NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

STREAM CROSSING OR ACCESS
(No.)

Code 728

Definition

A stabilized area to provide for crossing of a stream by livestock and farm machinery, or to provide access to the stream for livestock water.

Scope

This standard applies to areas where the concentration of livestock crossing or entering a stream is such that a structure is needed to stabilize the stream channel, control bank erosion, and reduce sedimentation. Relocation of existing crossings may be necessary. This standard does not apply to bridges.

Purpose

To provide a controlled stable crossing or water access point for livestock along with access for farm equipment. To control bank and streambed erosion, reduce sediment and enhance water quality.

Conditions where practice applies

Where access is needed from one grazing area to another grazing area, for livestock water, and/or where movement of equipment between areas is necessary for pasture maintenance; and where current livestock or farm equipment activities are causing degradation of the stream channel or banks.

Planning Considerations

Water Quantity

1. Effects on 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 and/or wetlands.

4. Effects on the interflow discharge into streams.

Water Quality

1. Filtering effects of vegetation and other erosion control practices 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 on site and downstream water resources.

4. Effects of construction and vegetation establishment on quality.

5. Effects of changes in water temperatures due to changes in streamside shading.

6. Short-term and long-term effects on wetlands and water-related wildlife habitats.

7. Effects of animal wastes in the stream.

NRCS-WV, TG IV

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Federal, State, and Local Laws

Design and construction activities shall comply with all federal, state, and local laws, rules, and regulations governing activities in or along streams, pollution abatement, health, and safety. The owner or operator shall be responsible for securing all required permits or approvals and for performing all planned work in accordance with such laws and regulations. NRCS employees are not to assume responsibility for procuring these permits, rights, or approvals, or for enforcing laws and regulations. NRCS may provide the landowner or operator with technical information needed to obtain the required rights or approvals to construct, operate, and maintain the practice.

Permits may be required from the following agencies:

1. U.S. Army Corps of Engineers

2. WV Department of Natural Resources

3. WV Public Lands Corporation

All contemplated projects and plans involving changes or alterations in any high quality stream, as defined in the publication “West Virginia High Quality Streams, Sixth Edition,” will be submitted to the Division of Natural Resources for review.

Work in "Waters of Special Concern" (Appendix I) will require individual approval from WVDEP and/or WVDNR. Work in waters in Appendix II require notification to the USFWS due to the present or possible presents of endangered/threatened species.

Design Criteria

Stream crossings or access ramps shall be designed to serve the planned land use and be stable for the expected livestock and vehicular traffic and for the bank full flow velocity at the site.

Site Selection Before installation, the stream shall be inventoried to determine where livestock and vehicular traffic are most frequently entering or crossing the stream. Crossings or access ramps will be installed at locations currently most actively used by livestock, where possible. They will be installed preferably perpendicular to the stream centerline but in no case shall the angle exceed 15^{o} from perpendicular. They will be installed along straight reaches of stream channel away from culverts, possible water supply intakes, bridge piers, or other obstructions that may cause turbulence that would result in damage to the crossing or access. If possible, the site should be selected so the area surrounding the entrance ramps will be stable for the anticipated livestock or vehicular traffic. Where this is not possible, additional stabilization material will be installed for the distance required to reach stable ground.

Type Crossings may be either submerged crossings or "low water" culvert crossings. The primary factors in selecting the type are depth of channel and the need to provide access for livestock water. Low water crossings will be installed whenever site conditions will permit and when livestock water access is not needed. Narrow deep channels, greater than 4 ft. in depth, should be considered for culvert installation.

Capacity When submerged crossings or access ramps are used, the cross sectional area will be such that the stream capacity will not be reduced. The bottom of crossings shall have a length equal to the bottom width of the stream, but no less than 4 ft. Livestock watering access ramps will extend into the stream at least 4 ft. beyond the normal water line of the stream.

The minimum culvert size for low water crossings will be 18 in. dia., however, larger culverts should be considered as a means of reducing maintenance caused by debris collection.

Where culverts can be installed without potential damage to upstream or downstream areas, the culverts will be designed to carry the capacity required by the "A" drainage curve in exhibit 14-2.1, NEH Part 650, Engineering Field Handbook, without overtopping the crossing. At locations where there is a potential of flood damage above or below the installation, or where drainage areas exceed the limits of exhibit 14-2.1, an analysis of the water surface profile for the stream will be performed to determine the suitability and capacity requirements for installing the crossing.

In some cases it may be necessary to widen the stream at the location of the culverts in order to install several culverts and maintain the water surface at acceptable levels.

Adequate Crossings constructed of rock riprap or gabion baskets will require the placement of gravel, precast concrete paving units, or concrete pavement to create a surface on which livestock can walk. On streams with bank full flow velocities of 5 fps or less and where the finished surface of the crossing will be flush with the stream bed, the crossing can be topped with coarse aggregate (ASTM C33 or D448). The specific gradation will be such that the maximum size stone will be the diameter determined from exhibit 16-1 in NEH Part 650, Engineering Field Handbook. The thickness of the coarse aggregate layer will be 2 inches or equal to the maximum stone size, whichever is greater. When very coarse aggregates (sizes 1,2,3,4 or 24) are required, the top 1" to 1 1/2" of the layer may be mixed with a finer aggregate (sizes 6,7, 67 or 68) to create a smoother walking surface for livestock and to prevent the gravel from "rolling" under wheel traffic. When crossings are designed with the coarse aggregate topping the O&M Plan will address the possible need to replace some or all of the aggregate after high flows.

Designs where stream velocities are greater than 5 fps, or installations where the finished surface will be above the stream bed, will require that the crossing or access be surfaced with more stable materials like concrete, precast paving units, or cellular matrix confinement grids filled with gravel or concrete. All designs utilizing these materials will be approved by the State Conservation Engineer.

Waste concrete from pavement repair in not suitable material.

Concrete slabs will not be used for submerged crossings unless they are designed to have the flexibility or strength to resist the pressures created by freezing and thawing.

When concrete is used it shall be 3000 psi (6 bag) mix with type 1 or 1A cement and aggregates meeting the requirements of ASTM C33. Minimum concrete thickness will be 4 in. and minimum reinforcing steel will be 6x6, 10 gauge placed at the center of the slab. Concrete will be placed on a minimum of 4 in. of #57 or #67 (ASTM C33) aggregate.

Geotextile fabric will be a pervious sheet of woven or nonwoven fabric meeting the requirements of Class IV fabric in NEH 20 Specification 95 Geotextile or WV 700 series specification 746, Geotextiles. The perimeter of the fabric will be anchored in trenches at least 6 in. deep and 6 in. wide.

Culvert pipes may be any of the types listed for principal spillway pipes in WV engineering standard 378, Ponds. Culverts will be installed with a minimum of one foot of cover over the pipe. The downstream face of the fill and the stream channel, for a minimum length of 10 ft. downstream of the culvert outlet, will be protected from erosion by installation of riprap or other protective measures.

All crossings or access ramps will be protected from undercutting. This can be accomplished by providing channel lining upstream and downstream of the structure or by constructing cutoff walls along the upstream and downstream edges of the crossing. Cutoff walls will extend a minimum of 2 ft., or to bedrock if less than 2 ft., below the stream bottom and laterally to at least 10 ft. beyond the edges of the stream bottom. The cutoff walls will be at least 12 in. wide for rock riprap and 8 in. wide if concrete.

The full length of entrance ramps will be stabilized in the same manner as the stream bottom. Where needed, because of wet conditions or livestock concentrations, the stabilization material will be extended beyond the end of the ramp to a stable area.

Geometry The width of stream crossings or access ramps will be 8 ft. minimum for livestock access and 12 ft. minimum when designed for vehicular traffic. The maximum width will be 16 ft.

Entrance ramps will be no steeper than 5:1 for livestock access and no steeper than 8:1 when designed for vehicular traffic.

Cut and fill slopes will be no steeper than 2:1.

To reduce turbulence in flow created by the excavation of access ramps through the stream bank, the stream banks and cut slopes of the access ramps will be rounded to create a smooth transition from normal stream cross-section to the cross-section of the crossing or access. Rounding will begin at a distance of at least 5 times the stream depth upstream and downstream of the crossing or access and end the same distance along the ramp cut slopes from the edge of the stream bottom.

Where the stream velocities at bank full flow exceed the allowable velocities for the type of soil in the bank, the rounded banks and the

stream bottom will be protected with rock riprap or other protective measures. Allowable velocity will be determined for bare channel conditions using the allowable velocities in WV engineering standard 582, Open Channel for drainage areas less than 640 ac. and in TR 25, Design of Open Channels for drainage areas larger than 640 ac.

Fencing Permanent or temporary fences will be installed to prevent livestock from entering the stream at locations other than the crossing or access ramp. The fence will extend across the stream or around the end of access ramps in the stream, to prevent livestock from moving up or down the stream from the crossing or access. Fences along the entrance ramps to crossings or watering access points will be placed in a manner that will prevent livestock from getting on cut or fill slopes for the ramp.

Along sections of the stream where site conditions limit the access of livestock to the stream, fences can be omitted. Fences will be designed to meet the requirements of WV standard 382, Fencing or 472, Livestock Exclusion.

Woven wire fences will not be used across or into the stream channel because of the increased potential of collecting trash and debris.

Vegetative Measures All disturbed areas not protected by structural measures will have vegetation established according to the requirements of WV standard 342, Critical Area Planting. Seeding on the stream banks will be protected by mulch anchored with netting or by the installation of excelsior erosion control blankets.

Newly seeded and mulched areas will be protected from livestock grazing until vegetation is established.

Environmental concerns Measures and construction practices which will limit the amount of sediment or other pollutants in the stream will be included in the design. These items include but are not limited to:

1. Where possible, divert the stream flow to one side of the channel while construction is completed on the opposite side or temporarily dam the stream flow and pump or pipe the flow past the site while construction is in progress. Remove fill material used to create a temporary dam and restore area to its original elevation.

2. Perform excavation from the stream bank as much as possible. Use rubber tired backhoes or excavators instead of dozers.

3. Complete excavation as rapidly as possible and during the time of year when high flows are not expected.

4. Do not install crossings or access ramp(s) during the warm water fish spawning season.

5. Do not install crossing or access ramp(s) in trout streams during September-October.

6. Haul excavated material to a disposal area and stabilize by establishment of vegetation to prevent it from being washed or eroded back into the stream or wetland area.

7. Protect concrete from flowing water until it cures and prevent concrete or cement from entering the stream.

8. Temporarily seed and mulch bare areas if conditions are such that permanent seeding and mulching cannot be completed and the area will be left barren for an extended period of time.

9. Install straw bale dikes, earth berms, or sediment fence to divert overland surface flows from excavated banks during construction and until vegetation or structural protection is provided.

10. Minimize the removal of mature riparian vegetation to the immediate construction limits.

Operation and Maintenance

An operation and maintenance plan will be developed for the crossing or access ramp. The plan shall include, as a minimum, the following items:

1. Inspection of the crossing or access ramp periodically and after each large storm event for accumulation of debris or damage to the structure or fences.

2. Repair of eroding areas and replacement of surfacing materials if washed away.

3. Removal of sediment and/or debris accumulations on or around the crossing or access.

4. Maintenance of vegetation by fertilization, liming, and/or reseeding.

Plans and Specifications

Plans and specifications for constructing stream crossings or access ramps shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Specifications may be developed from applicable NEH-20 specifications or West Virginia "700 series" specifications. For submerged crossings or accesses, the attached construction specification may also be used.

APPENDIX I

WATERS OF SPECIAL CONCERN

"Waters of Special Concern" — are those rivers or streams whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or state resource and shall include but not be limited to the following waters of the state, West Virginia Code of State Regulations, Requirements Governing Water Quality Standards Title 46, Series 1:

a) All Federally designated rivers under the Wild and Scenic Rivers Act, Public law 95-542, as amended, 16 U.S.C. 1271, ~et seq (Bluestone River from the upstream boundary of Pipestem State Park to Bluestone Reservoir, Meadow River from near the US 19 bridge to its junction with the Gauley River, also included are all rivers within the Monongahela National Forest designated as National Wild and Scenic Study Rivers);

b) All naturally reproducing trout streams in the following counties: Barbour, Fayette, Grant, Greenbrier, Hampshire, Hardy, Mercer, Mineral, Monroe, Nicholas, Pendleton, Pocahontas, Preston, Raleigh, Randolph, Summers, Tucker, Upshur and Webster. For information about specific streams, contact Wildlife Resource Section, Trout Fisheries Program at 304-367-0245;

c) All streams and other bodies of water in State and National Forests and Recreation Areas (included are streams and bodies of water located within the Spruce Knob, Seneca Rocks, and Gauley River National Recreation Areas); and

d) The New River National River, National Parks and Recreation Act of 1978, Public Law 95-625, as amended.

APPENDIX II

WV STREAMS WITH PRESENCE/POTENTIAL PRESENCE OF ENDANGERED/THREATENED SPECIES

Work in any of the following streams required notification to the USFWS due to the presence or possible presence of endangered/threatened species:

Back Creek — Berkeley County

Beaver Creek — Raleigh County

Bluestone River — Mercer and Summers Counties

Buckhannon River — Upshur County

Buffalo Creek — Raleigh County

Cacapon River — Morgan County

Clover Creek — Pocahontas County

Dunkard Creek — Monongalia County

Elk River — Braxton, Clay and Kanawha Counties

Gauley River — Nicholas and Fayette Counties

Greenbrier River — Greenbrier, Pocahontas and Summers Counties

Hackers Creek — Lewis County

Hughes River — Ritchie and Wirt Counties

Kanawha River — Kanawha Falls to Alloy, Fayette County

Little Kanawha River — Calhoun, Gilmer, and Wirt Counties

Marsh Fork — Raleigh County

Meadow River — Greenbrier and Fayette Counties

Meathouse Fork Middle Island Creek — Doddridge County

Middle Island Creek — Doddridge, Tyler, and Pleasants Counties

New River — Raleigh, Summers, and Fayette Counties

North Fork Hugues River — Ritchie County

Ohio River — Cabell, Mason and Wood Counties

Potts Creek — Monroe County

Sleepy Creek — Morgan County

South Fork Hughes River — Ritchie and Wirt Counties

South Fork Potts Creek — Monroe County

West Fork Greenbrier River — Greenbrier, Pocahontas and Summers Counties

West Fork River — Lewis, Harrison Counties

Wetlands — Berkeley County

CONSTRUCTION SPECIFICATIONS
WEST VIRGINIA
STREAM CROSSING OR ACCESS

The crossing or access will be installed at the location and in the manner shown on the drawings and described in this specification.

Construction shall be done in such a way that chemicals, fuels, lubricants, and waste materials will not enter the flow area. Erosion, air pollution, and water pollution will be minimized and held within legal limits.

Measures and construction methods that enhance fish and wildlife values and those for erosion and sediment control shall be incorporated as shown on the drawings. In addition, the following methods or practices will be utilized to the degree possible in the construction of the crossing or access, to reduce the potential for sedimentation of the stream:

1. Divert the stream flow to one side of the channel while construction is done on the opposite side. Or, where possible, temporarily dam the channel and pipe or pump the stream flow past the construction area.

2. Perform construction activities from the bank as much as possible. Use backhoes or excavators instead of dozers and use rubber tired equipment when construction activity must be conducted in the water.

3. Build the crossing or access during the time of year when high flows are not expected and do not build the crossing or access during fish spawning season.

4. Haul all excavated material to the appropriate disposal area, grade, and seed and mulch the material as soon as possible.

When required, all trees, shrubs, brush, and debris within the construction limits will be cleared and grubbed to a depth that will permit installation of the crossing or access ramp. All materials will be burned, buried, or piled in designated disposal areas. The clearing operation will be conducted in a manner to avoid damage to vegetation or property outside the work area and to prevent disturbance within the stream. Special attention will be given to protecting and maintaining key shade , food, and den trees when their removal is not necessary.

Excavation of the crossing or access will be completed to the line and grade shown on the drawings. All excavated material will be removed from the limits of the channel and hauled to designated waste disposal areas. If no disposal areas are designated, the excavated material will be utilized to shape the entrance areas to the crossing or ramp to provide free drainage and stability to the areas.

The bottom of excavations will be smoothed to prevent damage to the geotextile fabric. All large rocks, depressions or protruding items will be removed or filled with gravel. Geotextile fabric, of the type and grade shown on the drawings, will be laid on the finished surface in a loose fashion to allow for some movement during placement of riprap and during settlement after construction. When laps are needed in the geotextile, the two pieces of material will overlap by at least three feet. Laps will be such that the upstream or upslope panel of material is over top of the downstream or downslope panel. Repair of damaged fabric can be made by placing another piece of fabric over the damaged area. The repair panel will extend at least three ft. outside of the damaged area in all directions. The geotextile fabric will be anchored with 6 in. wire staples, on 3 ft. minimum centers, at the edges and at all laps to prevent displacement during riprap installation.

Geotextile fabric will be protected from damage or deterioration from ultraviolet sun rays. Fabric that is damaged or shows signs of deterioration because of improper storage and protection from the sun will not be used. Fabric that is brought on site will be stored in a safe, dry, shaded location. The manufacturers protective cover will be left in place until the fabric is to be used. If the manufacturers cover is not available

then the fabric will be protected by covering with dark plastic or a tarp. Fabric installed in the crossing or access will be covered with riprap and gravel within 24 hours of installation.

Rock riprap shall be limestone or sandstone and will be well graded within the limits shown on the drawings. It will be dense, sound, and free from, cracks, seams, and other defects conducive to accelerated weathering. The rock fragments shall be angular to subrounded in shape. The least dimension of an individual rock fragment shall be not less than one-third the greatest dimension of the fragment.

The riprap shall be placed to the required thickness in one operation. Riprap will be dumped on the geotextile with a drop of no more than three ft. and will not be pushed or rolled across the fabric. The rock will be delivered and placed in a manner that will insure the riprap in place will be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks filling the voids between the larger rocks.

Coarse aggregate surfacing material will be hard, durable limestone or sandstone aggregates meeting the grading limits shown on the drawings. It will be placed to the required thickness in one operation and in such a manner that segregation of the particle sizes will not occur. After placement the aggregate will be consolidated by traversing the entire surface of the crossing or ramp with four passes of the construction equipment.

Upon completion of construction, all disturbed areas shall be graded smooth and blend with the surrounding ground.

A protective cover of vegetation shall be established on all exposed surfaces where soil and climatic conditions permit. Lime and fertilizer shall be spread at the specified rate and disked into the soil to a depth of 4 inches to prepare a seedbed. Seed and mulch shall be applied at the specified rate. Mulch along the streambank will be anchored by mulch netting. Excelsior erosion control blankets may be used in lieu of the mulch and netting. Mulch netting or excelsior blankets will be held in place with 6 in. wire staples placed 3 ft. on centers in all directions.

In some cases, temporary vegetation may be used for protection until conditions are suitable for establishment of permanent vegetation. Where soil or climatic conditions do not permit the establishment of vegetation, and protection is needed, nonvegetative means such as mulches or gravel may be used.

Permanent seeding, temporary seeding or protective mulches will be applied to all bare areas within 10 days of stripping of vegetation.

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

June 22, 2001

REPLY TO
ATTENTION OF:
Operations and Readiness Division
Regulatory Branch

Richard D. Heaslip
Natural Resources Conservation Service
75 High Street
Room 301
Morgantown, WV 26505

Dear Mr. Heaslip:

This letter is written to confirm that the installation of the NRCS Conservation Practice Stream Crossing or Access (728) "for the construction and maintenance of farm and forest roads, in accordance with best management practices" is exempt under the Clean Water Act. Section 404 (f)(1)(E) is the provision of the Clean Water Act that provides for the exemption of the discharge of dredged or fill material in connection with the construction or maintenance of farm and forest roads, or temporary roads associated with mining.

Qualification for a Section 404(f) exemption requires that construction of a forest or farm road must comply with the requirements of 33 CFR 323.4(a)(6) and 33 CFR 323.4(b)-(c). Best management practices must be implemented to assure that the flow and circulation patterns and chemical and biological characteristics of the water body are not impaired, that the reach of waters is not reduced, and that any adverse effect on the aquatic environment will be otherwise minimized. A permit would be required if it is part of an activity whose purpose is to convert an area of waters of the United States into a use to which it was not previously subject.

Based on the information you provided we concur that the construction of farm roads as you describe does not require a permit if the crossing is for a farming operation and that best management practices are employed during construction and maintenance of the crossing. If you have any further questions concerning this matter, please contact Jessica Greenwood at 304-529-5710.

Sincerely,

Rick Buckley

Richard P. Buckley
Chief, South Permit Section