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Economical, Effective Concrete Rehab Solutions For Escondido

Less than an hour north of San Diego, CA, lies Escondido, a quaint city surrounded by rocky hills and beautiful skylines. Escondido was founded in 1888 and currently has a population of 144,000. The Escondido-Vista Water Treatment Plant supplies water to more than 25,000 residential, commercial and agricultural customers. As the city has continued steady growth, the water treatment plant's aging infrastructure has continued to deteriorate, therefore a solution was sought.

The plant, constructed in 1976, currently treats 75 million gallons per day (mgd) but has the capacity to treat up to 90 mgd. The local water originates from the watershed and well fields located near Lake Henshaw. It is then transferred to Lake Wohlford via an open canal. Additional water is purchased from the Colorado River and Northern California via the State Water Project. The water is stored in Dixon Lake and then enters the plant through a 54-inch diameter pipe. The treatment of the water includes coagulation, sedimentation, filtration and disinfection to ensure destruction of pathogenic organisms. After treatment, water is distributed from the Escondido-Vista Water Treatment Plant to the Vista Irrigation District, part of Rincon del Diablo MWD and throughout Escondido through a system of pipes and reservoirs.

Upon inspection of the facility, it was concluded that the plant's 90,000 square feet of concrete showed signs of degradation with exposed aggregate. To decrease the probability of building a new facility, it was decided to rehabilitate the current facility to save taxpayers' money.

The city of Escondido put out a call for bids and Murrieta, CA-based National Coating and Lining Company (NCLC), a Raven Certified Applicator, won the project for being low bidder. NCLC brings 40 years of combined expertise in the restoration and protection of concrete and ferrous metals throughout the water and waste water industry, making it an exceptional fit for the $1.2 million project in Escondido.

Neil Greenwood, city of Escondido utility construction manager, expressed that NCLC was the most experienced contractor of all those who submitted bids when it comes to concrete coatings and all the issues that were encountered with a project with this magnitude. Aquatapoxy's successful proven history in potable water infrastructures gave Greenwood confidence to specify Raven A-6 in the bid specifications. Greenwood was familiar with NCLC's ability, as one of the top applicators of Raven products, having had many successful projects with the city of Escondido.

Challenges and issues

The biggest challenge was accommodating the city's needs while accelerating a 150-day project in 60 days. The overall goal was to limit the time the plant was affected to allow operations to provide adequate water supply to the city, especially with summer approaching.

Other challenges included:

- Coating application was restricted to declining temperatures typically during late night shifts to aid in diminishing moisture vapor transmission;
- Coating concrete with excessively rough surface profile without a cementitious resurfacing; and
- Minor infiltration.

When asked how NCLC planned to tackle these challenges, Tom Unsell, NCLC vice president, said, "NCLC opted to increase the film thickening from the specified 80 mil to 160 mils in lieu of concrete restoration in order to expedite the completion date. To accommodate for the accelerated turn-around, we increased manpower and equipment as well as working nights."

The surface of the structure was degrading due to the chemicals used in water treatment. After the city of Escondido

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assessed the facility, it was determined a 100 percent Epoxy product, which must be NSF ANSI 61 certified, would protect and reinforce the structure from further deterioration. The technology used by NCLC would be a fluid-applied plural component, 100 percent-solids epoxy in lieu of a cementitious underlayment with an epoxy top coat. The solution to use AquataPoxy as the resurfacer and epoxy top coat would allow faster turn-around while providing a superior coating system.

Time and money were saved by eliminating cementitious repair, considering not having to wait for the concrete to cure and eliminating a secondary surface preparation of the cementitious repair. By utilizing the coating over a rough substrate, it increases the adhesion to the structure, as well as reinforcing structural integrity.

Other benefits include:

- Two times the millage increased thickness of the polymer and allowed for improved resistance to hydrostatic loading, as well as additional abrasion resistance; and
- Increased the service life of the structure versus a rebuild of structure.

"The Escondido-Vista Water Treatment project was the largest structure with the quickest turn around (60 days) in the history of Raven," said Donald Wroble, senior vice president of sales and marketing, Raven Lining Systems. "This was also the fastest application of its kind of Raven A6 Thick, measuring 90,000 square feet."

Process

The basins were drained and all remaining solids and debris were physically removed. A combination of a 5,000 psi hydro blast and abrasive blasting was performed over the entire structure with the goal to achieve a minimum concrete surface profile of csp3. At the edge where the coating application ceased, termination grooves and key ways were utilized to assure superior adhesion existed. After completing surface preparation, a final low-pressure water rinse was conducted to wash away the loose dust and debris. Once the substrate dried, two coats of primer were applied to reduce moisture vapor transmission. The first coat of Aquatapoxy A6 Thick was applied with a back trowel to smooth the surface of the coating and once that coat was tack free, a second coat was applied. Any pinholes found after holiday testing were then repaired within the recoat window. Pinholes discovered after the recoat window had expired were prepared and then repaired according to Raven recommended procedures.

During the project, NCLC provided full-time project management as well as a QA/QC officer to ensure all procedures implemented per Raven's specifications and NCLC SOP. Also, two visits to the facility were made by a Raven technical service specialist to ensure NCLC followed proper recommended procedures. Both of which pleased Greenwood to ensure quality and application efficiency.

The solution implementation benefits the city of Escondido, along with its citizens, by providing an increased service life of the structure, as well as protecting the life of their investment.

Unsell concluded, "To have the reputation of Raven behind NCLC, with Raven's training, experience and superior product, gives NCLC's clients peace of mind."

Founded in 2003, National Coating & Lining Company has a staff with over 40 years of experience in the painting and coating industry. The company provides full service industrial coating solutions specializing in the restoration and protection of concrete and ferrous metals throughout the water and wastewater industry. They are primarily engaged in the application of epoxy coatings, calcium aluminates, polyurethane linings, manhole restoration, T-Lock installation and welding, secondary containment, lead abatement and high performance painting;. NCLC works with an array of municipalities, engineering firms and general contractors while providing quality and reliable service with integrity and financial stability. NCLC is a member of NACE and SSPC, and is a Voting Member of LAPFCA, PDCA. NCLC is licensed as a General Contractor and a "Specialty Painting Contractor" with licenses in California, Washington, Arizona and Nevada.

Raven Lining Systems has been offering comprehensive solutions for the protection and renewal of wastewater and potable

water infrastructure since 1988. A cornerstone offering is the Raven Engineered System which is a combination of high performance protective coatings matched with specializeddispensing equipment and methods.

Conscious of the environmental needs of the global community, the Raven Engineered System is an environmentally friendly solution that exceeds EPA and Clean Air Act regulations.The proven hybrid epoxy system offers superior adhesion, chemical resistance and structural renewal strength. Specially designed application equipment meets the demands of difficult access in underground structures, collection systems, treatment plants, tanks and storage. This system has performed for more than 20 years in infrastructure corrosion control, containment and renewal projects nationwide.

Raven delivers its products and services via its network of Certified Applicators who are provided 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 50 Certified Applicators serving customers nationwide.

FOR MORE INFORMATION

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