



**SURTREAT®**

**MGE Utility Vault**

# CASE STUDY

## PROBLEM

Corrosion and loss of strength in concrete

## STRUCTURE

Madison Gas and Electric Utilities Vault, Madison, WI

## PROBLEM

Madison Gas and Electric reached out to Surtreat and Coordinated Systems Consulting Inc. about a possible remediation of one of their electric vaults. The vault has steel grating exposed to the elements at street level which over time have allowed de-icing salts and rain water to infiltrate into the vault area. These contaminants overtime reduced the pH of the concrete causing active corrosion to occur within the rebar structure.



PICTURED:  
(LEFT): Vault prior to repairs.

(RIGHT): Vault prior to repairs during concrete removal process.





## OUR SOLUTION

Using Surtreat's life extension solution, the active corrosion in the concrete was neutralized and the concrete repaired. After the surface was restored Surtreat and CSC worked with Fyfe FRP to develop an FRP Composite strengthening system to regain any capacity that was lost due to the rebar corrosion. Having CSC be a certified applicator of both Surtreat products and Fyfe FRP composites streamlined the total repair process allowing one installer to perform the entire scope of work.

## MATERIALS USED:

### FRP Reinforcement

- Tyfo A Epoxy
- Tyfo B Epoxy
- Short Stuff Filler
- SCH-41
- CFP Fireproofing

### Epoxy Crack Sealant

- Sikadur 35
- SIKA VOH

### Corrosion Inhibition Treatment

- Surtreat TPS II
- Surtreat TPS XII
- Surtreat Repel

### FRP Primer

- Surtreat SurCoPrimer 1 and 2



# PROJECT DETAILS:

3,077 Sq ft of TPS II, TPS XII, and Repel

158 Sq ft of Surco Primer I and II

158 Sq ft of CFRP

158 Sq ft of FRP CFP System

30 LF of Epoxy Injection

142 Sq ft of Concrete Repair



PICTURED:  
Completed Vault





PICTURED  
(LEFT):  
Concrete after  
Surtreat  
Treatment



PICTURED  
(RIGHT):  
Concrete after  
patching



PICTURED  
(LEFT): After  
application of  
FRP Primer



PICTURED  
(RIGHT): CFRP  
Installation





PICTURED :

(LEFT): CFRP Installation

(RIGHT): Final product Surtreat treated concrete, CFRP strengthening and CFP fireproofing.

# TEST RESULTS

Pull-off testing was performed in accordance with ASTM 7522, the measurements of this test provides a direct indication of the strength of adhesion between the coating and the substrate.

For FRP Strengthening typically require a minimum pull-off test of 200 psi. With the use of Surtreat we were able significantly increase the pull off strength of concrete due to the concrete densifying properties of Surtreat TPS II.



PICTURED:

(LEFT): Pull test result prior to installation of Surtreat

(RIGHT): Pull test result after installation of Surtreat

(CENTER): Puck after failure with concrete adhered to surface

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