

ITEM 603.63XXYY25 - PRECAST CONCRETE BOX CULVERT (Fill Height Less Than 2.0 Feet)
ITEM 603.64XXYY25 - PRECAST CONCRETE BOX CULVERT (Fill Height 2.0 Feet or Greater)
ITEM 603.65XXYY25 - PRECAST CONCRETE BOX CULVERT (Bridge Size, Fill Height Less Than 2.0 Feet)
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1. **DESCRIPTION:**

- 1.01 This work shall consist of furnishing and placing single or multi-cell precast reinforced concrete box culvert sections of the type indicated in the plans in accordance with these specifications in the locations indicated and in a manner approved by the Engineer.

2. **MATERIALS:**

- 2.01 The Precast Concrete Box Culvert sections shall meet the requirements of [REDACTED] except as noted herein.
- 2.02 **Galvanizing.** The bar reinforcement shall be [REDACTED] after bar fabrication, in accordance with [REDACTED]
- 2.03 **Miscellaneous Hardware.** Chairs, tie wires, nuts, bolts, washers, other devices, and miscellaneous hardware used to support, position, or fasten the reinforcement shall be made of or coated with, a non-conducting material, or galvanized. The specific hardware that the Contractor proposes to use shall be approved by the Engineer. If the specific hardware is galvanized, the hardware shall be prepared and galvanized in accordance with the requirements of both [REDACTED]
- 2.04 **Mechanical Connectors.** Mechanical connectors used for galvanized bar reinforcement shall be galvanized in accordance with the requirements of [REDACTED] prior to installation.

The thread shall be tapped oversize prior to being coated per [REDACTED].

The assembled connection on the galvanized reinforcing bars shall have no exposed uncoated steel. Any damage to the galvanized coating or uncoated area shall be repaired as indicated in [REDACTED] Repair Galvanized Coating.

The manufacturer of the mechanical connectors shall certify, in writing to the Engineer that the mechanical connectors, with oversize threads (if applicable), meet the following three parameters:

- A. The maximum slip, at [REDACTED] of the reinforcing bar, shall be [REDACTED]. At least [REDACTED] of the maximum slip shall have occurred on the first cycle.
- B. The maximum slip, at [REDACTED] of the reinforcing bar, shall be [REDACTED]
- C. The tensile strength of the splice shall be at least [REDACTED] of the specified minimum tensile strength of the reinforcing bar.
- 2.05 **Repair Galvanized Coating.** The fabricator shall be required to repair any damage to the galvanized coating done during shipping and handling, and to replace bars exhibiting severely damaged coatings. Repairable damage is defined as any bare or loose spots, or breaks in the coating which affects an area smaller than 4 square inches.

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2. **MATERIALS:** (cont'd)

2.05 **Repair Galvanized Coating** (cont'd)

Repair shall be allowed only when the total number of repairable damaged areas in any 10 foot length of bar is less than 6. Any material with a total number of damaged areas greater than the amount specified above, or material with any damaged area greater than 4 square inches, shall be rejected, immediately removed and replaced at no cost to the Authority.

The galvanized coating is to be repaired with a zinc-rich paint by the following method:

1. Clean the damaged area by power disk, wire brushing, sand or grit blasting, or any other suitable method approved by the Engineer to a near-white metal condition in accordance with SSPC-SP10 (1 to 2 mil anchor pattern), as a minimum. The surface shall also be clean, dry and free of oil, grease, flux residue, corrosion products, and any other foreign substance.
2. Using a minimum of two coats, and the methods recommended by the manufacturer of the zinc-rich paint, spray or brush apply the zinc-rich paint to the area in a manner to achieve the applicable ASTM adherence and quality requirements of the original coating, and a minimum dry film thickness of 4 mils.

All repairs shall be made at no cost to the Authority.

3. **CONSTRUCTION DETAILS:**

3.01 **Inspection, Storage and Handling:** Precast box sections will be inspected at the construction site to determine any damage during shipment and for conformance to the dimensional tolerances. An additional inspection will be made prior to placement of precast box sections to determine any damage during storage.

3.02 **Installation:**

- A. **Excavation:** The requirements specified in Section 206, Trench, Culvert and Structure Excavation, that apply to culverts and storm drains shall govern, except as modified in the plans or as directed by the Engineer.
- B. **Placement:** The precast manufacturer shall have a representative available to assist in the installation of the box culvert. Precast box sections shall be installed, true to line and grade, in accordance with the contract plans. Placement of the box sections shall start at the downstream end and proceed upstream, unless otherwise indicated in the contract plans.
- C. **Joints:** Precast box sections shall be installed with the female joints up grade and the male joints fully entered therein. The joint openings between adjacent precast units shall not exceed 0.787". The joints shall be sealed with a continuous gasket installed at the precast plant. Joints shall be drawn together with mechanical connectors, as shown on the approved working drawings. Culverts with a clear rise greater than 4.5 feet shall have a minimum of four connectors per joint. Smaller culverts shall have a minimum of two connectors per joint. The number of mechanical connectors supplied shall be equal to the number of connectors required per joint multiplied by the number of joints unless otherwise approved by the

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3. **CONSTRUCTION DETAILS:** (cont'd)

3.02 **Installation:** (cont'd)

Engineer. After installation, connectors may be left on or removed at the Contractor's option, unless otherwise noted in the contract plans. When the contract plans require, or the Contractor chooses to leave the connectors in place, they shall be located so that they do not create an obstruction inside the culvert. Gaps which occur on the interior surfaces of the culvert due to misalignment or grade difference shall be filled as ordered by the Engineer, with an approved concrete repair material so as to produce a smooth continuous surface.

D. **Backfilling:** The types of materials to be used in backfilling and the procedure of placement shall conform to the contract plans and the applicable provisions of Subsection 203-3.15 of the Standard Specifications. Movement of construction equipment, vehicles and loads over and adjacent to the culvert shall be done at the Contractor's risk.

3.03 **Repair of Damaged Sections:** Precast box sections that are damaged or disturbed through any cause prior to acceptance of the Contract shall be repaired, realigned or replaced as directed by the Engineer and at the Contractor's expense. Box sections which, as determined by the Engineer, cannot be satisfactorily repaired, or do not meet dimensional tolerances, will be rejected and shall be replaced with acceptable sections by the Contractor.

4. **METHOD OF MEASUREMENT:**

4.01 The quantity to be measured for concrete box culvert sections shall be the number of linear feet (laying length) furnished and installed in the work. Linear feet (laying length) shall be measured by multiplying the number of whole units by the nominal length of each unit and adding thereto to the length of any fractional units incorporated in the work. The nominal length of a unit or fractional unit shall be the inside measure length from one butting end to the other butting end measured along the bottom centerline of the unit.

5. **BASIS OF PAYMENT:**

5.01 The quantity to be paid for shall be the number of linear feet of each size box culvert section incorporated in the work. The unit price bid shall include the cost of furnishing all labor, materials, equipment and installation supervision by the precast manufacturer's representative, necessary to satisfactorily complete the work. The cost of furnishing and installing headwalls and cut off walls shall also be included in the unit price bid.

Payment shall be made under Item 603.63XXYY25, 603.64XXYY25, 603.65XXYY25 and 603.66XXYY25, where XX and YY, as indicated in the itemized proposal shall mean the inside span and rise dimensions respectively in feet, of the precast section.

5.02 Excavation and backfill will be paid for separately.