

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**STREAM CROSSING**

(ft.)  
CODE 578

**DEFINITION**

A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles.

**PURPOSE**

Improve water quality by reducing sediment, organic, and inorganic loading of the stream.

Reduce streambank and streambed erosion.

Provide crossing for access to another land unit.

**CONDITION WHERE PRACTICE APPLIES**

This practice applies to all land uses where an intermittent or perennial watercourse exists and a ford, bridge, or culvert type crossing is desired for livestock, people, and/or equipment.

**CRITERIA**

**Laws and Regulations.** This practice must comply with all applicable federal, state, local and tribal laws and regulations. Laws and regulations of particular concern include those involving water and drainage rights, pollution control, property easements, wetlands, Waters of the United States, preservation of cultural resources, and endangered species.

The landowner shall obtain all necessary permits prior to construction.

**Location.** Stream crossings shall be located in areas where the streambed is stable or where a stable crossing can be created without decreasing streambed stability. Avoid sites where channel grade or alignment changes abruptly, excessive seepage or instability is evident, overfalls exist, or large tributaries enter the stream.

**Avoid wetland areas.** Where possible, locate crossings away from shady areas to discourage livestock loafing in or near the stream.

Stream crossings must provide normal passage for water, fish, and other aquatic animals within the channel during all seasons of the year.

**Roads, Trails and Walkways.** Control erosion in travel ways and loafing areas. Divert surface runoff around approaches to prevent erosion of the approaches. Direct roadside ditches away from the crossing.

Approach roads, trails and walkways must meet appropriate South Dakota (SD) Natural Resources Conservation Service (NRCS) practice standards such as Access Road (560), Recreation Trail and Walkway (568), or Animal Trails and Walkways (575).

Approaches to the crossing must be stable, 4:1 or flatter and should blend with the existing site.

Select walking surface material that is compatible with animal health and usage.

**Width.** The approach and stream crossing width must be adequate for the intended use. Travel surfaces of multi-use stream crossings must be at least 10 feet wide. Travel surfaces of "livestock only" stream crossings must be at least six feet wide.

**Side Slopes.** Stream crossing cut and fill slopes must be stable and 2:1 (horizontal:vertical) or flatter for soil slopes or 1.5:1 or flatter for rock slopes.

**Rock.** Rock must be durable for the site conditions. Installed rock must be designed to remain in place at design flows of not less than those produced by the 10-year frequency, 24-hour duration storm.

**Fence.** Use fences to manage animal access to

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the crossing and adjacent areas.

Cross-stream fencing must be breakaway panels or similar designs to allow passage of flood debris. Fences crossing navigable streams must be registered with SD Department of Environment and Natural Resources (DENR).

Fences must meet SD NRCS practice standard Fence (382).

**Vegetation.** Areas to be vegetated must be protected from grazing until the vegetation is fully established. Vegetative cover or other protection must meet Critical Area Planting (342) or Heavy Use Area Protection (561).

**Bridges and Elevated Walkways.** Bridges and elevated walkways must be designed under the direct supervision of an engineer. Bridges and elevated walkways must be designed for the expected loading, but not less than 100 pounds per square foot of floor area. The design must be durable and must be stable during passage of flow from the 25-year frequency 24-hour duration storm.

Effective handrails and animal guards must be provided.

**Culverts.** Combined capacity of culverts located at crossing stream (inlet and outlet) bottom elevation must at least pass the 2-year duration, 24-hour peak flow. The length of culverts passing this flow must extend at least the full width of the crossing including side slopes.

Other culverts (or spillway pipes) must extend at least from the upstream fill slope surface (at inlet elevation) to the downstream toe of the fill. Outlets must be protected from excessive erosion.

Crossing sites must be protected from out-of-bank flows without structure or streambank damage or erosion of crossing cuts and fills during passage of flow from the 10-year frequency, 24-hour duration storm.

### **Additional Criteria for Ford Crossings.**

Ford crossings must have crossing profiles with stream flow capacity equal to the original stream cross section or the design must meet SD NRCS practice standard Grade Stabilization Structure (410).

Where needed, a portion of the ford crossing shall be depressed at or below the average stream bottom elevation to keep base or low flows concentrated.

Crossings must be designed to resist settlement, piping, undercutting, frost heave, ice damage, flooding, and other site hazards and loads. Crossings must be designed to be stable during the 10-year frequency, 24-hour duration discharge.

If the downstream edge of the ford crossing is above the original stream bottom, the crossing must be stabilized by following SD NRCS practice standard 584 Stream Channel Stabilization.

**Concrete Fords.** Concrete ford crossing foundations must be (or modified to be) firm, stable, and have adequate bearing strength.

Concrete shall have a minimum compressive strength of 3,000 pounds per square inch at 28 days. Concrete fords designed for heavy equipment loads must be designed using an appropriate procedure as described in ACI 360, Design of Slabs on Grade.

Pre-cast concrete panels may be used in lieu of cast-in place-slabs.

Concrete fords must be designed under the direct supervision of an engineer.

**Rock and/or Geotextile ford Crossings.** Rock and/or geotextile crossings are appropriate for most ford crossing sites including sites with soft or unstable subgrade.

Ford crossings using geotextiles must be designed and installed following the geotextile manufacturer's recommendations.

## CONSIDERATIONS

Where possible, avoid or minimize stream crossings by using alternate travel routes.

Ford crossings are often the least intrusive choice where use is infrequent. Ford crossings are adapted for crossing wide, shallow watercourses with stable streambeds.

Locate crossings where adverse environmental impacts will be minimized. Consider:

Effects on stream erosion, deposition flooding, water temperature and water quality.

Effects on adjacent riparian areas, including potentials for overgrazing, erosion, and loss of habitats.

Effects on threatened and endangered species and on other fish and wildlife.

Effects on scenic areas and cultural resources.

Evaluate the need for safety measures such as guard rails, or signs warning of water depth or other dangers.

## PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall meet this standard and include requirements needed to achieve its purpose. Include the location and the kind, amount, and quality of materials to be used.

## OPERATION AND MAINTENANCE (O&M)

An O&M plan must be prepared for use by the owner/operator. Specify inspection annually and after significant storm events to identify repair and maintenance needs. Include where appropriate:

Periodic grading or re-shaping to maintain grades and dimensions;

Periodic addition of surfacing materials where used;

Re-seed areas of damaged or destroyed vegetation;

Mend fences and gates;

Remove and manage manure accumulations.