

## **SECTION 1230 - STREAM AND CREEK CROSSINGS**

### **PART 1 - GENERAL**

#### **1.1 SCOPE OF WORK:**

Provide all labor, materials, equipment and services required to furnish and install all stream and creek crossings shown on the drawings and/or specified herein.

#### **1.2 SUBMITTALS:**

- A. Descriptive literature, catalog cuts, and dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the ENGINEER for review before ordering.
- B. At the time of submission, the CONTRACTOR shall, in writing, call ENGINEER's attention to any deviations that the submittals may have from the requirements of the ENGINEER's Contract drawings and specifications.

#### **1.3 DEFINITIONS:**

- A. Riparian Area - The area within two and one half (2.5) times the width of the stream bed measured from the toe of each bank on the horizontal, or fifty feet (50'), whichever is greater. Where areas near stream beds have slopes greater than 20%, the horizontal measurement should be made beginning at the top of the slope due to the increased risk of erosion.

### **PART 2 - PRODUCTS**

#### **2.1 ENCASED CREEK CROSSINGS:**

- A. Where shown on the Plans or determined by the ENGINEER, pipe through creek crossings shall be provided with concrete encasement as shown in the details.
- B. If the encased creek crossing is for a water main and is greater than 15 feet in length, a valve with 2 permanent taps shall be installed in an accessible manhole on both sides of the creek. A buried valve may be installed instead on the downstream side of the crossing if the water main is a transmission main with a designated direction of flow.

### **PART 3 - EXECUTION**

#### **3.1 GENERAL:**

It is the intent of the plans and specifications to install the stream and creek crossings in such a manner as to protect the streambed and banks from erosion and to restore, as much as practicable, the stream banks and bottom to their original condition or better. It is the CONTRACTOR'S responsibility to minimize the impacts of construction and to implement the requirements of the specifications for the stream crossing(s). Clearing for all stream crossings shall be limited to a 20-foot width through the entire riparian area unless otherwise specified or shown on the Plans. The top foot of material within the streambed, stream bank and riparian area shall be temporarily side cast and stored outside of the riparian area, if possible, for use during restoration, unless otherwise shown on the plans or approved by the OWNER. Whenever possible, other excavated or backfill materials shall not be stored within the riparian area. Silt fence shall be properly installed and maintained around stored material. Any location where construction vehicles or equipment will cross a stream, the contractor shall construct a temporary crossing using culverts or another generally acceptable method approved by the OWNER.

Each crossing shall be completed within twenty-four (24) hours unless otherwise approved in writing by the OWNER. Stream bank and streambed stabilization shall be completed within seventy-two (72) hours of completing the stream crossing construction.

### **3.2 CLEARING OF TREES AND OTHER VEGETATION:**

Trees within the riparian areas should be avoided as much as possible. The CONTRACTOR shall limit removal of trees within the riparian areas to only what is absolutely necessary for construction. In the event that a tree(s) must be removed so that a water or sewer main can be installed, the tree should be either cut at the ground or one to two feet above the ground so the root mass is maintained. Any other vegetation in the riparian area that must be cleared should be cut at or above the ground surface.

### **3.3 PROTECTION OF MAIN:**

Gravity sewer mains shall be protected from erosion either by concrete encasement around the pipe (per Paragraph 2.1 of this section and the details) when cover over pipe is less than four feet (4') or by a sufficient depth of compacted backfill when cover is four feet (4') or more. Water mains and sewage force mains shall be installed a minimum of four feet (4') below the flow line of the stream and shall be protected from erosion by concrete encasement, per Paragraph 2.1 of this section and the details.

### **3.4 CONSTRUCTION PROCEDURE:**

The CONTRACTOR shall construct a cofferdam or temporary dam of sand bags from the creek bank to a point beyond the centerline of the creek. Alternately, a bypass may be built by constructing dams with sandbags upstream and downstream of the trench and installing a culvert(s) between the dams over the trench. The pipe shall then be installed in a trench within the dammed area. Generally, the top foot of the streambed material shall be temporarily sidecast and replaced in the streambed during restoration. Any excess trench-excavated material shall be removed to an offsite disposal area. All streambed and bank restoration within the dammed area shall be completed prior to removal of the dam(s).

### **3.5 STREAMBANK RESTORATION:**

Stream bank stabilization shall include grading stream banks to an acceptable grade and vegetating or placing rip-rap according to Section 1170 STREAMBANK AND STREAMBED STABILIZATION AND PROTECTION. The trench within the stream banks shall be backfilled with mechanically compacted earth to approximately one foot below the finished ground surface. The top foot of soil that was temporarily side cast during excavation in the riparian area shall be replaced during restoration. In some cases, where shown on the plans or directed by the ENGINEER, compacted earth backfill shall be placed to approximately two feet below the finished ground surface and rip-rap shall be placed according to Section 1170.

### **3.6 STREAMBED RESTORATION:**

The trench within the streambed shall be backfilled with mechanically compacted earth to approximately one foot below the original ground surface. The top foot of streambed material that was temporarily side cast during excavation shall be replaced during restoration. When shown on the plans or directed by the ENGINEER, the streambed will be protected with rip-rap according to Section 1170 or another method. When rip-rap is used, compacted earth backfill shall only be placed to approximately two feet below the original ground surface. In the event that bedrock is encountered during excavation of the trench through the streambed, Low Strength Mortar - 50 (according to Section 1165) shall be used for backfill from the existing bedrock surface down to one foot (1') above the top of the pipe (maximum 3' depth of LSM-50). LSM-50 backfill shall extend horizontally at least from top of bank to top of bank.

## **PART 4 - BASIS OF PAYMENT**

Stream bank and Streambed Stabilization, Concrete Encasement, LSM-50 Backfill, Rock Channel Protection, and any valves or manholes will be paid as shown on the proposal forms and described in the respective specifications. All other costs associated with stream and creek crossings shall be included in the unit bid prices for the pipe.

END OF SECTION