> <p>Acreage Needed: Minimal</p> <p>Estimated Unit Cost: \$1 - \$8 per LF</p> <p>Monthly Maintenance: 100% of Installation</p>		 										
Target Pollutants												
<table style="width: 100%; border: none;"> <tr> <td style="text-align: center; width: 33%;">Significant ♦</td> <td style="text-align: center; width: 33%;">Partial ♦</td> <td style="text-align: center; width: 33%;">Low or Unknown ◇</td> </tr> </table>			Significant ♦	Partial ♦	Low or Unknown ◇							
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Sediment ♦	Heavy Metals ◇	Nutrients ◇	Oxygen Demanding Substances ◇	Toxic Materials ◇								
Oil & Grease ◇	Bacteria & Viruses ◇	Floatable Materials ◇	Construction Waste ◇									
<p>Description</p> <p>Suitable Applications</p> <p>Approach</p>	<p>To detain sediment-laden water, silt fences are used to promote deposit behind the fence before it can reach the non-construction site area. These fences are made of filter fabric that has been entrenched, attached to support poles and on occasion supported by a wire fence. This temporary sediment barrier does not stop sediment from entering the water ways, but it does slow it down enough to settle out of the runoff water.</p> <ul style="list-style-type: none"> ➤ Phase construction should allow silt fencing along the downstream perimeter, below the toe of a cleared slope, upstream of sediment traps or basins, along streams and channels and around temporary spoil areas. ➤ Across swales with catchments less than 1 acre and below other small cleared areas. <ul style="list-style-type: none"> ➤ Installed with 0.25 area draining to every 100-feet of silt fence. ➤ Used for downstream perimeter control. ➤ Use in areas where sheet flow occurs. ➤ Areas of level contour to prevent water from ponding more than 1.5 feet at any point. ➤ Maximum slope perpendicular to the fence line should be 1:1. ➤ Select filter fabric which retains 85% of the soil, by weight, based on sieve analysis but is not finer than an equivalent opening size of 70. ➤ Heavy duty prefabricated silt fence should be selected based on slope and time criteria. 											

Activity: Silt Fence



Installation Procedures

- Silt fences are typically installed with $\frac{1}{4}$ area draining to every 100-feet of silt fence. They are designed to function under a 10-year storm event and may be operated for as long as 5 to 8 months. Silt fences are designed to pond water behind them, so it is crucial that they are sufficiently anchored and follow contours. Silt fences that are not entrenched and follow contours can result in worsened erosion.
- Silt fences may be used for downstream perimeter control, placed upstream of the point(s) of discharge of sheet flow from a site. They may also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion, and perpendicular to minor swales or ditch lines for up to one acre contributing drainage areas. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows.
- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 feet at any point.
- The maximum slope perpendicular to the fence line should be 1:1.
- No more than 0.25 acre per 100 ft., or 0.5 cfs of concentrated flow should drain to any point along the silt fence.
- Turn ends of fence uphill to prevent scour from wash around.
- Provide area behind the fence for runoff to pond and sediment to settle (Approx. 1200 sq. ft. per acre draining to the silt fence).
- Select filter fabric that retains 85% of the soil, by weight, based on sieve analysis, but is not finer than an equivalent opening size of 70.

Activity: Silt Fence

SMP-02

Installation Procedures (Continued)

Select standard duty or heavy duty prefabricated silt fence based on criteria shown below:

Standard Duty Silt Fence

- Slope of area draining to fence is 4:1 (H:V) or less.
- Use is generally limited to less than five months.
- Area draining to fence produces low sediment loads.
- Use prefabricated standard duty silt fence.

Heavy Duty Silt Fence

- Slope of area draining to fence is 1:1 (H:V) or less.
- Use generally limited to eight months. Longer periods may require fabric replacement.
- Area draining to fence produces moderate sediment loads.
- Use prefabricated heavy-duty silt fence. Heavy duty silt fences typically have the following physical characteristics:
 - (1) Fence fabric has greater tensile strength than other fabric types available from manufacturer.
 - (2) Fence fabric has a greater permittivity than other fabric types available from manufacturer.
 - (3) Fence fabric may be reinforced with a backing or additional support to increase fabric strength.
 - (4) Posts may be spaced closer together than other premanufactured silt fence types available from manufacturer.
- Most manufactured silt fencing has a colored band that indicates the depth of trenching required. If the lower colored band is visible then the silt fence is not trenched deep enough.
- Install silt fence along a level contour, with the last 6 ft. of fence turned up slope. Except for the ends, the difference in elevation between the highest and lowest point along the top of the silt fence shall not exceed one-third the fence height.
- Posts should be spaced a maximum of 6 ft. apart and driven securely into the ground a minimum of 30 in.
- A trench should be excavated approximately 8 in. wide and 12 in. deep along the line of posts and upslope from the barrier.
- When standard strength filter fabric is used, a wire mesh support fence should be fastened securely to upslope side of the posts using heavy-duty wire staples at least 1-in. long, tie wires or hog rings. The wire should extend down into the trench a minimum of 4 in.

Activity: Silt Fence	SMP-02
Installation Procedures (Continued)	<ul style="list-style-type: none"> ➤ The standard strength filter fabric should be stapled or wired to the fence, and 40 inches of the fabric should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated and the filter fabric stapled or wired directly to the posts. ➤ Avoid the use of joints. The filter fabric should be purchased in a continuous roll, then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6-in. overlap, and both ends securely fastened to the post. ➤ The trench should be backfilled with compacted native material. <p style="margin-left: 40px;"><i>Generally, silt fencing should be used in conjunction with erosion source controls up slope to provide effective control.</i></p>
Maintenance	<ul style="list-style-type: none"> ➤ Inspect after every rainfall. ➤ Repair fence when damaged. ➤ Sediment height not to exceed 1/3 height of the fence. ➤ Perform required maintenance before a storm event. ➤ Remove fence when it is no longer needed and perform required maintenance to restore the site to its normal condition.
Inspection Checklist	<ul style="list-style-type: none"> <input type="checkbox"/> Silt fence follows a contour. <input type="checkbox"/> The last 6 feet of the silt fence is turned uphill and secured to the post. <input type="checkbox"/> Color band of the anchor trench is visible. <input type="checkbox"/> Accumulated sediment does not exceed 1/3 height of the fence. <input type="checkbox"/> If washaround or underwash occurs then fence should be reset.

Activity: Straw Bale Barrier

SMP-03

Installation Procedures

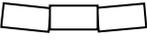
- Install along a level contour; make sure ends are turned uphill at least 6 feet.
- Locate barriers away from the toe of slopes with bales embedded in the soil 4 inches (minimum) and placed so the bindings are horizontal.
- Secure each bale with a minimum of two stakes. One placed vertical and the other placed at an angle toward the adjacent bale.
- Leave enough space behind the barrier for runoff and sediment settle.

Maintenance

- Inspect weekly and after each rainfall.
- Fill gaps tightly.
- Replace bale needing attention.
- Remove sediment when it has reached $\frac{1}{4}$ the height of the barrier.
- Remove barrier when no longer needed and stabilize the area.
- Take proactive measures when rain is forecasted.
- Recycle used straw as mulch for temporary or permanent seeding on other sites.

Inspection Checklist

- Barrier follows a contour.
- Ends of barrier should turn uphill for the last 6 feet.
- Posts are secured with every other post angled.
- Accumulate sediment behind the barrier does not exceed $\frac{1}{4}$ the height of the bale.
- Barrier should be removed if wash around or under wash occurs.
- No washed –out barriers.

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs)</p> <p>Activity: Sand Bag Barrier</p>	<p>SMP-04</p>
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: 3-6 months</p> <p>Acreage Needed: None</p> <p>Estimated Unit Cost: Avg: \$8/LF Range: \$6-\$10/LF</p> <p>Monthly Maintenance: 0% of Capital Costs</p>		 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>SB</p> </div>
Target Pollutants		
<p style="text-align: center;"> Significant ♦ Partial ♦ Low or Unknown ♦ </p>		
<p style="text-align: center;"> Sediment ♦ Heavy Metals ♦ Nutrients ♦ Oxygen Demanding Substances ♦ Toxic Materials ♦ Oil & Grease ♦ Bacteria & Viruses ♦ Floatable Materials ♦ Construction Waste ♦ </p>		
<p>Description</p> <p>Suitable Applications</p> <p>Approach</p> <p>Installation Procedures</p>	<p>Sand barriers provide detainment from sedimentation and runoff by allowing barriers to be formed as a result of the bags being stacked. While stacking these bags does not filter runoff, it does slow it down enough for sediment to settle out of the water. A reduction to sediment is a result of this practice.</p> <p>Sand barriers should be used along the perimeters of the site, at check dams, along streams and channels, across swales, at division dikes, below the toe of a cleared slope, around temporary sediment trap and parallel to roadways</p> <ul style="list-style-type: none"> ➤ Utilized when construction of check dams or sumps in a stream is undesirable ➤ Allows undisturbed vegetation and/or stream ➤ Provide semi-permeable barrier in potentially wet areas <ul style="list-style-type: none"> ➤ Berm height should be 18 inches minimum from ground to top of barrier. Width should be 48 inches minimum ➤ Length of the sand bags should be 24 to 30 inches, width 16 to 18 inches, thickness 6 to 8 inches and weight 90 to 125 pound ➤ Bag material must weigh a minimum of 4 ounces per square yard and should be polypropylene, polyethylene or polyamide. ➤ Sand grade should be course or gravel ➤ Sediment trap BMP should determine the area behind the sand bags 	

Activity: Sand Bag Barrier	SMP-04
Maintenance	<ul style="list-style-type: none">➤ Damaged sand bags need to be replaced or reshaped immediately upon inspection after each rainfall or weekly throughout the rainy season.➤ When sediment reaches 1/3 the height of the barrier, sediment should be removed and disposed.➤ When barriers are no longer needed, sand bags should be properly disposed.➤ Barriers should be inspected and maintained regularly.
Inspection Checklist	<ul style="list-style-type: none"><input type="checkbox"/> Barrier follows a contour.<input type="checkbox"/> End of the barriers turn uphill for the last 6 feet.<input type="checkbox"/> Barriers are cleaned as sediment exceeds 1/3 height of barrier.<input type="checkbox"/> Barrier 100 feet serves 5 acres or less of exposed area.

	New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)	SMP-05
	Activity: Brush or Rock Filters and Continuous Berms	
PLANNING CONSIDERATIONS: Design Life: Life Acreage Needed: None Estimated Unit Cost: Avg: Range: Monthly Maintenance: None		 
Target Pollutants		
<div style="display: flex; justify-content: space-between;"> Significant ♦ Partial ♦ Low or Unknown ♦ </div>		
<div style="display: flex; justify-content: space-between;"> Sediment ♦ Heavy Metals ♦ Nutrients ♦ Oxygen Demanding Substances ♦ Toxic Materials ♦ </div> <div style="display: flex; justify-content: space-between;"> Oil & Grease ♦ Bacteria & Viruses ♦ Floatable Materials ♦ Construction Waste ♦ </div>		
Description Suitable Applications Installation Procedures	<p>Filters, brushes and berms are used to dissipate sediment in construction runoff by anchoring rock deposits, rolls of fabric and/or brush barriers. These barriers are constructed of rocks ¾ to 5 inches in diameter which make up a berm to be placed along a contour. Brush wrapped in filter cloth and anchored to the toe of the slope creates a brush barrier which acts as another trapping method. Additionally, a continuous roll of fabric that captures sand, rock or native soil is an example of one more method to capture sediment. This BMP is used for sediment trapping and velocity reduction that will aid in significantly reducing sediment.</p> <ul style="list-style-type: none"> ➤ Rock filters should be applied near the toe of the slope, along the site perimeter, stream channels, spoil areas, small cleared areas, sediment traps ➤ Rock filters may also be used as check dams and with temporary roads <ul style="list-style-type: none"> ➤ A rock filter consists of open graded rock installed at the toe of a slope, along the perimeter of a developing or disturbed area, and as a check dam across construction roads. Their purpose is to intercept sediment-laden runoff from disturbed areas of the site, allow the runoff to pond, promote sedimentation behind the filter, and slowly release the water as sheet flow. ➤ Rock filters are less costly than other temporary barriers, and are relatively efficient at sediment removal when installed and maintained properly. ➤ Brush filters trap and filter sediments in a manner similar to other barriers in this handbook (e.g., silt fence, straw bale barrier, rock filter), but have the advantage of being constructed from brush cleared from the site and usually disposed off-site at a cost. 	

Activity: Brush or Rock Filters and Continuous Berms**Installation Procedures (Continued)**

- Use principally in areas where sheet or rill flow occurs.
- For rock filter, use larger rock and place in a staked, woven wire sheathing if placed where concentrated flows occur.
- Rock filters should be placed along a level contour to intercept sheet flow. Allow ample room for ponding, sedimentation, and access by sediment removal equipment between the berm and the toes of slopes.
- Flow through the filter should occur as sheet flow into an undisturbed or stabilized area.
- Leave area behind berm where runoff can pond and sediment can settle.
- Brush shall consist of site-cleared brush.
- Stakes: 1.5 in. x 1.5 in. (38 mm x 38 mm) wooden stake, or metal stake with equal holding capabilities.
- Rock: open-graded rock, 1- to 3-in. (2.5- to 7.6-cm) stone reinforced with 8- to 12-in. (20.3- to 30.5-cm) stone as illustrated in Figure TCP-16-1 for concentrated flow applications.
- Woven wire sheathing: 1-in. (25-mm) diameter, hexagonal mesh, galvanized 20 gauge (used with rock filters in areas of concentrated flow).

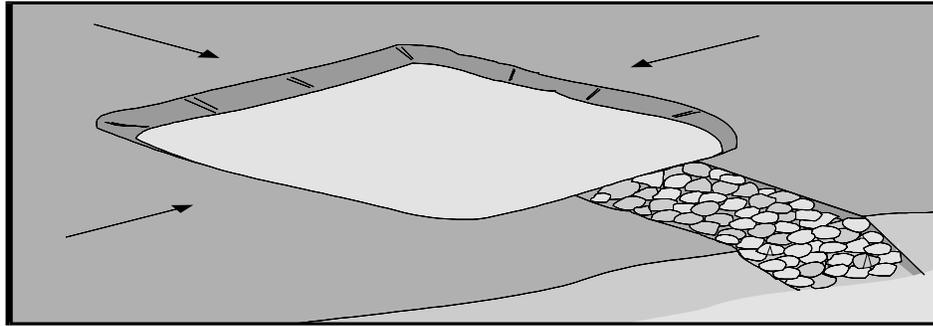
Maintenance

- Daily Inspection is required when installing in stream beds
- After each heavy rainfall inspect berms
- Maintain berms to guarantee proper utilization
- Inspect for sediment accumulation removing when depth reaches $\frac{1}{4}$ of berm height or 12 inches
- Remove berms upon completion of the project

Inspection Checklist

- Sufficient space for ponded water.
- Brush filters are performing.
- Drainage to structure does not exceed 5 acres.

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p> <p>Activity: Sediment Traps</p>	<p>SMP-06</p>										
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: 1.5 - 2 years</p> <p>Acreage Needed: Minimal</p> <p>Estimated Unit Cost: Avg: \$1100/drainage acre</p> <p>Monthly Maintenance: 20% of Installation</p>		 <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">ST</div>										
Target Pollutants												
<table style="width: 100%; text-align: center;"> <tr> <td style="width: 33%;">Significant ♦</td> <td style="width: 33%;">Partial ♦</td> <td style="width: 33%;">Low or Unknown ♦</td> </tr> </table>			Significant ♦	Partial ♦	Low or Unknown ♦							
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Sediment ♦	Heavy Metals ♦	Nutrients ♦	Oxygen Demanding Substances ♦	Toxic Materials ♦								
Oil & Grease ♦	Bacteria & Viruses ♦	Floatable Materials ♦	Construction Waste ♦									
<p>Description</p> <p>Suitable Applications</p> <p>Approach</p>	<p>Floatable materials and sediment are reduced from runoff as a result of using sediment traps. These traps act in small tributary areas as exhumed detainments that help sediment settle off from the runoff on the construction site.</p> <ul style="list-style-type: none"> ➤ Install detention in areas less than 5 acres having temporary construction issues. ➤ After stabilization of the construction area, re-establishment of the sediment trap should be installed. ➤ Along the perimeter of the site at locations where sediment-laden runoff is discharged off-site or areas where runoff can enter stabilized areas or waterways. <ul style="list-style-type: none"> ➤ Prepare sediment traps prior to beginning of construction. ➤ Traps are to be located to areas by hollowing out areas across swales or low embankments, places where damages are excluded and areas needing maintenance to reduce sediment accumulation. ➤ Create larger traps to include a greater amount of sediment buildup. 											

Activity: Sediment Traps**Installation Procedures**

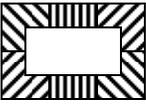
- Build outside the area prior to starting grading of the area.
- Basin side slopes should be restricted to 4:1 or flatter.
- The outline of the trap must be stabilized with rock, geotextile, vegetation, etc. to prevent erosion.
- Traps depend on the size of the drainage area, type of soil and the amount of sediment needing to be removed.
- Traps should have a minimum volume of 134 square yards/acre and 45 square yards/acre or drainage area.
- Inlet location should maximize the travel distance to the trap outlet.
- Length to width ratio shall be greater than 3:1.
- Baffles to be constructed of 4 in. x 4 in post and 4 ft x 8 ft x 0.5 in exterior plywood.
- Post to be 3 ft into the ground and 8 ft apart from the center points, with a height of 6 inches.

Maintenance

- Inspect traps weekly and before and after heavy rainfall.
- Maintain traps to guarantee correct utilization.
- Remove sediment after it reaches 1/3 the height of the trap.

Inspection Checklist

- Constructed traps serve 5 acres or less.
- Type of outlet structure used matches EPSC plan.
- Structure is stabilized to prevent erosion.
- Gage is visible and correctly indicates the depth of the trap.
- Sediment accumulation does not exceed height of trap.
- Trap is constructed in such a way that no damage occurs to life or property.
- Trap is maintained.

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p> <p>Activity: Temporary Sediment/Detention Basin</p>	<p>SMP-07</p>															
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: 12 – 18 months</p> <p>Acreage Needed: Minimal</p> <p>Estimated Unit Cost: Avg: \$100 Range: \$50-\$150</p> <p>Monthly Maintenance: 60% of Installation</p>		 															
<p style="text-align: center;">Target Pollutants</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>Significant ♦</td> <td>Partial ♦</td> <td>Low or Unknown ◇</td> </tr> <tr> <td>Sediment ♦</td> <td>Heavy Metals ◇</td> <td>Nutrients ◇</td> </tr> <tr> <td>Oil & Grease ◇</td> <td>Bacteria & Viruses ◇</td> <td>Floatable Materials ◇</td> </tr> <tr> <td></td> <td>Oxygen Demanding Substances ◇</td> <td>Toxic Materials ◇</td> </tr> <tr> <td></td> <td></td> <td>Construction Waste ◇</td> </tr> </table>			Significant ♦	Partial ♦	Low or Unknown ◇	Sediment ♦	Heavy Metals ◇	Nutrients ◇	Oil & Grease ◇	Bacteria & Viruses ◇	Floatable Materials ◇		Oxygen Demanding Substances ◇	Toxic Materials ◇			Construction Waste ◇
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	Oxygen Demanding Substances ◇	Toxic Materials ◇															
		Construction Waste ◇															
<p>Description</p> <p>Suitable Applications</p> <p>Approach</p>	<p>The purpose of this large temporary sediment/detention basin is to detain large runoff while allowing excessive amounts of sediment to settle out. The abundant area permits a severe reduction in sediment. Typically temporary sediment/detention basins require the construction of an embankment across the drainage path in order to create a pond to trap sediment and inhibit the potential of downstream flooding. Sediment basins are usually designed by a professionally licensed engineer.</p> <ul style="list-style-type: none"> ➤ For disturbed areas between 5 to 10 acres. Areas greater than 10 acres will require a design by a licensed professional engineer. ➤ Collect and store sediment from areas that have been cleared in preparation for construction. ➤ Used in areas where sediment-laden runoff may enter waterways. ➤ Suitable for almost all construction projects. <ul style="list-style-type: none"> ➤ The sediment control basin should be designed by using SEDCAD, or another suitable computer program. ➤ The intent of this BMP is to trap sediment before it leaves the construction area. ➤ Provide a detention time of 24-48 hours for a 10-year 24-hour wet weather event. ➤ Provide a minimum storage capacity of 3600 cf per acre of bare soil. ➤ The ratio of basin flow length to flow width is 2:1. 																

Approach (cont'd)	<p>➤ There are three components to the successful design of a sediment basin:</p> <ul style="list-style-type: none"> • Embankment • Principal Spillway • Emergency Spillway <p><i>Embankment Recommendations</i></p> <ul style="list-style-type: none"> • Slopes of the embankments for a basin shall not be steeper than 2.5:1 on the upstream side, and not steeper than 5:1 on the downstream side of the basin, in order to allow the area to be safely mowed and maintained. • Provide for a minimum of 1-foot of freeboard for a 100-year 6-hour wet weather event. • The minimum width at the top of the embankment is 12-inches. • Stabilize the slope with vegetation or rip rap. <p><i>Principal Spillway Requirements</i></p> <ul style="list-style-type: none"> • Provide a subsurface drain or solid riser pipe with dewatering holes to allow sufficient detention time. • The outlet pipe diameter shall be a minimum of 8-inches. • The post construction peak flow shall exceed the pre-developed levels of the 2-year and 10-year 24-hour wet weather events. • Install a trash rack and anti-vortex device on the riser pipe. • Prepare a stabilized apron for the outlet pipe. <p><i>Emergency Spillway Requirements</i></p> <ul style="list-style-type: none"> • Emergency spillway shall be designed to pass a 100-year 6-hour wet weather event, to the top of the embankment. • Provide a minimum of one foot of freeboard between the top of the riser pipe and the crest of the spillway.
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Installation Procedures	<p>➤ Construct this BMP prior to any clearing and grading on the construction site.</p> <p>➤ Fill material for the embankment shall be free of roots, woody vegetation, oversized stones, rocks and other deleterious materials.</p> <p>➤ Place fill material in 6 inch lifts with continuous layers extending the entire length fill, and compacted to 95 percent of maximum density and +/- 2 percent of optimum moisture content. Construction the embankment to a height 10% higher than the required crest elevation to allow for settlement if construction traffic (hauling in/out) is used to compact the soil. If compaction equipment is used, reduce the height to 5%.</p> <p>➤ Weld the principal spillway pipe to the discharge pipe with a watertight connection.</p> <p>➤ The principal spillway and discharge pipes shall be placed on a firm, smooth soil foundation. Pervious materials such as sand, gravel or crushed stone shall not be used as backfill around the pipes.</p>
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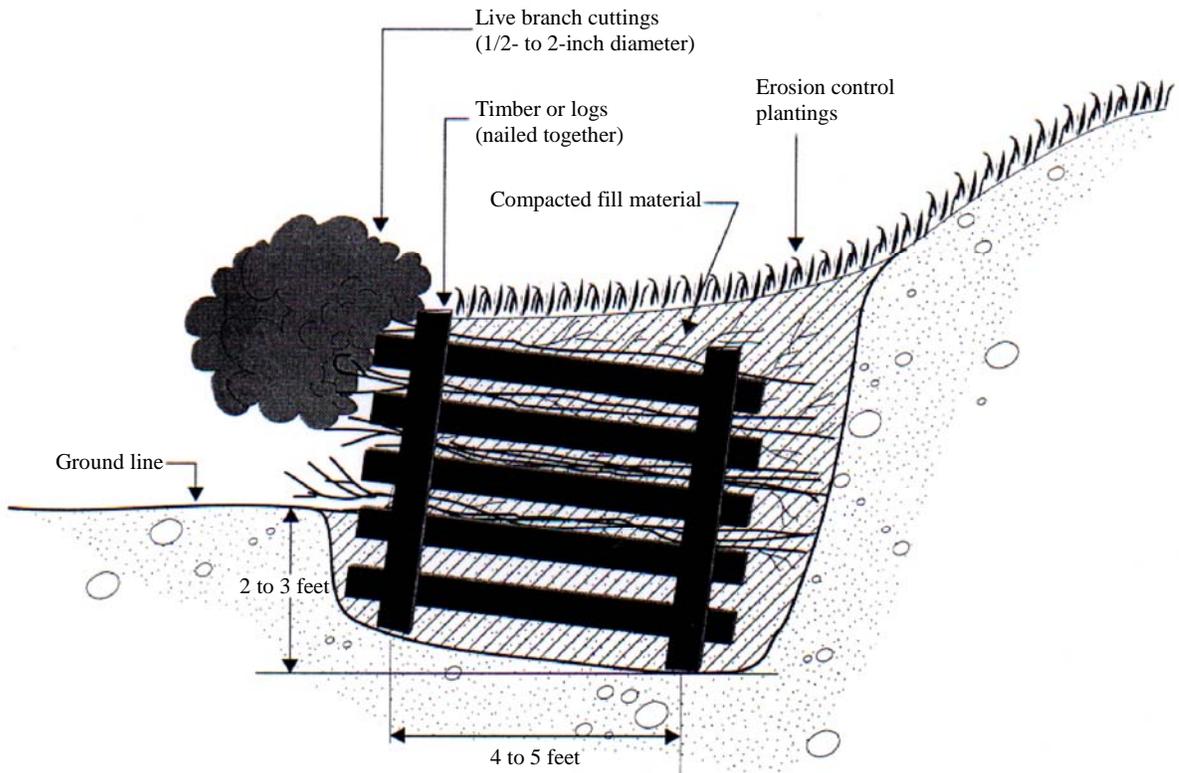
Activity: Temporary Sediment/Detention Basin	SMP-07
Maintenance	<ul style="list-style-type: none"> ➤ Inspect weekly as well as before and after wet weather events. ➤ Repair all damages to and within the basin due to construction by the end of the work day. ➤ Maintain all aspects of the basin (outlet area, outlet structures, etc.). ➤ Remove sediment when storage is 1/2 full. ➤ Ensure that all sediment removed from the basin will not erode from the site. ➤ Basin failure should not affect loss in life, property, roads, or utilities.
Inspection Checklist	<ul style="list-style-type: none"> <input type="checkbox"/> Structure has appropriate outlet design. <input type="checkbox"/> Stabilized outlet prevents erosion. <input type="checkbox"/> Sediment accumulation does not exceed 1/2 depth of basin. <input type="checkbox"/> Outlet is free of trash and deleterious materials that will clog the pipe and restrict flow. <input type="checkbox"/> Trash rack and anti-vortex device on riser is free of debris and other deleterious materials that will clog and restrict flow.

	New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)	SMP-08
PLANNING CONSIDERATIONS: Design Life: Life Acreage Needed: Minimal Estimated Unit Cost: Avg: Range: Monthly Maintenance: None	Activity: Bank Stabilization 	
Target Pollutants		
<div style="display: flex; justify-content: space-around;"> Significant ◆ Partial ◆ Low or Unknown ◇ </div>		
<div style="display: flex; justify-content: space-between;"> <div style="display: flex; gap: 10px;"> Sediment ◆ Oil & Grease ◇ </div> <div style="display: flex; gap: 10px;"> Heavy Metals ◇ Bacteria & Viruses ◇ </div> <div style="display: flex; gap: 10px;"> Nutrients ◆ Floatable Materials ◇ </div> <div style="display: flex; gap: 10px;"> Oxygen Demanding Substances ◇ Construction Waste ◇ </div> <div style="display: flex; gap: 10px;"> Toxic Materials ◇ </div> </div>		
Description Suitable Applications Approach Installation Procedures	<p>The reduction of velocity and erosion to a construction site is due to the implementation of this BMP. Bank stabilization prevents or reduces the amount of discharge to a stormwater management system through the use of vegetation, regrading and simple retaining structures.</p> <ul style="list-style-type: none"> ➤ Provides instantaneous protection from surface erosion and other forms of degradation. Forms such as shallow mass wasting, cut and fill slope stabilization, and earth embankment protection. ➤ Low retaining structures. ➤ Simple timber check dams. ➤ Standard earth retaining structures. ➤ Groove or stair step cut grading is recommended for slopes steeper than 3:1 (H:V) ➤ To control erosion vegetation and simple retaining structures should be considered. ➤ Retaining structure must meet two minimums: pressure beneath the base must not exceed the allowable soil pressure, structure should possess adequate strength under loaded conditions. ➤ Cribwall structures consisting of vegetative matters are called "live" cribwall. 	

Activity: Bank Stabilization	SMP-08
Installation Procedures (Continued)	<ul style="list-style-type: none"> ➤ Cribwall structures should start 2-3 feet below ground elevation at the lowest point of the slope to stabilize the structure. ➤ The first course of reinforcement should start 4-5 feet apart and parallel to the slope contour. This enforcement may consist of concrete beams, logs and timber. ➤ Place next course of reinforcement at right angles on top of the first course of action overhanging the front and back of the first course by 3-6 inches. ➤ Other courses of reinforcement will follow the same pattern as the first and second course while being fastened with nails, bars, or bands to the previous course. ➤ Rock Gabions follows the same procedures for foundation stabilization as Cribwall. ➤ The back of the foundation should be exhumed slightly deeper than the front to add stability. ➤ Fabricated wire baskets should be placed at the bottom of the exhumed site prior to rock filling. Rock filling should be between and behind the basket wire. ➤ Continue filling area with wire baskets and rock fill until desired height is reached. ➤ ALL structure construction must be performed by a Licensed Professional Engineer.
Maintenance	<ul style="list-style-type: none"> ➤ Inspect structure before and after rainfalls. ➤ Make repairs when necessary.
Inspection Checklist	<ul style="list-style-type: none"> <input type="checkbox"/> Licensed Professional Engineer's stamp is clearly placed on plans in order to construct the appropriate retention structure. <input type="checkbox"/> Changes to site conditions have been transmitted for review by the Project Engineer.

Activity: Bank Stabilization

Cross section
Not to scale

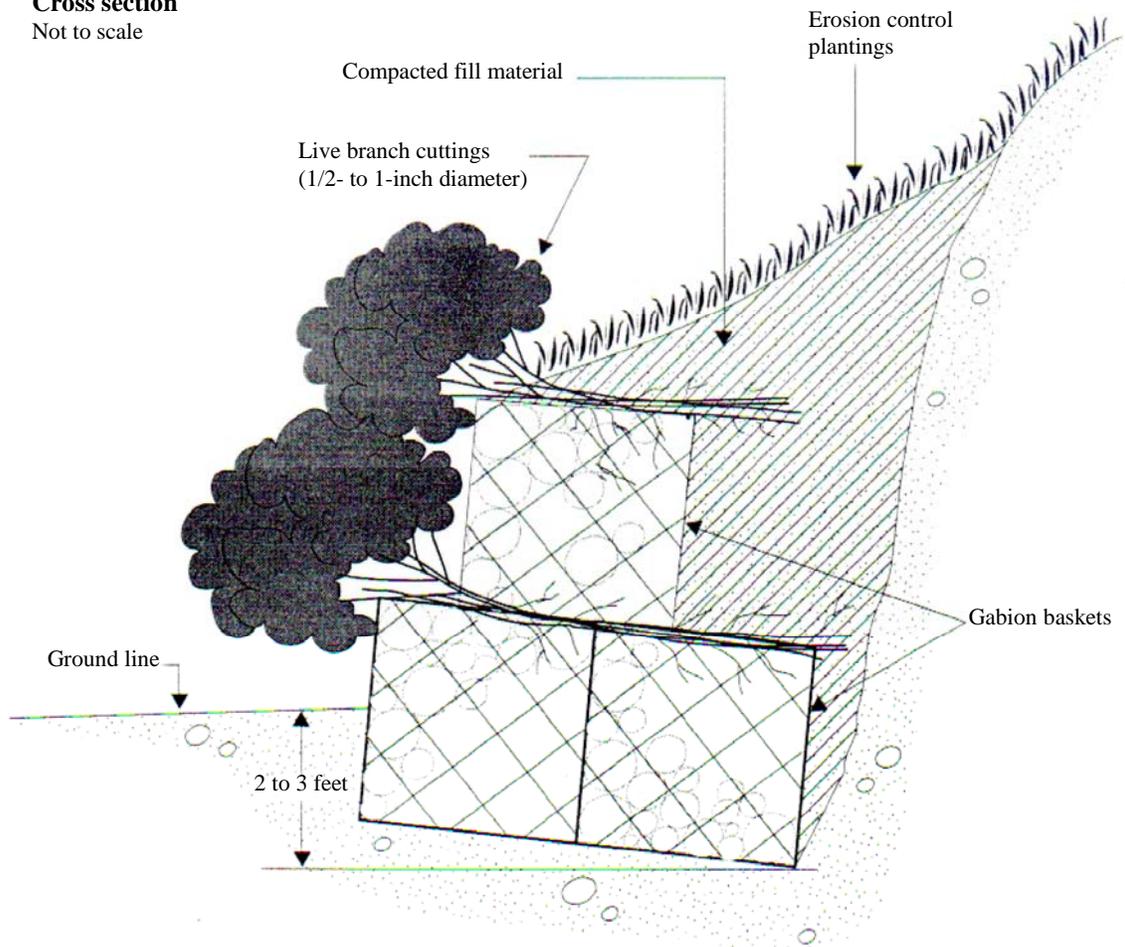


Note:
Rooted/leafed condition of the living
plant material is not representative of
the time of installation.

Figure SMP-08-1
Live Cribwell

Activity: Bank Stabilization

Cross section
Not to scale



Note:
Rooted/leafed condition of the living plant material is not representative of the time of installation.

Figure SMP-08-2
Vegetated Rock Gabions

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p> <p>Activity: Rip-Rap</p>	<p>SMP-09</p>																				
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: Life</p> <p>Acreage Needed: None</p> <p>Estimated Unit Cost:</p> <p>Monthly Maintenance: 0% of Capital Costs</p>	 <div style="text-align: right; margin-top: 10px;">  </div> <div style="text-align: right; margin-top: 10px;">  </div> <table border="1" style="width: 100%; text-align: center; margin-top: 10px;"> <thead> <tr> <th colspan="5">Target Pollutants</th> </tr> <tr> <th>Significant ♦</th> <th colspan="2">Partial ♦</th> <th colspan="2">Low or Unknown ♦</th> </tr> </thead> <tbody> <tr> <td>Sediment ♦</td> <td>Heavy Metals ♦</td> <td>Nutrients ♦</td> <td>Oxygen Demanding Substances ♦</td> <td>Toxic Materials ♦</td> </tr> <tr> <td>Oil & Grease ♦</td> <td>Bacteria & Viruses ♦</td> <td>Floatable Materials ♦</td> <td colspan="2">Construction Waste ♦</td> </tr> </tbody> </table>	Target Pollutants					Significant ♦	Partial ♦		Low or Unknown ♦		Sediment ♦	Heavy Metals ♦	Nutrients ♦	Oxygen Demanding Substances ♦	Toxic Materials ♦	Oil & Grease ♦	Bacteria & Viruses ♦	Floatable Materials ♦	Construction Waste ♦		
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<p>Description Used to protect slopes, stream banks, channels, or other areas subject to erosion.</p> <p>Suitable Applications ➤ Areas subject to wave actions, channels desiring infiltration and around outlets and/or inlets to prevent scour and undercutting are all suitable applications for this BMP</p> <p>Installation Procedures ➤ Clear the area of all brush, trees, stumps, debris, and trash ensuring that no reduction in the design waterway occurs while preparing the rip-rap subgrade.</p> <p> ➤ When used as slope protection, rip-rap should be keyed into the slope toe by at least the greater of 6 inches or one half the designed rip-rap diameter.</p> <p> ➤ Rip-rap should not be placed until final subgrade elevation has been verified by the licensed engineer overseeing design and/or construction.</p> <p> ➤ If a filter or sand/gravel filter on subgrade is required, placement should fall under the direction of approved site plans. Care shall be taken to place rip-rap in such a manner as to avoid displacing or tearing the filter.</p> <p> ➤ When subgrade filters are not required, the subgrade should be compacted as to prevent undercutting or slumping from occurring.</p> <p> ➤ Rip-rap should be of masonry stone that is sound, dense, and durable as described below.</p>																						

Activity: Rip-Rap	SMP-09
Installation Procedures (Continued)	<p data-bbox="464 247 776 281"><i>Rubble-Stone Rip-rap (Plain)</i></p> <ul style="list-style-type: none"> <li data-bbox="448 285 1414 516">➤ Rubble-stone rip-rap should consist of at least 90% of the stone not less than 8 inches wide by 12 inches long by 12 inches deep and should be approximately rectangular in shape. Rubble-stone should be hand placed so that the stones are close together, are staggered at all joints as far as possible, and are placed so as to reduce the voids to a minimum. The main stone should be thoroughly “chinked” or anchored in place with 1-in. to 3-in. stones by throwing them over the surface in any manner that is practical for the smaller stones to fill the voids. <li data-bbox="448 552 1430 617">➤ The standard depth should be 24 inches. The average depth should not be less than the required depth and is determined from evaluation of a 25 square foot surface area. <li data-bbox="448 653 1414 718">➤ When rubble-stone rip-rap is constructed in layers, the layers should be thoroughly tied together with large stones protruding from one layer into the other. <p data-bbox="464 753 808 787"><i>Rubble-Stone Rip-rap (Grouted)</i></p> <ul style="list-style-type: none"> <li data-bbox="448 791 1406 856">➤ Stone placement for rubble-stone rip-rap (grouted) is the same as for rubble-stone rip-rap (plain). The grouting procedure is as follows: <li data-bbox="448 892 1398 1052">➤ When grouting is used, care should be taken to prevent earth or sand from filling the spaces between the stones before the grout is poured. Grout should be composed of one part portland cement and four parts of sand, measured by volume, and mixed thoroughly with sufficient water to a consistency that it will flow into and completely fill the voids. <li data-bbox="448 1087 1422 1289">➤ Immediately before pouring the grout, the stones should be wetted by sprinkling. Beginning at the lower portion of the rip-rap, the grout should be carefully poured into the voids between the stone and at a slow enough rate to prevent oozing to the surface. The pouring of the grout should be accomplished by the use of vessels, chutes, tubes, or hoses of adequate size and shape. Broadcasting, slopping, or spilling of grout from the vessels on the surface of the rip-rap is not allowed. <li data-bbox="448 1325 1430 1390">➤ As soon as any section of the grouted rip-rap has hardened sufficiently, it should be kept moist with water that is free from salt or alkali for a period of not less than 72 hours. <p data-bbox="464 1425 786 1459"><i>Sacked Sand-Cement Rip-rap</i></p> <ul style="list-style-type: none"> <li data-bbox="448 1463 1422 1759">➤ Sand for sacked sand-cement rip-rap may be manufactured or natural but should conform to state regulations. The same is true for Hydraulic cement. The sand and cement should be mixed dry, with a mechanical mixer, in the proportion of one bag (94 pounds) of cement to 5 cubic feet of dry sand, until the mixture is uniform in color. The sand-cement mix should be poured into sacks of approximately 1 cubic foot capacity until they are approximately $\frac{3}{4}$ full. Sacks should be of either cotton or jute standard grade of cloth which will hold the sand-cement mixture without leakage during handling and tamping. The sacks should then be securely fastened with hog rings, by sewing, or by other suitable methods that prohibit leakage of the mixture from the bags. <li data-bbox="448 1774 1430 1871">➤ The sacks of sand-cement should be bedded by hand on the prepared grade with all the fastened ends on the grade and with the joints broken. The completed rip-rap should have a minimum thickness of 10 inches with a tolerance of 3 inches.

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p>	<p>SMP-10</p>																		
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: Life</p> <p>Acres Needed: None</p> <p>Estimated Unit Cost:</p> <p>Monthly Maintenance: 0% of Capital Costs</p>		<p>▨ CL ▨</p> <p>CL</p> <p>Target Pollutants</p> <table border="1"> <tr> <td>Significant ♦</td> <td>Partial ♦</td> <td>Low or Unknown ♦</td> </tr> <tr> <td>Sediment ♦</td> <td>Heavy Metals ♦</td> <td>Nutrients ♦</td> </tr> <tr> <td>Oil & Grease ♦</td> <td>Bacteria & Viruses ♦</td> <td>Floatable Materials ♦</td> </tr> <tr> <td></td> <td></td> <td>Oxygen Demanding Substances ♦</td> </tr> <tr> <td></td> <td></td> <td>Toxic Materials ♦</td> </tr> <tr> <td></td> <td></td> <td>Construction Waste ♦</td> </tr> </table>	Significant ♦	Partial ♦	Low or Unknown ♦	Sediment ♦	Heavy Metals ♦	Nutrients ♦	Oil & Grease ♦	Bacteria & Viruses ♦	Floatable Materials ♦			Oxygen Demanding Substances ♦			Toxic Materials ♦			Construction Waste ♦
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<p>Description</p> <p>Suitable Applications</p> <p>Approach</p> <p>Maintenance</p> <p>Inspection Checklist</p>	<p>To protect against erosion to soil, artificial surfacing of bed, banks, shores or embankments are channel lined. Channel lining is the application of rip-rap (SMP-09) to channels, creeks, streams, ditches and other waterways to provide a barrier against the erosions of the environment during construction.</p> <p>Channel lining is used for several different purposes, one being the promotion of vegetative growth in a drainage way, while another application would result from seeding and mulch not being able to withstand the maximum shear force of channel flow for 2-year, 24-hour flow.</p> <p>➤ Channel Lining is most effective in wet-weather conveyances and has applicable materials such as: Excelsior, jute mats and cells, wood fiber mats and cells, geosynthetic mats or cells, brush layering.</p> <p>➤ Inspect after every storm event ➤ Check Rip-rap BMP for appropriate installation and maintenance processes ➤ Repair damaged material immediately</p> <p><input type="checkbox"/> Adequate coverage is provided to prevent washout. <input type="checkbox"/> Repair torn netting or mats. <input type="checkbox"/> Slope of channel is consistent with contract documents.</p>																			

	<p>New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)</p>	<p>SMP-11</p>															
<p>PLANNING CONSIDERATIONS:</p> <p>Design Life: Life</p> <p>Acreage Needed: None</p> <p>Estimated Unit Cost:</p> <p>Monthly Maintenance: 0% of Capital Costs</p>		<p><input type="checkbox"/> TD <input type="checkbox"/></p>															
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<p>Description</p> <p>Suitable Applications</p> <p>Installation Procedures</p>	<p>The offset of runoff on a construction site to sediment basins or traps happens as a result of slope drains, swales and other numerous drainage systems. These temporary drains offer functionalities such as conveyance of runoff down cut or fill slopes, subsurface drains that drain off excessive soil saturation, minimize the sheet flow over slope surfaces and rescue sedimentation.</p> <ul style="list-style-type: none"> ➤ The digression of upslope runoff through drains and diversions around un-stabilized or disturbed areas can be accomplished by utilizing temporary drains and swales. These two methods bypass disturbed or sensitive areas on the construction site and transport runoff to stable and/or protected areas or to permanent infrastructures. ➤ Drains act to prevent slope failures, damage to adjacent property, erosion and sediment control and removes excess water from soil. ➤ Diversions act to catch runoff at the end of an undisturbed slope before entering a bared area, direct runoff, preserve stable conveyance and to prevent overflow. <p>A diversion does not itself control erosion or remove sediment from runoff; it prevents erosion by directing runoff to an erosion control device such as a sediment trap or directing runoff away from an erodible area. Temporary diversions should not adversely impact adjacent properties and must conform to local floodplain management regulations, and should not be used in areas with slopes steeper than 10%. The advantages of the temporary earth dike include the ability to handle flows from large tributary areas. Once stabilized, diversions require relatively little maintenance. Additionally, they are relatively inexpensive to install since the soil material required for construction may be available on-site, and can be constructed as part of the initial grading operations, while the equipment is on-site.</p>																

Activity: Temporary Diversions, Drains and Swales**Installation Procedures (Continued)**

Temporary swales will effectively convey runoff and avoid erosion if constructed and maintained properly:

- Size temporary swales in the same manner as a permanent channel.
- A permanent channel must be designed by a licensed professional civil engineer.
- At a minimum, the swale should conform to predevelopment flow patterns and capacities.
- Construct the swale with an uninterrupted, positive grade to a stabilized outlet.

Drains

Diversion drains are only effective if they are properly installed. Swales are more effective than dikes because they tend to be more stable. The combination of a swale with a dike on the downhill side is the most cost-effective diversion.

- Can be placed on or buried underneath the slope surface.
- Should be anchored at regular intervals of 50 to 100 ft.
- If a slope drain conveys sediment-laden water, direct flows to a sediment trap or basin.
- When using slope drains, limit tributary area to 2 acres per pipe. For larger areas, use a rock-lined channel or a series of pipes.
- Maximum slope generally limited to 2:1 (H: V), as energy dissipation below steeper slopes is difficult.
- Drain or swale should be laid at a grade of at least 1 percent, but not more than 15 percent.
- The swale must not be overtopped by the 10-year, 24-hour storm, meeting or exceeding the design criteria stated above.
- Remove all trees, stumps, obstructions, and other objectionable material from the swale when it is built.
- Compact any fill material along the path of the swale.
- Stabilize all swales immediately. Seed and mulch swales at a slope of less than 5 percent, and use rip-rap or sod for swales with a slope between 5 and 15 percent.

Activity: Temporary Diversions, Drains and Swales**Installation Procedures (Continued)**

- Do not operate construction vehicles across a swale unless a stabilized crossing is provided.
- Direct surface runoff to slope drains with diversion swales, dikes and berms.
- When installing slope drains:
 - Install slope drains perpendicular to slope contours.
 - Compact soil around and under entrance, outlet, and length of pipe.
 - Securely anchor and stabilize pipe and appurtenances into soil.
 - Check to ensure that pipe connections are watertight.
 - Protect inlet and outlet of slope drains: use standard flared end section at entrance for pipe slope drains 12 in. and larger.
 - Protect area around inlet with filter cloth.
 - Protect outlet with geosynthetics and rip-rap or other energy dissipation device. For high-energy discharges, reinforce rip-rap with concrete or use reinforced concrete devices.
- When installing subsurface drains:
 - Slightly slope subsurface drain towards outlet.
 - Check to ensure that pipe connections are watertight.
 - Review relative size of soil and slot/perforation size in the pipe to prevent sediment from entering pipe.
 - Relief drains lower groundwater table. Install parallel to slope and drain to side of slope. Use gridiron, herringbone or random pattern.
 - Interceptor drains prevent excessive soil saturation on sensitive slopes. Install perpendicular to slope and divert discharge to the side of the slope.

Diversions

- Select design flows and safety factor based on careful evaluation of risks due to erosion of the measure, over topping, flow backups, or washout.
- High flow velocities may require the use of a lined ditch, or other methods of stabilization.
- When installing diversion ditches and berms:
 - Protect outlets from erosion.
 - Utilize planned permanent ditches/berms early in construction phase when practicable.
- All dikes and berms should be compacted by earth-moving equipment.
- All dikes should have positive flow to a stabilized outlet.
- Top width may be wider and side slopes may be flatter at crossings for construction traffic.
- Dikes should direct sediment-laden runoff into a sediment trapping device.

Activity: Temporary Diversions, Drains and Swales**Installation
Procedures
(Continued)**

- Dikes should be stabilized with vegetation, chemicals, or physical devices.
- Compact any fills to prevent unequal settlement.
- Dikes should remain in place until disturbed areas are permanently stabilized.
- Examine the site for run-on from off-site sources (control off-site flows through or around site).
- Select flow velocity limit based on soil types and drainage flow patterns for each project site
- Establish a maximum flow velocity, shear stress or 3-5 ft/s, for using earth dikes and swales, above which a lined ditch must be used.
- Design an emergency overflow section or bypass area for larger storms that exceed the 10-year design storm.
- Conveyances must be lined or reinforced when velocities exceed allowable limits for soil. Consider use of geotextiles, engineering fabric, vegetation, rip-rap or concrete.

Maintenance

- Inspect drains before and after each storm event
- Inspect weekly until drainage area is stabilized
- Maintain drains and swales to eliminate erosion, accumulation of debris and sediment
- Check status of water ponding activities. Remove water if such activities occur
- Temporary conveyances should be removed when surroundings become stable or when the construction is complete

**Inspection
Checklist**

- Routine visit after every heavy net water event.
- No evidence of washout, accumulated debris and build up in ditches or berms.

	New Albany, Indiana Stormwater Best Management Practices (BMPs) Sediment Management Practices (SMPs)	SMP-12
	Activity: Filter Strips	
PLANNING CONSIDERATIONS: Design Life: 1 yr Acreage Needed: Minimal Estimated Unit Cost: Avg: \$100 Range: \$50-\$150 Monthly Maintenance: 60% of Installation		 FS 
		 FS
	Target Pollutants	
	<div style="display: flex; justify-content: space-around;"> Significant ♦ Partial ♦ Low or Unknown ♦ </div>	
	<div style="display: flex; justify-content: space-between;"> Sediment ♦ Heavy Metals ♦ Nutrients ♦ Oxygen Demanding Substances ♦ Toxic Materials ♦ </div> <div style="display: flex; justify-content: space-between;"> Oil & Grease ♦ Bacteria & Viruses ♦ Floatable Materials ♦ Construction Waste ♦ </div>	
Description Suitable Applications	<p>Utilizing vegetation allows soil to be protected from erosion and velocity flow while reducing or preventing discharge of pollutants to the storm system or waterways. This method uses filter strips to accomplish the goal of filtering sediment needing to be settled out of runoff.</p> <ul style="list-style-type: none"> ➤ Areas that need immediate cover (such as sodding and plugging) due to having turf prior to construction, areas subject to erosion (graded or cleared areas), and permanent vegetative areas ➤ Wetlands and/or sensitive water bodies ➤ Steep and unstable slopes ➤ Temporary or permanent buffer areas that include the floodway and 50 feet perpendicular to the floodway. If a floodway has not been determined then the buffer must be 25 feet perpendicular from each side of the stream bank, creek, or unnamed waterway under "bank-full conditions" ➤ Area within the buffer must not be cleared. It should be surveyed, flagged and delineated by a colored temporary fence and these instructions explained to each employee on the site 	

Activity: Filter Strips	SMP-12
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Installation Procedures	<ul style="list-style-type: none"> ➤ Cultivate the area then install the irrigation system ➤ Areas should be excavated and backfilled (plant holes) ➤ Areas are to be fine graded and rolled prior to sodding ➤ Sodded areas are to be uniform and smooth (prior to sodding) and distributed with top soil were needed (to even out the area) ➤ Sod end of adjacent strips should stagger by half the width or length ➤ Areas adjacent to sidewalks, concrete headers, header boards and other paved borders shall be 1.5 in-0.25 in below the top grade of the facilities ➤ Seed beds should be added to fertilizers and added to the correct site condition to slow the velocity of runoff and allow sediment to take place ➤ Roll sod to eliminate air pockets and allow a closer contact with the soil. ➤ Water sod so that the soil at a minimum depth of 4 feet is moistened ➤ Do not allow sod to dry out ➤ Sod should not be planted on slopes that are greater than 3:1 (H:V) if no mowing is to occur ➤ Vegetate sodded areas ➤ Do not use buffer strip for vehicular traffic ➤ All fertilization efforts should follow the outline of the state, county, and/or local government
Maintenance	<ul style="list-style-type: none"> ➤ Inspect weekly after rainfall events until turf is established ➤ Mowing shall consist of "tall" mowing, weeding and the irrigation system is growing and operating properly ➤ Fertilize as needed and as indicated by soil testing ➤ Overseed, repair bare spots, or apply additional mulch as necessary
Inspection Checklist	<ul style="list-style-type: none"> <input type="checkbox"/> Check for vehicular traffic. <input type="checkbox"/> Dead areas requiring seeding, plugging or resodding <input type="checkbox"/> Under wash turf compacted.

Activity: Temporary Inlet Protection**Installation Procedures (Continued)**

high. Wire mesh should be over the outside vertical face of the concrete blocks to prevent stone from washing through blocks. Pile wash stone against the wire mesh to the top of the blocks. Use $\frac{3}{4}$ to 3 in. gravel.

- **Gravel and Wire Mesh Filter** is used on curb or drop inlets where construction equipment may drive over the inlet. Place over drop inlet so that wire extends on both sides at a minimum of 1 ft. Use hardware cloth or wire mesh with $\frac{1}{2}$ in. opening. Place $\frac{3}{4}$ to 3 in. gravel over the filter fabric/wire mesh. Depth should be 12 inches over the entire inlet opening. Excavate drop inlet sediment trap, minimum storage capacity calculated at the rate of 67 cubic yards per acre (yd^3/ac) of tributary area should be sized.
- **Sand Bag Barriers** are used to create a small sediment trap upstream of inlets on sloped, paved streets. Bags should be made of geotextile material and fill with $\frac{3}{4}$ in. rock or $\frac{1}{4}$ in. pea gravel. Leave room upstream for settlement and ponding. Place several layers of bags and pack them tightly together leaving a gap of one bag on the top row to serve as a spillway.
- Excavated Drop Inlet Sediment Traps are excavated areas around inlets to trap sediment.
- Gates and inlets should be a sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps 1 to 2 feet with 2:1 (H:V) side slopes around the inlet.
- Provide areas around the inlet for water to pond without flooding structures and property.

Maintenance

- Replace clogged fabric immediately.
- Remove sediment when depth exceeds half the height of the filter or half the depth of the sediment trap.
- Inspect all inlets and catch basins weekly before and after each rain event.
- Inspect once every 24 hours during heavy rainfall events.
- After site is stabilized remove all inlet devices within 30 days.
- Bring disturbed area to final grade and smooth and compact it.
- Clean around and inside the storm drain inlet.

Inspection Checklist

- The stakes of filter fabric fence are secure.
- The filter fabric is clean and not torn or clogged.
- Sediment behind the silt fence does not exceed $\frac{1}{3}$ height of the fabric fence.
- Blocks of the block gravel filter are in good working conditions. Gravel around the blocks is preventing wash through.
- Sediment from behind the gravel pack does not exceed $\frac{1}{3}$ height of the fabric fence.
- Bags are cleaned and properly maintained.
- Structures have not been displaced.
- Volume of sediment is less than $\frac{1}{2}$ of the basin's volume.

Activity: Temporary Outlet Protection**Installation
Procedures**

- Should be designed and sized by a licensed professional engineer as a part of the culvert, conduit or channel design.
- Apply a rip-rap apron for temporary use during construction
- Apron should consist of a zero grade, alignment with receiving stream, avoid damaging the underlain filter fabric. Keep apron straight throughout the length of the stream curving in the upper section of the harpoon if curve is needed. Bank reinforcement should be downstream to account for the curved apron

Maintenance

- Grouted or wire-tied rock rip-rap minimizes maintenance requirements
- Inspect weekly and before and after rainfall events
- Inspect apron for displacement and/or damage to the underlying fabric, scour beneath the rip-rap and around outlet.
- Remove devices as soon as work is completed to the construction site

**Inspection
Checklist**

- Rock washed out by large storms is replaced.
- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Grouted rip-rap may break up in areas of freeze and thaw.
- Grouted rip-rap may break up from hydrostatic pressure without adequate drainage.