

---

**Greenville County Technical Specification for:**  
**RC-04 TEMPORARY STREAM CROSSING**

---

**1.0 Temporary Stream Crossing**

**1.1 Description**

A temporary stream crossing is a bridge or culvert across a stream or watercourse for short-term use by construction vehicles and heavy equipment. A stream crossing provides a means for construction vehicles to cross streams or watercourses without moving sediment to streams, damaging the stream bed or channel, or causing flooding.

Prior to constructing a temporary stream crossing, the owner/person financially responsible for the project must submit an Application for Permit to construct across or along a stream to South Carolina Department of Health and Environmental Control (SCDHEC). Temporary stream crossings require a Section 404 Permit from the Corps of Engineers. If the crossing creates more than 200 linear feet of fill or more than 1/3 acre of fill, a 401 Permit.

When feasible, one should always attempt to minimize or eliminate the need to cross streams. Temporary stream crossings are a direct source of pollution; therefore, every effort should be made to use an alternate method (e.g., longer detour), when feasible. When it becomes necessary to cross a stream, a well planned approach will minimize the damage to the streambank and reduce erosion. The design of temporary stream crossings requires knowledge of the design flows and other information; therefore, the services of a professional engineer to deal with specific state and local requirements should be considered. The specific loads and the stream conditions will dictate what types of stream crossing to employ.

**1.2 Design**

**1.2.1 Temporary Bridge Crossing Design Criteria**

- Structures may be designed in various configurations. However, the materials used to construct the bridge must be able to withstand the anticipated heavy loading of the construction traffic.
- Crossing Alignment - The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location. However, every effort shall be taken to install the crossing perpendicular to the stream. All fill materials associated with the roadway approach shall be limited to a maximum height of 2-feet above the existing flood plain elevation.
- A water diverting structure such as a dike or swale shall be constructed (across the roadway on both roadway approaches) 50-feet (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50-feet is measured from the top of the waterway bank. The flow captured in these dikes and swales shall be directed to a sediment trapping structure. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.
- Appropriate perimeter controls such as silt fences, must be employed when necessary along banks of streams parallel to the same.
- All crossings shall have one traffic lane. The minimum width shall be 12-feet with a maximum width of 20-feet.

### 1.2.2 Temporary Culvert Crossing Design Criteria

- Limit the width of fill to that only necessary for the actual crossing.
- Where culverts are installed, coarse aggregate of clean shot limestone rock, riprap with 6-inch D50 stone or greater will be used to form the crossing.
- Clean shot rock and/or riprap may be used as fill for crossings that will be in place for 6 to 12 months. A concrete cap may be constructed over the rock for crossings that will be in place for more than 12 months.
- The depth of stone cover over the culvert shall be equal to  $\frac{1}{2}$  the diameter of the culvert or 12-inches, whichever is greater, but no greater than 18-inches. To protect the sides of the stone from erosion, riprap shall be used.
- The culvert crossing shall be large enough to convey the flow from a two-year frequency storm without appreciably altering the stream flow characteristics. A qualified professional must design the structure.
- The maximum possible number of pipes should be placed within the stream banks with a maximum spacing of 12-inches between pipes.
- The minimum-sized pipe culvert that may be used is 24-inches.
- All culverts shall be strong enough to support their cross-sectional area under the maximum expected heavy equipment loads.
- The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes.
- The slope of the culvert shall be at least 0.25-feet per foot.
- Crossing Alignment – A temporary culvert crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15 degrees from a line drawn perpendicular to the centerline of the stream at the intended crossing location. However, every effort shall be taken to install the crossing perpendicular to the stream. All fill materials associated with the roadway approach shall be limited to a maximum height of 2-feet above the existing flood plain elevation.
- The approaches to the structure shall consist of stone pads meeting the following specifications:
  1. Clean stone or concrete fill only
  2. Minimum thickness: 6-inches
  3. Minimum width: equal to the width of the structure
  4. 20-feet minimum approach length
- A water diverting structure such as a dike or swale shall be constructed (across the roadway on both roadway approaches) 50-feet (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50-feet is measured from the top of the waterway bank. The flow captured in these dikes and swales shall be directed to a sediment trapping structure. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.
- A temporary culvert crossing should be in place no longer than 24 months.

### 1.3 Installation

- Crossings shall be installed prior to any other activities.

- Pump-around diversions shall be installed and maintained prior to any excavation and during the installation of the crossing.
- Crossings shall be placed in temporary construction easements only.
- The temporary waterway crossing shall be at right angles to the stream. Where approach conditions dictate, the crossing may vary 15° from a line drawn perpendicular to the centerline of the stream at the intended crossing location. However, every effort shall be taken to install the crossing perpendicular to the stream. All fill materials associated with the roadway approach shall be limited to a maximum height of 2-feet above the existing flood plain elevation.
- A water diverting structure such as a dike or swale shall be constructed (across the roadway on both roadway approaches) 50-feet (maximum) on either side of the waterway crossing. This will prevent roadway surface runoff from directly entering the waterway. The 50-feet is measured from the top of the waterway bank. The flow captured in these dikes and swales shall be directed to a sediment trapping structure. If the roadway approach is constructed with a reverse grade away from the waterway, a separate diverting structure is not required.
- Stream bank clearing shall be kept to a minimum. Do not excavate rock bottom streambeds to install the crossing. Lay the culvert pipes on the streambed “as is” when applicable. Place as many pipes as possible within the low area of the stream. Place remaining pipes required to cross the stream on the existing stream bottom.
- The maximum number of pipes as possible should be placed within the stream banks with a maximum spacing of 12-inches between pipes. The minimum sized pipe culvert that may be used is 24-inches.
- The length of the culvert shall be adequate to extend the full width of the crossing, including side slopes. The slope of the culvert shall be at least 0.25-feet per foot.
- Coarse aggregate of clean limestone riprap with a 6-inch D50 stone or greater will be used to form the crossing. The depth of stone cover over the culvert shall be equal to one-half (½) the diameter of the culvert or 12-inches, whichever is greater but no greater than 18-inches.
- All fill materials associated with the roadway approach shall be limited to a maximum height of 2-feet above the existing flood plain elevation.

#### **1. 4 Inspection and Maintenance**

- Inspect crossings every seven calendar days and inspections are recommended within 24-hours after each rainfall event that produces ½-inches or more of precipitation. Check the structure integrity and for excessive sediment deposition and replace fill stone as needed.
- Clean mud and/or sediment from the roadway and prevent it from entering the stream.
- The structure shall be removed when it is no longer required to provide access to the construction area. During removal, leave stone and geotextile fabric for approaches in place. Place fill over the approaches as part of the streambank restoration operation. A temporary culvert crossing should be in place no longer than 24 months.