When a feeder circuit in conduit passes through electrical duct, make the conduit continuous through the duct unless specifically noted otherwise in the plans. After feeder circuits in conduit are extended through duct, plug the duct with oakum or duct seal.

When only feeder circuits are required, install the load current carrying conductors and grounding conductors in either existing conduit or conduit installed under other contract items.

When more than one circuit is installed in a single raceway, a single equipment grounding conductor sized as required for the largest circuit may be used without change in the contract unit bid prices.

Multiple circuits may be placed in the same trench if they are grouped and separated a minimum distance of 3". When more than one circuit is installed in the same trench there will not be any adjustment of the contract unit bid prices.

**1410-4 MEASUREMENT AND PAYMENT**

___ Feeder Circuits will be measured and paid as the actual number of linear feet of each size and type feeder circuit completed and accepted. Measurement will be to the nearest whole foot from electrical terminal to electrical terminal of the longest load current carrying conductor.

___ Feeder Circuit in ____ Conduit will be measured and paid as the actual number of linear feet of each size and type feeder circuit completed and accepted. Measurement will be to the nearest whole foot from electrical terminal to electrical terminal of the longest load current carrying conductor.

Payment will be made under:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>___ Feeder Circuit</td>
<td>Linear Foot</td>
</tr>
<tr>
<td>___ Feeder Circuit in ____ Conduit</td>
<td>Linear Foot</td>
</tr>
</tbody>
</table>

**SECTION 1411**

**ELECTRICAL JUNCTION BOXES**

**1411-1 DESCRIPTION**

Provide junction boxes made from fiberglass reinforced polymer concrete and cast-metal boxes encased in concrete of the appropriate type at locations noted in the plans, complete with all necessary covers, conduits, duct and hardware, in accordance with the contract.

**1411-2 MATERIALS**

Refer to Division 10.

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backfill</td>
<td>545, 1005</td>
</tr>
<tr>
<td>Electrical Junction Boxes</td>
<td>1091-5</td>
</tr>
</tbody>
</table>

Provide a polymer concrete junction box which is open bottom with a foot. Provide a standard “Electric” logo on the cover unless specifically noted otherwise in the plans. Backfill beneath and around the boxes using ABC in conformance with Section 1005.

**1411-3 CONSTRUCTION METHODS**

Install conduits and duct before the polymer concrete (PC) boxes are set in place. Do not rest the bottom of the box directly on conduits, ducts or cables.
Section 1412

Place the top of the box on the same grade as the surrounding area. Perform backfilling with sufficient care that no part of the junction box, conduit or duct is displaced or moved out of alignment. Backfill beneath and around the box to at least 12" using #67 washed stone aggregates in conformance with Section 545 and Section 1005.

Locate junction boxes for best routing of conduit and duct and to minimize drainage problems. Do not locate boxes in useable shoulders or pavements or other areas where they may be subjected to traffic loadings.

Stub the ends of conduit and duct up vertical as near the top of the box as practical and seal. Arrange wiring so that it will not lay in the bottom of the box.

Install cast-metal (BR) boxes and arrange conduits and ducts to best fit field conditions. During the construction of the median barrier reinforcement, accurately space and securely attach Type BR junction boxes and conduits inside the reinforcement. Bond junction box to the reinforcement in accordance with NEC Article 250.52. Place boxes with covers flush with surface of concrete (generally traffic side of median barrier).

Place mastic between the cast metal box frame and the cast concrete barrier, as shown on plans to allow easy replacement of the frame.

1411-4 MEASUREMENT AND PAYMENT

Electrical Junction Boxes ____ will be measured and paid as the actual number of the appropriate type and size junction boxes installed and accepted. Payment for the conduit, duct and wiring will be paid under other contract items. Items used for splicing are incidental to the junction boxes.

Payment will be made under:

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Junction Boxes</td>
<td>Each</td>
</tr>
</tbody>
</table>

SECTION 1412

UNDERPASS LIGHTING

1412-1 DESCRIPTION

Furnish and install wall mounted and/or pendant mounted luminaires with electrical circuitry, for underpass lighting at locations shown in the plans. Work includes, but is not limited to, furnishing and installing underpass luminaires with lamp, ballast and mounting hardware as well as furnishing and installing circuit breakers and enclosure, pull boxes, conduit, conductors, expansion fittings, anchors, straps and ground rod.

1412-2 MATERIALS

Refer to Division 10.

<table>
<thead>
<tr>
<th>Item</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduit</td>
<td>1091-3</td>
</tr>
<tr>
<td>Wire and Cable</td>
<td>1091-2</td>
</tr>
</tbody>
</table>

Use luminaires that are listed as “Suitable for Wet Locations” according to UL Standard 1572, with sealed and filtered optical assemblies. Use high power factor ballasts that are completely pre-wired integral units, for reliable starting and operating of high pressure sodium lamps at -40°F ambient temperature. Use heavy-duty mogul base lamp sockets, with split shell tempered brass lamp grips and a free-floating, spring-loaded center contact. Use the luminaire type, wattage, voltage and IES illumination distribution pattern as shown in the plans.