1.8 Utility Stream Crossing

Description

This chapter includes protective measures to reduce the impacts of pipelines, overhead electrical transmission lines, sanitary sewers, water mains, and similar permanent linear utilities installed across a stream or river.

Planning and Feasibility

Planning a utility stream crossing begins with an assessment of the stream to determine the most suitable location for the crossing, the best method of construction, and which protective measures may be necessary. Evaluate the lateral and vertical stability of the channel, the floodplain conditions, and stream flows to guide the crossing's design.

A geotechnical investigation may be necessary to plan trenchless installations.

A utility stream crossing may require authorization under sections 404 and 401 of the Clean Water Act from the US Army Corps of Engineers and the Ohio Environmental Protection Agency.

Design Criteria

Apply the following criteria to all utility stream crossings.

Construction Method

Horizontal directional drilling (HDD) or boring a utility under a stream channel are the least impactful installation methods and are recommended wherever economically and physically feasible. A site-specific HDD contingency and containment plan should be in place to address any unintentional release of drilling fluids. If trenchless technologies are not feasible, the plow-in method is preferred to trenching. If an open-cut trench is necessary, it must be done dry. Wet trenching in a stream without diverting in-stream flow can have significant adverse environmental impacts.

Crossing Location

Cross the stream channel where it will cause the least impact, generally along straight riffle sections of channel between bends (see Figure 1.8.1). Avoid sharp bends, steep banks, and deep pools, as these are unstable areas where erosion is naturally concentrated.

The limits of disturbance (including clearing) through the entire riparian area at the crossing site must be as narrow as possible. Every effort should be made to cross a stream as few times as possible, including concentrating multiple utilities in one location and/or encasing them into one conduit. Make the crossing perpendicular to the channel (+/- 15 degrees from perpendicular) to minimize the area of streambed impacted.

Indicate the limits of disturbance on the construction plans and physically mark them in the field.

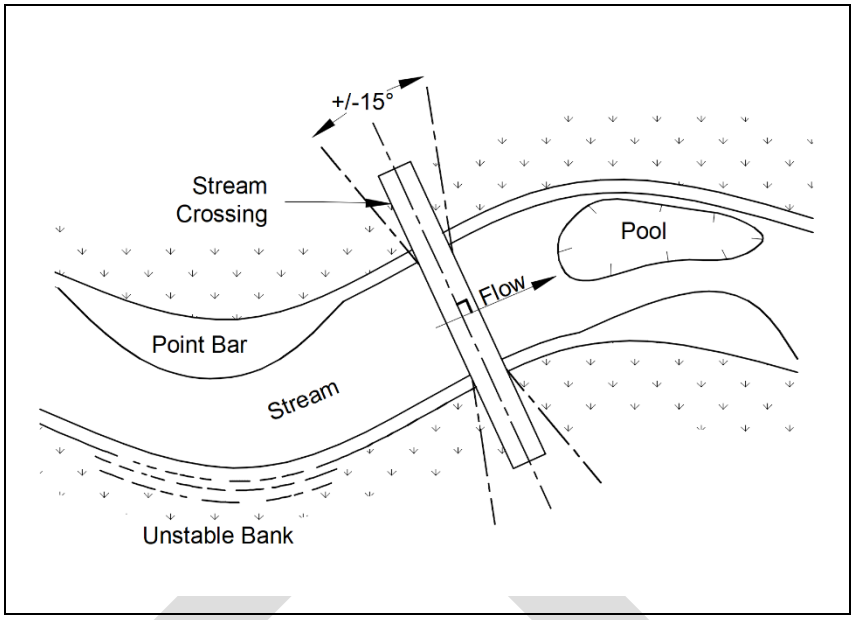

Figure 1.8.1 Alignment and Location of a Utility Stream Crossing

Temporary Rerouting

Reroute the stream around the work area when trenching or extensive work in the channel is planned. Stream flow may be pumped around the work area, or a temporary channel may be constructed. If the channel is wide enough, an instream diversion may be used. Stabilize temporary channel bottoms and side slopes with a geotextile lining or other suitable materials.

Confining/Phasing Large Work Areas

Limit the area of disturbance at any given time by using a cofferdam or barricade to confine the work area when crossing larger rivers. For example, use a cofferdam of sheet pilings or sandbags to contain the work area to one bank prior to moving to the next bank.

Construction Season

A stream is best crossed during periods of low flow, usually in late summer and fall. Avoid working in perennial streams or important spawning streams during fish spawning and migration season (March 15 through June 15) or during dates determined by the ODNR Division of Wildlife as sensitive for a particular stream or local fish species.

Duration of Construction

Minimize the duration of construction activity, from initial clearing to final stabilization, within the riparian area. Specifying specific time limits with liquidated damages in the contract documents for the crossing construction is strongly recommended.

Runoff and Sediment Control

Implement runoff and sediment controls at the crossing site, including:

- water bars to prevent the approaching access road or easement from routing sediment-laden runoff to the stream,
- stockpiling excavated material well back from the streambanks and surrounding it with a sediment barrier,
- using timber mats, aggregate, or other stabilized work pads for equipment operation,
- installing trench breaks in approaching open trenches,
- installing turbidity curtains where applicable.

Dewatering

The dewatering of trenches and boring excavations must not discharge turbid water into the stream. See Chapter 4.3 for dewatering controls.

Streambank Restoration and Stabilization

Restore the streambanks to their original line and grade, without narrowing the channel or restricting flow, and stabilize immediately upon completion.

The construction plans should define the type of stabilization, ideally, woody vegetation. It may be necessary to use temporary or permanent erosion control products to protect streambanks until vegetation matures. Where compatible with the utility, replant trees in the riparian area.

Fill Placed Within the Channel

When the placement of fill is authorized, only place clean stone aggregate in the channel. Do not place soil or other fine material in the channel unless backfilling a trench with material originally excavated from the channel. Do not backfill with soil in flowing water.

Structures

Locate manholes and other utility structures where they will not interfere with the free discharge of flood flows of the stream.

Maintenance Considerations

Re-establishing vegetation may require maintenance activity for several growing seasons beyond construction.

References

Tennessee. 2025. Erosion Prevention and Sediment Control Handbook Section 3.3.2.7 – Utility Stream Crossing. Revision 1 (6/20/2025). Department of Environment and Conservation. Nashville, TN.

Health Research, Inc. 2014. Recommended Standards for Wastewater Facilities. Policies for the Design, Review and Approval of Plans and Specifications for Wastewater Collection and Treatment Facilities. Albany, NY.