ALBERTA TRANSPORTATION

TECHNICAL STANDARDS BRANCH

BT002 - JULY 2000

TEST PROCEDURE FOR ALKALINE RESISTANCE OF PENETRATING SEALERS FOR BRIDGE CONCRETE

SCOPE - This test procedure outlines the steps required to assess the alkaline resistance of penetrating sealers for bridge concrete.

1.0 GENERAL

1.1 INTRODUCTION

This test procedure is a continuation of those performed in BT001 for vapour transmission, waterproofing and hiding power. The test uses the same three treated and three control cubes as used in the BT001. Alkaline resistance is checked for the Type 1 sealers only.

Alkaline resistance is a factor in the service life of penetrating sealers applied to new concrete surfaces, where moisture coupled with the concrete's high alkalinity may reduce sealer durability. Alkaline resistance is of less significance on older or carbonated surfaces.

1.2 RELATED DOCUMENTS

- ASTM D5095, "Standard Test Method for Determination of Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments"
- B388, "Specifications for the Supply of Concrete Sealers"
- BT001, "Alberta Test Procedure for Measuring the Vapour Transmission, Waterproofing and Hiding Power of Concrete Sealers"
- BT010, "Test Procedure for Casting and Storing Test Specimens for use in Approval Testing of Sealers"

1.3 HAZARDOUS MATERIALS

This test procedure may involve hazardous materials, operations and equipment. This procedure does not propose to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to use.

2.0 PROCEDURE FOR MEASURING ALKALINE RESISTANCE

2.1 SEALER TREATED AND CONTROL CUBES

The cubes used for measuring alkaline resistance are the same as those used in the waterproofing performance test after abrasion. The weight of the treated cubes just after abrasion and before immersion are known from 6.3 and the average weight gain of the control cubes (CG) is known from 6.2 of Test Procedure BT001.

2.2 ALKALINE BATH

The three treated cubes which have previously come out of the tap water bath used for the waterproofing performance shall be dried in an oven at $60 \pm 2^{o}C$ to reach the weight after abrasion in Section 6.3 of Specification BT001. The cubes are then immersed in the alkaline bath for a period of 21 days. This bath is a solution of 0.1 normal KOH. The cubes are immersed to a depth of 25 mm from the surface. The cubes are held up from the bottom of the pan by shims to allow exposure to the bottom face.

Record the weight gained to the nearest 0.1 grams after light towel drying to an S.S.D. condition.

2.3 TAP WATER BATH

Dry the three treated cubes at $60^{o}C$ to attain the previously measured weights of the cubes just after abrasion and before immersion $\pm$ 2 grams. Record the weights to the nearest 0.1 grams. Immerse the cubes to a depth of 25 mm from the surface, bottom face shimmed up. Leave for 120 hours, remove and lightly towel to a S.S.D. condition and re-weigh to the nearest 0.1 grams.

2.4 WATERPROOF PERFORMANCE AFTER ALKALINE TEST

Calculate the waterproofing performance as per BT001 Test Procedure.

$$\text{Waterproofing Performance} \qquad \frac{CG - TG3}{CG} \times 100\%$$

CG - average weight gain per cube of the control set.

TG3 - average weight gain per cube of sealed set after the final tap water bath.

2.5 REPORT RESULTS

Report the original after-sandblasted waterproofing performance, the weight gain in grams of the 21-day KOH immersion, and the final waterproofing performance.