

500 STRUCTURES

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 holes. The furnishing and placing of steel for dowels is included with Item 509.

510.02 Materials. Cement grout consists of 1 part of hydraulic cement conforming to Item 701 and 3 parts sand conforming to Item 703.03 by volume and water.

510.03 Drilling Holes. Drill holes at the location and 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 bars. Drill holes for nonshrink, nonmetallic grout at least 1/16 inch (1.6 mm) larger than the dowel bar. Drill hole diameters for encapsulated type nonshrink, nonmetallic grout as recommended by the manufacturer.

Nonshrink, nonmetallic grout will meet the requirements of Item 705.20.

Formed holes may be used in lieu of drilled holes, but laitance is to be 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 and then blow out all excess water. The holes must be filled with enough cement grout to completely fill the holes when the dowel is installed.

Before installing nonshrink, nonmetallic grout holes, clean and dry the dowel holes. Immediately after mixing, place a sufficient amount of nonshrink, nonmetallic grout in the prepared holes to provide complete coverage around the dowel to ensure anchorage.

Obtain the correct protrusion of the anchors or dowels and hold the 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. Remove this material after the grout has hardened. Do not use material which 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° (11° to 20° C)	1 1/2 hours
above 68° (20° C)	1 hour

510.06 Basis of Payment. The City will pay for drilling or forming holes, and furnishing and placing grout at the contract prices for:

Item	Unit	Description
<i>510</i>	<i>Each</i>	<i>Dowel Holes with Cement Grout</i>
<i>510</i>	<i>Each</i>	<i>Dowel Holes with Non-shrink, Non-metallic Grout</i>