



Temporary Bridges and Low-Water Ford Crossings

Are permits required for temporary bridges and low-water ford crossings?

Property owners may install a crossing over public waters streams without obtaining a public waters permit from the Department of Natural Resources (DNR) if the project has a minimal impact on the stream. This guide sheet describes how to determine locations of public waters, the boundary of public waters streams, and two types of stream crossings that may be installed without a DNR public waters permit.



Where are public waters?

Public waters streams are identified on public waters inventory maps. All designated trout streams and trout stream tributaries are public waters. Public waters inventory maps are available for inspection at the DNR office in Saint Paul, as well as DNR regional and area offices, local offices of soil and water conservation districts, and county auditors' offices. Maps can also be accessed on the DNR website: http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html.

What is the boundary of a public waters stream?

The boundary of a public waters stream is defined by the ordinary high-water level (OHWL). The OHWL on streams is the elevation of the top of the bank of the channel. For reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool. Although temporary bridges may not require a DNR public waters permit, local units of government and other agencies, such as the U.S. Army Corps of Engineers, may still require permits for these projects.

What are the site considerations for stream crossings?



Use angular rock (above) or river rock (below) for bridge approach.



In determining the best location for a bridge or ford, it is important to avoid areas with extensive wetlands or floodplains adjacent to the channel. There are limits to the permitted placement of fill for approach roads in such areas. Since streams overtop their banks every 2 to 5 years, the best crossing sites are areas of higher terrain on both sides of the channel.

Site considerations are similar to those of bridges for which a dry, stable approach to the actual crossing is preferred. When grading the banks of the stream to achieve a slope not steeper than 5 to 1 horizontal to vertical, shape the sideslope areas so they will be stable. Anticipate the need to control erosion during construction and seed and stabilize the approach and its sideslopes. It may be desirable to place 2-inch angular or river rock on the approach if frequent use will prevent vegetation from becoming established. Because water and frost usually are responsible when stones move, 2-inch rock is a preferred choice in wet locations since it is solid yet allows water drainage.

What types of stream crossings may be installed?

Temporary bridges (on streams only). A DNR public waters work permit is not required if **all** of the following conditions can be met:

- The streambank can support the bridge without using foundations, pilings, culverts, excavation, or other special site preparation.
- Nothing is placed in the bed of the stream.
- The bridge is designed and constructed so that it can be removed for maintenance and flood damage prevention.
- The bridge is firmly anchored at one end and constructed to swing away to allow floodwaters to pass.

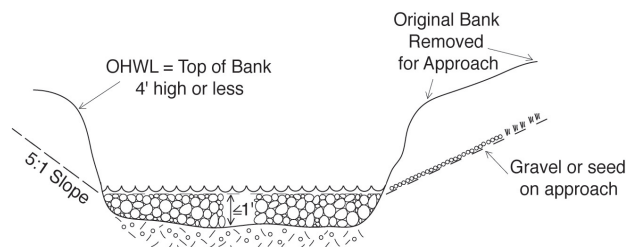


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- The bridge has 3 feet of clearance between the lowest portion of the bridge and the OHWL on a navigable stream.
- The bridge is consistent with state and local rules and regulations for floodplain, shoreland, and wild and scenic river ordinances.

Low-water ford crossings (on streams only). A DNR public waters work permit is not required if all of the following conditions can be met:

- The streambed is capable of supporting the ford crossing without special site preparation.
- The water depth does not exceed 2 feet under normal summer flow conditions.
- The crossing conforms to the natural cross section of the stream channel and does not reduce or restrict normal low-water flows.
- The original streambank at the site does not exceed 4 feet in height.
- The crossing is constructed of gravel, natural rock, steel matting, or other durable inorganic material not exceeding 1 foot in thickness. Recycled asphalt or construction rubble is not allowed.
- The approach is graded to a finished slope not steeper than 5 to 1 horizontal to vertical, and all graded banks are seeded and mulched to prevent erosion and sedimentation.
- The crossing is not placed on an officially designated trout stream; on a wild, scenic, or recreational river; or on an officially designated canoe and boating route.



A cross-section drawing of a low-water ford crossing for a small stream.

What design constraints must be considered?

Bridge design. Design the structure to fit the anticipated use; farm tractors will require stronger materials than all-terrain vehicles. If local timber is available, the horizontal members that span the stream may be built using fresh logs. Fasten a metal cable around one end of the bridge and connect it firmly to a stout tree or other anchoring device to keep the structure from being carried away by floodwaters. Where clearance is needed on navigable streams, use a thicker base to lift the ends of the deck to the required height and construct ramps at the ends.

Low-water ford design. A ford should be constructed for infrequent use because sediment or contaminants may be introduced into the stream. Fords work best near headwaters or where the streamflows are normally low. Wider, deeper streams normally carry higher flows in the spring, which may cause materials to be transported out of the project area or may render the crossing temporarily unusable. In those cases, large-diameter rock is needed; however, the total thickness of the crossing may not exceed 1 foot. If possible, place larger rock at the bottom and smaller rock on top to provide a smooth surface.



A low-water ford crossing is designed for infrequent use by vehicles.

DNR Contact Information



DNR Ecological and Water Resources website and a listing of Area Hydrologists:
<http://mndnr.gov/waters>

DNR Ecological and Water Resources
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DNR Information Center

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Minnesota toll free: 1-888-646-6367
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This information is available in an alternative format on request.