



# CASE HISTORY ~ CH-044

## BIO-GARD 257 SEALS AND PROTECTS CONCRETE DAM SURFACES AGAINST FROST AND LEAKAGE

CH-43 FOLLOW UP

**THE CHALLENGE:** A high altitude, massive concrete buttress type dam suffered from leakage through the structure and consequent freeze/thaw damage on both the downstream and pressure-side walls during frequent periods of heavy frost. Although the dam was in no danger of structural failure continual freeze/thaw damage was causing significant wear on the pressure side and heavy spalling damage on the downstream face. Since it is almost impossible to properly coat surfaces on the negative side of hydrostatic pressure and flowing leaks it was necessary to identify suitable coatings capable of being applied to the positive side of the water flow under the cold and wet conditions often prevailing at the dam.

A further requirement was that the coating must be environmentally benign in order that there would be no possibility of damage to local wildlife and ultimate down-stream users of the dams' water.

**THE SOLUTION:** During initial trials TFT modified three of its standard underwater/wet surface epoxy coatings to tailor-make a product for the application. All three formulations were variations of a product that had received complete and unreserved approval as a coating for potable water applications.

The three formulations in this initial testing had variations of viscosity and cure rate using essentially the same resin system. After nine months of weathering which included one winter all test areas remained in perfect condition. BIO-GARD 257 was chosen as the best of the three materials tested primarily because it was the easiest to brush and roll under cold conditions.

Following the successful outturn from the initial trials a 1,000 sq.ft. area was scheduled for coating following the exact procedures that would be



employed in the full-scale coating. The two-tiered scaffold shown was used to provide close and safe access to the dam face.

Water jetting using about 5,000 psi yielded a clean surface with excellent productivity. A two-coat system was planned, with a white base coat being the first applied followed by the Haze Gray finish coat shown above each being applied at a nominal 100 sq.ft./gallon to yield 16 mils per coat.

**RESULT:** Application by roller directly on to running wet concrete was completely without problems. The BIO-GARD 257 coats cured well overnight even when underwater and have formed a tough, tightly adherent coating which will give many years of protection to the irreplaceable dam structure.

For more information regarding this project, contact:

Jeff Longmore,  
TFT Technical Director

Email: [Jeff@thinfilmtech.net](mailto:Jeff@thinfilmtech.net)

PRODUCT: BIO-DARD 257

YEAR: 2007

LOCATION: SNOWDONIA,

*We go where others fear to spread!*

Thin Film Technology, Inc.  
802 Utah Street  
South Houston TX 77017  
USA

PHONE (713) 910-6200  
FAX (713) 910-6210  
E-MAIL [Answers@thinfilmtech.net](mailto:Answers@thinfilmtech.net)  
WEB SITE <http://www.thinfilmtech.net>

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