

# Temporary Stream Crossing

**Definition:** A temporary structural span installed across a flowing watercourse for use by construction traffic. Structures may include bridges, round pipes or pipe arches.

**Purpose:**

1. To provide a means for construction traffic to cross flowing streams without damaging the channel or banks.
2. To keep sediment generated by construction traffic out of the stream.

**Conditions Where Practice Applies:**

Generally applicable to flowing streams with drainage areas less than 1 square mile. Structures which must handle flow from larger drainage areas should be designed as permanent structures by a registered professional engineer.

## Planning Considerations

Temporary stream crossings are necessary to prevent construction vehicles from damaging streambanks and continually tracking sediment and other pollutants into the stream. However, these structures are also undesirable in that they represent a channel constriction which can cause flow backups or washouts during periods of high flow. For this reason, the temporary nature of stream crossings is stressed. They should be planned to be in service for the shortest practical period of time and to be removed as soon as their function is completed.

The specifications contained in this practice pertain primarily to flow capacity and resistance to washout of the structure.

From a safety and utility standpoint, the designer must also be sure that the span is capable of withstanding the expected loads from heavy construction equipment which will cross the structure.

## Design Criteria

1. The structure shall be large enough to convey the flow expected from a 2-year frequency storm without appreciably altering the stream flow characteristics. The structure may be a span or culvert. If culverts are selected, the standard on culverts may be used to determine the appropriate size. Multiple culverts may be used in place of one large culvert if they have the equivalent capacity of the larger one. The minimum-sized culvert that may be used is 18-inches.
2. Where culverts are installed, compacted soil or rock will be used to form the crossing. The depth of cover over the culvert shall be a minimum of 12 inches. To protect the sides of soil fill from erosion, riprap shall be used and be designed in accordance with the standard for open channels.
3. The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes.
4. The slope of the culvert shall be at least 0.25 inch-per foot.
5. The top of the compacted fill and approaches shall be covered with 6 inches of crushed stone.

## Operation and Maintenance

An operation and maintenance plan will be developed for the crossing. The plan shall include, as a minimum, the following items:

1. Inspection of the crossing periodically and after each large storm event for accumulation of debris or damage to the structure.
2. Repair of eroding areas and replacement of surfacing materials if washed away.
3. Removal of sediment and/or debris accumulations on or around the crossing or access.

## Specifications

The crossing will be installed at the location and in the manner shown on the drawings.

Construction shall be done in such a way that chemicals, fuels, lubricants, and waste materials will not enter the flow area. Erosion, air pollution, and water pollution will be minimized and held within legal limits.

Measures and construction methods that enhance fish and wildlife values and those for erosion and sediment control shall be incorporated as shown on the drawings. In addition, the following methods or prac-

tices will be utilized to the degree possible in the construction of the crossing, to reduce the potential for sedimentation of the stream:

1. Divert the stream flow to one side of the channel while construction is done on the opposite side. Or, where possible, temporarily dam the channel and pipe or pump the stream flow past the construction area.
2. Perform construction activities from the bank as much as possible. Use backhoes or excavators instead of dozers and use rubber tired equipment when construction activity must be conducted in the water.
3. Build the crossing when high flows are not expected.
4. Haul all excavated material to the appropriate disposal area, grade, and seed and mulch the material as soon as possible.

When required, all trees, shrubs, brush, and debris within the construction limits will be cleared and grubbed to a depth that will permit installation of the crossing. All materials will be burned, buried, or piled in designated disposal areas. The clearing operation will be conducted in a manner to avoid damage to vegetation or property outside the work area and to prevent disturbance within the stream. Special attention will be given to protecting and maintaining key shade, food, and den trees when their removal is not necessary.

Excavation of the crossing will be completed to the line and grade shown on the drawings. All excavated material will be removed from the limits of the channel and hauled to designated waste disposal areas. The excavated material may be utilized to shape the entrance areas to the crossing to provide free drainage and stability to the areas.

Rock riprap shall be limestone or sandstone and will be well graded within the limits shown on the drawings. It will be dense, sound, and free from, cracks, seams, and other defects conducive to accelerated weathering. The rock fragments shall be angular to subrounded in shape.

The riprap shall be placed to the required thickness in one operation. The rock will be delivered and placed in a manner that will insure the riprap in place will be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks filling the voids between the larger rocks.

Surfacing material will be hard, durable limestone or sandstone aggregates meeting the grading limits shown on the drawings. It will be placed to the required thickness in one operation and in such a manner that segregation of the particle sizes will not occur. After placement the

aggregate will be consolidated by traversing the entire surface of the crossing with four passes of the construction equipment.

Upon completion of construction, all disturbed areas shall be graded smooth and blend with the surrounding ground.

A protective cover of vegetation shall be established on all exposed surfaces where soil and climatic conditions permit. Lime and fertilizer shall be spread at the specified rate and disked into soil to a depth of 4 inches to prepare a seedbed. Seed and mulch shall be applied at the specified rate. Mulch along the streambank will be anchored by mulch netting. Excelsior erosion control blankets may be used in lieu of the mulch and netting. Mulch netting or excelsior blankets will be held in place with 6-inch wire staples placed 3-feet on centers in all directions.

In some cases, temporary vegetation may be used for protection until conditions are suitable for establishment of permanent vegetation. Where soil or climatic conditions do not permit the establishment of vegetation, and protection is needed, nonvegetative means such as mulches or gravel may be used.

The crossing shall be removed as soon as it is no longer necessary for project construction. Upon removal of the structure, the stream shall be reshaped to its original cross-section and properly stabilized.