



Province of
British Columbia

Ministry of
Transportation
and Highways

CENTRAL ISLAND DISTRICT

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Our File: 14000-01

Attn.: Mr. Bob Pascoe

Re: Evercrete Sealant - DPS (Deep Penetrating Sealer)

This letter is to summarize the works completed since March 1996 years involving Evercrete DPS on bridge structures in Central Island District.

In this district of the Ministry of Transportation and Highways we have coated approximately 55,000 square meters. Included in this total are 23 older structures (12,000 square meters) and 46 very new structures on the new Duke Point Hwy, Nanaimo Parkway and the Parksville to Mud Bay sections of the new Inland Island Highway. (some structures are twinned and now have separate distinction for previous information)

Other sealants were considered including silanes and linseed oil but past projects and test information generally indicated that the cost benefit was not there and this left the door open for other products or methods,

Inland Island Highway

The 46 structures on this new highway have been built in a major project since 1995 and had not seen any public traffic and were not exposed to any de-icing chemicals prior to sealing. The idea here was to treat these structures prior to opening to try and minimize concrete deterioration and corrosion of reinforcing steel.

In the process of securing Ministry support for the use of this product, which had not been used prior to this proposal, supplier application was made to the Ministry New Products Review Committee and was granted approval on the "Tentative" list which is for products not tested by the Ministry. After discussions with you, suppliers from Oslo, Norway and after a review of some test data and applications in the private sector it was decided to give Evercrete DPS a try. DPS was applied to concrete bridge decks and cast in place bridge parapets.

Part of the support hinged on providing treated and untreated sections of concrete bridge decks for comparison testing. One lane on most structures was left untreated where there was two lanes in both directions otherwise the entire deck was treated. Data was recorded for each structure including, date, weather conditions, absorption time and area treated. This formed the bases for protection of the decks as well as ongoing monitoring for sealant effectiveness and condition of the decks.

Due to the size of these structures as well as superstructure designs there are both shrinkage and flexural cracking problems .

Older structures

These structures vary in age from 5 to 40 years old and have various designs from overlays on Prestressed concrete box stringers to steel through trusses. The majority these structures have been milled and resurfaced with high density overlay concrete. De-bonding of overlays as well as frequent shrinkage and flexural cracking are common maintenance problems. Standard repair method is to cut and patch areas where concrete has failed either due to contaminated concrete and/or corroded reinforcing steel.

Cracksealing/crackfilling

It is important to note that cracksealing was also a part of the process to seal these concrete decks so that all inspections and observations must be reviewed with this in mind. Evercrete DPS cannot seal cracks that are greater than approximately .7mm (1/32nd inch) consequently a crack sealer (Sika Dur 35) was used in conjunction with the DPS to address our sealing needs.

Inspections and Observations

Prior to the combination sealing/crackfilling our inspections noted some serious leakage in both old and new decks. Significant dripping, efflorescence and leaching lime was noted on most of our structures, this included the new ones where the problems appeared to be more notable than some of the older structures. After sealing of the decks our visual and hands on inspections indicated very impressive results with only minor leakage that we addressed with additional applications of both DPS and Sika Dur. Untreated sections of decks did show signs of continued leakage (deck underside in cracked areas were notably wetter than other treated areas) but these areas had been crack sealed, again addition cracksealing is planned for these areas as testing is one thing but the preservation of the decks will continue to be our focus. The use of these two products has been very successful and only time, future inspection combined with alternate test methods will give us further evidence that our process will continue to protect these concrete bridge decks.

Note

Moisture penetration results from field readings taken recently in warm dry weather indicated that the untreated sections have 8-10% higher moisture in the top surface of the concrete. This information is just raw data at this point but will be included with inspection information when all data is gathered and validated.

Pat Trippell
Area Manager, Bridges
Central Island District

CC: Bruce McGorman, P.Eng., Regional Bridge Eng.

Ross Shepherd, Bridges Manager, Mainroad, Midland, Contracting Ltd.