

Standing Tough: Scott Air Force Base & Raven Lining Systems Protect with Confidence

From the Wright Brothers' first successful flight in 1903 at Kitty Hawk, North Carolina to the American landing on the moon, the U.S. has since dominated the global airspace. Construction of what would become Scott Air Force Base (SAFB), named after aviation crash victim Corporal Frank Scott, began June 1917, only two months after the U.S. entered World War I. Serving primarily as an aeromedical field, SAFB was recommended to become the General Headquarters of the Air Force in 1938. In preparation for this task, the base nearly doubled in size from its original 624 acres; however, it was soon rejected for the position because of pressure from war allies to enter into World War II. In early 1940, the base encountered another expansion and another new role within the air force when it established its own aviation radio school. Although the war disrupted their potential to serve as a central point for the air force, SAFB and its personnel continued its excellence in aeromedical and other air mobility operations, becoming the air force base of the Midwest.

Today, SAFB sits about twenty miles east of St. Louis, Missouri and is home to the 375th Air Mobility Wing. The base has grown from its original 624 acres to nearly 3,000 acres, housing 30 tenant units with upwards of 15,000 personnel, who serve approximately 40,000 associated people. The base is also one of four air force bases in the U.S. to host both a Reserve Unit and an Air National Guard, the 932nd Air Wing and the 126th Air Refueling Wing, respectively. To augment the grandeur and excellence of SAFB throughout its history, the *Air Force Times* named it the number one air force base to be stationed in 2014.

Scott Air Force Base's water is supplied by Illinois American Water Company. In 2007, American Water signed a 50-year contract to maintain water quality and treatment standards for SAFB under the Department of Defense's Utility Privatization Program. This award is an Air Force investment strategy to update their water infrastructure to current industry standards. With expansions built in the 1940s and very little rehabilitation of facilities since, updating one of very few on-base wastewater treatment plants presented an opportunity for success. The plant treats about 2.2 million gallons of water per day (MGD) with the capacity to treat and store three MGD. The plant consists of three primary clarifiers, three secondary clarifiers, and two digesters, of which all were in need of rehabilitation. With the rough condition of the structures, the estimated completion time for the project was planned for three to four months to coat almost 41,000 square feet, with a start time of April 2016.

RP Coatings, Inc. (RPC) of Troy, Illinois, a Raven Lining Systems' Certified Applicator, won the bid and would perform the rehabilitation. Traditionally, these types of rehabilitation projects

follow a series of sequential steps to achieve quality and superior performance. First, the basins were drained and residual solids were rinsed and pumped out. Once all of the contaminants were removed, the surface profiling could then begin. The inspection revealed that the 60 plus-year old structures' substrates required repairing before being top coated. For this particular project, an abrasive blast method was utilized to remove laitance and poorly adhered concrete, while also creating a surface profile adequate for lining systems. This method also exposed cracks and troublesome areas where water can seep in or out. The surface was severely deteriorated to a concrete surface profile 7 (CSP), showing exposed aggregate and numerous cracks. Active leaks are repaired using a hydraulic cement, which after mixed, set up very rapidly to stop infiltration. Also when removing laitance and surface irregularities, the reconditioned surface occasionally becomes too aggressive for coating applications. In these instances, a resurfacing repair mortar is utilized to fill small voids, pits and any other excessively aggressive surface areas. After surface preparation of each basin, Raven 760 High Performance Polymer Cement (HPPC) was used to repair these areas. The Raven 760 HPPC was spray applied at approximately ¼" using a mortar pump; it was then trowel/brush finished to provide an appropriate profile.

"The 760 HPPC is a product that was developed by Raven for projects requiring a fast set with an extended recoat window. This allows applicators to over coat the cementitious re-build lining within a few hours, which helps the contractor meet quicker return to service requirements such as the SAFB project," stated Raven's Midwest Regional Sales Manager, Randy Berthold.

RP Coatings then applied Raven's 171FS (fast-set), a 100% solids penetrating epoxy primer approximately three hours of dry time for the 760 HPPC. This would assist in the elimination of outgassing due to the rapidly changing spring temperatures. To further aid in the elimination of outgassing, RP Coatings coated in the evenings for the benefit of falling temperatures. With the 171FS primer set at 5-10mils DFT and ready for top coating, RP Coatings would spray apply a monolithic top coat. The Raven 405 high build epoxy was spray applied at 80 mils DFT with a Graco fixed ratio XP70, set 3:1. Spray application ensured that the coating was sprayed on ratio, providing the best application possible.

"RP Coating's goal was to successfully complete this rehabilitation for SAFB, with a proven high-performance lining system," stated Cody Litteken, RP Coatings, Inc., Project Manager. "We contacted Raven because of our familiarity of Raven's engineered solutions that really do stand the test of time, which includes the Raven 405 epoxy coating's 50-year design life cycle."

A similar procedure occurred for the clarifiers; however, the teeth on the clarifier had to be plastic-wrapped before application as they were laser-plated with married bolts. While not a difficult task, the extra steps cut into the project time even though it only took 4-5 days to complete each

clarifier. Being able to shorten the application time is beneficial to both the applicator and the base.

Some unexpected challenges arose once the project started. Beginning in April 2016 and continuing into mid-May, rainy weather slowed the progress of the rehabilitation project. Additionally, the other ongoing challenge was to balance the treatment plant's capacity vs demand. Serving thousands of personnel per day, RPC needed to work around rush hour times in order to eliminate shutting down the entire plant for extended periods of time. Thus, certain basins would need to be drained then cleaned before any product could be applied.

What makes this project stand out, Berthold, states, "Raven has developed a strong reputation for product performance that stands the test of time over the past 28 years in the municipal water and wastewater industries. Having our lining systems applied at a facility such as Scott Air Force Base allows us to expand our portfolio and reach a market segment we're not as well-known in. Raven is confident that Scott Air Force Base will be pleased over the quality and life span of the products used on this project."

According to a 2012 economic impact analysis, SAFB contributes roughly over \$2 billion to the regional economy and is a top five employer in the region as well. The total cost for the project hovered around \$973,000.

"By selecting Raven products, we were able to save the project and SAFB an estimated 20% in total costs, or about \$195,000," states Litteken.

His final words on the project and working with the U.S. military and Air Force reflect the tremendous opportunity presented before Raven and RP Coatings to help give back to the troops, "The U.S. Military is the backbone of our country. RP Coatings, Inc. fully supports and respects the sacrifice each and every person in the military gives to our country so we can live the way we do. Performing work at SAFB is extra special, since I was born and raised just 10 minutes away. The base impacts all local communities within the area."

RP Coatings, Inc. is a full service painting and coatings contractor headquartered in Troy, Illinois. They provide painting and coating services on all types of Industrial and Commercial projects, however, our emphasis is focused on wastewater and water treatment plants and large scale industrial/commercial projects.

Raven Lining Systems has been offering comprehensive solutions for the protection and renewal of wastewater and potable water infrastructure since 1988. Raven concentrates its efforts on protection and rehabilitation of water and wastewater infrastructure. Raven utilizes its years of experience and dedicates technical sales engineers and scientists to assist municipalities

and engineering firms in the design build, rehabilitation and specification process. Raven delivers its products and services via its network of Certified Applicators. We provide our Certified Applicators continuous education on methods and technology along with proven products, enabling them to deliver the solutions demanded by today's aging and deteriorating infrastructure. Currently there are more than 60 Certified Applicators serving customers nationwide. Embracing the opportunity to serve people and communities everywhere, Raven will continue to lead this growing market by offering cost effective environmentally friendly infrastructure solutions.



Figure 1- Basin, before



Figure 2- Basin, after



Figure 3- Clarifiers



Figure 4- Clarifier, after



Figure 5- Digester, before

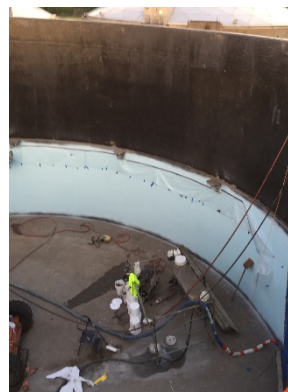


Figure 6 – Digester, after