

Sediment Bale Barrier (Non-Channel) (1055)

Wisconsin Department of Natural Resources
Technical Standard

I. Definition

A temporary sediment barrier consisting of a row of entrenched and anchored straw bales, hay bales or equivalent material used to intercept sediment-laden sheet flow from small drainage areas of disturbed soil.

II. Purpose

The purpose of this practice is to reduce slope length of the disturbed area and to intercept and retain transported sediment from disturbed areas.

III. Conditions Where Practice Applies

A. This standard applies to the following applications where:

1. Erosion occurs in the form of *sheet and rill erosion*¹. There is no concentration of water flowing to the barrier (*channel erosion*).
2. Where adjacent areas need protection from sediment-laden runoff.
3. Effectiveness is required for less than 3 months.
4. Conditions allow for the bales to be properly entrenched and staked as outlined in the Criteria Section V.

B. Under no circumstance shall sediment bale barriers be used in the following applications:

1. Below the ordinary high watermark or placed perpendicular to flow in streams, swales, ditches or any place where flow is concentrated.

2. Where the maximum gradient upslope of the sediment bale barriers is greater than 50% (2:1).

IV. Federal, State, and Local Laws

Users of this standard shall be aware of applicable federal, state, and local laws, rules, regulations, or permit requirements governing the use and placement of the sediment bale barrier. This standard does not contain the text of federal, state, or local laws.

V. Criteria

This section establishes the minimum standards for design, installation and performance requirements.

A. Placement

1. At a minimum, sediment bale barriers shall be placed in a single row, lengthwise on the contour, with the ends of adjacent sediment bale barriers tightly abutting one another. The holes between bales shall be chinked (filled by wedging) with straw, hay or equivalent material to prevent water from escaping between the bales.
2. The maximum allowable slope lengths contributing runoff to a sediment bale barrier are specified in Table 1.

Table 1.	
Slope	Barrier Row Spacing
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 33%	25 feet
33 to 50%	20 feet
> 50%	Not Permitted

3. Sediment bale barriers shall not be placed perpendicular to the contour.
 4. The end of the sediment bale barrier shall be extended upslope to prevent water from flowing around the barrier ends.
- B. Height – Installed sediment bale barrier shall be a minimum of 10 inches high and shall not exceed a maximum height of 20 inches from ground level.
- C. Anchoring and Support
1. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a sediment bale barrier and the length of the proposed barrier to a minimum depth of 4 inches. After bales are staked and chinked, the excavated soil shall be backfilled and compacted against the barrier. Backfill to ground level on the down slope side. On the upslope side of the sediment bale barrier backfill to 4 inches above ground level.
 2. At least two wood stakes, "T" or "U" steel posts, or ½ inch rebar driven through at equidistance along the centerline of the barrier shall securely anchor each bale. The minimum cross sectional area for wood stakes shall be 2.0 by 2.0 inches nominal. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes shall be driven a minimum 12-inches into the ground to securely anchor the sediment bale barriers.
 3. Bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales

in order to prevent deterioration of the bindings.

VI. Considerations

- A. Improper placement as well as improper installation and maintenance of sediment bale barriers will significantly decrease the effectiveness of this practice.
- B. Sediment bale barriers should not be used upslope of the disturbed area.
- C. A double row of sediment bale barriers may be installed in areas where additional protection is needed.
- D. For safety, place all anchoring flush with the sediment bale barrier or cap any exposed anchoring device.

VII. Plans and Specifications

- A. Plans and specifications for installing sediment bale barriers shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. The plans and specifications shall address the following:
 1. Location of sediment bale barrier
 2. Contributory drainage area
 3. Schedules
 4. Standard drawings and installation details
 5. Restoration after removal
- B. All plans, standard detail drawings, or specifications shall include schedule for installation, inspection, and maintenance. The responsible party shall be identified.

VIII. Operation and Maintenance

- A. Sediment bale barriers shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.
- B. Damaged or decomposed sediment bale barriers, any undercutting, or flow channels

around the end of the sediment bale barriers shall be repaired.

- C. Sediment shall be properly disposed of once the deposits reach 1/2 the height of the sediment bale barrier.
- D. Sediment bale barriers and anchoring devices shall be removed and properly disposed of when they have served their usefulness, but not before the upslope areas have been permanently stabilized.
- E. Any sediment deposits remaining in place after the sediment bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

IX. Definitions

Channel Erosion (III.A.1): The deepening and widening of a channel due to soil loss caused by flowing water. As rills become larger and flows begin to concentrate soil detachment occurs primarily as a result of shear. The transport capacity of the flow in a channel is based on the availability of sediment and is a monatomic function of velocity.

Sheet and Rill Erosion (III.A.1): Sheet and rill erosion is the removal of soil by the action of rainfall and shallow overland runoff. It is the first stage in water erosion. As flow becomes more concentrated rills occur. As soil detachment continues or flow increases, rills will become wider and deeper forming gullies.