

## STREAM CROSSING CONSTRUCTION SPECIFICATIONS

### 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.

### 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 begins. 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 workman-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 foot wide and 2 feet 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

Geotextile shall be Class I, non-woven, needle punched material as defined in the current NRCS NEH-20 Material Specification 592, Table 2. Geotextile shall weigh a minimum of 6 ounces per square yard. When more than one width of geotextile is required, the downstream panel shall be installed first. See Detail, Geotextile Overlap. Anchoring pins shall be placed through the geotextile in all excavated trenches, overlapped fabric, and across the width of the channel on 3' centers. Anchoring pins shall be located 6 inches from the edge of the lap. Install anchor pins with the top width lying perpendicular to the direction of flow. Anchor pins shall be driven into the undisturbed soil. If anchor pins are removed for any reason, the opening created by the pin shall be plugged with a wadded ball of geotextile. Tears in the geotextile shall be repaired immediately upon discovery by removing all surfacing material and soil for a minimum distance of 24 inches in all directions of the tear. Spread a new section of geotextile over the cleaned area and anchor with anchor pins on all sides on 3' centers.

#### Gravel Surfacing Material

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 in unstable soils. Coarse stone may also be used as 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.

Stone surfacing shall be no higher than the stable natural channel. Surfacing material shall consist of pug mix, lime, or crusher run aggregate with the approved material or specified coarse aggregate as base material. The top elevation of the surfacing material shall be no higher than the natural stable grade of the stream channel.

#### Construction

Site preparation shall consist of the clearing of trees, stumps, roots, sod, loose rock, or other objectionable material. The cross-section of the crossing shall be excavated to the neat lines shown on the drawings and staked in the field. Over-excavated areas shall be backfilled with moist soil compacted to the density of the surrounding material. Construction operations shall minimize erosion and water pollution. Compliance with all Federal, State and local laws and permit requirements is required.

#### 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 manufacturer's 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.

#### Fencing

Permanent fencing of the streambank areas to exclude livestock from the stream is required. All materials and construction shall be in accordance with the current, applicable, NRCS Practice Standard 382 - Fencing.

#### Vegetation

All disturbed areas shall be prepared, fertilized, limed, seeded, and mulched in accordance with the current NRCS Practice Standard 342, Critical Area Planting.

#### Inspection

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