CONSTRUCTION SPECIFICATION

NATURAL RESOURCES CONSERVATION SERVICE

STREAM CROSSING

1. SCOPE

This item shall include all plans, specifications and construction operations required for the installation of stream crossings. Construction operations shall be carried out in such a manner that erosion, air, water, and noise pollution will be minimized within legal limits as established by state regulations.

2. SPECIFICATIONS

Clearing and Grubbing

Clearing and grubbing shall be kept to the minimum needed in order to install the structure. All trees and brush shall be removed from the area before excavation starts. The foundation shall be cleared of all stumps, roots, brush, sod, and other debris. All waste materials shall be disposed of in a sightly and work-man-like manner in a designated area outside the natural floodway. Limbs shall be pruned around ford crossings which have free access by cattle in order to minimize shade in the crossing.

Foundation Excavation

All material shall be removed from the foundation of the stream crossing to the depths, widths, and lengths required by the design. Excavation may be limited to one side of the stream at a time in order to facilitate diversion of the stream. It may be advantageous to divert the stream flows around the site using a pipe or ditch. The stream may also be temporarily impounded during construction. Note, however, that stream diversion during construction shall be conducted in a manner that minimizes erosion and sedimentation.

For ford construction, trenches at least 1 ft. wide and 2 ft. deep shall be excavated on both the upstream and downstream sides of the stream crossing bottom and transition on 1H to 1V slopes.

Diversions

Diversions and side ditches shall conform to the lines, grades, and sections as specified on the plans.

Geotextile Filter Cloth (for Fords)

Geotextile filter cloth shall be a non-woven needle-punched geotextile material with a minimum tensile strength of 120 lbs. (minimum average roll value).

A geotextile filter cloth shall be installed under the entire crossing as well as in the toe trenches.

Longitudinal ends of the geotextile filter cloth shall be lapped back over the top of the backfill toe trench a minimum of one foot beyond the edge of the trench and anchored to the fabric using anchoring pins placed on five foot centers. When more than one width of cloth is required, the downstream panel shall be installed first. The next upstream panel shall be installed with a minimum of 18 inches overlap over the first section. Anchoring pins shall be installed on 3-foot centers, 6 inches from the downstream edge of the lap. Pins shall penetrate both sections of cloth in the lap.

Every precaution shall be taken not to tear the geotextile filter cloth. Tears shall be repaired immediately by removing all surface material and soil from the tear for a minimum distance of 18 inches in all directions of the tear. Spread a new section of cloth over the cleared area and anchor with anchoring pins around all sides.

Where stream channels are composed of a stable coarse rocky material or solid bedrock, the requirement to extend fabric filter cloth across the channel bottom may be waived upon the approval of the engineer.

Anchoring Pins for Geotextile

Anchoring pins shall be fabricated using No. 3 reinforcing steel or material of equivalent or greater size and durability and shaped as shown on the drawings. All anchor pins shall be installed with the top width lying perpendicular to the direction of flow in the stream. Pins shall be driven vertically into undisturbed soil to provide maximum resistance to removal.

Anchoring pins shall be placed through the filter cloth at all excavated trenches on approximately 3-foot centers. Pins shall be installed through all overlapped fabric and across the width of the channel bottom on approximately 3 foot centers. For crossings using only one width of fabric, plan to use a number of pins equal to 0.85 times the total length of the crossing from entrance to exit end. For crossings using two widths of fabric, use 1.3 times the total length.

Care shall be taken not to rip the fabric while installing anchor pins. Pins shall be sharpened to permit easy penetration through the fabric. Also, the fabric will fit tightly around anchor pins with sharpened ends. If a pin must be removed, plug the opening with a wadded ball of fabric filter cloth.

Light weight wire staples such as used to anchor mulch netting may be used to hold filter cloth in place temporarily while construction is in progress. Such staples cannot substitute for anchor pins.

Culvert pipes

Pipes shall be on a firm foundation to the neat lines and grades shown on the plans. Selected backfill shall be placed around the pipes in 4-inch layers and thoroughly compacted. Gravel can be used to bed pipe under wet conditions and the gravel shall be protected with larger stone at the upper and lower ends of the pipe.

Joints of pipe will be sealed in accordance with the manufactures' specifications. Pipes will not be laid directly on rock; there must be a soil bed or gravel cushion of at least 6 inches between the pipe and rock.

The outlet end of culverts shall terminate on the natural streambed unless protective outlet structures are installed.

Culvert materials shall be as specified by the engineer or as shown on the drawings.

Stone Aggregate

Acceptable material consisting of coarse sands and/or gravel, if present in the foundation excavation, may be stockpiled for later use in the toe trenches or on the roadway. Large washed stone or creek gravel may be used to prepare a foundation for the geotextile filter cloth in unstable soils. Coarse stone may also be used as a subgrade filler between the filter cloth and the surfacing material.

No equipment shall operate directly on the geotextile until surfacing material is spread with a minimum of 6 inches of cover over the geotextile.

Inspection

All materials shall be inspected by the technician before installation. Written certification of conformance to specifications will be required if physical inspection is not conclusive.