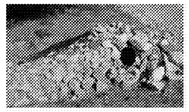
St

STORM DRAIN OUTLET PROTECTION

DEFINITION

Paved and/or riprapped channel sections placed below storm drain outlets.



PURPOSE

- Reduce the velocity of flow before entering receiving channels below storm drain outlets.

INSTALLATION

- Install according to the approved plan.
- The apron may be lined with riprap, grouted riprap, or concrete.
- Compact any fill required in the subgrade to the density of the surrounding undisturbed material.
- Ensure that the riprap and gravel filter conform to the specified grading limits on the plan.
- Install geotextile between the riprap and the soil base.
- Protect the geotextile from punching or tears during installation. Overlap connecting joints a minimum of 1 ft.
- The minimum thickness of the riprap should be 1.5x the maximum stone diameter.
- Place riprap by hand or equipment. Be careful to avoid damaging the filter fabric.

St

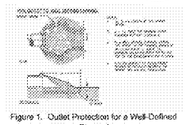


Figure 1. Outlet Protection for a Well-Defined Channel

- Construct the apron on zero grade with no overfall at the end. Ensure the top of the riprap at the downstream end is level with the receiving area or slightly below it.
- Place any necessary curves in the upper section of the apron.
- Ensure the apron is properly aligned and preferably straight throughout its length.
- Stabilize all disturbed areas after construction.

Apron Width for a Well-Defined Channel

- Side slopes of the channel shall be no steeper than 2:1.
- Extend the apron across the channel bottom.
- Extend the apron up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank (whichever is less).

Apron Width for a Flat Area

- The upstream end of the apron shall have a width 3x the diameter of the outlet pipe.
- For a Minimum Tailwater Condition, the downstream end of the apron shall have a width equal to the pipe diameter plus the length of the apron.

St

- For a Maximum Tailwater Condition, the downstream end shall have a width equal to the pipe diameter plus 0.4x the length of the apron.

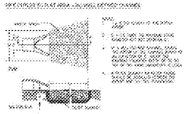


Figure 2. Outlet Protection for a Flat Area

MAINTENANCE

- Inspect riprap outlet structures after heavy rain events to see if any erosion has taken place around or below the riprap.
- Make as needed repairs immediately to prevent further damage.

St

(This page left blank intentionally.)

Su

SURFACE ROUGHENING

DEFINITION

Providing a rough soil surface with horizontal depressions created by operating a tillage or other suitable implement on the contour.

PURPOSE

- Aid in the establishment of vegetative cover with seed.
- Reduce runoff velocity and increase infiltration.
- Reduce erosion and provide for sediment trapping.

INSTALLATION

- Conduct according to the approved plan.
- Required on all slopes steeper than 3:1 if they are to be stabilized with vegetation.
- If slope is to be stabilized with matting and blankets, the surface should not be roughened.
- Not required on slopes with a stable rock face.
- Lightly roughen and loosen soil to a depth of 2"-4" on slopes 3:1 or flatter.
- Areas that will be mowed should have slopes less than 3:1.
- Groove or maintain roughness of fill slopes steeper than 3:1.

Su

- Stair step grade or groove cut slopes steeper than 3:1.

Roughening Methods

Stair-Step Grading

- May be carried out on any material soft enough to be ripped with a bulldozer.
- Particularly good for slopes with soft rock and some subsoil.
- The ratio of the vertical cut distance to the horizontal distance shall be less than 1:1.
- Horizontal portion of the "step" shall slope toward the vertical wall.

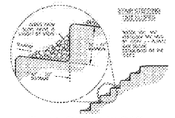


Figure 1. Stair-Stepping Cut Slopes

- Individual vertical cuts are not to exceed 30" on soft materials and not more than 10' in rocky materials.

Grooving

- Use discs, harrows, spring harrows, or the tracks on a tracked loader.
- On uncultivated slopes, minimum groove depth of 3" and maximum groove spacing of 15".
- On mowed slopes, minimum depth of 1" and maximum groove spacing of 12".

Su

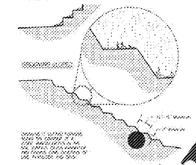


Figure 2. Grooving Slopes

Tracking

- Not recommended on clayed soils unless other alternatives are available.
- Sandy soils may be tracked because they will not compact excessively.
- Minimize the number of tracking passes to minimize compaction.

Roughened slopes shall be seeded and mulched as soon as possible to obtain maximum seed germination and growth.

Figure 3. Tracking

Su

Figure 4. Fill Slope Tracking

REFERENCES

- Ds1 Disturbed Area Stabilization (With Mulching Only)
- Ds2 Disturbed Area Stabilization (With Temporary Seeding)
- Ds3 Disturbed Area Stabilization (With Permanent Vegetation)
- Ds4 Disturbed Area Stabilization (With Sodding)

Tp

TOPSOILING

DEFINITION

The stripping off of the fertile topsoil, storing it, then spreading it over the disturbed area after the completion of construction activities.

PURPOSE

- Provide a suitable soil medium for vegetative growth on areas where other measures will not produce or maintain a desirable stand.

SPECIFICATIONS

- Recommended for sites with slopes 2:1 or flatter where:
  - (1) the texture of the exposed subsoil or parent material is not suitable to produce adequate vegetative growth;
  - (2) the soil material is so shallow that the rooting zone is not deep enough to support plants with continuing supplies of moisture and food.
  - (3) the soil to be vegetated contains material toxic to plant growth.
- Topsoil should be friable and loamy, free of debris, objectionable weed and stones, and contain no toxic substance that may be harmful to plant growth.

Tp

- A stripping depth of 4"-6" is common and should be confined to the immediate construction areas.
- Stockpiles should not obstruct natural drainage or cause off-site environmental damage.
- Stockpiles shall be contained by sediment barriers and stabilized with temporary vegetative measures.
- Where the pH of the subsoil is 5.0 or less or composed of heavy clays, agricultural lime shall be spread at a rate of 100lbs/1000 sq ft.
- Subsoil shall be loosened by discing or scarifying to a minimum depth of 3" to permit bonding of the topsoil to the subsoil. Tracking by a bulldozer is also adequate.
- Topsoil should be applied at a uniform depth of 5" (unsettled), but may be adjusted at the discretion of the design professional.
- Topsoil should be handled only when dry in order to prevent damaging the soil structure.

Table 1. Cubic Yards of Topsoil Required for Application at Various Depths

Depth (in.)	Per Sq.	Per Ac
	3.1	134
2	6.2	268
3	9.3	403
	12.4	537
	15.5	672
	18.6	806

Tr

TREE PROTECTION

DEFINITION

The protection of desirable trees from injury during construction activity.

PURPOSE

To ensure the survival of desirable trees where they will be effective for erosion and sediment control, watershed protection, landscape beautification, dust and pollution control, noise reduction, shade and other environmental benefits while the land is being converted.

SPECIFICATIONS

- Contact the local government to obtain information regarding tree ordinances BEFORE ES&PC plans are designed.

Tree Protection Zones

(1) Measure the diameter of the tree trunk in inches 4.5 ft from the ground. This is the Diameter Breast Height (DBH).

(2) Multiply this value by 1.5. This result is the radius of the root protection zone in ft. Also considered the critical rooting distance.

Tr

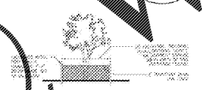


Figure 1. Chain Link Fence Installation

Tree Protection Zone Fencing

Tree protection zone fencing may be one of the following:

- For areas of large remnant forest to be protected, use 4 ft high orange plastic fabric fencing stapled in 3 locations to 2x4 treated wood stakes. Set stakes 6 ft on center. Do not use rebar as stakes.
- For single family homes use a treated wood fencing. It may have orange fabric attached to it.
- For all other developments use 6 ft high chain link fencing attached to galvanized metal post.

*Please refer to the American National Standard(ANSI) or the International Society of Arboriculture for more information regarding standards for adequate tree protection.

Figure 2. "Snow" Fence Installation

PROJECT OWNER

PROJECT TITLE

POPS WINE & SPIRITS

FORSYTH COUNTY, GA

NO.	DESCRIPTION	DATE

ISSUES & REVISIONS

SITE PLAN

BUILDING NAME

DRAWING TITLE

EROSION DETAILS VI

DRAWN BY	PROJECT NO
BSR	201822
CHECKED BY	SCALE
BSR	NTS
APPROVED BY	DATE
BSR	01/15/2019

DRAWING NO.

C11.08

811

IF YOU DIG GEORGIA
CALL US FIRST!
UTILITIES PROTECTION CENTER
1-800-282-7411
(404) 525-5000
(METRO ATLANTA ONLY)

IT'S THE LAW