NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

STREAM CHANNEL STABILIZATION
(ft)
CODE 584

DEFINITION

Stabilizing the channel of a stream with suitable structures.

SCOPE

This standard applies to the structural work done to control aggradation or degradation in a stream channel. It does not include work done to prevent bank cutting or meander.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to stream channels undergoing damaging aggradation or degradation that cannot be feasibly controlled by clearing or snagging, by the establishment of vegetative protection, or by the installation of upstream water control facilities.

DESIGN CRITERIA

It is recognized that channels may aggrade or degrade during a given storm or over short periods. A channel is considered stable if over long periods the channel bottom remains essentially at the same elevation.

In the design of a channel for stability, consideration shall be given to the following points:

1. The character of the materials comprising the channel bottom.
2. The quantity and character of the sediments entering the reach of channel under consideration. This shall be analyzed on the basis of both present conditions and projected changes caused by changes in land use or land treatment and upstream improvements or structural measures.
3. Streamflow peaks, velocities, and volumes at various flow frequencies.
4. The effects of changes in velocity of the stream produced by the structural measures.

Structures installed to stabilize stream channels shall be designed and installed to meet NRCS standards for the particular structure and type of construction.

PLANS AND SPECIFICATIONS

Plans and specifications for stream channel stabilization shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

OTHER CONSIDERATIONS

The location and design of channels shall give careful consideration to minimizing water pollution, damage to fish and wildlife habitat, protection of forest resources, and the quality of the landscape. Consider requirements for construction, operation and maintenance. Selection is to consider the overall landscape character, selected woody plants, prominent view, and the fish and wildlife habitat requirements.

Quality of the landscape shall be maintained by both location of the channel work and plantings as appropriate. Minimum disturbance of existing vegetation and blending to the existing landscape would be ideal. Removal and disposal of any trees and brush required shall be done in such a manner as to avoid damage to other trees and property and to have the least detrimental effect on the environment.

An associated conservation and resource plan for adjacent lands shall be developed at the same time as the channel stabilization plans. Considerations should be given in the channel design for

conservation practices and land use of adjacent lands such that all treatments present a coordinated overall plan of the project area.

1. Capacity

The capacity for structures or stabilized channels shall be determined by procedures applicable to the purposes to be served, and in accordance with related NRCS standards and design guidelines. The "n" value for stabilized channels shall be based on the materials used and the expected vegetation along with other retardance factors considering the level of maintenance prescribed in the operation and maintenance plan developed with the owners or sponsors. The required capacity may be established by consideration of volume-duration removal rates, peak flow, or a combination of the two as determined by the topography, purpose of the channel, desired level of protection and economic feasibility.

2. Channel Armoring or Riprap Lining

Channel armoring or riprap lining may be used to protect critical portions of the channel cross-section or over erodible soils. This application may be used in conjunction with vegetative slopes where vegetation can give long term protection of the banks and withstand expected submergence and flow attack.

Riprap lined channels or chutes may also be used to take up the grade in the channel and promote stability. Channel armoring and riprap design shall meet the requirements set forth in Minnesota Technical Release No. 3, "Loose Riprap Protection".

3. Channel Crossings

Channel crossings for livestock or equipment shall be designed such that the crossing does not create instability in the channel bottom or sides either upstream or downstream from the crossing. Crossings may be concrete or riprap. On concrete crossings, the ramps shall be notched or otherwise roughened to provide adequate footing for livestock. Where appropriate, consult the standards for Access Road (560) and Heavy Use Protection (561).

For riprap crossings, the minimum size riprap should meet or exceed the requirements of Minnesota Technical Release No. 3, "Loose Riprap Protection", for channel lining for a 4:1 side slope. Large stones may be desired for stability of ramps under equipment travel and livestock usage. Rock depth, rock size, and need for bedding below the rock need to be considered in the design.

Fencing the crossing may be necessary to restrict livestock usage to the crossing surface only.

4. Seeding

Vegetation will be established on all channel slopes, berms, spoil, and other disturbed areas not protected with armoring, rock or other non-vegetative protection. Mulching may be needed to achieve an adequate vegetative cover. For seeding and mulching requirements, see Conservation Practice Standard 342, Critical Area Planting, and Conservation Practice Standard 484, Mulching.