CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

<table>
<thead>
<tr>
<th>Condition for Use of Cross Pipes</th>
<th>Pipe Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>Q2</td>
<td>1 1/2&quot;</td>
</tr>
<tr>
<td>3 or more pipe culverts</td>
<td>3&quot; 4&quot;</td>
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</tbody>
</table>

The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe more than 6" above the flow line.

Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 1 1/2" standard pipe (I.D.) for the first bottom pipe.

Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe. Ensure that all bolts are installed according to the manufacturer's instructions. Allow drainout access at the Contractor's option.

Match cross slope as shown elsewhere in the plans. Cross slope of 0.1 or flatter is required for vehicle safety.

Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted.

Riprap quantities are for Contractor's information only.

MATERIAL NOTES:
- All steel and metal pipe components (CMP or RCP) are to be galvanized after fabrication. Repair galvanizing damaged during transport or fabrication.
- Reinforcing steel other than A706 (Type "E" or "S", Gr B), ASTM A500 (Gr B), or API 5LX52 is not to be used in those installations where out of control vehicles are likely to be present. Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Place the top of the first cross pipe no more than 6" above the flow line.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Match cross slope as shown elsewhere in the plans. Cross slope of 0.1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".