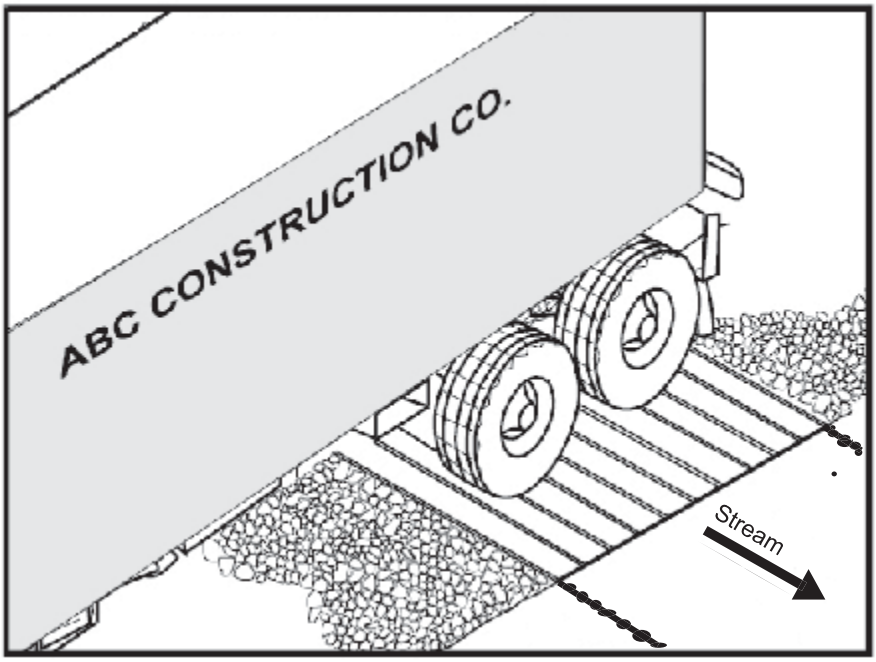
Temporary Stream Crossing



Estimated Cost
Temporary bridging costs vary as a function of the width of the bridge span and the amount of time the bridge is installed. If the bridging is permanent, a mean cost of $50 per square foot for an 8-foot wide steel arch bridge (no foundation costs included) can be used for cost estimation.

Alternatives
None

Notes:

A temporary stream crossing is a non-permanent structural span installed across a stream channel that serves two primary purposes – to provide a means for construction vehicles to cross streams without damaging stream banks or channels and to keep sediment created by vehicular traffic from entering stream flows. These structures create a channel restriction which may cause flow backups and washouts during high stream flow events. Therefore, they should be planned to be in service for the shortest period of time possible and are to be left in place only as long as necessary. These are temporary modifications and once removed the stream channel is to be restored and stream banks stabilized. A temporary stream crossing may be a bridge, culvert, or ford.

Usage

- wherever heavy construction equipment must be moved from one side of a stream channel to another
- wherever multiple stream channel crossings are anticipated while construction activities are being carried out
- applicable to flowing streams that drain areas less than 1 square mile

Bridges

- preferable to other types of stream crossings because they cause the least channel disturbance and stream flow disruption
- most applicable for narrow and/or deep stream channels
- typically, temporary bridges are more expensive to design and construct than culverts or fords. Bridges also have higher maintenance and repair costs should they fail

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Usage (continued)

Culverts

- most suitable for the crossing of wide stream channels
- better structural support for equipment that may be too heavy for bridges

Fords

- most suitable for use where low levels of construction traffic are expected
- should not be used to cross channels with streambanks greater than 4 feet in height

Benefits

- protects streambanks from the destabilizing impacts of vehicular traffic
- reduces the amount of sediment entering stream flows from vehicular traffic
- reduces rates of streambank erosion that can be worsened by vehicular traffic

Limitations

- any modifications to flowing streams require permitting. Information and guidance about permit requirements is available from the Clermont County of Stormwater Management, Ohio Environmental Protection Agency, and the Ohio Department of Natural Resources, Division of Water Planning
- stream fords and culvert stream crossings should not be constructed between March 15 and June 15 due to impacts on fish spawning
- fords result in sediment being directly transported into a stream and should only be used during periods of low flow
- culvert construction and removal typically causes high levels of stream channel disturbance and spikes in sediment loads
- culverts are more likely to cause flow obstructions and inhibit fish migration
- culverts may be more susceptible to washout
- fords have a high erosion potential and may require substantial streambank reinforcement
- fords should not be used to cross stream channels where bank height exceeds 4 feet

Notes:

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Notes:

Installation Tips

- due to stream degradation, flooding, and safety hazards every attempt should be made to find alternatives to stream crossings in the site design
- in addition to environmental considerations, designers must also engineer stream crossings to ensure that they are capable of withstanding the expected loads of heavy construction equipment
- every attempt should be made to limit stream channel and bank disturbance.
- effectively limiting disturbance activities will greatly reduce the amount of bank and channel reconstruction necessary following temporary crossing removal
- stream crossings should be located at a point with the narrowest channel width
- stream crossing should be located in straight channel sections
- stream crossings should be made at right angles to the stream channel to minimize the length of channel disturbance
- crossings that deviate up to 30 degrees from perpendicular are not acceptable
- stream crossings should not cause sudden changes in stream elevation, drops, and/or waterfalls
- roads that lead to stream crossings should not direct sediment laden runoff directly to the stream
- at a minimum of 50 feet from the stream channel, runoff should be diverted with swales or water bars that directly cross the road
- diverted runoff should be directed into some type of sediment retention structure
- all temporary structures that have been installed to facilitate stream crossings should be removed immediately when they are no longer needed
- clean stone and rock should be left in the channel following the removal of the temporary crossing; removal would create significant amounts of channel disturbance and sedimentation
- following structure removals streambanks should be stabilized according to stream channel stabilizations guidelines as set forth in ODNR Rainwater and Land Development Manual
- detailed installation tips for temporary stream crossings can be found in the ODNR Rainwater and Land Development manual
- for specific guidelines and stream channel and bank restoration techniques consult the Ohio Stream Management Guide, available from the ODNR's Division of Water (available electronically at http://www.dnr.state.oh.us/water/pubs/fs_st/stfs01.htm)

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Maintenance

Temporary stream crossings should be inspected at least once a week and after all significant rainfall events. If there is any structural damage to a bridge or culvert, construction traffic should not be permitted until the damage is repaired. Any streambank erosion should be immediately repaired.

Fords should be inspected after major storm events to ensure that stabilization materials have not been dislocated by streamflow. If ford material has been lost, the material should be replaced immediately.

Notes:

Vendors

See Appendix page F20

References

Mecklenburg, Dan. 1996. Rainwater and Land Development, Second Edition. ODNR. Columbus, Ohio.

USEPA. 2004. Development Document for Final Action for Effluent Guidelines and Standards for the Construction and Development Category. USEPA, Washington, D.C.

Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation. 2002. Virginia Erosion and Sediment Control Handbook.