



SOLAR TESTING LABORATORIES, INC.

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PROJECT: MP 147.99 149.78

Resistance of Concrete to Chloride Ion Penetration

CLIENT: PA Turnpike

DATE: 10-17-97

DESCRIPTION: AASHTO T-259

FILE NO.: B96031X2

CONTRACT NO.: 84-039-RE 34

For This testing, concrete cylinders were selected from current STL concrete projects using 4000 PSI air entrained concrete

Concrete samples A and B contained limestone aggregate and were a spare cylinder set cast and cured per ASTM requirements. Fresh concrete test results were 4.0" slump, 6.0% air, and 75F.

Concrete samples C and D contained sandstone aggregate and were a spare cylinder set cast and cured per ASTM requirements. Fresh concrete test results "Slump" 4.25", Air 5.2 and 80F.

Concrete cylinder samples C and D were cut longitude in order to coat this type of surface. Perma crete sealant was applied in successive coats as recommended with a total of (5) five coats applied to each sample. The samples were then cured at lab temperature and humidity for 28 days.

A dam was placed on the exposed surface of samples c and D and on the end of cylinders a and B, the dams were filled with three percent sodium chloride solutions to a depth of one half Inch (0.5") minimum for a period of ninety (90) days. After removal of solution, the samples were permitted to dry and the surfaces were brushed prior to obtaining chloride Ion samples.

The following is a table of chloride ion results:

| Concrete Sample # | Chloride Ion Sample # | Depth (IN) | Chloride Ion % | Absorbed Chloride Ion % | Average Absorbed Chloride Ion % |
|-------------------|-----------------------|-------------|----------------|-------------------------|---------------------------------|
| A | 1 | 0.06"-0.50" | 0.084 | 0.073 | 0.062 |
| A | 2 | 0.50"-1.00" | 0.052 | 0.044 | 0.034 |
| B | 3 | 0.06"-0.50" | 0.062 | 0.050 | |
| B | 4 | 0.50"-1.00" | 0.032 | 0.024 | |
| C | 5 | 0.06"-0.50" | 0.159 | 0.148 | 0.132 |
| C | 6 | 0.50"-1.00" | 0.145 | 0.137 | 0.136 |
| D | 7 | 0.06"-0.50" | 0.167 | 0.150 | |
| D | 8 | 0.50"-1.00" | 0.143 | 0.135 | |

Average chloride ion not ponded: 0.06"-0.50" 0.011%, 0.50"-1.00" 0.08%

Due to the differences in the ponded surfaces, samples A and B, and C and D are separated.

Surface abrasion was not performed as described in section 3.1 on samples A and B

INSPECTOR: W. Gross

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