

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

CUT BANK STABILIZATION

(feet)

CODE 742 CA INTERIM

DEFINITION

To stabilize and treat cut banks of bare earth with vegetation and/or structural measures to protect against erosion by wind or water.

Scope

This standard applies to measures used to stabilize and protect bare earth or decomposed rock banks usually associated with the construction of roads, parking lots, storage yards, building pads or other similar disturbed areas. It applies to naturally occurring banks but NOT to streambanks which are covered by Practice Standard 580-Streambank and Shoreline Protection.

PURPOSES

To treat cut banks for one or more of the following purposes:

1. To reduce erosion and the resulting sediment loads causing downstream damage.
2. To maintain or enhance water quality.
3. To improve the conditions to sustain vegetative growth.
4. To improve the wildlife habitat.
5. To improve the visual appearance of the area.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to natural or excavated earthen cut banks where erosion can be reduced by the establishment of vegetation, or a combination of structural measures and vegetation, and where the failure of structural measures will not result in loss of life or serious damage to property.

CRITERIA

Because each cut bank is unique, treatment will be designed for the specific site conditions, and installed according to a plan.

Designs shall address the following:

1. Geology exploration; determination of the extent and stability of the cut bank.
2. Soils investigation; determination of soil profile, and any alternations needed for plant growth, and also evaluation of the soil mechanics of soil loadings and stability of footings.
3. Hydrology investigation; determination of runoff, for both before and after treatment with intent of reducing runoff; determination of peak runoff at bottom of cut bank.
4. Erosion study; determination of soil erosion rates for both before and after treatment, using USLE, and noting the existing "C"; the aged "C" values; and determination of allowable slope to maintain plant growth.
5. Hydraulics analysis; determination of peak flows at bottom of slope for various frequency storm events, and of needed conveyance system to discharge the flow to the same watercourse.

The design discharge should be compatible with the project life, and with other risk factors.

6. Structural analysis; insure structural measures are adequate and serviceable for the project life, given proper scheduled maintenance and repair.
7. Vegetation evaluation; vegetative practices must be consistent with the project objectives. The seedbed preparation, species, fertilizer, mulch and other vegetative requirements shall be as set forth in Practice Standard 342-Critical Area Planting. Irrigation may be needed to establish, and maintain vegetative growth.

8. Maintenance; specify any and all maintenance requirements needed for the project to reform as designed.

Protection Measures Guidelines:

The following is a partial list of elements that may be included in a plan for Cut Bank Protection:

1. Scaling and grading of the slope, and the removal of fallen or hazardous trees, rocks, and other debris.
2. Flattening of slope of the bank to provide a suitable condition for establishment and maintenance of vegetative growth.
3. If bank can be sloped to a 2:1, then establish vegetation.
4. If bank cannot be sloped to a 2:1; then construct retaining walls to a height needed to provide a 2:1 slope from the top of bank, and then establish vegetation.
5. Installation of structural measures to provide for stable conditions, so that vegetation can be established on the modified slope. Structural measures may include:
 - a. timber retaining walls
 - b. gabion retaining walls
 - c. Rock Toe-walls
 - d. Rocked slopes, or slopes reinforced with screen blocks, or other geotextile materials.
 - e. Concrete curb and gutter at toe of bank.
 - f. Grassed waterways, or lined channels. Lined channels maybe loose rock, grouted rock, modular block, shotcrete, or concrete.
6. Diversion of excess runoff away from the upper edge of the bank, and providing for toe protection.
7. Conveyance system downslope for concentrated flows, including drop inlets and culverts as needed.
8. Provide irrigation as may be need for plant establishment.

Wildlife

Special attention shall be given to improving the habitat for wildlife.

Landscape

Consideration shall be given to the use of construction materials, grading, and vegetation, that either improves, or minimizes the visual impacts, and maintains or complement the existing landscape.

CONSIDERATIONS

Water Quantity

1. Effects on the water budget, especially on volumes and rates of runoff, infiltration, deep percolation, and ground water recharge.
2. Effects on downstream flows and aquifers that affect other uses and users.
3. Effects on the water table of adjoining fields.
4. Effects on the interflow discharge into streams.
5. Effects on soil moisture storage, and rooting depths and transpiration of vegetation.

Water Quality

1. Filtering effects of vegetation on movement of sediment, and sediment-attached and dissolved substances.
2. Effects on erosion and movement of sediment, and soluble and sediment-attached substances carried by runoff and streamflow.
3. Effects on the visual quality of onsite and downstream water resources.
4. Effects of construction and vegetation establishment on quality.
5. Effects of changes in water temperatures.
6. Short-term and long-term effects on wetlands and water-related wildlife habitats.
7. Effects on the visual quality of the water resource.

Endangered Species Considerations

Determine if installation of this practice with any others proposed will have any effect on any federal or state listed Rare, Threatened or Endangered species or their habitat. NRCS's objective is to benefit these species and others of concern or at least not have any adverse effect on a listed species. If the Environmental Evaluation indicates the action may adversely affect a listed species or result in adverse modification of habitat of listed species which has been determined to be critical habitat, NRCS will advise the land user of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the landowner selects one of the alternative conservation treatments for installation; or at the request of the landowners, NRCS may initiate consultation with the Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game. If the Environmental Evaluation indicates the action will not affect a listed species or result in adverse modification of critical habitat, consultation generally will not apply and usually would not be initiated. Document any special considerations for endangered species in the Practice Requirements Worksheet.

Some species are year-round residents in some streams, such as, freshwater shrimp. Other species, such as steelhead and salmon, utilize streams during various seasons. Be aware that critical periods, such as spawning, eggs in gravels, and rearing of young may preclude activities in the stream that may directly affect the stream habitat during those periods. For example there should be no disturbance of stream gravel beds that may have eggs in them. That could include any equipment in the stream or even walking in the stream or work upstream that may result in sediment depositing in the gravel beds. Document any special considerations for endangered species in the Practice Requirements Worksheet.

PLANS AND SPECIFICATIONS

Plans and specification for CUT BANKS shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

California Interim Construction Specifications shall be used for this practice, or Practice Specifications shall

be provided by the State Conservation Engineer when plans are submitted for approval.

OPERATION AND MAINTENANCE

A maintenance plan will be prepared listed all the necessary maintenance items, the inspections, and the replacement of any item necessary for the proper performance of the system. The plan will be given to the landowner with the Plans and Specifications.