

The measurement of lumber and timber and of glued laminated girders and beams shall include only such material as is a part of the completed and accepted work, and shall not include materials used for erection purposes, such as falsework, bracing, sheeting, etc.

507.06. BASIS OF PAYMENT.

The accepted quantities, measured as provided above, will be paid for at the contract price per unit of measurement for the pay items listed below that are shown in the bid schedule.

- (A) LUMBER M.F.B.M. (CUBIC METER)
- (B) GLUE LAMINATED GIRDER (*DESCRIPTION*) LINEAR FOOT (METER)

Payment for timber, lumber and glued-laminated girders and beams shall be considered to be full compensation for all costs of furnishing of materials, including hardware and timber connectors, preservative treatment, equipment, tools, and labor for the fabrication, erection, and painting necessary to complete all of the work in compliance with the plans and specifications in a satisfactory manner. Metal parts, other than hardware and timber connectors, will be measured and paid for as provided in Section 506. Concrete will be measured and paid for as provided in Sections 509.

**SECTION 508
CONCRETE CULVERTS**

508.01. DESCRIPTION.

This work shall consist of constructing concrete culverts in accordance with these Specifications and in reasonably close conformity with the lines and grades specified in the contract documents or established by the Engineer. Precast concrete box culverts may be used in lieu of cast-in-place concrete box culverts only if approved by the Engineer or permitted by the contract documents and, when used, comply with the contract documents.

508.02. MATERIALS.

Materials shall meet the requirements specified in the following Subsections of Section 700 - Materials.

Structural Concrete (<i>Class A</i>)	509
Reinforcing Steel for Structures	511

Precast concrete box sections for culverts shall meet the requirements of AASHTO M 259 or M 273. Joint materials shall meet the requirements specified under Subsection 726.02(a).

508.04. CONSTRUCTION METHODS.

- (a) **General.** Comply with the applicable requirements of Sections 501, 502, 509 and 511. Construct curtain walls as directed by the Engineer to insure protection against undermining.

When the barrel length of cast-in-place culverts exceeds 60 feet (18m) , a construction joint may be placed in the culvert. When the barrel length of cast-in-place culverts exceeds 100 feet (30m) , place a construction joint in the culvert. Construct the joint according to the

requirements of Section 509.04(d) and the details shown on the plans. Extend longitudinal reinforcing steel through the joint a minimum of 18 inches (0.5m) and lap 18 inches (0.5m) with the longitudinal reinforcing steel in the adjoining section.

- (b) **Finish.** Give the exposed surface of all wings, curbs, rails and retaining walls a Class 2 - Rubbed Finish as specified in Subsection 509.04(g)2.
- (c) **Bedding.** Provide bedding for precast concrete box culverts a minimum depth of 4 inches below the precast box sections unless otherwise specified on the Plans. Bedding material shall meet the requirements for Class "B" Bedding in accordance with Subsection 613.04(c).
- (d) **Laying Precast Sections.** Lay precast concrete box sections after the Engineer has approved the condition of the bedding material. Slowly lower and place the precast section into final position by hoisting equipment adequate to handle the section without damage to the section or the bedding material. Replace damaged sections at no additional cost to the Department. The inside of the barrel shall be clean and free of debris when the sections are lowered into place.

Start laying the conduit at the downstream end of the culvert. Lay the sections reasonably true to the established line and grade. After the precast culvert has been inspected and approved, backfill carefully to prevent displacement or damage of the sections. Join precast sections as required in Subsection 613.04(e).

- (e) **Box Culvert End Sections.** Cast in place end sections for all concrete box culverts. End sections include wingwalls, curbs, end of barrels, curtain walls, and aprons. When precast sections are used in skewed structures, build the wings in the same skewed relationship to the culvert walls as shown on the Plans for the cast-in-place culvert. Build curbs and curtain walls perpendicular to the barrels of precast sections for skews between 90° and 60°.
- (f) **Working Drawings for Precast Box Sections.** Before constructing precast concrete box culverts, furnish fully engineered and sealed working drawings of the proposed construction to the Engineer for approval. Comply with Subsection 105.02. Show on these drawings complete details of reinforcing steel and concrete dimensions.
- (g) **Extension of Existing Cast-in-Place Culvert.** When the contract documents require extension of an existing cast-in-place culvert, perform the following work:

Remove and dispose of the existing wing walls. Remove and dispose of existing curbs, handrails, aprons, etc., as required by the plans. Repair damaged areas of the remaining culvert, caused by the removal process.

Provide dowel bars of the same diameter and grade as the longitudinal reinforcing steel in the new adjoining section of culvert. Lap each dowel bar 18 inches with each longitudinal bar in the new section. Comply with Subsection 509.04(d)3.

508.05. METHOD OF MEASUREMENT.

The work described in Subsection 508.04(g) will be measured per each culvert end extended under the pay item, *removal of culvert end*. Dowel bars will be measured as reinforcing steel.

508.06. BASIS OF PAYMENT.

When shown on the Plan bid schedule, accepted quantities of “Removal of Culvert End” will be paid at the contract price per unit of measurement for the pay item listed below. Payment will be full compensation for the respective work prescribed in this section:

- (A) REMOVAL OF CULVERT END EACH

The quantities which constitute the completed and accepted structure will be measured for payment according to the contract documents for the several pay items as provided under Sections 501, 509, and 511 of these Specifications, which will be full compensation for all materials, falsework, labor, equipment, and incidentals necessary to complete the work as specified.

Payment for precast concrete box culverts will be made based on unit prices bid for the items and quantities of a cast-in-place box of the length required as determined by field measurements for the construction.

**SECTION 509
STRUCTURAL CONCRETE**

509.01. DESCRIPTION.

- (a) **General.** This work consists of furnishing, placing, finishing, and curing concrete in bridges, culverts, and miscellaneous structures in accordance with these specifications and in reasonably close conformity with the lines, grades, and dimensions specified in the contract documents. The work may include elements of structures constructed by cast-in-place and precast methods using either plain (unreinforced), reinforced, or prestressed concrete or any combination thereof.
- (b) **Related Work.** Other work involved in the construction of concrete structures shall be as specified in the applicable sections of this specification, especially Section 502, “Temporary Works,” Section 503, “Prestressed Concrete Bridge Members,” Section 504, “Concrete Bridge Decks,” Section 511, “Reinforcing Steel for Structures,” and Section 517, “Post-tensioning.”

509.02. MATERIALS.

Conform to the requirements of following Sections and Subsections, except as otherwise specified:

Portland Cement Concrete	701
Fly Ash	702
Anchor Bolts for Bridge Structures	724.05
Elastomeric Bearing Pads	733.06
Waterstops	733.08
Concrete Surface Finish for Structures	737

509.04. CONSTRUCTION METHODS.

- (a) **General.** For handling and measuring materials, batching, and mixing, comply with the requirements of Subsections 414.04(c), (d), and (e) except as otherwise specified.