

OHD L-40
METHOD OF CORE TEST FOR DETERMINING DEPTH OF PENETRATION OF
PENETRATING WATER REPELLENT TREATMENT SOLUTION
INTO PORTLAND CEMENT CONCRETE

- I. **SCOPE.** This method covers the core test for determining the depth of penetration of penetrating water repellent treatment solution into the surface of Portland Cement concrete.
- II. **TEST SAMPLE.** One four (4) inch (10 cm) diameter core approximately four (4) inches (10 cm) in length retrieved from the surface of Portland Cement concrete that has been treated with penetrating water repellent solution.
- III. **PROCEDURE.**
 - A. The core shall be oven dried at $230 \pm 9^{\circ}$ F ($110^{\circ} \pm 5^{\circ}$ C) to a constant weight.
 - B. Split the core perpendicular to the tines and along an axis running from top to bottom of the core.
 - C. Immediately immerse the top half of the core in a permanent dye (Sulfonazo III, sodium salt) capable of staining only the untreated portland concrete. Rinse the excess dye off with water and allow the core to dry.
 - D. Wet the exposed surface of both core halves with water and position the halves so that their tops lay end to end and the exposed surfaces facing upwards. Place a ruler with 0.01 inch (0.25mm) increments between the two halves at the same elevation as the exposed faces.
 - E. Photograph the core halves so that the entire width of the exposed surface and depth of penetration for each half will be shown in one 8 x 10 inches (20 x 25 cm) picture. The pictures shall be taken using 35 mm color film and an appropriate lens that will provide focus for irregular field depths.
 - F. After developing the picture, select one of the two halves in the photograph and outline the area of penetration with a permanent marking pen.
 - G. Using a planimeter, determine the area of penetration (A) in the photograph to the nearest 0.01 inch^2 (6.45 mm^2)
 - H. Using a ruler, measure the photograph width (W) of the area investigated to the nearest 0.01 inch (0.25mm).
 - I. Using a ruler, measure a 3 inch section of the photographed ruler and record to the nearest 0.01 inch. The scale of the photograph (S) is then calculated by dividing this value by 3 and rounding to the nearest 0.01 inch.

J. Calculate the average depth of penetration (D) to the nearest 0.01 inch using the following

equation:
$$D = \frac{A}{W \times S}$$

Where:

D = Average depth of penetration (inches)
A = Cross sectional area of penetration (inches²)
W = Width (inches)
S = Scale of the photograph used

IV. **REPORT.** Report the average depth of penetration to the nearest 0.01 inch.