Temporary Swale BMP 40

Description

A temporary swale is an excavated drainage way designed to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet. Another purpose of a temporary swale is to intercept sediment laden-water and divert it to a sediment-trapping device.

Applications

Temporary swales are constructed for the following reasons:

- To divert flows from a disturbed area
- Intermediately across disturbed areas to shorten overland flow distance.
- To direct sediment laden water along the base of slopes to a trapping device.
- To transport off-site flows across disturbed areas such as rights-of-way.
- Swales collecting runoff from disturbed areas should remain in place until the disturbed areas are permanently stabilized.

Limitations

Drainage area – 10 ac.
Minimum bedrock depth – 5 ft
NRCS soil type - BCD
Drainage/flood control – yes
Maximum slope – 14%
Minimum water table – 3 ft
Freeze/thaw – fair

Targeted Pollutants

Sediment
Trace metals

Design Parameters

The following design criteria should be met, depending on the drainage area served by the swale:

	Swale A	Swale B
Drainage Area	5 ac. or less	5-10 ac.
Bottom Width of Flow Channel	4 ft	6 ft
Depth of Flow Channel	1 ft	1 ft
Side Slopes	2:1 or flatter	2:1 or flatter
Grade	0.5% min 20% max	0.5% min, 20% max

- The temporary swale should be designed with an outlet that functions with a minimum of erosion, and dissipates runoff velocity prior to discharge off the site.
- Runoff should be conveyed to a sediment-trapping device such as a sediment trap or sediment basin until the drainage area above the swale is adequately stabilized.
- The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet condition.
- If a swale is used to divert flows from entering a disturbed area, a sediment-trapping device may not be needed.

Construction Guidelines

- Stabilization of the swale should be completed within 10 days of installation with proper seeding or mulching techniques (see BMP 21-

Seeding or BMP 15-Mulching). The flow channel should be stabilized according to the criteria in Table 40-1 below.

- In highly erodible soils, as defined by the Soil Survey (NRCS) of the project's county, refer to the next higher slope grade for type of stabilization.

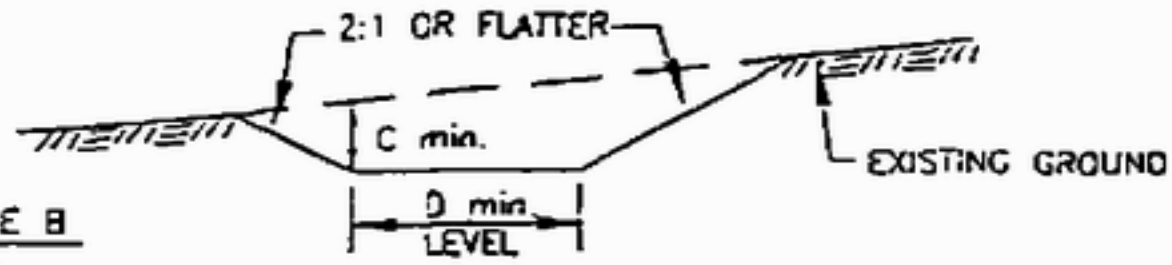
Maintenance

- Remove sediment and debris regularly.
- Mow vegetation regularly to encourage thicker, healthier growth.
- Do not overfertilize; it may compound water quality problems.

Table 40-1. Flow Channel Stabilization Criteria

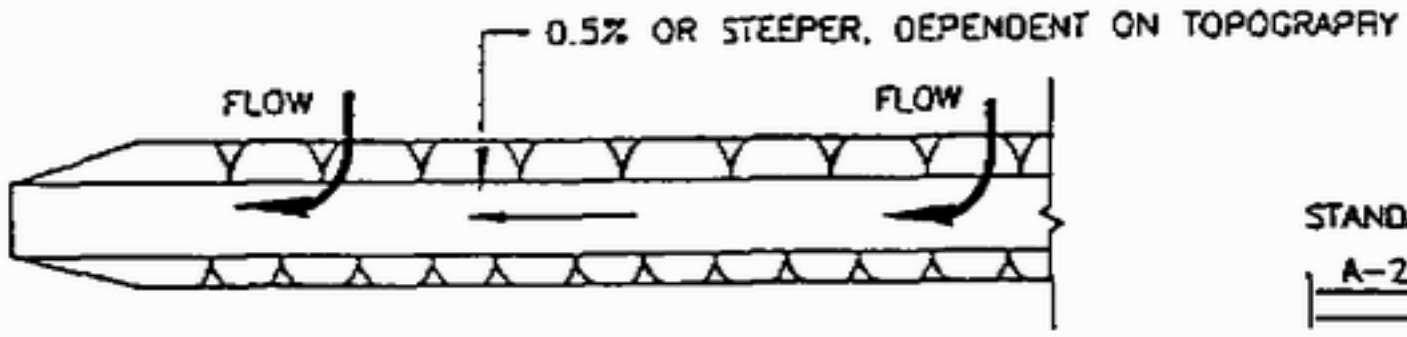
Type of treatment	Channel grade (percent)	Flow Channel A (less than 5 acres)	Flow Channel B (5-10 acres)
1	0.5-3.0	Seed and Straw Mulch	Seed and Straw Mulch
2	3.1-5.0	Seed and Straw Mulch	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone
3	5.1-8.0	Seed and cover with Jute or Excelsior; Sod, or line with 2 in. stone	Line with 4-8 in. stone or Recycled Concrete Equivalent[a]
4	9.1-20	Line with 4-8 in. stone or Recycled Concrete Equivalent[a]	Engineering Design

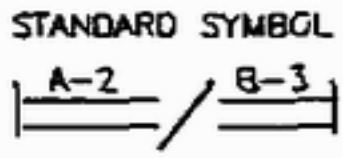
[a] Recycled Concrete Equivalent should be concrete broken into the required size, and should contain no steel reinforcement.



	SWALE A	SWALE B
C	1'	1'
D	4'	6'

CROSS SECTION





OUTLET AS REQUIRED
SEE ITEM NO. 8 BELOW

PLAN VIEW

CONSTRUCTION SPECIFICATIONS

1 ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.

2 DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.

3 DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.

4 ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.

5 THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.

6 FILLS SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.

7 ALL EARTH REMOVED AND NOT NEEDED ON CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.

8 STABILIZATION SHALL BE AS PER THE CHART BELOW.

FLOW CHANNEL STABILIZATION

TYPE OF TREATMENT	CHANNEL GRADE	A (5 AC OR LESS)	B (5 AC-10 AC)
1	0.5-3.0%	SEED AND STRAW MULCH	SEED AND STRAW MULCH
2	3.1-5.0%	SEED AND STRAW MULCH	SEED USING JUTE OR EXCELSIOR
3	5.1-8.0%	SEED WITH JUTE OR EXCELSIOR; SOD	LINED RIP-RAP 4"-8" RECYCLED CONCRETE EQUIVALENT
4	8.1-20%	LINED 4"-8" RIP-RAP	ENGINEERED DESIGNED

9 PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	TEMPORARY SWALE	STANDARD DRAWING
TOOTHMAN-ORTON ENGINEERING COMANY BOISE, IDAHO McCALL, IDAHO		TS-1