

# CHAPTER 2. VEGETATION AND SOIL STABILIZATION CONTROL MEASURES

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## 2.1 GRASS CHANNELS



**Figure 2.1. Stream channel (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)**

### Overview

**Description:** An excavated drainageway to convey runoff through, along, or around the area to be protected; the channel is lined with vegetation to stabilize the surface from erosion. For additional information, refer to Vegetated Channels in Section 1.6.

**Problem identification:** Water runoff must be conveyed across the construction site while retaining sediment that enters or is collected onsite.

**Design purpose:** To convey runoff across the construction site while reducing water velocity and allowing for sediment collection.

**Associated practices:** Used with sediment trapping device if sediment-laden runoff is being diverted; also used with berms and diversions.

**Installation:** When temporary channel grades are steeper than 2.5% to 3.0%, some type of protection is needed to prevent erosion. Depending on the grade, some of the following protective ditch liners can be used: asphalt, burlap, concrete, excelsior, fiberglass, grass, jute, nylon, plastic sheeting, riprap, and sod. The manufacturers normally include specifications to

indicate the velocities and grades that the product will tolerate. For permanent waterways over 0.005 grade, ditch protection may be needed.

Flow should not exceed four fps.

The waterway and outlet shall be shaped to grade with a uniform cross-section. The waterway shall be stabilized with seed, fertilizer and mulching. Vegetative linings vary in the protection afforded. Erosion in the channel bottom should be graded or corrected to the original grade and covered with a ditch liner, excelsior, sod, or other appropriate material.

**Maintenance/inspection:** Inspect after each precipitation event.

**Design life:** Permanent.

**Estimated cost:** Usually bid as square (100 sq ft): grass range is \$9.80 to \$35.00 (2004) and riprap is \$32.00 per ton (2004).

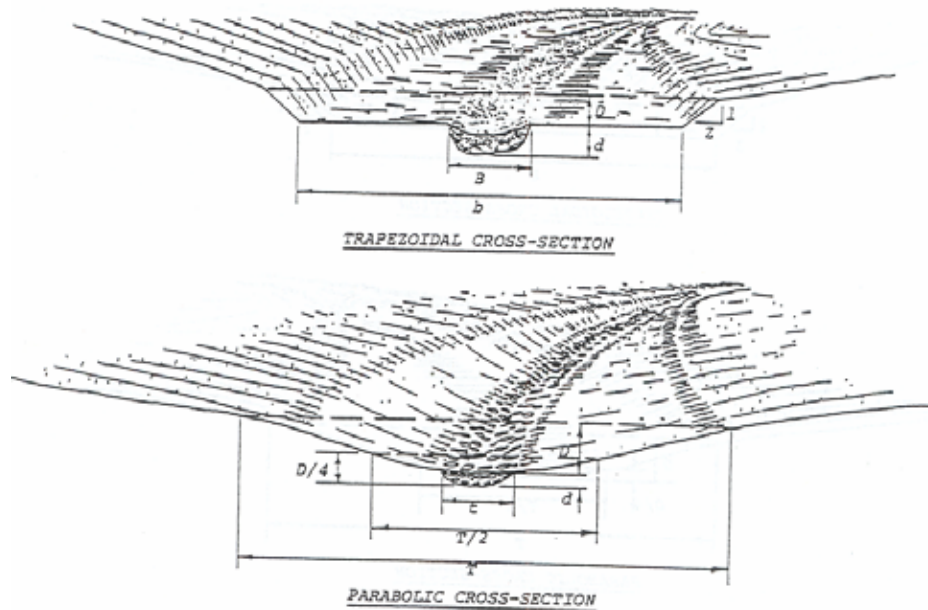
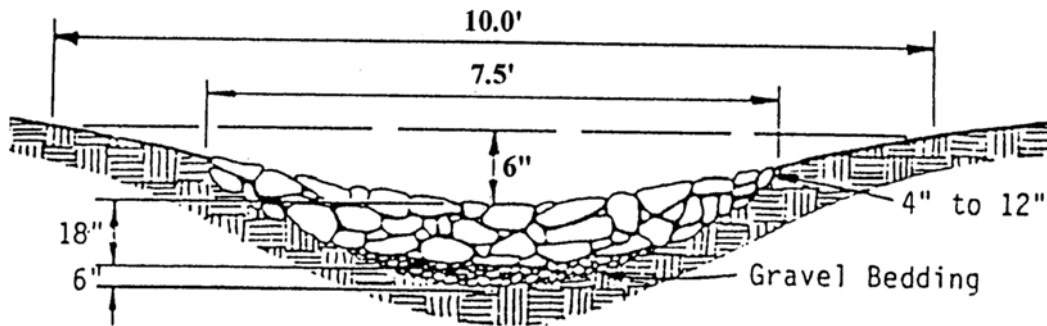


Figure 2.2. Waterway cross section (Source: Omaha Soil Erosion Manual)

## Construction Specifications

1. All trees, 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 the line, grade, and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities that 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 standards and specifications for vegetative practices.
  - For design velocities of less than 3.0 fps, seeding and mulching may be used for the establishment of the vegetation.
  - For design velocities of more than 3.0 fps, the waterway shall be stabilized with seeding protected by jute, excelsior matting, or with seeding and mulching including temporary diversion of the water until the vegetation is established.



**Figure 2.3. Waterway (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)**

## Instructions for Figure 2.4

Wood excelsior matting is one example of special ditch control. Materials and methods for installation shall conform to current standard specifications and to specifications as directed by the engineer. Other mat-type materials may be considered by the engineer for this purpose.

The wood excelsior mat shall be subject to approval by the engineer at the job site. Approval of the final project constitutes approval of the material.

At locations where silt conditions require shaping of a ditch to provide proper types of area for installing the wood excelsior mat for special ditch control, the necessary excavation shall be done by the contractor.

All excavated material should be used to fill low areas, gullies, backslope scours, and otherwise facilitate the free flow of surface water into the channel as directed by the engineer. Alignment should be smooth and abrupt changes should be avoided.

At locations where erosion has created gullies in ditches or backslopes, the gullies shall be filled and compacted in lifts not more than eight inches.

The wood excelsior mat shall comply with the following minimum requirements:

- The mat shall have interlocking wood fibers with plastic netting applied to both sides to hold the excelsior in place.

- The mat shall be nontoxic to the growth of plants and germination of seeds.
- The mat shall be furnished in rolls as follows:
  - Width of strips: minimum 48 in.
  - Length of rolls: minimum 180 ft
  - Minimum weight per sq yd: 0.88 lbs

The netting applied to both sides of the mat shall have a mesh size approximately 5/8 in. by 3/4 in. Netting shall be polypropylene and black in color. The material shall be furnished in plastic bags or otherwise protected to prevent damage from handling and weather conditions.

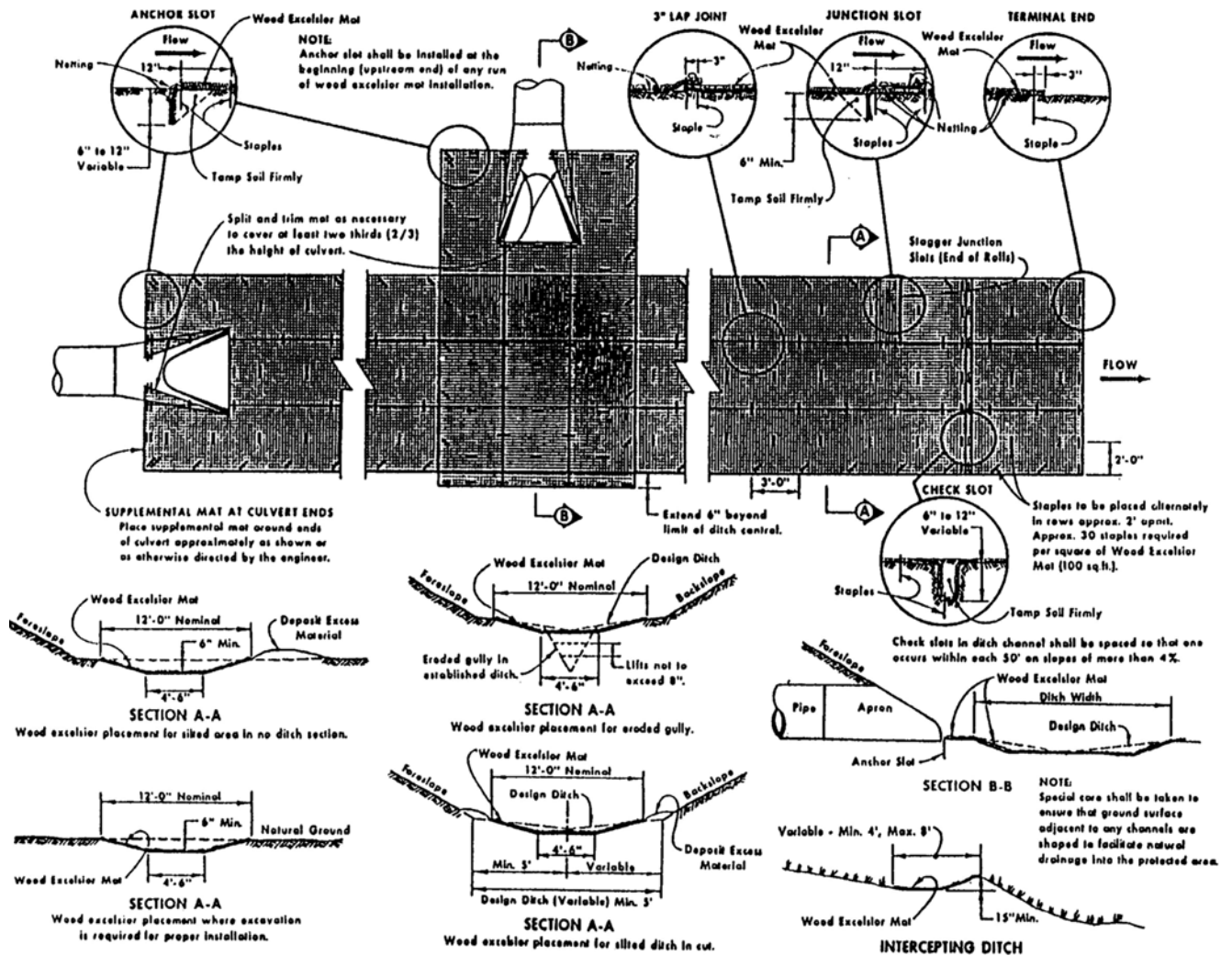


Figure 2.4. Special ditch control (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)