

709 – Sediment Barriers & Filters

709.06 Rock Berm

Definition:

A rock berm is a temporary barrier of aggregate to intercept sediment-laden stormwater run-off to result in temporary pooling and deposition of sediment.



Rock berm end terminated upslope to prevent flow-arounds

Exhibit 709.06-A.
Source: IDEM

Purpose:

- To trap sediment from small, disturbed areas by reducing the velocity of sheet flows and small concentrated flows. Rock berms capture sediment by ponding run-off water to allow sediment deposition, not by filtration through the berm.
- Due to their strength, rock berms can be implemented where flooding or stream overflows are expected to inundate and damage other sheet-flow control measures.
- Due to their ease of construction, rock berms can be installed on frozen, soft, or dense soil conditions, over tree roots, shallow rock, or irregular surface conditions where installation of other sheet-flow control measures or diversionary measures may not be practical.

Specifications:

Implementation Criteria

Locate the rock berm so that it is parallel to the contour of the slope (as much as is possible) or according to plan requirements and at least 10 feet beyond the toe of the slope or toe of the planned fill to provide a sediment pooling or storage area. If necessary, excavate to provide a level 10-foot-wide (minimum) pooling area behind the planned berm.

709.06 Rock Berm

The table below provides the limitations for use of the rock berm.

Slope Steepness Restrictions		
Percent slope		Maximum Distance
< 2%	< 50:1	400 feet
2% - 5%	50:1 to 20:1	300 feet
5% - 10%	20:1 to 10:1	200 feet
10% - 20%	10:1 to 5:1	100 feet
> 20% ¹	> 5:1	60 feet

Exhibit 709.06-B.

¹ Consider other alternatives.

Note: Multiple rows of rock berms are not recommended on the same slope.

- When rock berms are implemented as a perimeter control practice not installed on the contour that results in diversion and concentrated flows then watersheds may be controlled by a series of J-hooks, (refer to Exhibit 709.06-I). J-hooks shall be installed in locations to maximize water storage that result in discharges that prevent the concentrated flows. Watersheds up stream of the J-hook shall not exceed 1 acre.
- J-hooks shall be a minimum of 6 inches higher than the top elevation of the perimeter rock berm to prevent bypass flows to the downstream J-hook cells. Each J-hook cell discharges through the perimeter rock berm.
- Flood prone areas: Placement of the rock berm practice should be located such that the aggregate does not end up in the waterway. Create as much distance as possible from the berm and the waterway.
- Locate or configure such that it is accessible for maintenance (removal of sediment and berm repair).
- Do not implement across or within water resource areas or channels without appropriate permitting.

Rock Berm Specifications:

- Berm height: 2 to 3 feet.
- Top width (riprap): 1 foot.
- Front slope (pooling side): 2:1 or flatter.
- Back slope: 2:1 or flatter.
- Pooling side face of berm: covered with facing stone 1 foot thick of INDOT CA No. 8. Aggregate (refer to Appendix D).
- Geotextile (optional): located under the total width of the berm (refer to Appendix C).

Materials:

- Rock berm: INDOT uniform A riprap or revetment riprap (refer to Appendix D).

709.06 Rock Berm

- Facing stone (pooling side face of berm): INDOT CA No. 8. aggregate (refer to Appendix D). The purpose of this aggregate is to cause flow reduction that results in the detention or pooling of run-off to allow for sediment to settle out and sediment deposition to occur.
- Geotextile fabric (optional): (refer to Appendix C).

Installation:

- (1) If rock berm location is on undisturbed or unexcavated areas, then remove all debris, cut off woody vegetation at ground level (root mass/stump can be left if place), and cut or remove any dense vegetative cover to allow good aggregate ground contact (grass cover can be left in place).
- (2) Place a berm of riprap according to plan requirements. Maintain a level top elevation to prevent overtopping at low points. Terminate rock berm upslope 6 inches above the top elevation to prevent flow around berm ends.
- (3) Where required, install J-hook riprap berms by extending rock berms upslope perpendicular to the perimeter berm so that they terminate 6 inches above the top elevation to prevent flow around J-hook ends (refer to Exhibit 709.06-I).
- (4) Cover upstream face of the riprap berm and J-hooks where installed with a 1-foot thick layer of INDOT CA No. 8 aggregate (refer to Appendix D).
- (5) Stabilize any disturbed areas downslope of the berm with temporary seeding and mulching at a minimum or with other appropriate stabilization measures.
- (6) Seed and mulch any disturbed areas excavated to provide level pooling areas upslope of the berm since these areas may be left idle or inactive.

Maintenance:

- Make needed repairs immediately, such as riprap displacement and facing stone movement.
- Inspect prior to predicted or anticipated significant rain events and restore any practice element as needed to maintain practice function.
- At a minimum, inspect within 24 hours of a rain event.
- Check rock berm for overflow low points and stone displacement areas. Promptly restore stone displacements and take care to maintain a level top elevation of the berm as conditions permit. If low discharge points result in erosion scour or gully action and cannot be avoided or remedied, consider implementing a stable riprap outlet apron and extending to receiving channels or stable locations.
- Where repeated overflows have occurred, evaluate the watershed for the cause of the excessive run-off overflows. Evaluate the need for additional practices and implementation of J-hooks to minimize concentration of run-off.
- If flows have gone around the ends of the berm, the ends need to be extended and raised.
- Remove sediment when it has accumulated to one-third the effective height of the berm.
- When the contributing drainage area has been stabilized, remove and properly dispose of all sediment and construction material, then stabilize any resulting disturbed areas with the appropriate practice.

709.06 Rock Berm



Exhibit 709.06-C. A rock berm is implemented at the base of a fill-slope area and has sufficient pooling area for sediment trapping. The rock berm was selected due to its increased strength and ability to accommodate a larger watershed.

Source: IDEM



Exhibit 709.06-D. Rock berms have been installed along the margins of the stream channel to protect it from sediment discharges and as a barrier to construction impacts.

Source: IDEM

709.06 Rock Berm



Exhibit 709.06-E. Rock berms have been installed along the margins of the stream channel to protect it from sediment discharges and as a barrier to construction impacts.

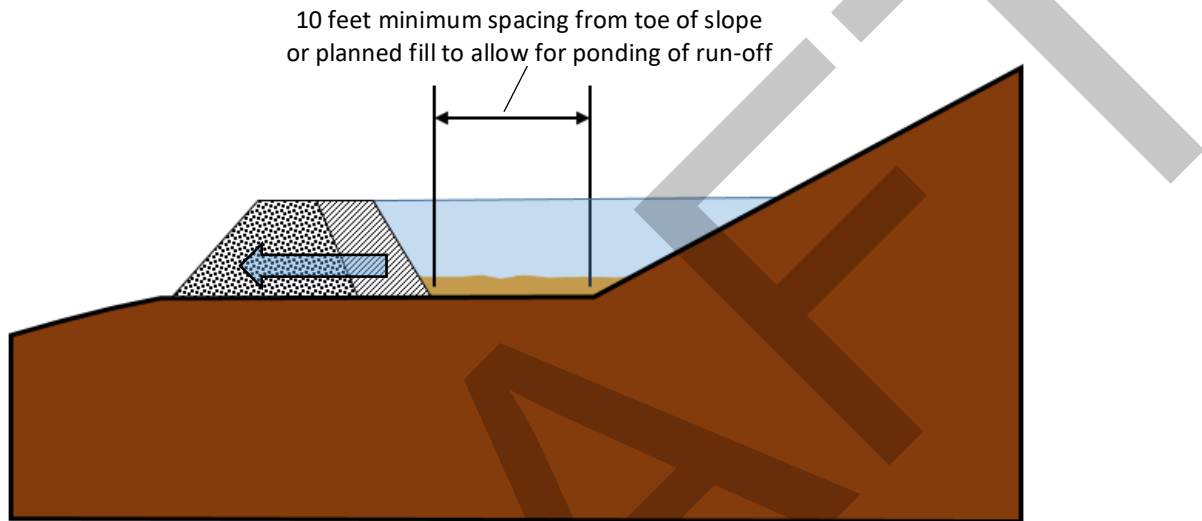
Source: IDEM



Exhibit 709.06-F. Rock berms have been installed along the margins of the stream channel to protect it from sediment discharges and as a barrier to construction impacts. Leveling has been done upslope of the berm to facilitate berm installation and to provide additional pooling storage area.

Source: IDEM

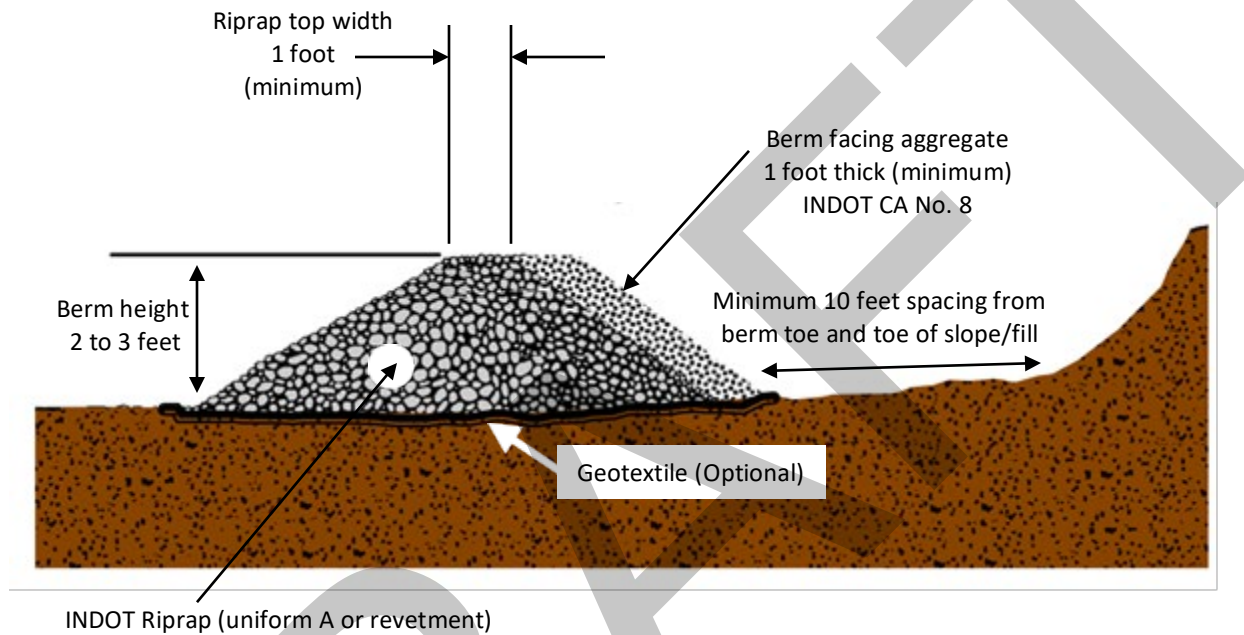
TEMPORARY ROCK BERM TYPICAL PRACTICE DIAGRAM (NOT TO SCALE)



Notes:

- Provide at least 10 feet beyond the toe of the berm and the toe of the slope or planned fill to provide a sediment pooling or storage area. If necessary, excavate to provide a level 10-foot-wide (minimum) pooling area behind the planned berm.
- The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams/drawings are to be used to communicate the concepts for implementation of this control measure.

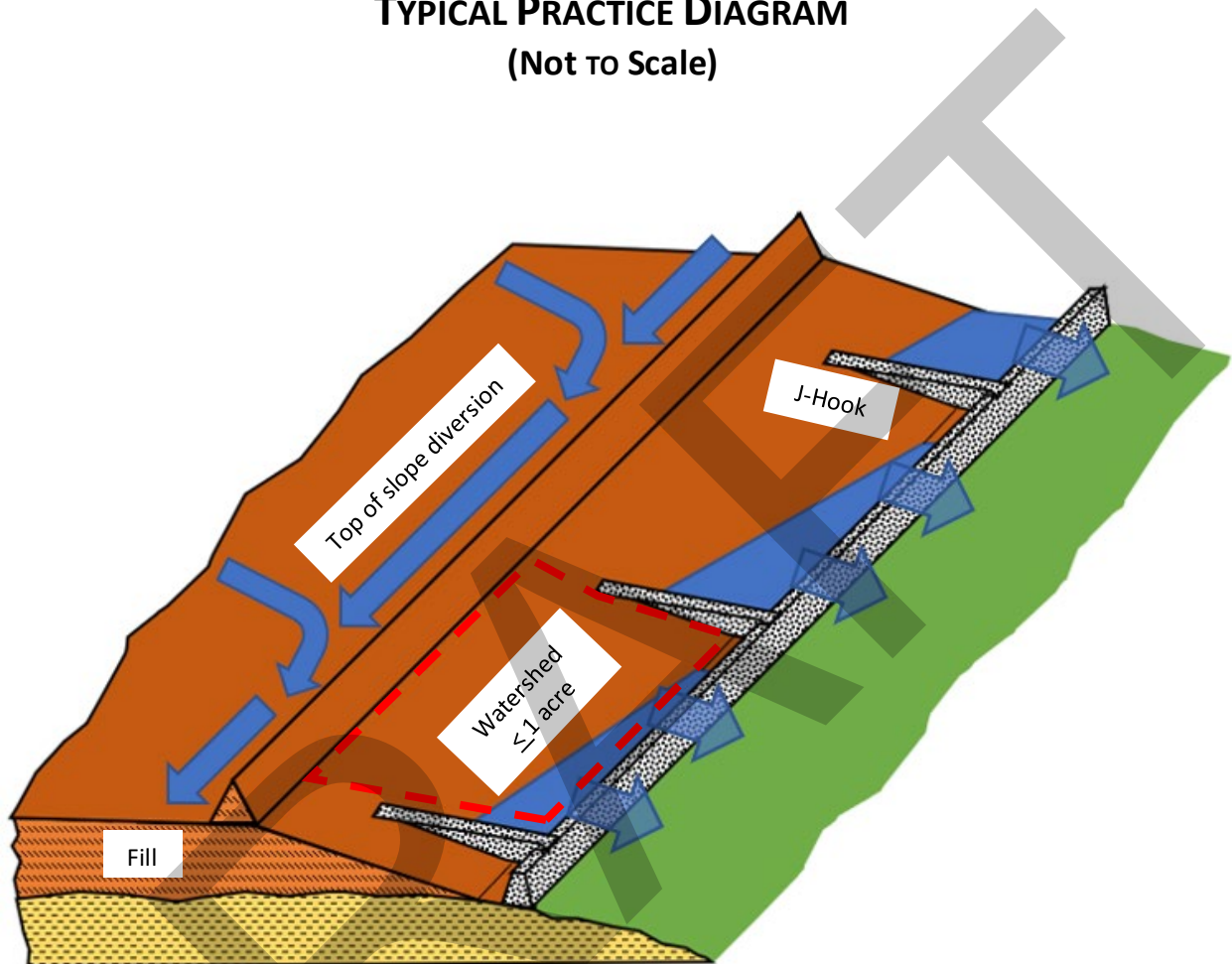
TEMPORARY ROCK BERM TYPICAL PRACTICE DIAGRAM (NOT TO SCALE)



Notes:

- Provide at least 10 feet beyond the toe of the berm and the toe of the slope or planned fill to provide a sediment pooling or storage area. If necessary, excavate to provide a level 10-foot-wide (minimum) pooling area behind the planned berm.
- The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams/drawings are to be used to communicate the concepts for implementation of this control measure.

TEMPORARY ROCK BERM WITH J-HOOKS TYPICAL PRACTICE DIAGRAM (Not to Scale)



Notes:

- Run-off controls: top of slope diversion diverts run-off to appropriately sized concentrated flow sediment controls such as temporary sediment traps or basins.
- Maintain watershed of each J-hook cell to be 1 acre or less.
- The illustrations in this exhibit are not intended to serve as construction drawings. The diagrams/drawings are to be used to communicate the concepts for implementation of this control measure.