CATEGORY: Runoff Management

USE GROUP: Temporary or Permanent

EARTH BERMS AND DRAINAGE SWALES

ISSUED: 10-1-2008

DEFINITION AND PURPOSE:

A compacted earth or gravel ridge, excavated channel or a combination of ridge and channel designed to direct runoff away from or around disturbed areas. Diversions built on a level contour are used in combination with temporary slope drains to provide adequate conveyance. Diversions built with positive drainage slopes release runoff into additional BMPs, such as sediment traps or level spreaders.

APPROPRIATE APPLICATIONS:

These features may be used to: convey surface runoff down sloping land, intercept and divert runoff to avoid sheet flow over sloped surfaces, divert and direct runoff towards a stabilized watercourse, drainage pipe or channel, and intercept runoff from paved surfaces. Berms, swales, and lined ditches also may be used: below steep grades where runoff begins to concentrate, along roadways and facility improvements subject to flood drainage, at the top of slopes to divert run-on from adjacent or undisturbed slopes. Also, at bottom and mid-slope locations to intercept sheet flow and convey concentrated flows.

CONDITIONS FOR EFFECTIVE USE:

Type of Flow: Sheet flow and low-volume concentrated flows.

Contributing Area: Contributing slope length-300 feet maximum.

WHEN BMP IS TO BE INSTALLED:

Prior to disturbance of natural vegetation on slopes and at intervals during construction of fill slopes.

STANDARDS AND SPECIFICATIONS:

Care must be applied to correctly size and locate berms, swales, and ditches. Excessively steep, unlined berms and swales are subject to gully erosion. Grade and compact channel and/or ridge. Conveyances should be stabilized with vegetation or a protective lining. Provide stabilized outfall areas. Other BMPs, such as check dams and erosion control blankets, may be necessary to prevent scour and erosion.

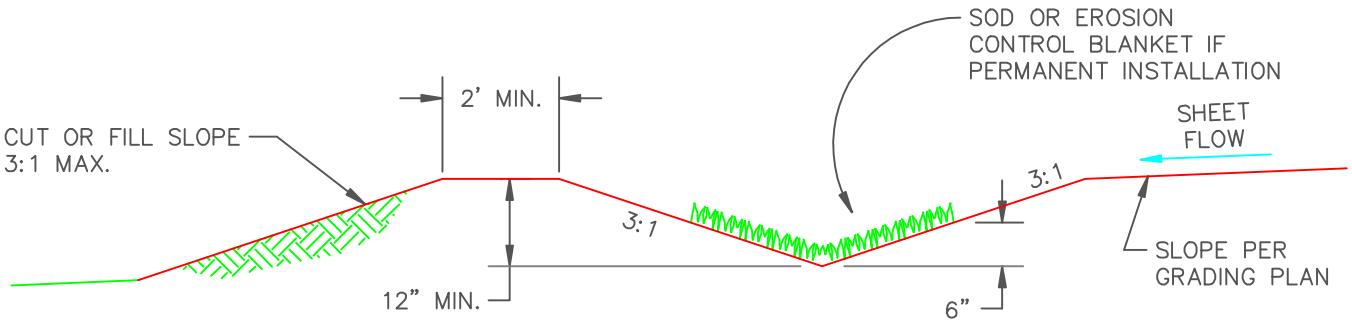
OPERATION AND MAINTENANCE PROCEDURES:

Inspect at least once per seven calendar days, or within a reasonable time period (not to exceed 48 hours) of a rainfall event which causes stormwater runoff to occur on-site. Inspect channel linings, embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment, repair linings and embankments as needed-replace riprap, linings or soil stabilizers as needed.

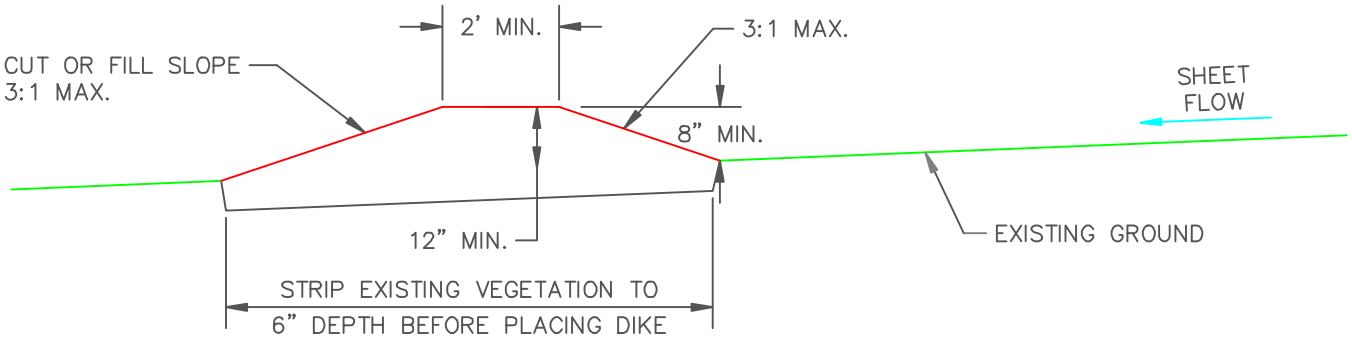
SITE CONDITIONS FOR REMOVAL:

Temporary diversions should be removed as soon as the surrounding drainage area has been stabilized.

TYPICAL DETAILS: RM-2.1, RM-2.2, and RM-2.3



SWALE



DIKE

NOTES:

1. DIKE SHALL BE COMPACTED TO DENSITY EQUAL TO THAT SPECIFIED FOR ADJOINING AREA (90% STANDARD PROCTOR DENSITY, MINIMUM).
2. MINIMUM 1% GRADE MUST BE PROVIDED FOR SWALE OR ALONG UPSLOPE SIDE OF DIKE FOR PROPER DRAINAGE.

Modified From Greene County Missouri – Storm Water Design Standards

NTS

City of Springfield, Missouri

Department of Public Works
Storm Water Services Division

EARTH BERMS & SWALES

Figure: RM–2.1
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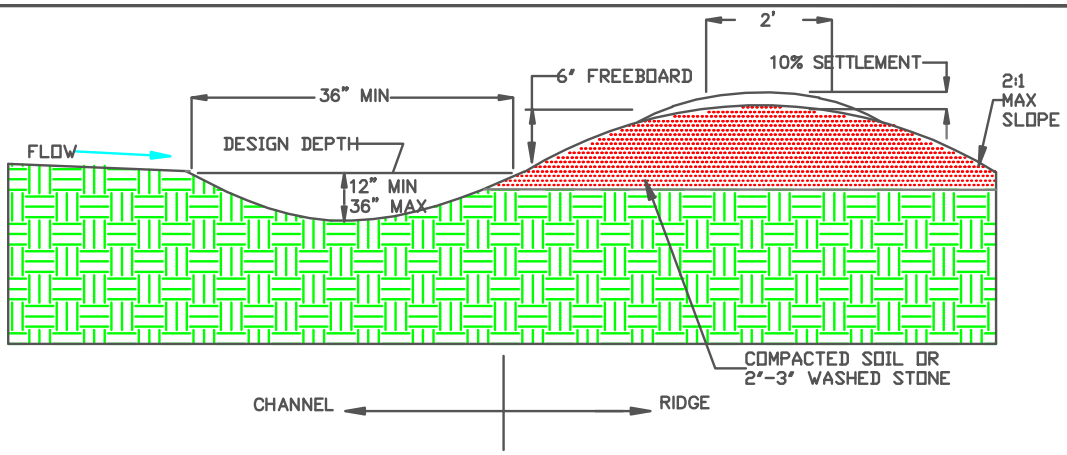
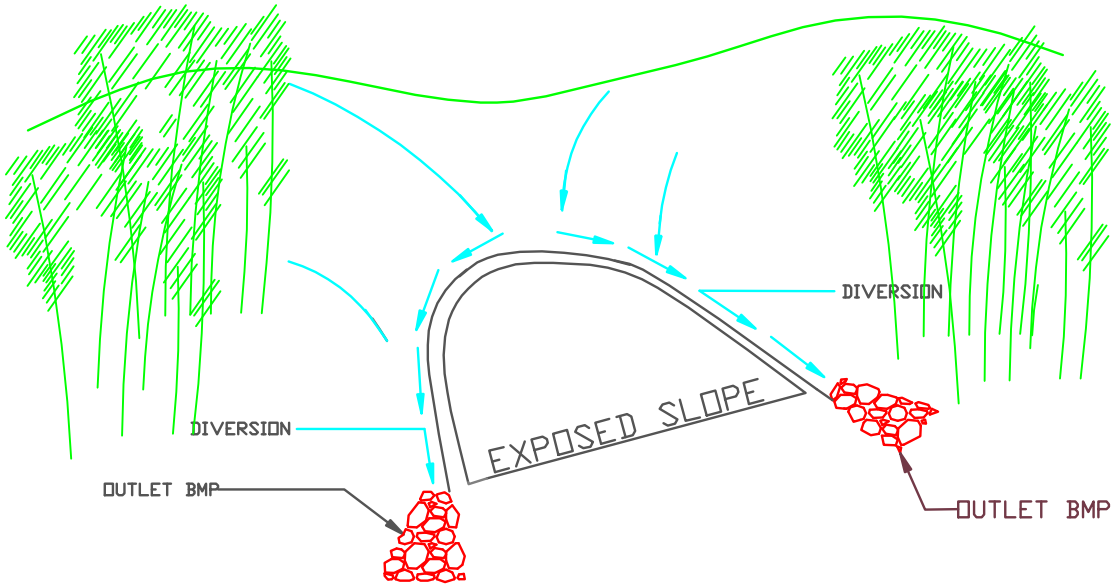
Revised:

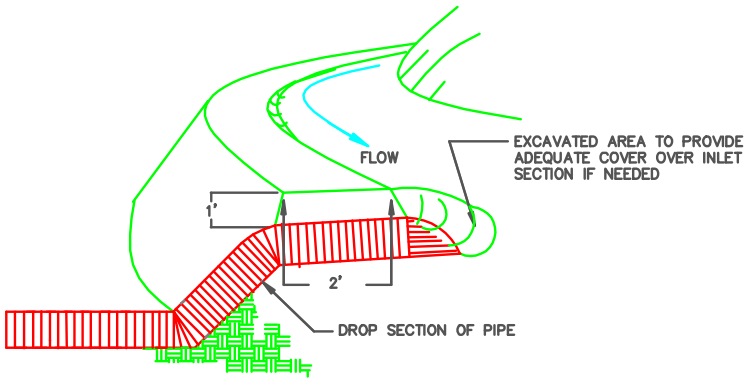


CROSS SECTION

ALL SURFACE STABILIZED WITH MULCH, SEED OR GRAVEL



TYPICAL PERIMETER PROTECTION



TYPICAL TOP OF SLOPE INSTALLATION

Modified from Chesterfield, Missouri Model BMPs for Land Disturbance

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EARTH BERMS & SWALES

Figure: RM-2.2
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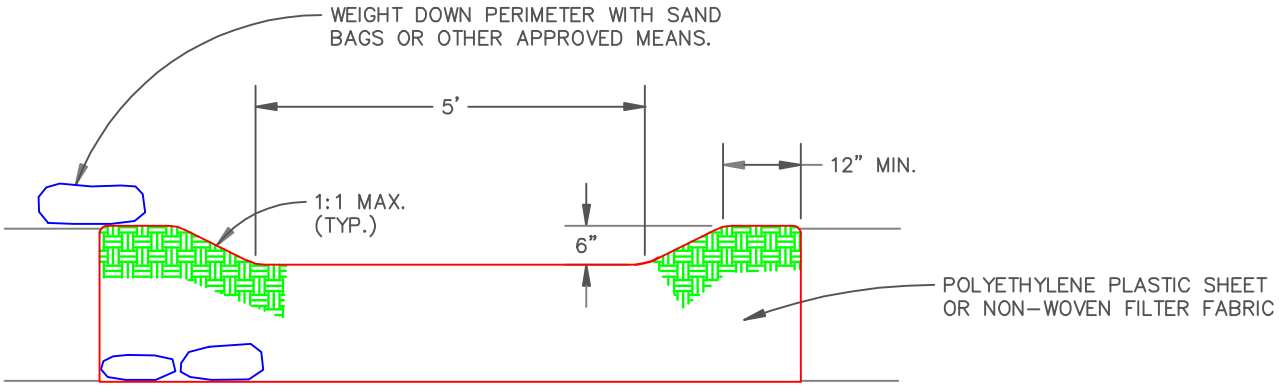
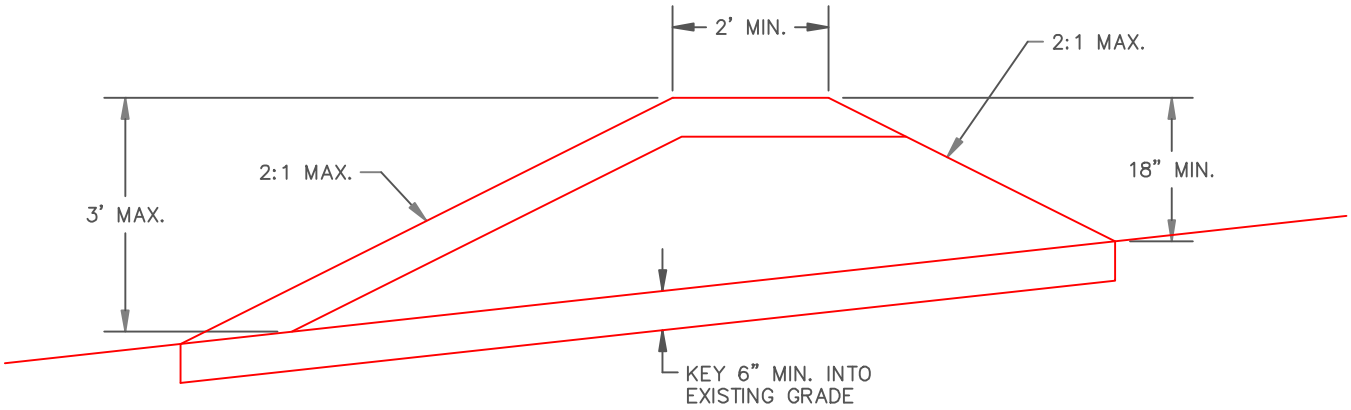


OVERFLOW AREA



NOTES:

1. SOIL IN BERM SHALL BE FIRMLY COMPACTED.
2. AT EACH END OF BERM, TURN BERM UPSLOPE AND EXTEND UNTIL GROUND SURFACE RISES TO TOP OF BERM ELEVATION.
3. PROVIDE OVERFLOW AREAS AT 200 FT. MAX. INTERVALS.

Modified From Greene County Missouri – Storm Water Design Standards

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TEMPORARY SILT CONTAINMENT BERM

Figure: RM-2.3
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Revised: