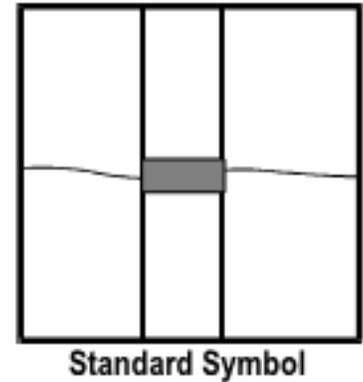


NS-4 TEMPORARY STREAM CROSSING

Refer to: ITD Standard Specifications, Section 602.



Definition and Purpose

A temporary stream crossing (a bridge or culvert) provides a means for construction vehicles to cross streams or watercourses without damaging the streambed or channel and protects the stream bank from degradation, compaction, and sediment or vegetation loss.

Appropriate Applications

- When it is necessary to cross a stream or canal and a permanent crossing is not feasible or not yet constructed.
- When equipment must be moved from one side of a channel to another.
- Where construction vehicles have to cross the stream channel frequently.
- When crossing perennial streams or watercourses causes significant erosion.

BMP Objectives	
<input type="checkbox"/>	Perimeter Control
<input type="checkbox"/>	Slope Protection
<input type="checkbox"/>	Borrow and Stockpiles
<input type="checkbox"/>	Drainage Areas
<input type="checkbox"/>	Sediment Trapping
<input checked="" type="checkbox"/>	Stream Protection
<input type="checkbox"/>	Temporary Stabilizing
<input type="checkbox"/>	Permanent Stabilizing

The specific loads, stream conditions, and any applicable regulatory requirements or permits will dictate which of the following types of stream crossing to employ.

- **Bridge:** Bridges are appropriate for streams with high flow velocities, steep gradients, and/or where temporary restrictions in the channel are not allowed. Where conditions are adequate, bridges are the preferred method to cross a stream. A bridge provides the least disturbance or obstruction to flows and fish migration. Old flatbed rail cars in some instances can be used effectively to bridge a stream.
- **Culvert:** A culvert may be used on perennial intermittent streams, where conditions are not adequate for bridges.

- **Fords:** Fords are appropriate during the dry season in arid areas. Used on dry washes and ephemeral streams, as well as low-flow perennial streams. A Cellular Confinement System (CCS) is appropriate for use in fording streams.

Limitations

- A bridge is expensive to design and install and may be difficult to justify for a temporary crossing. Culverts cause greater disturbance during installation and removal. In sensitive stream systems, the disturbance impact may be prohibitive. When it is necessary to cross a stream, a well-planned approach will minimize damage to the stream bank and reduce erosion.
- The use of stream crossing measures below the high water mark of a stream or other Waters of the U.S. should be carefully evaluated. A U.S. Corps of Engineers Section 404 permit would be required. A 401 Water Quality Certification and an Idaho Department of Water Resources Stream Alteration Permit may be required.
- Monitoring may be required based water quality standards (WQS). If monitoring is not addressed in the contract documents, contact the Engineer.
- Installation may require dewatering or temporary diversion of the stream. See NS-2 (Dewatering Operations) and NS-5 (Clear Water Diversion).
- Stream crossings may constrict the waterway, obstructing high flows and causing backups or washouts.
- Fording a stream by placing gravel or rock in the bottom of a live streambed is typically **unacceptable**. It may be an option in intermittent streams, when work will take place in the dry.
- Use of natural bed material or other gravel in the stream for construction of a CCS ford crossing will be contingent upon approval by resource agencies.
- CCS should not be used in high or fast flows.
- Upon completion of construction activities, CCS blocks must be removed from stream.

General Considerations

Stream crossing designs must be location specific. Location of temporary stream crossing shall consider:

- Erosion potential of the stream and streambank.
- Historic stream flows.
- Soil strength.
- The ability of the crossing and adjacent areas to withstand the design flow.
- Designs shall be prepared under the direction of and approval by a registered Professional Engineer.
- Surface treatments on the temporary crossing, such as oil, are not allowed.

Construction Considerations

- Temporary erosion and sediment control BMPs (See Chapters 1 and 2) will be installed to minimize sediment transport.
- Vehicles and equipment shall not be driven, operated, fueled, cleaned, maintained, or stored , except as authorized by an Engineer.
- Temporary water body crossings and encroachments shall be constructed to minimize scour.
- The exterior of vehicles and equipment shall be maintained free of grease, oil, fuel, and residues.
- Disturbance or removal of vegetation shall not exceed the minimum necessary to complete operations. Disturbed vegetation shall be replaced with the appropriate soil stabilization measures.
- Riparian vegetation, when removed pursuant to the provisions of the work, shall be cut off no lower than ground level to promote rapid re-growth.
- Any temporary obstruction placed within flowing water shall only be built from clean material.
- Drip pans shall be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- Project plans should contain specific construction requirements. Make Engineer approved field adjustments as necessary to ensure proper performance.

Specific Considerations

- Bridges are generally more expensive to design and construct and have specific load restrictions, but provides the least disturbance of the stream bed and constriction of the waterway flows.
- Culverts are relatively easy to construct and able to support heavy equipment loads, but are more disruptive to the stream bed.
- Fords are easy to construct and have no load limits, but can be very disruptive to the stream bed and bank.
- Temporary fords are not appropriate if construction will continue through the rainy season, if thunderstorms are likely, or if the stream is perennial.
- CCS crossing structures consist of clean, washed gravel and CCS blocks. CCS are appropriate for streams that would benefit from an influx of gravel; for example, salmonid streams, streams or rivers below reservoirs, as well as urban, channelized streams.
- CCS allow designers to use either angular or naturally-occurring, rounded gravel, because the cells provide the necessary structure and stability. Natural gravel is optimal

for this technique, because of the habitat improvement it will provide after removal of the CCS.

- A gravel depth of 2 to 12 inches for a CCS structure is sufficient to support most construction equipment.
- An advantage of a CCS crossing structure is that relatively little rock or gravel is needed because the CCS provides the stability.

Maintenance and Inspection

- Inspections shall be conducted as required by the NPDES permit or contract specifications.
- Maintenance provisions shall include:
 - Periodic removal of debris behind fords, in culverts, and under bridges.
 - Replacement of lost protective aggregate from inlets and outlets of culverts.
 - Removal of temporary crossing promptly when it is no longer needed.
- Corrections will be made based on the NPDES Permit inspections. If erosion or undermining of the structure occurs, take corrective action immediately.
- Upon removal of the stream crossing, the stream bank and streambed will be stabilized and the site will be returned to as near-natural condition as possible. Some form of rock rip-rap and revegetation may be required if the stream bank has been disturbed.