



SURTREAT®

**CANADIAN
RAILROAD**

CASE STUDY

PROBLEM

Treating active corrosion on the bridge using Surtreat's products

STRUCTURE

Pine Street Bridge and the Church Street Bridge in Hallstead, Pennsylvania

PROBLEM

The Canadian Pacific Railroad runs on 14,000 miles of track in the Northern United States and Canada. In 1995, the railroad selected Surtreat to be used in repairs of its bridges in the Northeast United States and Ontario, Canada. As part of this project, two nearly identical bridges that were to be coated with a vinyl cement repair material developed by the railway were selected as test projects for the use of Surtreat. The bridges, constructed in 1914, are the Pine Street Bridge and the Church Street Bridge in Hallstead, Pennsylvania.

SOLUTIONS

The Pine Street Bridge was treated with Surtreat TPS-II prior to application of the vinyl cement repair material, while the Church Street Bridge was left untreated and was to be observed as a control. Observations of the two bridges showed that Surtreat has significantly improved the appearance and physical characteristics of the treated Pine Street Bridge. Photos on the following page show that the vinyl cement repair material subsequently de-bonded from the Church Street Bridge, and deterioration of the concrete at that bridge has continued. The coating at the Pine Street Bridge has remained in good condition, solidly bonded to the concrete.



ABOVE: Pine Street Bridge in 1999



LEFT: Church Street Bridge in 1999

OUR PROCESS

The core technology of Surtreat is a number of proprietary chemical formulations, which, when applied to the surface of Portland cement concrete, penetrate and combine with the cement paste to:

- Abate and inhibit reinforced steel corrosion in concrete
- Pacify and inhibit penetration of chlorides and other chemical attackers
- Reduce the cement porosity and inhibit water penetration
- Increase the hardness of the concrete • Increase the compressive strength of the concrete

PINE STREET BRIDGE IN 1999

**NOTE GOOD
CONDITION OF
REPAIR COATING.**



CHURCH STREET BRIDGE IN 1999

**NOTE POOR
CONDITION OF
REPAIR COATING.**

TESTING

Pre- and post- application testing was conducted on the Pine Street bridge in the Fall of 1995. Another series of tests was conducted in 1999.

The concrete was tested for compressive strength using a Germann Instruments Capo Pull-out test apparatus. Acid resistance was tested by applying a drop of hydrochloric acid on the surface and visually observing the result. Alkalinity (pH) was tested using rainbow dye indicator. In 1999, permeability and hardness was also tested.

TEST RESULTS AND ANALYSIS

	Pine Street Bridge – before treatment	Pine Street Bridge – after treatment
Compressive Strength (psi)	2100	3500 (1995) 4800 (1999)
Acid Resistance	Violent reaction, acid etching on surface	No reaction
pH	7	11
Permeability (cc/minute)	---	.85
Hardness	---	44.2

CONCLUSION

The test results and the physical appearance of the bridges show that Surtreat has greatly improved the physical characteristics of the concrete.

SURTREAT'S TPS II INCREASED THE CONCRETE'S COMPRESSIVE STRENGTH BY 128% AND INCREASED THE PH OF THE CONCRETE, CREATING AN ENVIRONMENT TO REDUCE THE RISK OF FUTURE CORROSION.

We invite your comments, questions, and inquiries.
Reach us at one of the below.