



SURTREAT®

**KENNEDY SPACE
CENTER**

CASE STUDY

PROBLEM

Severe concrete deterioration from combination of atmospheric chlorides and fuel emission

STRUCTURE

Rocker Panel Base, Launch Pad 39A

PROBLEM

The Rocker panel base of Launch Pad 39A was experiencing severe concrete deterioration from exposure to a combination of corrosive atmospheric chlorides and fuel emission potassium percolate producing hydrochloric acid effluent from the shuttles rocket combustion system. Surface deterioration combined with wearing and cracking was allowing water to leak through the panel base to a tunnel below. Also, advanced corrosion of the imbedded steel in the structure and chloride contamination was contributing to the demise of the structure.



ABOVE: Corrosive chemical runoff from the rocket launches caused major damage to concrete

BELOW: An example of the corrosion that appears on metal elements at the launch pad.



SOLUTIONS

To arrest further deterioration and corrosion, Surtreat formulations were applied to improve the chemical and physical properties of the concrete. The formulations that were chosen for this project inhibit deterioration; improve durability and longevity of the structure by:

- Substantially reduces porosity
- Elevates and controls pH
- Reacts with concrete to purge and stabilize contaminants (chlorides)
- Increases compressive strength
- Increases hardness
- Increases surface adhesion
- Converts ferrous oxide (rust) into hard inert shell
- Re-passivates white steel to half further corrosion
- Resists attack and penetration by acids, effluents, salts, and other contaminants

Demolition and removal of spalled and delaminated concrete took place before the application. Once the area was cleaned, application of Surtreat TPS II and TPS IV commenced. A special formulation was also used in designated repair areas to convert the ferrous oxide (rust) into a hard inert shell. Once the first application was completed, repairs to the spalled areas were made and a final application of formulations was made to the newly placed repairs.



LEFT: Corroded metal elements on the launch pad being repaired and treated to prevent further corrosion to the structure.

CONCLUSION

After application of Surtreat products, testing was conducted to ensure the expected results were obtained. The specified results of the project were met and the project was completed on time. Below are the results of the testing, which includes the measurements and the percentage change for each test conducted.

- Half Cell Positive Change of **43%**
 - 350mV to -200mV
- Corrosion Current Change of **133%**
 - 90 micro amps to +30 micro amps
- Polarization Resistance change of **55%**
 - 4281 ohm-cm² to 6612 ohm-cm²

LEFT: Section of concrete that had the Surtreat TPS applied to the surface.



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