

X-Shield FS450 - Reflecting Pond, 3M World HQ, St Paul MN USA, October 2005

The Problem:

Originally built in the late 1960s, this Reflecting Pond was lined with asphalt and contained 3ft deep water. Due to the harsh Minnesota winters the pond only held water for 6 months of the year (May-Sept). Over time, the asphalt substrate had cracked and it was costing the owners \$30,000 to \$40,000 per year to keep the pond watertight. The need was for a lining system that could waterproof the aged and cracked substrate and also withstand the 6 months wet and 6 months dry UV exposure for many years with out cracking.

The Solution:

Polyurea was selected as the best coating material to meet the needs. The Polyurea would form a tough elastomeric coating that could be applied to a geotextile fabric rolled out directly on to the substrate. The use of a geotextile fabric meant a seamless membrane would be achieved without the need to address all the cracks in the substrate. Areas above the waterline that were continuously exposed were also to be top coated with a color stable roller grade polyurea.



Birds eye view of the new polyurea liner
Note: The color stable roller grade polyurea along the edges of the Settling Pond.

The following products were specified:-

Polyurea Membrane: X-Shield FS450

Polyurea Top Coat: X-Shield RG40



Geotextile fabric rolled over heavily cracked asphalt and sprayed with X-Shield FS450 polyurea coating

X-Shield FS450: is a high elongation, elastomeric, chemically resistant waterproof coating. This coating is approved by the EPA as a storage tank system.

Other key advantages are its UV resistant with no loss of physical properties when used in direct sunlight. X-Shield FS450 has an elongation of 450% and is very fast setting. The product can be open to service (immersion) in 1 hour.

X-Shield RG40: is a Roller Grade UV resistant aliphatic polyurea coating. It has excellent color stability and resistance to abrasion, weathering and a wide range of chemicals. It can be roller or spray applied on horizontal and vertical surfaces.

Application:

The pond was emptied and the asphalt substrate cleaned by pressure washing. Rolls of 15ft x 100ft wide 12oz geotextile were laid out directly on top the asphalt. These rolls were fixed along the perimeter of the pond directly to a marble wall and/or concrete wall which ran along the edge of the pond. These edge walls were first sand ballasted and then sprayed with a tack coat of polyurea. The geotextile fabric was immediately placed in the fast setting polyurea to achieve a bond. Joining individual rolls of geotextile was carried in similar fashion. First an entire roll would be sprayed with 60 mils thick polyurea except for a 6 in wide edge strip. When the next roll was ready to be joined, this 6 inch edge would be sprayed with a tack coat of polyurea and then edge of the adjacent roll immediately laid into the tack coat. Once the joint was achieved the whole topside was sprayed with 60 mils polyurea thus creating a seamless membrane. The total project involved spraying 80,000 ft² of high build polyurea and rolling 20,000 ft² of polyurea topcoat. The entire project took 8 days including one rain day.



The polyurea liner was terminated along concrete edge wall