

St STORM DRAIN OUTLET PROTECTION

NOT TO SCALE

Methods and Materials

A. TEMPORARY METHODS

Mulches

See standard Ds1-Disturbed Area Stabilization (With Mulching Only). Synthetic resins may be used instead of asphalt to bind mulch material. Refer to standard Tp-Tackifiers and Binders. Resins such as Curosol or Terrastack should be used according to manufacturer's recommendations.

Vegetative Cover

See standard Ds2-Disturbed Area Stabilization (With Temporary Seeding). Spray-on Adhesives. These are used on mineral soils (not effective on muck soils). Keep traffic off these areas. Refer to standard Tp-Tackifiers and Binders.

Tilting

This practice is designed to roughen and bring clods to the surface. It is an emergency measure which should be used before wind erosion starts. Begin plowing on windward side of site. Chisel type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.

Irrigation

This is generally done as an emergency treatment. Site is sprinkled with water until the surface is wet. Taped as needed.

Barriers

Solid board fences, snowfences, burlap fences, crate walls, bales of hay and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling wind erosion. Calcium Chloride. Apply at rate that will keep surface moist. May need re-treatment.

B. PERMANENT METHODS

Permanent Vegetation

See standard Ds3-Disturbed Area Stabilization (With Permanent Vegetation). Existing trees and large shrubs may afford valuable protection if left in place. This entails covering the surface with less erosive soil material. See standard Tp-Topselling.

Stone

Cover surface with crushed stone or coarse gravel. See standard G-Construction Road

Storm Outlet Protection Calculations

Location	Construction	Flow Characteristics			Apron Dimensions						
		Size [in]	Q [cfs]	v [fps]	T.W.C.	La [ft]	W1 [ft]	W2 [ft]	d50 [in]	Dmax [ft]	D [ft]
#1	St-Rp	72	175	7.2	Minimum	32.0	18.0	38.0	1.0	1.5	2.3
#2	St-Rp	60	224	12.3	Maximum	44.0	15.0	23.0	0.4	0.6	0.9
#3	St-Rp	72	331	12.9	Maximum	42.0	18.0	27.0	0.5	0.8	1.1
#4	St-Rp	18	10.9	4.7	Maximum	30.0	1.5	11.5	0.3	0.5	0.7
#5	St-Rp	30	NA	NA	Maximum	12.0	1.0	6.0	0.3	0.5	0.7
#6	St-Rp	30	NA	NA	Maximum	12.0	1.0	6.0	0.3	0.5	0.7

Disturbed Area Stabilization (With Mulching Only) Ds1

CONSTRUCTION SPECIFICATIONS

Site Preparation

- Grade to permit the use of equipment for applying and anchoring mulch.
- Install needed erosion control measures as required such as dikes, diversions, berms, terraces and sediment barriers.
- Loosen compact soil to a minimum depth of 3 inches.

Mulching Materials

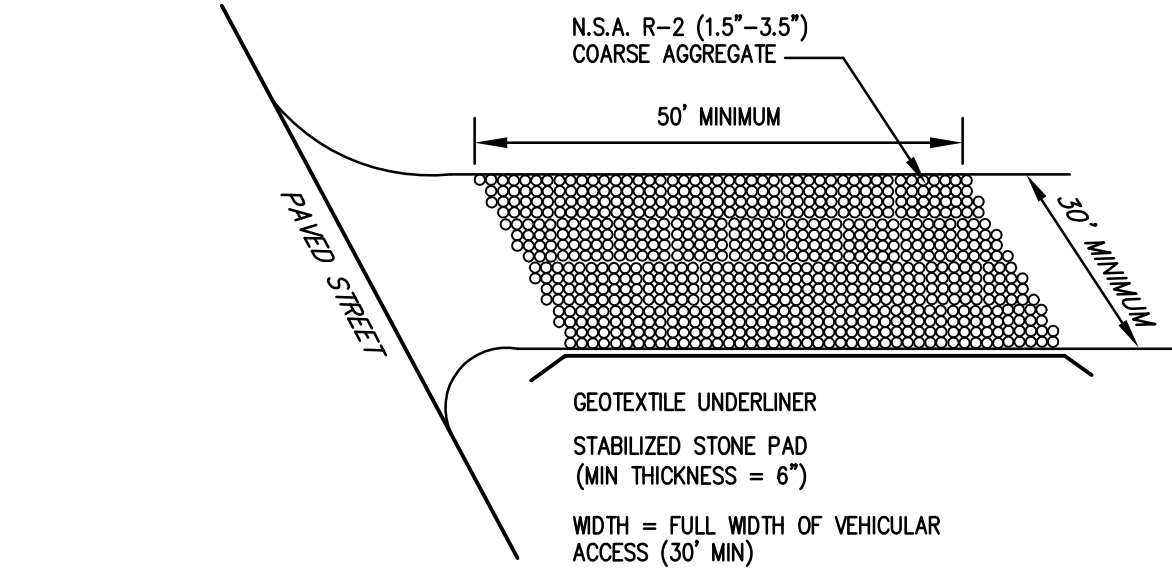
- Select one of the following materials and apply at the depth indicated:
- Dry straw or hay shall be applied at a depth of 2 to 4 inches providing complete soil coverage. One advantage of this material is easy application.
 - Wood waste (chips, sawdust or bark) shall be applied at a depth of 2 to 3 inches. Organic material from the clearing stage of development should remain on site, be chipped, and applied as mulch. This method of mulching can greatly reduce erosion control costs.
 - Cutback asphalt (slow curing) shall be applied at 1200 gallons per acre (or ¼ gallon per sq. yd.).
 - Polyethylene film shall be secured over banks or stockpiled soil material for temporary protection. This material can be salvaged and re-used.

Applying Mulch

- When mulch is used without seeding, mulch shall be applied to provide full coverage of exposed area.
- Dry straw or hay mulch and wood chips shall be applied uniformly by hand or by mechanical equipment.
 - If the area will eventually be covered with perennial vegetation, 20-30 pounds of nitrogen per acre in addition to the normal amount shall be applied to offset the uptake of nitrogen caused by the decomposition of the organic mulches.
 - Cutback asphalt shall be applied uniformly. Care should be taken in areas of pedestrian traffic due to problems of "tracking in" or damage to shoes, clothing, etc.
 - Apply polyethylene film on exposed areas.

Anchoring Mulch

- Straw or hay mulch can be pressed into the soil with a disk harrow with the disk set straight or with a special "poker" disk. Disks should be smooth or serrated and should be 20 inches or more in diameter and 8 to 12 inches apart. The edges of the disk should be dull enough not to cut the mulch but to press it into the soil leaving much of it in an erect position. Straw or hay mulch shall be anchored immediately after application.



Washing

If the action of the vehicle traveling over the gravel pad does not sufficiently remove the mud, the tires should be washed prior to entrance into public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone and provisions that intercept the sedimentladen runoff and direct it into an approved sediment trap or sediment basin. It is recommended that the entrance area be excavated to depth of 3 inches and be cleared of all vegetation and roots.

Diversion Ridge

On sites where the grade toward the paved area is greater than 2% a diversion ridge 6 to 8 inches high with 3:1 side slopes shall be constructed across the foundation approximately 15 feet above the road.

Geotextile

The geotextile underliner must be placed the full length and width of the entrance. Geotextile selection shall be based on AASHTO M2898B specification:

- For subgrades with a CBR greater than or equal to 3 or shear strength greater than 90 kPa, geotextile must meet requirements of section AASHTO M2898B Section 7.4, Separation Requirements.
- For subgrades with a CBR between 1 and 3 or shear strength between 30 and 90 kPa, geotextile must meet requirements of section AASHTO M2898B Section 7.4, Stabilization Requirements.

MAINTENANCE

The exit shall be maintained in a condition which will prevent tracking or flow of mulch onto public rights-of-way. This may require periodic top dressings with 1.5-3.5 inch stone, as conditions demand, and repair and/or removal of any structures to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles or site onto roadways or into storm drains must be removed immediately.

STONE PAD CONSTRUCTION EXIT

NOT TO SCALE

Surface Roughening Su

CONSTRUCTION SPECIFICATIONS

Cut Slopes Steeper than 3:1

- Cut slopes with a gradient steeper than 3:1 should not be mowed. They shall be stair-step graded or grooved.
- Stair-step grading may be carried out on any material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair-step grading. The ratio of the vertical cut distance to the horizontal distance shall be less than 1:1 and the horizontal portion of the "step" shall slope toward the vertical wall. Individual vertical cuts shall not be more than 30 inches on soft soil material and not more than 40 inches in rocky materials.
 - Grooving consists of using machinery to create a series of ridges and depressions which run perpendicular to the slope (on the contour). Grooves may be made with any appropriate implement which can be safely operated on the slope and which will not cause undue compaction. Suggested implements include disc, tillers, spring harrows, and the teeth on a front-end loader bucket. Such grooves shall not be less than 3 inches deep nor further than 15 inches apart.

Fill slopes Steeper than 3:1

- Fill slopes with a gradient steeper than 3:1 should not be mowed. They shall be grooved or allowed to remain rough as they are constructed. Method (1) or (2) below may be used.
- Groove according to #2 of "Cut Slopes Steeper than 3:1".
 - As lifts of the fill are constructed, soil and rock material may be allowed to fall naturally onto the slope surface. Colluvial materials (soil deposits at the base of slopes or from old stream beds) shall not be used in fills as they flow when saturated.

Cuts, Fills, and Graded Areas Which Will Be Mowed (less than 3:1)

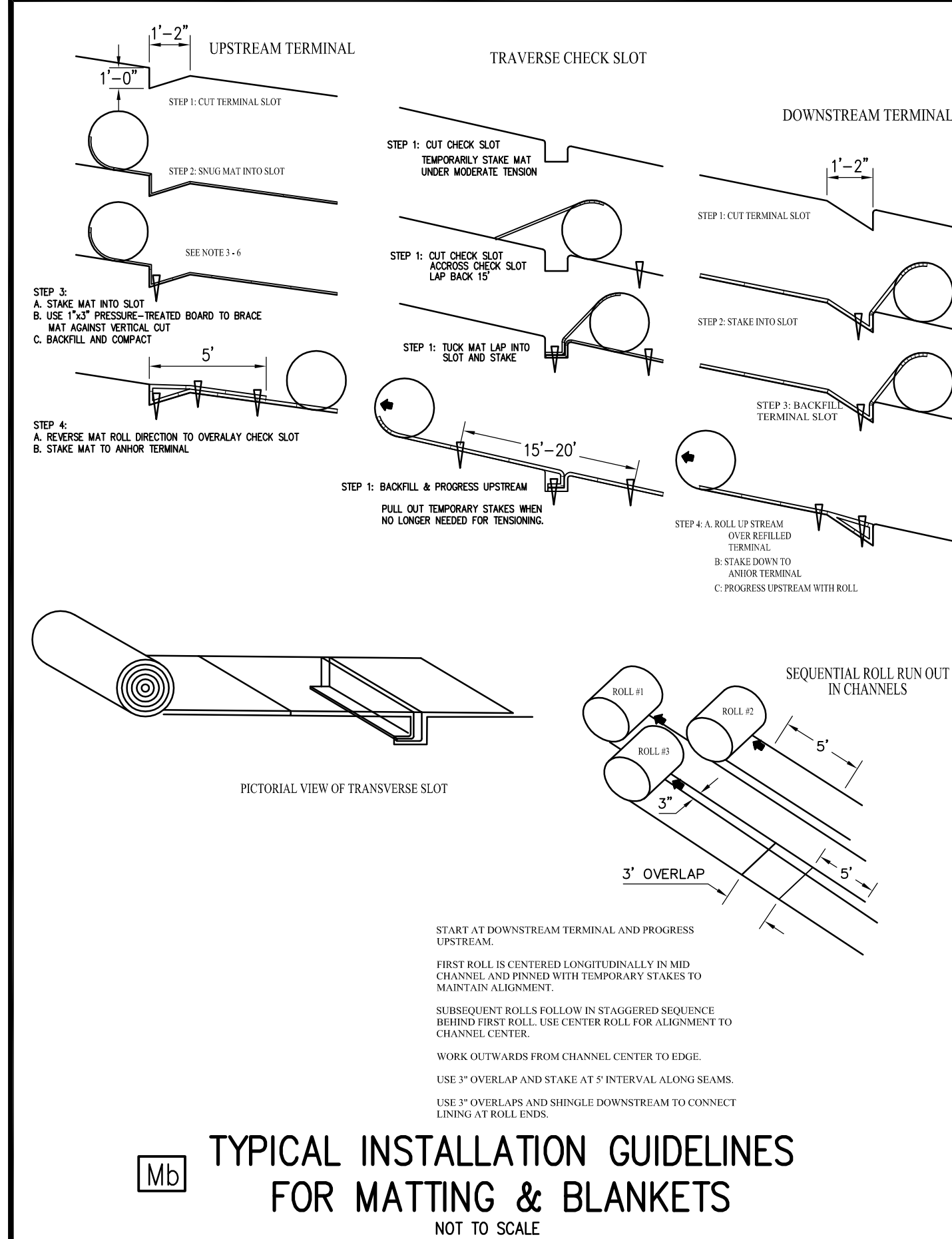
- Mowed slopes should not be steeper than 3:1. Excessive roughness is undesirable where mowing is planned.
- These areas may be roughened with shallow grooves such as remain after tilling, disking, harrowing, raking, or use of a multipacker-seeder. The final pass of any such tillage implement shall be on the contour (perpendicular to the slope).
- Grooves formed by such implements shall not be less than one inch deep and not further than 12 inches apart.

Fill slopes which are left rough as constructed may be smoothed with a dragline or pickchain to facilitate mowing.

Roughening With Tracked Machinery

Roughening with tracked machinery on clayed soils is not recommended unless no alternatives are available. Under compaction of surface soil results from this practice. Sandy soils do not compact severely may be tracked. In no case is tracking as effective as the other roughening methods described.

When tracking is the chosen surface roughening technique, it shall be done by operating tracked machinery up and down the slope to leave horizontal depressions in the soil. As few passes of the machinery as possible should be made to minimize compactions.



TYPICAL INSTALLATION GUIDELINES FOR MATTING & BLANKETS

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

Materials

Topsoil should be friable and loamy, free of debris, objectionable weeds and stones and contain no toxic substance that may be harmful to plant growth. A pH range of 5.0-7.5 is acceptable. Soluble salts should not exceed 500 ppm.

Testing

Field exploration should be made to determine whether the quantity and quality of surface soil justifies stripping.

Stripping

Stripping should be confined to the immediate construction area.

A 4 to 6 inch stripping depth is common, but may vary depending on the particular soil.

Topsoil pH

If pH value is less than 6.0, lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoils containing soluble salts greater than 500 parts per million shall not be used.

Stockpiles

The location of topsoil stockpiles should not obstruct natural drainage or cause off-site environmental damage.

Stabilization

Stockpiles shall be contained by sediment barriers to prevent sedimentation on adjacent areas. Stockpiles shall be stabilized in accordance with specifications Ds1 and Ds2 - Disturbed Area Stabilization (With Mulching) and (With Temporary Grassing), respectively, or Pm - Polyacrylamide or Tb - Tackifiers and Binders.

Site Preparation (Where topsoil is to be added)

Topselling

When topselling, maintain needed erosion control practices such as diversions, grade stabilization structures, berms, dikes, level spreaders, waterways, sediment basins, etc.

Grading

Grades on the areas to be topsoiled which have been previously established shall be maintained.

Temporary Erosion Control Blankets

This includes temporary "combination" blankets (rolled erosion control blankets-RECB) consisting of a plastic netting which covers and is interwoven with a natural organic or manmade mulch, or, act alone as a soil stabilization blanket.

Temporary Blankets as a minimum shall be used to stabilize concentrated flow areas with a velocity less than 5 ft/sec and slopes 2.5:1 or steeper with a height of 10 feet or greater. Because temporary blankets will deteriorate in a short period of time, they provide no enduring reduction in erosion potential.

Benefits of using erosion control blankets include the following:

- Protection of the seed and soil from rainfall impact and subsequent displacement.
- Thermal consistency and moisture retention for seeded area.
- Stronger and faster germination of grasses and legumes.
- Prevention of sloughing of topsoil added to steeper slopes.

Permanent Erosion Control Matting

Consists of a permanent non-degradable, three-dimensional plastic structure which can be filled with soil prior to planting. These mats are also known as permanent soil reinforcing mats (soil reinforcement matting). Roots penetrate and become entangled in the matrix, forming a continuous anchorage for surface growth and promoting enhanced energy dissipation. Matting shall be used when a vegetative lining is desired in stormwater conveyance channels where the velocity is between five and ten feet per second.

Benefits of using erosion control matting include the following:

- All benefits gained from using erosion control blankets.
- Grass root to dry out of stormwater and fill matrix with fine soils which become the growth medium for the development of roots.
- Acts with the vegetative root system to form an erosion resistant cover which resists hydraulic lift and shear forces when embedded in the soil within stormwater channels.

Materials

All blanket and matting materials shall be on the Georgia Department of Transportation Qualified Products List (QPL #62 for blankets, QPL #49 for matting).

All blankets shall be non-toxic to vegetation and to the germination of seed and shall not be injurious to the unprotected skin of humans. At a minimum, the plastic netting shall be interwoven with the mulching material fiber to maximize strength and provide for ease of handling.

Temporary Blankets

Machine produced temporary combination blankets shall have a consistent thickness with the organic material evenly distributed over the entire blanket area. All combination blankets shall have a minimum width of 48 inches. Machine produced combination blankets include the following:

- Straw blankets are combination blankets that consist of weed-free straw from agricultural crops formed into a blanket. Blankets with a top side of photodegradable plastic mesh with a maximum mesh size of 5/16 x 5/16 inch and sewn in the straw with biodegradable mesh is appropriate for slopes. The blanket shall have a minimum thickness of 1/8 inch and minimum dry weight of 0.5 pounds per square yard.
- Excelsior blankets are combination blankets that consist of curled wood excelsior (80% of fibers are six inches or longer) formed into a blanket. The blanket shall have clear markings indicating the top side of the blanket and be weather resistant. Blankets shall be photodegradable plastic mesh with a maximum mesh size of 1/2 x 1/2 inches. The blanket shall have a minimum thickness of 1/4 of an inch and a minimum dry weight of 0.8 pounds per square yard. Slopes require excelsior matting with the top side of the blanket covered in the plastic mesh, and for waterways, both sides of the blanket require plastic mesh.

- Coconut fiber blankets are combination blankets that consist of 100% coconut fiber formed into a blanket. The minimum thickness of the blanket shall be 1/4 of an inch with a minimum dry weight of 0.5 pounds per square yard. Blankets shall have photodegradable plastic mesh, with a maximum mesh size of 5/8 x 5/8 inch and sewn in the fiber with a breakdown resistant synthetic yarn. Plastic mesh is required on both sides of the blanket is used in waterways. A maximum of two inches is allowable for the stitch pattern and row spacing.

- Wood fiber blankets are combination blankets that consist of reprocessed wood fibers that do not possess or contain any growth or germination inhibiting factors. The blanket shall have a photodegradable plastic mesh, with a maximum mesh size of 5/8 x 3/4 inch, securely bonded to the top of the mat. The blanket shall have a minimum dry weight of 0.35 pounds per square yard. A maximum of two inches is allowable for the stitch pattern and row spacing. This practice shall be applied only to slopes.

- Jute Mesh can be applied to slopes. Jute mesh with a 48 inch width shall show between 76 and 80 wrappings and a one yard length shall show between 19 to 43 wrappings. The woven mesh shall be at least 45 inches wide. Yarn shall have a unit weight of at least 0.9 pounds per square yard, but not more than 1.5 pounds per square yard.

Permanent Matting

Permanent matting shall consist of a loamy web of mechanically or melt bonded polymer netting, monofilaments or fibers which are entangled to form a strong and dimensionally stable matrix. Polymer welding, thermal of polymer fusion, or the placement of fibers between two high strength, basically oriented nets bound securely together by parallel lock stitching with polyethylene, nylon or polyester threads are all appropriate bonding methods. Mats shall maintain their shape before, during, and after installation, under dry or water saturated conditions. Mats must be stabilized against ultraviolet degradation and shall be inert to chemicals normally encountered in a natural soil environment.

The mat shall conform to the following physical properties:

	Minimum Value
Types	63 inch
Thickness	63 inch
Weight	63 inch
Roll Width	58 inches
Tensile Strength	15 lbs. in.
Length (90% elongation)	28 lbs. in.
Length (ultimate)	28 lbs. in.

Liming

Soil tests should be used to determine the pH of the soil. Where the pH of the subsoil is 5.0 or less or composed of heavy clays, agricultural limestone shall be spread at the rate of 100 pounds per 1,000 square feet. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedure.

Bonding Use one of the following methods to insure bonding of topsoil and subsoil:

- Tilling.** After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or scarifying to a depth of at least 3 inches to permit bonding of the topsoil to the subsoil.

- Tracking.** Passing a bulldozer over the entire surface area of the slope to leave horizontal depressions.

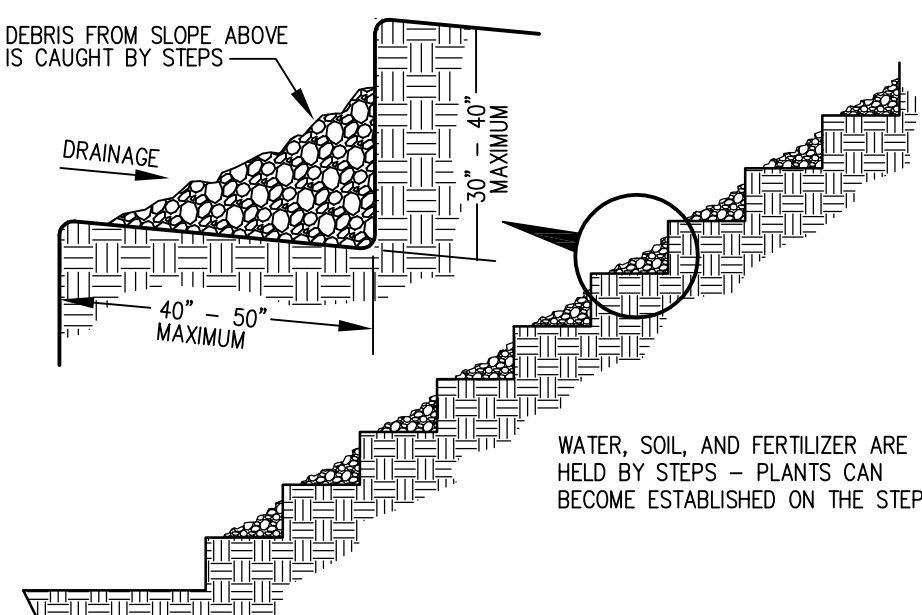
Applying Topsoil

- Topsoil should be handled only when it is dry enough to work without damaging soil structure.
- A uniform application of 5 inches (unsettled) is recommended, but may be adjusted at the discretion of the engineer or landscape architect.

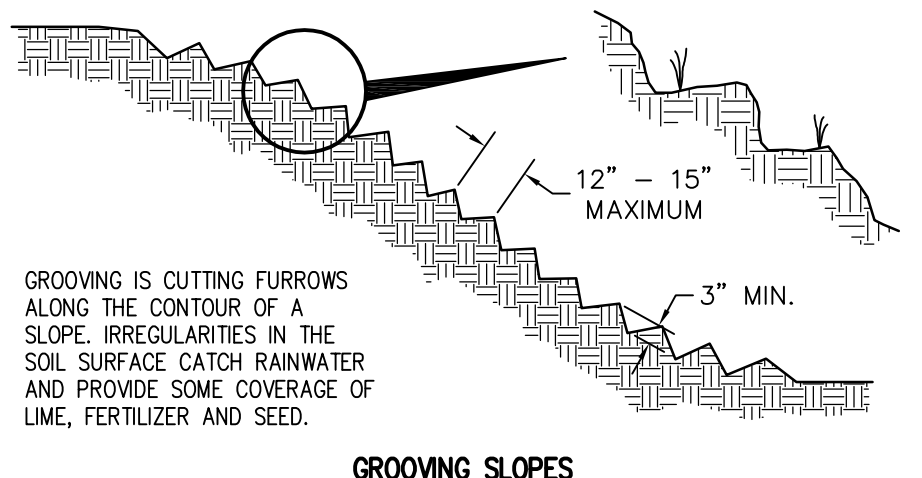
Cubic Yards of Topsoil Required For Application to Various Depths	Per 1000 Square Feet	Per Acre
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806

Table 0-26.1

Du Dust Control on Disturbed Areas

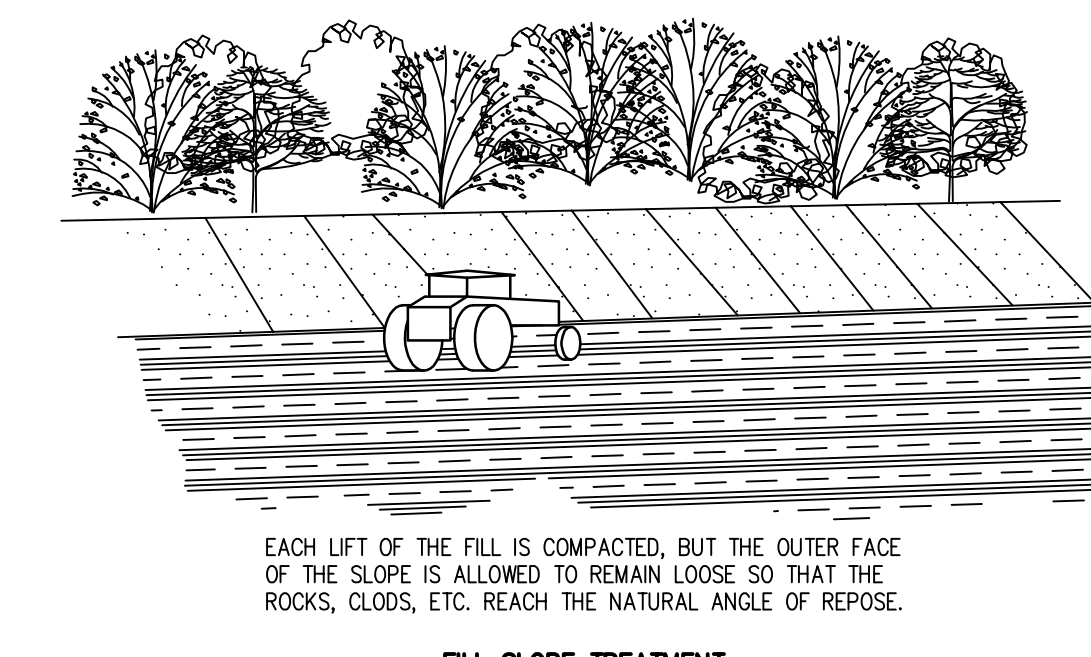


STAIR STEPPING CUT SLOPES CUT SLOPES STEEPER THAN 3:1

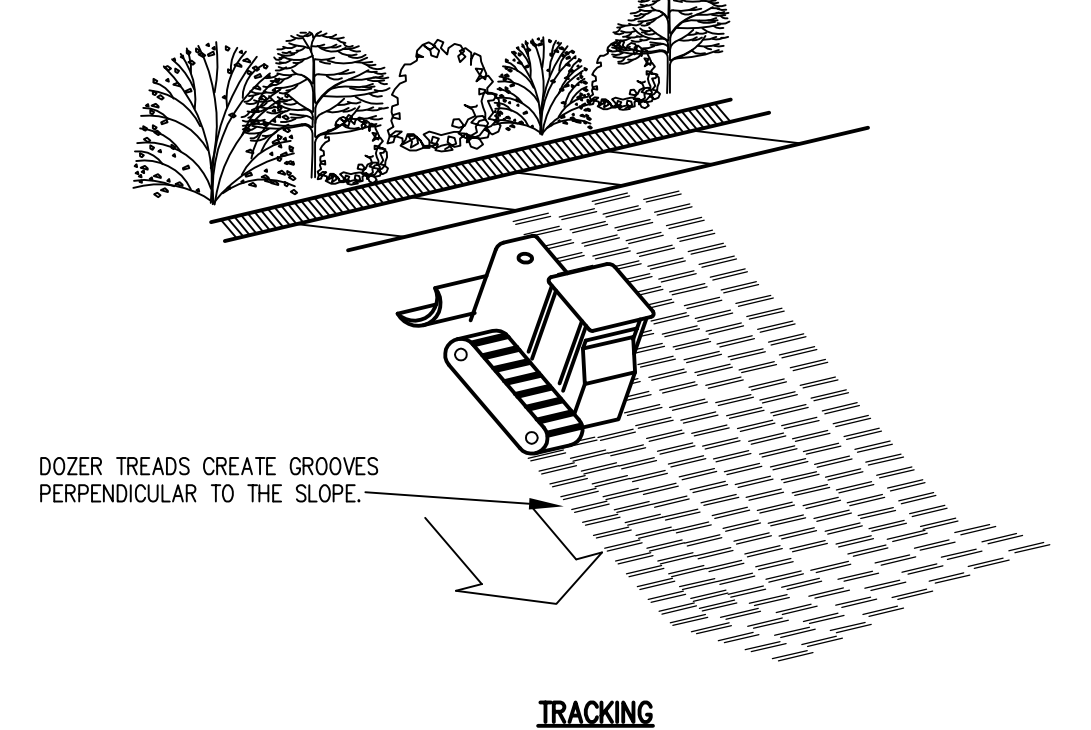


Su CUT SLOPES STEEPER THAN 3:1 AND FILL SLOPES STEEPER THAN 3:1

NOT TO SCALE



FILL SLOPE TREATMENT



Su FILL SLOPES STEEPER THAN 3:1

24-HOUR CONTACT PERSON:

GARY MINOR
(801, INC.)
(770) 841-1500

OWNER:

HomeGoods, Inc.
770 Cochituate Road
Framingham, Massachusetts 01701
Telephone: (508) 390-5765

ISSUE NO. 1 8/14/13 ADDRESS ADDITIONAL JCWSA COMMENTS
ISSUE NO. 3 8/12/13 ADDRESS ADDITIONAL CITY COMMENTS
ISSUE NO. 2 7/22/13 ADDRESS COMMENTS

PREPARED BY:

TD Engineers

2302 Paper Chase Drive
Lawrenceville, Georgia 30043
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EROSION CONTROL NOTES & DETAILS EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN For

JEFFERSON DISTRIBUTION CENTER: HOMEGOODS DISTRIBUTION CENTER

DESIGNED: TDK	TOTAL PROJECT AREA = 104,666 AC.	7
DRAWN: MTN	DISTURBED AREA = 83.4± AC.	OF
CHECKED: TDK	TAX PARCELS 078-003, 078-006, AND 078-010	14
APPROVED: TDK	G.M.D. 455	ISSUE #
DATE: 6/24/13	CITY OF JEFFERSON	4
SCALE: AS SHOWN	JACKSON COUNTY	
JOB # 07013		



GSWCC Certification No. 14354