

**Description** Topsoiling is the placement of topsoil or other suitable plant growth material over disturbed lands to provide a suitable soil medium for vegetative growth and a supply of native or locally occurring seeds and propagules. Topsoiling may involve bringing in soils from off site or merely replacing fertile topsoil that was stripped and stockpiled during earlier site development activities.

**Applications** Topsoiling is recommended on slopes 2:1 or flatter where the native soil is unsuitable for vegetative growth. It is an effective way of improving plant establishment on sites where moisture, nutrients, or pH levels are low, or where the remaining soil is too shallow to support root systems.

**Limitations**

Drainage area – unlimited	Maximum slope – 50%
Minimum bedrock depth – 3 ft	Minimum water table – 2 ft
NRCS soil type – N/A	Freeze/thaw – fair
Drainage/flood control – no	

Be careful not to apply topsoil over a subsoil of contrasting texture. For instance, clay-like topsoil placed over a sandy soil may cause the topsoil to slough as water flows between the two soil layers of different permeability. Also, topsoil should not be applied when the subsoil is frozen or extremely wet.

**Targeted Pollutants** Sediment

**Design Parameters** Plan to maintain the existing or established grade of the subsoil. The topsoil should be uniformly distributed at a minimum compacted depth of 2 in. on slopes 3:1 or steeper, and 4 in. deep on flatter slopes. The soil should be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or other mixture approved by an agronomist. It should be free of subsoil, refuse, sticks, noxious weed seeds, other extraneous materials, and stones larger than 1.5 in. diameter.

Topsoil can either be obtained commercially or stripped, stockpiled, and replaced on the construction site. Stockpiled topsoil should undergo a laboratory analysis to determine organic content, pH, and soluble salts. A pH of 6.0 to 7.5 and organic content of not less than 1.5% by weight is recommended. Where soil pH is less than 6.0, lime may be applied to adjust pH to 6.5 or higher. Any soils having soluble salt content greater than 500 parts per million should not be used.

If desired, it is possible to place a thin layer of topsoil 1.2 to 2 in. thick on benched slopes. In such applications, it is important not to apply so much topsoil that the value of the benches is destroyed. This method is especially valuable on rocky benches, especially on south- or west-facing slopes, however, proper placement of the soil is often a problem. In some cases, soil has been bucketed onto slopes. This produces an uneven spread and the

quantity is hard to control. Soil can also be blown onto the slope using a snow blower. In that case, organic matter can be mixed with the soil, but the soil should be screened to remove any rocks larger than 2 in.. The advantage is that the amount of soil needed is much less and it can be spread very rapidly on the horizontal surfaces. The soil may need some form of stabilization before the next rain event. Consider whether mulch, matting, geotextiles or seeding is required and when.

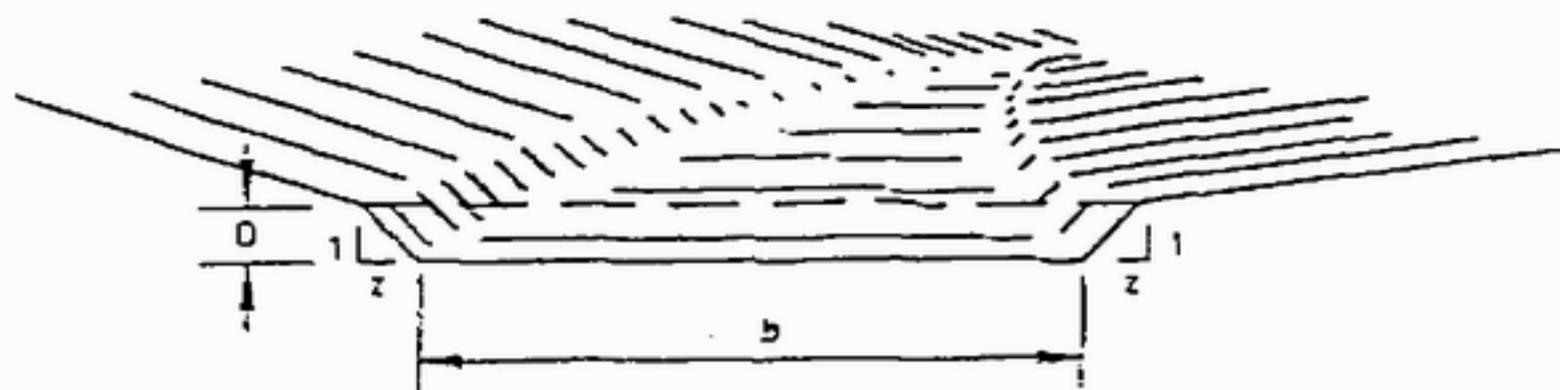
### Construction Guidelines

The following guidelines apply to the placement of topsoil:

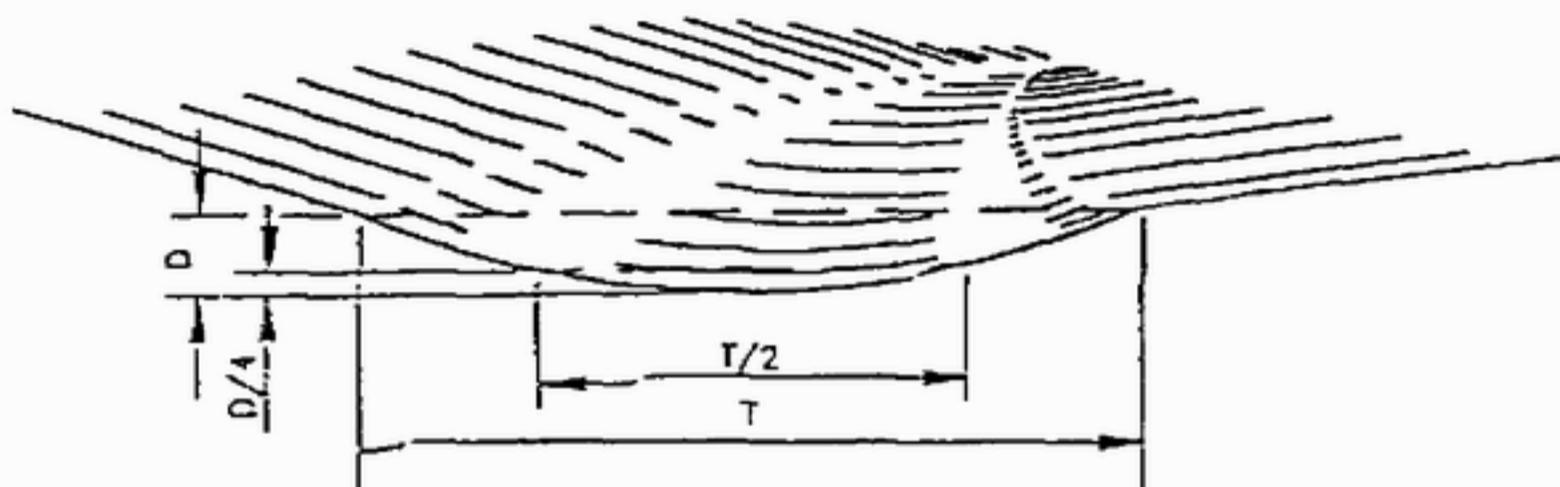
- The existing or established grade of subsoil should be maintained.
- Lime may be uniformly applied over designated areas where subsoil is highly acidic or heavy in clay content.
- Prior to spreading topsoil, loosen the subgrade by discing (or other method) to a depth of 2 in. to permit bonding of subsoil to topsoil. Tracking a bulldozer vertically over the slope will pack the soil and create horizontal erosion check slots to prevent topsoil from sliding down the slope.
- Spread the topsoil uniformly at a minimum compacted depth of 2 in. on 1:3 or steeper slopes and 4 in. on flatter slopes. A depth of 6 to 12 in. is preferred. Any surface irregularities should be corrected in an effort to prevent formation of water-holding depressions.
- Where quantities of stockpiled topsoil on site are limited, it is more desirable to cover all areas of exposed subsoil to a lesser depth than to cover partial areas to the suggested minimum depth of 3.1 in..
- Topsoil should not be placed when the subgrade is frozen, excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or vegetation establishment.

### Maintenance

Periodically and after major storm events, inspect, repair, and reseed as necessary to control slope erosion and subsequent topsoil losses.



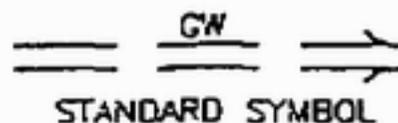
TRAPEZOIDAL CROSS-SECTION



PARABOLIC CROSS-SECTION

CONSTRUCTION SPECIFICATIONS

- 1 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 WATERWAY.
  - 2 THE WATERWAY 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.
  - 3 FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETE WATERWAY.
  - 4 ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE WATERWAY.
  - 5 STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE "STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES".
- A FOR DESIGN VELOCITIES OF LESS THAN 3.5 ft. per sec., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS SHOULD BE USED TO PREVENT WATER FROM ENTERING THE WATERWAY DURING THE ESTABLISHMENT OF THE VEGETATION.
  - B FOR DESIGN VELOCITIES OF MORE THAN 3.5 ft. per sec., THE WATERWAY SHALL BE STABILIZED WITH SOIL, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED.
  - C STRUCTURAL - VEGETATIVE PROTECTION
    - (1) SUBSURFACE DRAIN FOR BASE FLOW SHALL BE CONSTRUCTED AS SHOWN ON THE STANDARD DRAWING AND AS SPECIFIED IN THE "STANDARD AND SPECIFICATIONS FOR SUBSURFACE DRAIN".



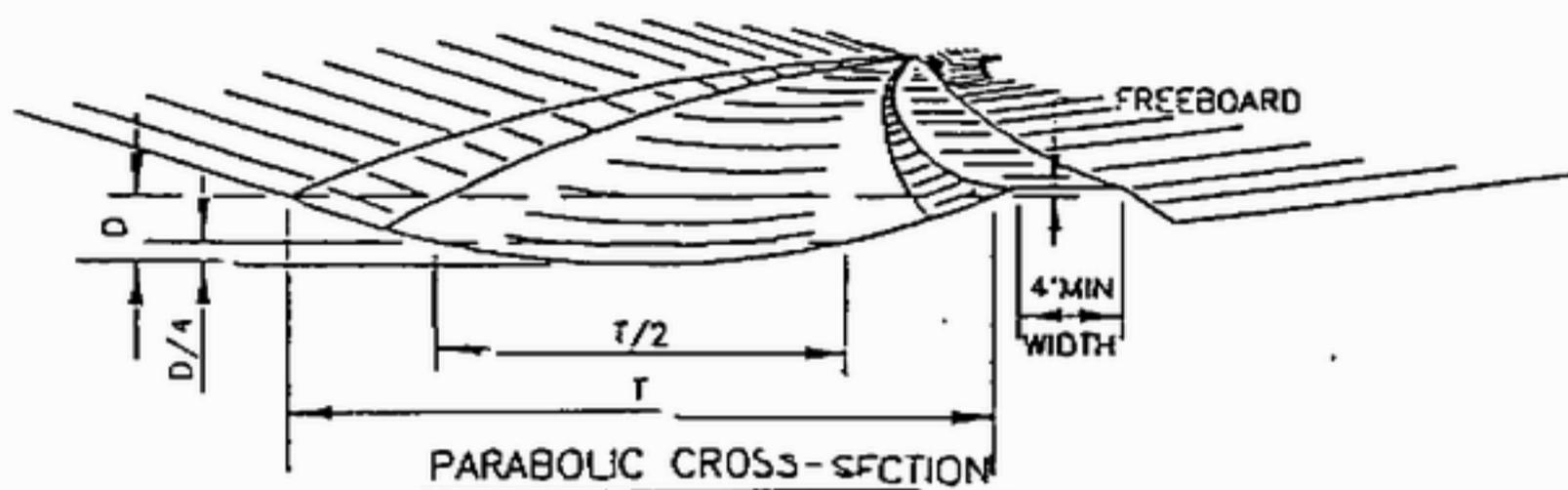
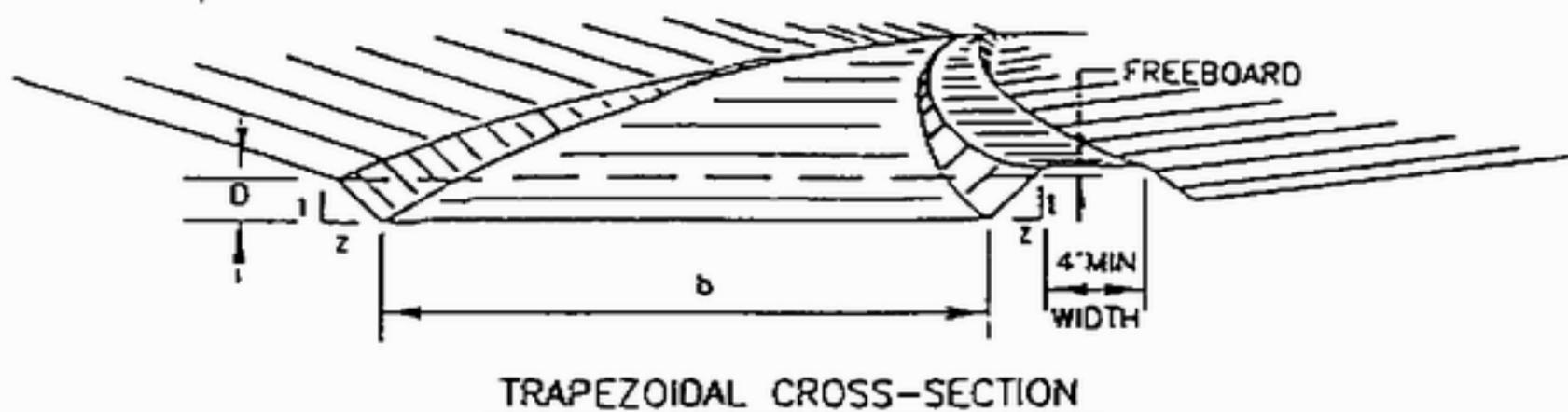
U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

TOOTHMAN-ORTON ENGINEERING COMPANY  
BOISE, IDAHO McCALL, IDAHO

GRASSED WATERWAY

STANDARD  
DRAWING

GW-1



### CONSTRUCTION SPECIFICATIONS

- 1 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 DIVERSION.
  - 2 THE DIVERSION 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.
  - 3 FILLS SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETED DIVERSION.
  - 4 ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIVERSION.
  - 5 STABILIZATION SHALL BE DONE ACCORDING TO THE APPROPRIATE "STANDARD AND SPECIFICATIONS FOR VEGETATIVE PRACTICES".
- A FOR DESIGN VELOCITIES OF LESS THAN 3.5 ft. per sec., SEEDING AND MULCHING MAY BE USED FOR THE ESTABLISHMENT OF THE VEGETATION. IT IS RECOMMENDED THAT, WHEN CONDITIONS PERMIT, TEMPORARY DIVERSIONS OR OTHER MEANS BE USED TO PREVENT WATER FROM ENTERING THE DIVERSION DURING THE ESTABLISHMENT OF THE VEGETATION.
- B FOR DESIGN VELOCITIES OF MORE THAN 3.5 ft. per sec., THE DIVERSION SHALL BE STABILIZED WITH SOIL, WITH SEEDING PROTECTED BY JUTE OR EXCELSIOR MATTING OR WITH SEEDING AND MULCHING INCLUDING TEMPORARY DIVERSION OF THE WATER UNTIL THE VEGETATION IS ESTABLISHED. SEE "THE STANDARD AND SPECIFICATIONS FOR PROTECTIVE MATERIALS".

STANDARD SYMBOL

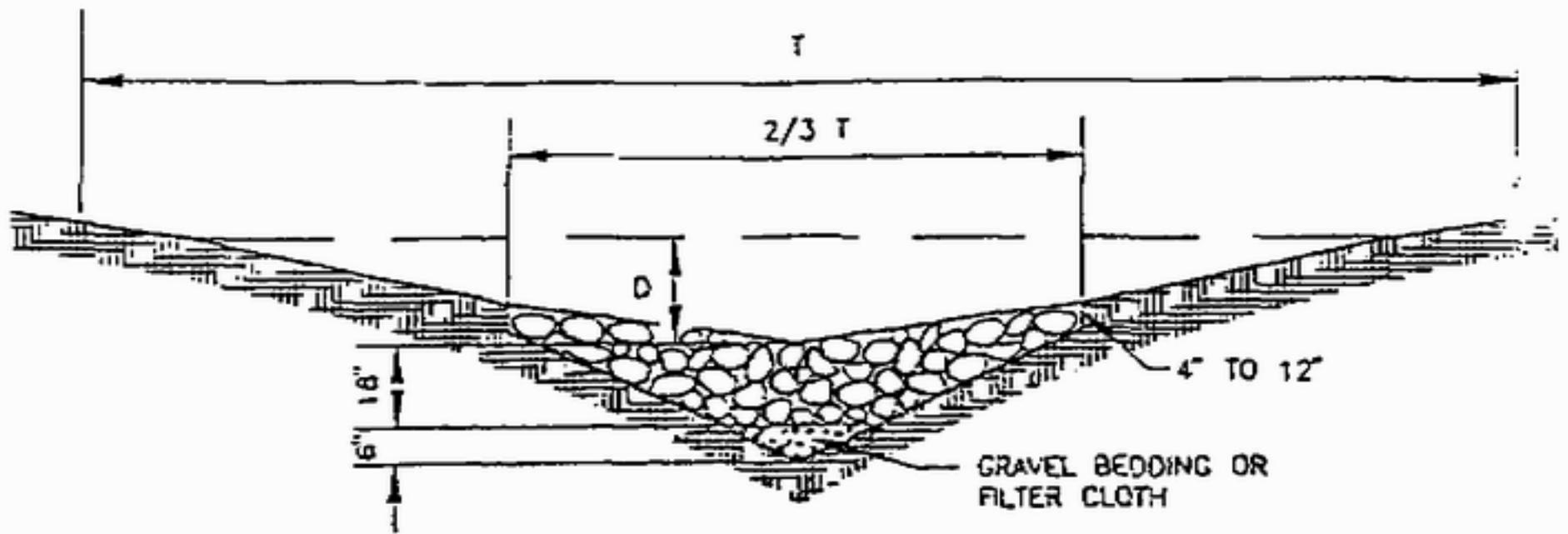
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DIVERSION

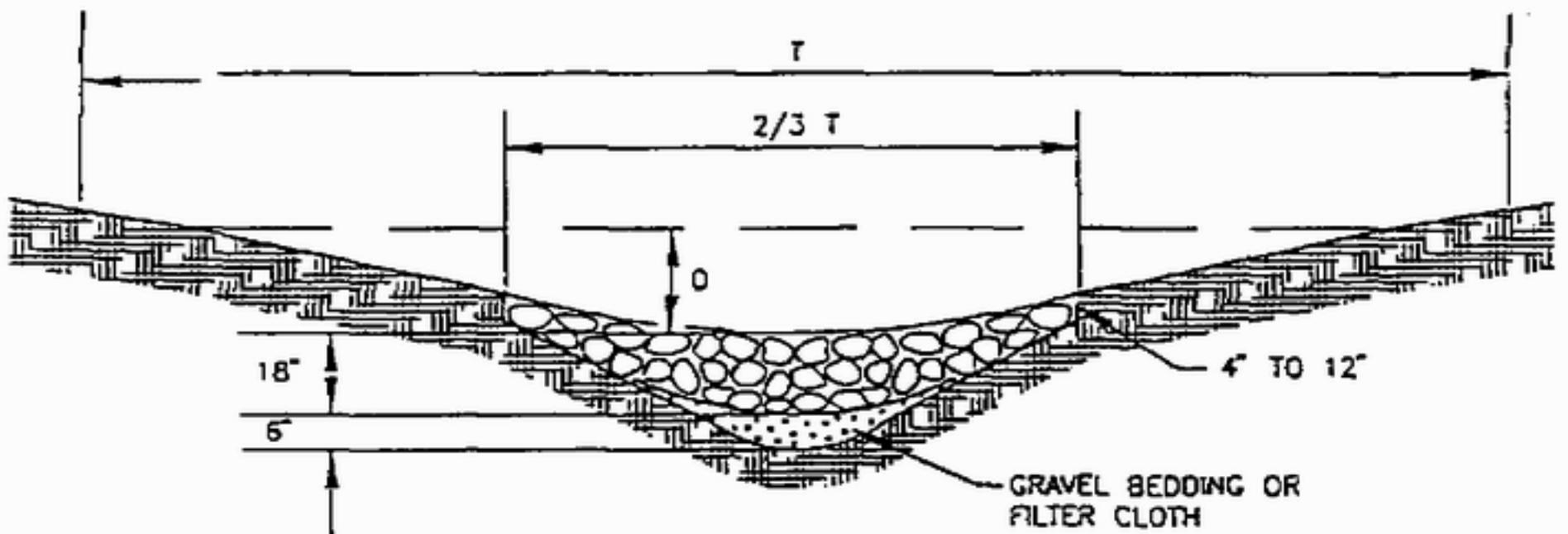
STANDARD  
DRAWING

GW-3



WATERWAY WITH STONE CENTER DRAIN  
"V" SECTION SHAPED BY MOTOR PATROL

"V" SECTION



WATERWAY WITH STONE CENTER DRAIN  
ROUNDED SECTION SHAPED BY BULLDOZER

ROUNDED SECTION

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WATERWAY WITH STONE  
CENTER

STANDARD  
DRAWING

RW-1