Scale: 1" Horizontal = _____ feet
1" Vertical = _____ feet

TBM Description & _____
TBM Elevation: _____

Stream Cross-Section

Numbers in circles correspond to Design Notes listed at the bottom of this sheet. Match number to appropriate detail to determine expected construction methods.

Date

Designed

Drawn

Checked

Approved

(1) Locations of initial cuts to provide the required 8:1 entrance and exit slopes start at station _____+_____ and station _____+_____. Excess material to be disposed of out of floodplain in location(s) approved by the landowner.

Stream Crossing/Access Design Notes

1) Locations of the initial cuts to provide 8:1 slopes are shown. Ramp slope to be 8:1 or flatter. Grade side slopes to 3:1 if they are to be seeded. Grade to 2:1 if they are to be armored with VDOT #1 stone over geotextile. Excess material to be disposed of out of floodplain in location approved by landowner.

2) If necessary to provide a solid bottom to the crossing, the existing streambed may be excavated six inches (or until a stable foundation is reached) and backfilled with VDOT #1 stone. If no stone is needed to harden the stream bottom, then stone on ramps needs to be placed so the ramps blend naturally into the existing streambed. Do not place stone that will obstruct the natural flow path of the stream. Any stone placed to harden channel bottom must be installed below the existing natural grade of the stream.

3) Geotextile used will have the following minimum specifications (non-woven is recommended):

* 120 pound minimum tensile strength.
* 320 pound minimum bursting strength.
* Elongation at failure greater than 50%.
* 90 pound minimum puncture strength.
* 70% minimum residual tensile strength in 150 hours exposure to Ultraviolet light.

4) Geotextile will be keyed on both ends per manufacturer's specifications and stapled in place.

5) If the livestock will have access to the slopes they shall be armored with stone (See note 1). If the fencing will restrict access then the slopes may be seeded. All seeding will be done according to the Plant Establishment Guide for Virginia.

6) The minimum ramp armor for streams will be 3 inches of VDOT #57 or #357 stone placed over 6 inches of VDOT #1 stone placed over geotextile. Refer to sheet 2 of 2 for drawings of the actual layer details. Additional finer stone may be brought in as a cap to provide a more suitable hoof-contact zone if the crossing will be used on a frequent basis by livestock.

7) Fencing shall be of type, extent, and location as required and approved by local NRCS or Conservation District personnel.

8) Construct fencing across the stream so that it is not directly anchored to the permanent riparian fencing. This will keep the permanent fencing from being torn down along with the fencing across the stream in the event of a flood. The cross-stream fencing may be anchored to separate posts erected next to the riparian fencing. This will allow for easier repair should the cross-stream fencing be torn down. Cross-stream fencing shall be of a type approved by local NRCS or Conservation District personnel.

VIRGINIA ENGINEERING STANDARD DRAWING	
/s/ Mathew Lyons, SCE	Standard Drawings shall NOT be altered without State Conservation Engineer Approval
STANDARD DWG NO: VA-ENG-SO-801	
DATE 2/05	SHEET 1 OF 2

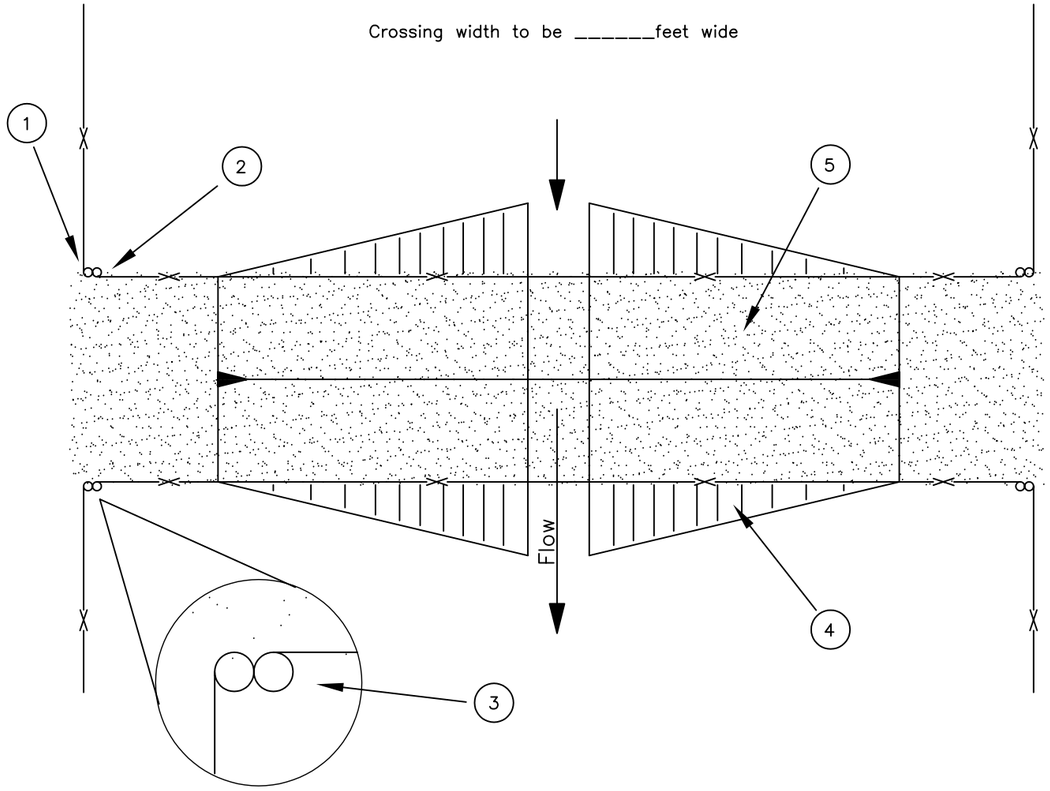
NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File Name VA-ENG-SO-INT801.dwg

Drawing Name Stream Crossing Design Sheet

Sheet of

Typical Plan View
Showing typical fencing detail (no scale)



1) End Permanent riparian fencing here.

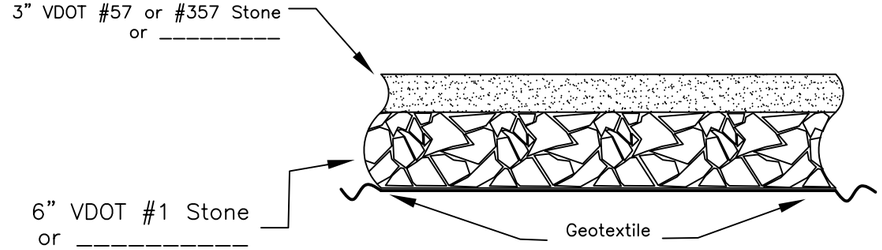
2) Begin cross stream riparian fencing here.

3) Cross the stream with fencing that is not attached directly to the permanent riparian fencing. Double fence posts at the fence intersections will prevent permanent fence damage in a flood. Type of fence to be approved by local NRCS or Conservation District.

4) Seed side slopes according to the Plant Establishment Guide for Virginia if fence runs along edge of ramp. If the fence must be installed along top of slope or the side slopes are too steep to be stable then armor the slope with 4" to 6" thick layer of VDOT #1 stone over geotextile. Side slopes must be 2:1 or flatter.

5) Ramp slopes are to be 8:1 or flatter.

Typical Stone Layer
for Streams Flowing 6 FPS or less



Stream Profile

Notice to Landowners and Contractors– Unless otherwise specifically shown by means of plan view, profiles, and elevations, this construction plan represents only surface conditions and layout requirements. No representation is made by the NRCS, USDA, as to the existence of unmarked underground hazards. Prior to the start of construction, it is the responsibility of the landowner to contact Miss Utility of Virginia at 1–800–552–7001 or 1–800–257–7777.

VIRGINIA ENGINEERING STANDARD DRAWING	
/s/ Mathew Lyons, SCE	Standard Drawings shall NOT be altered without State Conservation Engineer Approval
STANDARD DWG NO: VA–ENG–SO–801	
DATE 2/05	SHEET 2 OF 2

Date
Designed
Drawn
Checked
Approved

Project Name
Landowner
County
Tract#
, Virginia

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

File Name
VA–ENG–SO–INT801.dwg

Drawing Name
Stream Crossing Design Sheet

Sheet of