City of Berea, Kentucky
Stormwater Best Management Practices (BMPs)
Erosion Prevention Practices (EPPs)

EPP 4.2.13

Activity: Terracing (T)

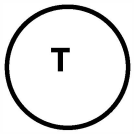
PLANNING CONSIDERATIONS:

Design Life: Permanent

Acreage Needed: As Required

Estimated Unit Cost: Medium

Monthly Maintenance: N/A



Target Pollutants

Significant ♦	Partial ◊	Low or Unknown ◊

Sediment ♦ Heavy Metals◊ Nutrients◊ Oxygen Demanding Substances ◊ Toxic Materials
Oil& Grease ◊ Bacteria & Viruses ◊ ◊ Floatable Materials ◊ Construction Waste ◊

Description

This BMP is likely to reduce sediment by creating small areas to establish vegetation to reduce runoff velocity, increase infiltration and trap sediment. This reduces the amount of sediment leaving a site.

Suitable Applications

- Cleared areas prior to temporary or permanent seeding and planting or erodible slopes steeper than 3:1 (H:V) and higher than 5 feet.
- Graded areas with smooth, hard surfaces.
- Areas where slopes need to be shortened. Adequate drainage and stabilized outlets must be a part of the design and should follow the guidelines of a licensed professional civil engineer based on site conditions.

Approach

Slope roughening/terracing is performed in several ways:

- Stair-step grading
- EPP-08
- Rough grading
- No grading

On slope 3:1 (H:V) the following practices found in EPP-08 can be considered:

- Grooving
- Furrowing
- Tracking

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Installation Procedures

Graded areas with smooth, hard surfaces give a false impression of "finished grading" and a job "well done". It is difficult to establish vegetation on such surfaces due to reduced water infiltration and the potential for erosion. Rough slope surfaces with uneven soil and rocks left in place may appear unattractive or unfinished at first, but they encourage water infiltration, speed the establishment of vegetation, and decrease runoff velocity. Rough, loose soil surfaces give lime, fertilizer, and seed some natural coverage. Niches in the surface provide microclimates which generally provide a more favorable moisture level that aids seed germination.

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, and tracking. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

1. Disturbed areas which will not require mowing may be stair-step graded, grooved, or left rough after filling.
2. Graded areas steeper than 3:1 (H:V) should be stair-stepped with benches. The stair-stepping will help vegetation become attached and also trap soil eroded from the slopes above. Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material which sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment.
3. Make the vertical cut distance less than the horizontal distance, and slightly slope the horizontal position of the step in towards the slope.
4. Do not make individual vertical cuts more than 24 in. (600 mm) high in soft materials or more than 3 ft. (1 m) high in rocky materials.
5. Groove the slope using machinery to create a series of ridges and depressions that run across the slope and on the contour.

Fill Slope Roughening

- Place fill slopes with a gradient steeper than 3:1 (H:V) in lifts not to exceed 8 in. (200 mm), and make sure each lift is properly compacted.
- Ensure that the face of the slope consists of loose, uncompacted fill 4 in. (100 mm) to 6 in. (150 mm). This is not to be confused with proper compaction necessary for slope stabilization.
- Use grooving or tracking to roughen the face of the slopes, if necessary.
- Apply seed, fertilizer, and mulch and then track or crimp in the mulch. See EPP 4.2.5, EPP 4.2.10: Temporary Seeding and Mulching, respectively.
- Do not blade or scrape the final slope face.

Cuts, Fills, and Graded Areas

- Slopes that will be maintained by mowing should be no steeper than 3:1 (H:V).
- To roughen these areas, create shallow grooves by normal tilling, disking, harrowing, or use a mechanical seeder. Make the final pass of any such tillage on the contour.
- Make grooves formed by such implements close together, less than 10 in. (250 mm), and not less than 1 in. (25 mm) deep.
- Excessive roughness is undesirable where mowing is planned.

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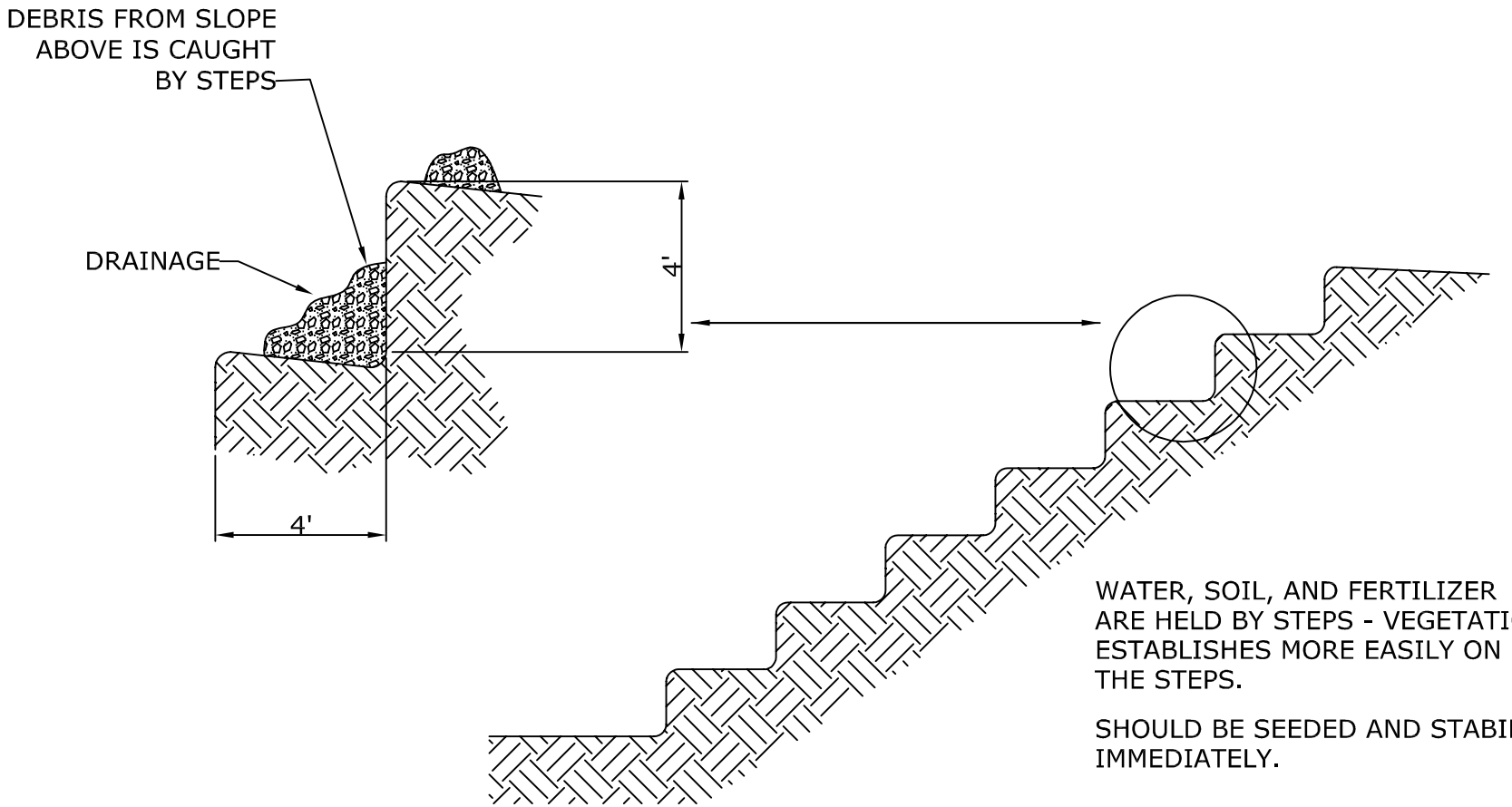
Maintenance

- Periodically check the seeded or planted slopes for rills and washes, particularly after significant storm events greater than 0.5 in. (12 mm). Fill these areas slightly above the original grade, then re-seed and mulch as soon as possible.
- Inspect roughened slopes weekly and after rainfall for excessive erosion.

Inspection Checklist

- ❑ Furrows at least 6 in. deep.
- ❑ Furrows are spaced no more than 50 ft. apart.
- ❑ Horizontal distance is greater than vertical distance on stepped slopes. Stepped
- ❑ slopes or terraced slopes cut so that they drain in on themselves.



WATER, SOIL, AND FERTILIZER ARE HELD BY STEPS - VEGETATION ESTABLISHES MORE EASILY ON THE STEPS.

SHOULD BE SEEDED AND STABILIZED IMMEDIATELY.

STAIR STEPPING CUT SLOPES

SOURCE: LOUISVILLE MSD

City of Berea
Stormwater Manual

Terracing Details

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Usage:

To slow erosion, stair step grading should be done within 7 days after the vegetation has been removed from the slope.

Stair-step grading can be used with seeding, and planting to stabilize an area.

Installation:

Stair-step grading may be carried out on any material soft enough to be moved with a bulldozer. The ratio of vertical cut distance to horizontal distance should not be steeper than 1: 1 and the horizontal portion of the "step" should slope towards the vertical wall.

Areas that are graded in this manner should be seeded within 14 days.

Inspection and Maintenance:

Inspections should be made every seven (7) calendar days and within 24-hours after each rainfall event that produces ½ - inches or more of precipitation.

If rills (small watercourses that have steep sides and are usually only a few inches deep) appear, they should be re-graded and re-seeded immediately.

SOURCE: LOUISVILLE MSD

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