

## 510.01

### ITEM 510 DOWEL HOLES

#### 510.01 Description

#### 510.02 Materials

#### 510.03 Drilling of Holes

#### 510.04 Placement

#### 510.05 Curing and Loading

#### 510.06 Basis of Payment

**510.01 Description.** This work consists of drilling holes into concrete or masonry, and furnishing and placing grout into the holes. The furnishing and placing of steel for dowels is included in Item 509.

**510.02 Materials.** Cement grout consists of one part of hydraulic cement conforming to Item 701 and three parts sand conforming to 703.03, by volume, and water.

Furnish nonshrink, nonmetallic grout conforming to 705.20.

**510.03 Drilling of Holes.** Drill holes at the location and the depth shown on the plans without spalling the concrete.

Drill holes for cement grout at least 1/2 inch (13 mm) larger in diameter than the dowel bar. Drill holes diameters for nonshrink, nonmetallic grout at least 1/16 inch (1.5 mm) larger in diameter than the dowel bar. Drill hole for encapsulated type nonshrink, nonmetallic grout as recommended by the manufacturer.

Instead of drilling holes, the Contractor may install formed holes with laitance removed.

**510.04 Placement.** Do not install grout if the temperature of the concrete into which the grout is being placed is below 40 °F (4 °C). Force dowel bars into the holes, to the specified depth, spreading the grout around the bar and solidly filling the hole.

Before installing cement grout and dowels, saturate cement grout dowel holes with water then blow out all excess water. Place enough cement grout to completely fill the holes during dowel installation. If cement grout does not completely fill the hole, remove the dowel, pour additional grout into the hole, and reinstall the dowel.

Before installing nonshrink, nonmetallic grout and dowel, clean and dry the grout holes. Immediately after mixing, place a sufficient amount of nonshrink, nonmetallic grout to provide complete coverage around the dowel to ensure anchorage. If nonshrink, nonmetallic grout does not completely fill the hole, pour additional grout in until the hole is filled flush.

Obtain the correct protrusion of the anchors or dowels, and hold dowels in the plan position within the holes until the grout has initially hardened.

If horizontal holes are specified, provide a means of retaining the grout in the hole flush with the vertical face and remove this material after the grout has hardened. Do not use material for retaining the grout that bonds to the grout.

**510.05 Curing and Loading** Before applying any stresses to dowels, cure nonshrink, nonmetallic grout as follows:

|                                   |                     |
|-----------------------------------|---------------------|
| Daily Minimum Ambient Temperature | Minimum Curing Time |
| 33 to 50 °F (1 to 10 °C)          | 3 hours             |
| 51 to 68 °F (11 to 20 °C)         | 1 1/2 hours         |
| above 68 °F (above 20 °C)         | 1 hour              |

**510.06 Basis of Payment.** The City will pay for accepted quantities at the contract prices as follows:

| <b>Item</b> | <b>Unit</b> | <b>Description</b>                            |
|-------------|-------------|---|
| 510         | Each        | Dowel holes with cement grout                 |
| 510         | Each        | Dowel holes with nonshrink, nonmetallic grout |