

USDA
NATURAL RESOURCES
CONSERVATION SERVICE

DELAWARE CONSERVATION
PRACTICE STANDARD

CHANNEL STABILIZATION

CODE 584
(Reported by Ft.)

CONSIDERATIONS

Consider areawide planning for proper design, function and management of protective measures where the design reach involves by multiple stakeholders.

An assessment of channel stabilization needs should be considered in sufficient detail to identify the causes contributing to the instability (e.g. watershed alterations resulting in significant modifications of discharge or sediment production). Due to the complexity of such an assessment, use of an interdisciplinary team should be considered.

The design of the channel stabilization should consider specific site conditions such as the position and extent of the floodplain, and the extent of the channel's entrenchment.

When designing protective measures, consider the changes that may occur in the watershed hydrology (such as changes in land use due to development) and sedimentation over the design life of the measure.

Consider utilizing woody debris removed during construction in the overall practice design.

Measures should consider habitat and migration needs of aquatic species.

Consider maintaining or improving the habitat value for fish and wildlife, which includes lowering or moderating water temperature, and improving water quality.

Consider opportunities to improve habitat for threatened, endangered, and other species of concern, where applicable.

Consider maximizing adjacent wetland functions and values with the project design and minimizing adverse effects to existing wetland functions and values.

Consider protecting side channel inlets and outlets from erosion or sedimentation.

Consider the type of human use and the social

DEFINITION

Measure(s) used to stabilize the bed or bottom of a channel.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following:

- Maintain or alter channel bed elevation or gradient.
- Modify sediment transport or deposition.
- Manage surface water and groundwater levels in floodplains, riparian areas, and wetlands.

**CONDITIONS WHERE PRACTICE
APPLIES**

This practice applies to the beds of existing or newly constructed channels, alluvial or non-alluvial, undergoing damaging aggradation or degradation that cannot be feasibly controlled by clearing or snagging, by the establishment of vegetative protection, by the installation of bank protection, or by the installation of upstream water control measures.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

and safety aspects when designing the protective measures. Use construction materials, grading practices, vegetation, and other site development elements that enhance aesthetics, recreational use, and maintain or complement existing landscape uses such as pedestrian paths, climate controls, and buffers. Avoid excessive disturbance and compaction of the site during installation.

Measures should be designed to minimize safety hazards to boaters, swimmers, or people using the channel.

This practice has the potential to affect National Register listed cultural resources or eligible (significant) cultural resources. These may include archeological, historic, or traditional cultural properties. Care should be taken to avoid adverse impacts to these resources. Follow NRCS state policy for considering cultural resources during planning.

CRITERIA

Criteria Applicable to All Purposes

Measures shall be designed and installed according to a site-specific plan, including an evaluation of the stream type (based on stream slope, valley slope, geology and soils).

The bankfull flow for a natural stream channel shall be determined independently from the design storm event (i.e. the 25-year, or 100-year event), which will be utilized to evaluate the adequacy of the floodplain.

Measures to be applied shall be compatible with improvements planned or being carried out by others.

Sufficient depth shall be maintained to provide adequate outlets for subsurface drains, tributary streams or ditches, or other channels.

Effect of channel work on existing structures such as culverts, bridges, buried cables, pipelines, and irrigation flumes shall be evaluated to determine impact on their intended functions.

Measures shall be designed for flow duration, depth of inundation, buoyancy, uplift, scour, angle of attack, and stream velocity.

Measures shall be compatible with the bank or shoreline materials, water chemistry, channel hydraulics, and slope characteristics, both above and below the water line.

Measures shall be designed for anticipated ice action, debris impact and fluctuating water levels.

Spoil material from clearing, grubbing, and channel excavation shall be disposed of in a manner that will not interfere with the function of the channel and in accordance with all local, state, and federal laws and regulations.

All disturbed areas around measures shall be protected from erosion. Vegetation shall be selected that is best suited for the anticipated site conditions.

Measures applied shall seek to avoid adverse effects to endangered, threatened, and candidate species and their habitats, whenever possible.

Measures applied shall seek to avoid adverse effects to archeological, historic, structural, and traditional cultural properties, whenever possible.

Channel clearing to remove stumps, fallen trees, debris, and bars shall only be done when they are causing or could cause detrimental bank erosion or structural failure. Habitat forming elements that provide cover, food, pools, and water turbulence shall be retained or replaced to the extent possible.

Measures shall be functional for the design flow and sustainable for higher flow conditions based on acceptable risk.

Measures shall be designed to maintain the appropriate sediment transport regime in order to avoid detrimental erosion or sedimentation upstream and downstream.

Measures shall not impair the floodplain function.

Measures shall not result in adverse affects on the function of the stream or the stream corridor.

When water surface elevations are a concern, the effects of protective measures shall not cause detrimental changes in water surface elevations.

The quantity and character of the sediments entering the reach of channel under consideration shall be analyzed on the basis of both present conditions and projected conditions caused by changes in land use or land treatment and upstream improvements or structural measures.

SPECIFICATIONS

Plans and specifications for establishment of this practice shall be prepared in accordance with the previously listed criteria. Plans and specifications shall contain sufficient detail to ensure success of the practice. Documentation shall be in accordance with the section "Supporting Data and Documentation" in this standard.

OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan shall be prepared for each management unit. The plan shall provide specific instructions for operating and maintaining the system to insure that it functions properly. It shall also provide for periodic inspections and prompt repair or replacement of damaged components. Appropriate job sheet(s), fact sheets, or other information sheets may be used to serve as the management plan as well as supporting documentation and shall be provided to the client. These sheets shall be referenced in the conservation plan narrative.

SUPPORTING DATA AND DOCUMENTATION

The following is a list of the minimum data and documentation to be recorded in the case file:

1. Extent of planting in acres, field number, and the location of the practice marked on the conservation plan map;
2. Assistance notes shall include dates of site visits, name or initials of the person who

made the visit, specifics as to alternatives discussed, decisions made, and by whom;

3. Completed copy of the appropriate job sheet(s) or other specifications and operation and management plans.

Field Data and Survey Notes

The following is a list of the minimum data needed:

1. Plan view sketch of the area.
2. Establish and describe a temporary benchmark.
3. Topographic survey of the area needing stabilization.
4. Cross-sections and profile of the channel.
5. Location and description of fallen trees and other debris that may need to be removed.
6. Location and elevation of soil borings.

Design Data

Record on appropriate engineering paper. For guidance on the preparation of engineering plans see Chapter 5 of the Engineering Field Handbook - Part 650. The following is a list of the minimum required design data:

1. Locate the practice on the farm plan map in the case file.
2. Determine bank material and identify any special restrictions.
3. Determine the quantity and character of the sediments entering the reach of channel under consideration.
4. Design the channel stabilization to meet the criteria of this practice standard.
5. Determine channel capacity from the contributing drainage area for the required design storm in accordance with Chapter 2, EFH, Part 650, or by other approved method.

6. Size the channel in accordance with National Engineering Handbook (NEH), Part 653 (Stream Corridor Restoration Principles, Processes and Practices), or other source.
7. Stabilize the banks in accordance with National Engineering Handbook (NEH), Part 653, or other source.
8. Provide for the safe transition at the inlet and outlet of flow from the constructed channel.
9. Provide for the control of erosion during and following construction.
10. Show job class on the plan.
11. Estimated Quantities.
12. Planting plan. This must meet the criteria, specifications and documentation requirements of the appropriate conservation practice standard. Show on the plans.
7. Type and location of geotextiles, if utilized in the stabilization.
8. Statement as to the condition or adequacy of vegetation on the banks, and other disturbed areas.
9. Final quantities and documentations for quantity changes. Materials certifications as appropriate.
10. Sign and date check-notes and plans by someone with appropriate approval authority. Include statement that practice meets or exceeds plans and NRCS practice standards.

Construction Check Data/As-Built Plans

Record on survey notepaper, NRCS-ENG-28, or other appropriate engineering paper. Survey data will be plotted in red on the as-built plans. The following is a list of minimum data needed for As-built documentation:

1. Documentation of site visits on CPA-6. The documentation shall include the date, who performed the inspection, specifics as to what was inspected, all alternatives discussed, and decisions made and by whom.
2. Profile notes along centerline of the constructed channel.
3. Cross-section notes at one or more locations on the completed channel as needed to determine whether planned grade and dimensions have been met.
4. Profile notes along the top of the banks.
5. Cross-section notes of emergency spillways.
6. Location, size, type, grade, and/or pertinent elevations of any structures used for stabilization.