

# **QPL 23 CONCRETE WATERPROOFING**

## **SECTION A: NON-PENETRATING TYPE SEALERS (NON-TRAFFIC BEARING)**

### **PROCEDURES**

#### **GENERAL**

This evaluation procedure outlines the Department's approval process for the use of penetrating type sealers for waterproofing concrete and non-penetrating type sealers used in waterproofing non-traffic bearing concrete.

#### **SPECIFICATIONS**

AASHTO T 259  
AASHTOT T 260

#### **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information, a sample of the product being tested and manufacturer's recommended mixing instructions must be submitted to the Division of Materials and Tests.

A six-inch by twelve-inch hardened Portland cement concrete cylinder will be used as a test specimen. The six-inch by twelve-inch concrete cylinder will be sawed in half at an angle of ninety degrees from the twelve-inch axis. The concrete surface shall be abraded using sandblasting techniques. Next place a dam around the top edge of the concrete cylinder. The submitted product will be applied to the concrete surface as recommended by the manufacturer and allowed to cure. The concrete specimen will be covered with a 3% solution of NaCl to a depth of one-half inch and maintained for ninety days in accordance with AASHTO T 259.

After ninety days of exposure the specimen shall be allowed to dry and then the surface shall be wire brushed until all salt crystal buildup is completely removed. A test sample will be taken at the one-half to one-inch depth from each end of the test cylinder. The untreated end of the test cylinder will be the control. The chloride content of each sample shall be determined in accordance with the procedure in AASHTO T 260. The amount of NaCl absorbed into the test cylinder will be determined by subtracting the control from the sample taken from the area treated with the submitted product and covered with a 3% solution of NaCl.

The maximum amount of chloride ion penetration allowed is 1.0 pound per cubic yard of concrete.

## **SECTION B: PENETRATING TYPE SEALERS**

### **PROCEDURES**

#### **GENERAL**

This evaluation procedure outlines the Department's approval process for the use of penetrating type sealers for waterproofing concrete and non-penetrating type sealers used in waterproofing traffic bearing concrete.

#### **SPECIFICATIONS**

AASHTO T 259  
AASHTOT T 260

#### **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information, a sample of the product being tested and manufacturer's recommended mixing instructions must be submitted to the Division of Materials and Tests.

A six-inch by twelve-inch hardened Portland cement concrete cylinder will be used as a test specimen. The six-inch by twelve-inch concrete cylinder will be sawed in half at an angle of ninety degrees from the twelve-inch axis. The concrete surface shall be abraded using sandblasting techniques. Next place a dam around the top edge of the concrete cylinder. The submitted product will be applied to the concrete surface as recommended by the manufacturer and allowed to cure. The concrete specimen will be covered with a 3% solution of NaCl to a depth of one-half inch and maintained for ninety days in accordance with AASHTO T 259.

After ninety days of exposure the specimen shall be allowed to dry and then the surface shall be wire brushed until all salt crystal buildup is completely removed. A test sample will be taken at the one-half to one-inch depth from each end of the test cylinder. The untreated end of the test cylinder will be the control. The chloride content of each sample shall be determined in accordance with the procedure in AASHTO T 260. The amount of NaCl absorbed into the test cylinder will be determined by subtracting the control from the sample taken from the area treated with the submitted product and covered with a 3% solution of NaCl.

The maximum amount of chloride ion penetration allowed is 1.0 pound per cubic yard of concrete.

## **SECTION C: NON-PENETRATING COAL TAR EPOXY SEALERS**

## **PROCEDURES**

### **GENERAL**

This evaluation procedure outlines the Department's approval process for use of non-penetrating coal tar epoxy sealers used in waterproofing non-traffic bearing concrete.

### **SPECIFICATIONS**

ASTM D 570  
ASTM C 881, Table 1

### **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information, a sample of the product being tested and manufacturer's recommended mixing instructions must be submitted to the Division of Materials and Tests.

A 3"x6" concrete cylinder dried to a constant weight will be used as a test specimen. The manufacturers' product will be applied to the test specimen and allowed to cure as recommended by the manufacturer.

After curing, the test specimen will be weighed, then submerged in water for 72 hours. At the end of 72 hours, the test specimen will be removed from the water and surfaced dried and weighed to determine water absorption according to ASTM D 570.

Approval will be based upon the product meeting the requirements for water absorption as set forth in ASTM C 881, Table 1.

## **SECTION D: THIN OVERLAY SYSTEMS FOR BRIDGE DECKS (1/2 INCH THICKNESS OR LESS)**

### **SECTION D: POLYMER MODIFIED CEMENTITIOUS SYSTEM**

## **PROCEDURES**

### **GENERAL**

This evaluation procedure outlines the Department's approval process for polymer-modified cementitious, epoxy urethane and low modulus epoxy materials applied as thin overlays on bridge decks used to seal the decks and improve skid resistance.

### **SPECIFICATIONS**

AASHTO T 259  
AASHTO T 260

## **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information and a sample of the product being tested must be submitted to the Division of Materials and Tests. This product will also need to be submitted to NTPEP for evaluation.

A six-inch by twelve-inch hardened Portland cement concrete cylinder will be used as a test specimen. The six-inch by twelve-inch concrete cylinder will be sawed in half at an angle of ninety degrees from the twelve-inch axis. The concrete surface shall be abraded using sandblasting techniques. Next place a dam around the top edge of the concrete cylinder. The submitted product will be applied to the concrete surface as recommended by the manufacturer and allowed to cure. The concrete specimen will be covered with a 3% solution of NaCl to a depth of one-half inch and maintained for ninety days in accordance with AASHTO T-259.

After ninety days of exposure the specimen shall be allowed to dry and then the surface shall be wire brushed until all salt crystal buildup is completely removed. A test sample will be taken at the one-half to one-inch depth from each end of the test cylinder. The untreated end of the test cylinder will be the control. The chloride content of each sample shall be determined in accordance with the procedure in AASHTO T-260. The amount of NaCl absorbed into the test cylinder will be determined by subtracting the control from the sample taken from the area treated with the submitted product and covered with a 3% solution of NaCl.

The maximum amount of chloride ion penetration allowed is 1.0 pound per cubic yard of concrete.

A one year field demonstration and evaluation period, evaluated by NTPEP, will be required prior to product approval. Smoothness, sealing capabilities and skid resistance will be evaluated on the in-place product.

## **SECTION D: TYPE 1 THIN OVERLAY (EPOXY-URETHANE)**

### **PROCEDURES**

#### **GENERAL**

This evaluation procedure outlines the Department's approval process for epoxy-urethane thin overlay systems applied as thin overlays on bridge decks used to seal the decks and improve skid resistance.

#### **SPECIFICATIONS**

(Note 1) TYPE 1 THIN EPOXY OVERLAY SYSTEM – USE DECK PRETREATMENT/PRIMER PER MANUFACTURER'S RECOMMENDATION, AND 2 LIFTS OF AN EPOXY-URETHANE COPOLYMER AND AGGREGATE. TYPE 1 OVERLAY SHALL BE APPLIED MECHANICALLY USING METERED EQUIPMENT; HAND MIXING OF MATERIAL IS NOT PERMITTED.

THIN OVERLAY SYSTEM SHALL BE FROM THE QUALIFIED PRODUCTS LIST 23, SECTION D2. MINIMUM OVERLAY THICKNESS SHALL BE 3/8 INCH.

APPLICATION EQUIPMENT SHOULD :

- A) BE CAPABLE OF METERING, MIXING AND DISTRIBUTING THE POLYMER AND PRETREATMENT TO MANUFACTURER'S RECOMMENDATION.
- B) USE AN APPLICATION MACHINE THAT FEATURES POSITIVE DISPLACEMENT VOLUMETRIC METERING PUMPS CONTROLLED BY A HYDRAULIC POWER UNIT.
- C) STORE COMPONENTS IN TEMPERATURE CONTROLLED RESERVOIRS CAPABLE OF MAINTAINING 100 DEGREES FAHRENHEIT (PLUS OR MINUS 10 DEGREES) TO INSURE OPTIMAL MIXING.
- D) CHECK MIXING RATIO AT THE PUMP OUTLETS AS WELL AS CYCLE COUNTING CAPABILITIES TO MONITOR OUTPUT ON STANDARD FEATURES.
- E) USE MOTIONLESS IN-LINE MIXING SO AS TO NOT OVERLY SHEAR THE MATERIAL TO ENTRAP AIR IN THE MIX.
- F) MAXIMIZE MATERIAL WORKING TIME BY MIXING IT IMMEDIATELY BEFORE DISPENSING.

AGGREGATE SHALL BE ANGULAR, HAVING LESS THAN 0.2% MOISTURE AND FREE OF DIRT, CLAY, ASPHALT AND OTHER FOREIGN OR ORGANIC MATERIALS. AGGREGATE FOR ALL LAYERS SHALL BE BAUXITE OR FLINT ROCK PRODUCTS FLINT AND MEETS THE FOLLOWING GRADATION:

<u>SIEVE SIZE</u>	<u>% PASSING</u>
NO. 6	95-100
NO. 10	10-35
NO. 20	0-3

FULL AND PARTIAL DEPTH DECK REPAIR SHALL CURE A MINIMUM OF 28 DAYS BEFORE THE OVERLAY IS PLACED. TRAFFIC SHALL BE ALLOWED TO USE THE BRIDGE DURING THE CURING PERIOD OF THE PATCHES BUT NOT AFTER SHOTBLASTING. MAGNESIUM PHOSPHATE BASED MATERIALS WILL NOT BE ALLOWED.

THE CONCRETE DECK SURFACE SHALL BE CLEANED BY SHOTBLASTING TO REMOVE ANY OIL, DIRT, RUBBER, TRAFFIC STRIPING, OR ANY OTHER POTENTIAL DETRIMENTAL MATERIAL SUCH AS CURING COMPOUND AND LAITANCES, WHICH THE MANUFACTURER AND ENGINEER'S OPINION WOULD PREVENT PROPER BONDING AND CURING OF THE MATERIAL. IN AREAS WHERE SHOTBLASTING EQUIPMENT CAN NOT REACH (I.E., ALONG CURBS AND BRIDGE RAILS) SANDBLASTING IS PERMITTED TO AN EXTENT TO THE ENGINEER'S AND MANUFACTURER'S APPROVAL. IMMEDIATELY BEFORE APPLICATION, ALL PREPARED SURFACES SHALL BE CLEANED WITH COMPRESSED AIR OR VACUUMED TO REMOVE DUST AND DEBRIS.

ALL SURFACES THAT ARE TREATED SHALL BE DRY AT THE TIME OF APPLICATION. THE OVERLAY SHALL NOT BE APPLIED WHEN IT HAS RAINED 24 HOURS PRIOR TO, OR RAIN IS FORECAST WITHIN 8 HOURS AFTER, APPLICATION. THE MOISTURE CONTENT IN THE DECK SUBSTRATE SHALL BE TESTED. MOISTURE IS NOT TO EXCEED 4.5 PERCENT WHEN MEASURED BY ELECTRONIC METER. IF THE TEST SHOWS EXCESS MOISTURE, THE DECK SHALL CONTINUE TO DRY BEFORE APPLICATION PROCEEDS.

BLUSHING (A WAXY SURFACE COATING ON THE EPOXY) IS CAUSED BY THE REACTION OF MOISTURE WITH THE HARDENING AGENT. BLUSHING CREATES A SURFACE THAT MAKES FUTURE LAYERS DIFFICULT TO ADHERE. LIFTS THAT SHOW SIGNS OF BLUSHING SHALL BE REMOVED AND REPLACED PRIOR TO APPLICATION OF THE NEXT. THE COST TO REMOVE AND REPLACE THESE AREAS SHALL BE AT THE CONTRACTOR'S EXPENSE.

TRAFFIC, OTHER THAN APPLICATION EQUIPMENT, SHALL NOT BE ALLOWED ON ANY PORTION OF THE DECK THAT HAS BEEN SHOTBLASTED OR WHERE PART OF THE APPLICATION HAS BEEN PLACED.

SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED AMBIENT AND SURFACE TEMPERATURES AND HUMIDITY LIMITS FOR APPLICATION.

THE MANUFACTURER SHALL HAVE A REPRESENTATIVE ON THE JOB SITE AT ALL TIMES DURING APPLICATION AND CURE TIME. THE REPRESENTATIVE, ALONG WITH CONSULTATION WITH ENGINEER, MAY SUSPEND ANY ITEM OF WORK THAT IS SUSPECT AND DOES NOT MEET THE REQUIREMENTS OF THE SPECIFICATIONS. WORK SHALL NOT RESUME UNTIL THE ENGINEER AND REPRESENTATIVE ARE SATISFIED THAT APPROPRIATE REMEDIAL ACTION HAS BEEN TAKEN BY THE CONTRACTOR.

ALL COSTS FOR AGGREGATE, EPOXY FOR MINIMUM OF TWO LIFTS, SURFACE PREPARATION, LABOR AND ANY OTHER MISCELLANEOUS MATERIALS REQUIRED TO PLACE THIN OVERLAY SHALL BE INCLUDED IN ITEM NO. 617-04.01, TYPE 1 THIN EPOXY OVERLAY (EPOXY URETHANE), SY; OR 617-04.02, TYPE 2 THIN EPOXY OVERLAY (LO-MOD EPOXY), SY, AS CALLED FOR ON THE QUANTITY SHEET.

THICKNESS VERIFICATION: THE PROJECT ENGINEER SHALL BE NOTIFIED OF THE NUMBER OF GALLONS USED ON THE PROJECT WITH NOTARIZED QUANTITY STATEMENTS FROM THE CONTRACTOR AND THE MANUFACTURER. THE CONTRACTOR SHALL VERIFY TO TDOT THAT THE OVERLAY IS AN AVERAGE OF AT LEAST 3/8 INCH THICK AT THREE RANDOM LOCATIONS AGREED UPON BY THE PROJECT ENGINEER AND THE MATERIAL MANUFACTURER REPRESENTATIVE. IF 3/8 INCH AVERAGE IS NOT ACHIEVED, A RETEST SHALL BE PERFORMED IN ADJOINING AREAS. THIN AREAS SHALL BE RE-COATED AS DESCRIBED ABOVE BY THE CONTRACTOR AND RE-VERIFIED AT NO ADDITIONAL COST TO TDOT. THIS VERIFICATION MAY CONSIST OF CORES, HOLES, ETC., BUT IN ALL CASES, ANY DESTRUCTIVELY TESTED AREAS SHALL BE REPAIRED BY THE CONTRACTOR BEFORE FINAL ACCEPTANCE BY THE PROJECT ENGINEER.

AASHTO T 259

AASHTO T 260

## **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information and sample of the product being tested must be submitted to the Division of Materials and Tests. This product will also need to be submitted to NTPEP for evaluation.

A six-inch by twelve-inch hardened Portland cement concrete cylinder will be used as a test specimen. The six-inch by twelve-inch concrete cylinder will be sawed in half at an angle of ninety degrees from the twelve-inch axis. The concrete surface shall be abraded using sandblasting techniques. Next place a dam around the top edge of the concrete cylinder. The submitted product will be applied to the concrete surface as recommended by the manufacturer and allowed to cure. The concrete specimen will be covered with a 3% solution of NaCl to a depth of one-half inch and maintained for ninety days in accordance with AASHTO T-259.

After ninety days of exposure the specimen shall be allowed to dry and then the surface shall be wire brushed until all salt crystal buildup is completely removed. A test sample will be taken at the one-half to one-inch depth from each end of the test cylinder. The untreated end of the test cylinder will be the control. The chloride content of each sample shall be determined in accordance with the procedure in AASHTO T-260. The amount of NaCl absorbed into the test cylinder will be determined by subtracting the control from the sample taken from the area treated with the submitted product and covered with a 3% solution of NaCl.

The maximum amount of chloride ion penetration allowed is 1.0 pound per cubic yard of concrete.

A one year field demonstration and evaluation period, by NTPEP, will be required prior to product approval. Smoothness, sealing capabilities and skid resistance will be evaluated on the in-place product.

## **SECTION D: TYPE 2 THIN OVERLAY (LOW-MODULUS EPOXY)**

### **PROCEDURES**

#### **GENERAL**

This evaluation procedure outlines the Department's approval process for low modulus epoxy thin overlay systems applied as thin overlays on bridge decks used to seal the decks and improve skid resistance.

#### **SPECIFICATIONS**

(Note 2) TYPE 2 THIN EPOXY OVERLAY SYSTEM – USE 2 LIFTS OF LOW MODULUS EPOXY AND AGGREGATE. TYPE 2 HAS THE OPTION OF USING THE APPLICATION EQUIPMENT DESCRIBED BELOW OR HAND MIXING.

THIN OVERLAY SYSTEM SHALL BE FROM THE QUALIFIED PRODUCTS LIST 23, SECTION D3. MINIMUM OVERLAY THICKNESS SHALL BE 3/8 INCH.

APPLICATION EQUIPMENT SHOULD :

- A) BE CAPABLE OF METERING, MIXING AND DISTRIBUTING THE POLYMER AND PRETREATMENT TO MANUFACTURER'S RECOMMENDATION.
- B) USE AN APPLICATION MACHINE THAT FEATURES POSITIVE DISPLACEMENT VOLUMETRIC METERING PUMPS CONTROLLED BY A HYDRAULIC POWER UNIT.
- C) STORE COMPONENTS IN TEMPERATURE CONTROLLED RESERVOIRS CAPABLE OF MAINTAINING 100 DEGREES FAHRENHEIT (PLUS OR MINUS 10 DEGREES) TO INSURE OPTIMAL MIXING.
- D) CHECK MIXING RATIO AT THE PUMP OUTLETS AS WELL AS CYCLE COUNTING CAPABILITIES TO MONITOR OUTPUT ON STANDARD FEATURES.
- E) USE MOTIONLESS IN-LINE MIXING SO AS TO NOT OVERLY SHEAR THE MATERIAL TO ENTRAP AIR IN THE MIX.
- F) MAXIMIZE MATERIAL WORKING TIME BY MIXING IT IMMEDIATELY BEFORE DISPENSING.

AGGREGATE SHALL BE ANGULAR, HAVING LESS THAN 0.2% MOISTURE AND FREE OF DIRT, CLAY, ASPHALT AND OTHER FOREIGN OR ORGANIC MATERIALS. AGGREGATE FOR ALL LAYERS SHALL BE BAUXITE OR FLINT ROCK PRODUCTS FLINT AND MEETS THE FOLLOWING GRADATION:

<u>SIEVE SIZE</u>	<u>% PASSING</u>
NO. 6	95-100
NO. 10	10-35
NO. 20	0-3

FULL AND PARTIAL DEPTH DECK REPAIR SHALL CURE A MINIMUM OF 28 DAYS BEFORE THE OVERLAY IS PLACED. TRAFFIC SHALL BE ALLOWED TO USE THE BRIDGE DURING THE CURING PERIOD OF THE PATCHES BUT NOT AFTER SHOTBLASTING. MAGNESIUM PHOSPHATE BASED MATERIALS WILL NOT BE ALLOWED.

THE CONCRETE DECK SURFACE SHALL BE CLEANED BY SHOTBLASTING TO REMOVE ANY OIL, DIRT, RUBBER, TRAFFIC STRIPING, OR ANY OTHER POTENTIAL DETRIMENTAL MATERIAL SUCH AS CURING COMPOUND AND LAITANCES, WHICH THE MANUFACTURER AND ENGINEER'S OPINION WOULD PREVENT PROPER BONDING AND CURING OF THE MATERIAL. IN AREAS WHERE SHOTBLASTING EQUIPMENT CAN NOT REACH (I.E., ALONG CURBS AND BRIDGE RAILS) SANDBLASTING IS PERMITTED TO AN EXTENT TO THE ENGINEER'S AND MANUFACTURER'S APPROVAL. IMMEDIATELY BEFORE APPLICATION, ALL PREPARED SURFACES SHALL BE CLEANED WITH COMPRESSED AIR OR VACUUMED TO REMOVE DUST AND DEBRIS.



ALL SURFACES THAT ARE TREATED SHALL BE DRY AT THE TIME OF APPLICATION. THE OVERLAY SHALL NOT BE APPLIED WHEN IT HAS RAINED 24 HOURS PRIOR TO, OR RAIN IS FORECAST WITHIN 8 HOURS AFTER, APPLICATION. THE MOISTURE CONTENT IN THE DECK SUBSTRATE SHALL BE TESTED. MOISTURE IS NOT TO EXCEED 4.5 PERCENT WHEN MEASURED BY ELECTRONIC METER. IF THE TEST SHOWS EXCESS MOISTURE, THE DECK SHALL CONTINUE TO DRY BEFORE APPLICATION PROCEEDS.

BLUSHING (A WAXY SURFACE COATING ON THE EPOXY) IS CAUSED BY THE REACTION OF MOISTURE WITH THE HARDENING AGENT. BLUSHING CREATES A SURFACE THAT MAKES FUTURE LAYERS DIFFICULT TO ADHERE. LIFTS THAT SHOW SIGNS OF BLUSHING SHALL BE REMOVED AND REPLACED PRIOR TO APPLICATION OF THE NEXT. THE COST TO REMOVE AND REPLACE THESE AREAS SHALL BE AT THE CONTRACTOR'S EXPENSE.

TRAFFIC, OTHER THAN APPLICATION EQUIPMENT, SHALL NOT BE ALLOWED ON ANY PORTION OF THE DECK THAT HAS BEEN SHOTBLASTED OR WHERE PART OF THE APPLICATION HAS BEEN PLACED.

SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED AMBIENT AND SURFACE TEMPERATURES AND HUMIDITY LIMITS FOR APPLICATION.

THE MANUFACTURER SHALL HAVE A REPRESENTATIVE ON THE JOB SITE AT ALL TIMES DURING APPLICATION AND CURE TIME. THE REPRESENTATIVE, ALONG WITH CONSULTATION WITH ENGINEER, MAY SUSPEND ANY ITEM OF WORK THAT IS SUSPECT AND DOES NOT MEET THE REQUIREMENTS OF THE SPECIFICATIONS. WORK SHALL NOT RESUME UNTIL THE ENGINEER AND REPRESENTATIVE ARE SATISFIED THAT APPROPRIATE REMEDIAL ACTION HAS BEEN TAKEN BY THE CONTRACTOR.

ALL COSTS FOR AGGREGATE, EPOXY FOR MINIMUM OF TWO LIFTS, SURFACE PREPARATION, LABOR AND ANY OTHER MISCELLANEOUS MATERIALS REQUIRED TO PLACE THIN OVERLAY SHALL BE INCLUDED IN ITEM NO. 617-04.01, TYPE 1 THIN EPOXY OVERLAY (EPOXY URETHANE), SY; OR 617-04.02, TYPE 2 THIN EPOXY OVERLAY (LO-MOD EPOXY), SY, AS CALLED FOR ON THE QUANTITY SHEET.

THICKNESS VERIFICATION: THE PROJECT ENGINEER SHALL BE NOTIFIED OF THE NUMBER OF GALLONS USED ON THE PROJECT WITH NOTARIZED QUANTITY STATEMENTS FROM THE CONTRACTOR AND THE MANUFACTURER. THE CONTRACTOR SHALL VERIFY TO TDOT THAT THE OVERLAY IS AN AVERAGE OF AT LEAST 3/8 INCH THICK AT THREE RANDOM LOCATIONS AGREED UPON BY THE PROJECT ENGINEER AND THE MATERIAL MANUFACTURER REPRESENTATIVE. IF 3/8 INCH AVERAGE IS NOT ACHIEVED, A RETEST SHALL BE PERFORMED IN ADJOINING AREAS. THIN AREAS SHALL BE RE-COATED AS DESCRIBED ABOVE BY THE CONTRACTOR AND RE-VERIFIED AT NO ADDITIONAL COST TO TDOT. THIS VERIFICATION MAY CONSIST OF CORES, HOLES, ETC., BUT IN ALL CASES, ANY DESTRUCTIVELY TESTED AREAS SHALL BE REPAIRED BY THE CONTRACTOR BEFORE FINAL ACCEPTANCE BY THE PROJECT ENGINEER.

AASHTO T 259  
AASHTO T 260

## **PROCEDURES**

A completed Product Evaluation Form, MSDS sheets, if applicable, product data information and sample of the product being tested must be submitted to the Division of Materials and Tests. This product will also need to be submitted to NTPEP for evaluation.

A six-inch by twelve-inch hardened Portland cement concrete cylinder will be used as a test specimen. The six-inch by twelve-inch concrete cylinder will be sawed in half at an angle of ninety degrees from the twelve-inch axis. The concrete surface shall be abraded using sandblasting techniques. Next place a dam around the top edge of the concrete cylinder. The submitted product will be applied to the concrete surface as recommended by the manufacturer

and allowed to cure. The concrete specimen will be covered with a 3% solution of NaCl to a depth of one-half inch and maintained for ninety days in accordance with AASHTO T-259.

After ninety days of exposure the specimen shall be allowed to dry and then the surface shall be wire brushed until all salt crystal buildup is completely removed. A test sample will be taken at the one-half to one-inch depth from each end of the test cylinder. The untreated end of the test cylinder will be the control. The chloride content of each sample shall be determined in accordance with the procedure in AASHTO T-260. The amount of NaCl absorbed into the test cylinder will be determined by subtracting the control from the sample taken from the area treated with the submitted product and covered with a 3% solution of NaCl.

The maximum amount of chloride ion penetration allowed is 1.0 pound per cubic yard of concrete.

A one year field demonstration and evaluation period, by NTPEP, will be required prior to product approval. Smoothness, sealing capabilities and skid resistance will be evaluated on the in-place product.

