odor control collaboration


The project involved more than 1,000 ft of fiberglass ductwork and fittings.

By Leslie Beck

Constructing an odor control system for Texas sewer system

Over the past two decades, Austin, Texas, has become one of the fastest growing cites in the U.S. Fueled by a booming music scene, growing economy and eclectic nightlife, the city has gained 1 million residents since 1990. But as Austin's population steadily skyrocketed, its wastewater infrastructure fell behind.

The two major sewer lines serving downtown Austin on the north and south shores of Lady Bird Lake were nearing capacity. By 2001, the undersized and aging infrastructure installed more than 50 years earlier had become a major issue for Austin's downtown wastewater collection system. Imminent sanitary sewer overflow necessitated the construction of a new pipeline to intercept the existing sewer mains. In early 2010, construction began on Austin's new 3.9-mile wastewater relief tunnel, an initiative to alleviate the stress on aging water lines.

The wastewater tunnel, which transports liquid sewage to treatment plants, serves as a sustainable solution for meeting the infrastructure demands of the growing city. Addressing efforts to redevelop downtown Austin and encourage the growth of its urban core, the new tunnel increases wastewater management and facilitates residential and business growth in the area. ECS Environmental Solutions collaborated with global resin supplier AOC LLC to construct an essential part of the $40-million wastewater infrastructure project: its odor control system.

Constructing an effective odor control system was critical to offsetting the effects of malodorous fumes and hazardous byproducts generated by vent duct lines. Wastewater treatment facilities are sites where corrosive, flammable and toxic chemicals are used at virtually every part of the collection system—from lift stations to drop structures—releasing objectionable odors at each stage in the treatment process.


ECS field service technician Phillip Johnson (left) assists in the startup, balancing and training of the biofiltration unit.

ARTICLE SUMMARY

Challenge: As the population of Austin, Texas, continued to grow, the city responded by upgrading its wastewater infrastructure. As part of the upgrade, an odor control system was needed.

Solution: More than 1,000 ft of fiberglass-reinforced plastic ductwork were installed.

Conclusion: An effective odor control system was critical to offsetting the effects of malodorous fumes and encouraging residential and business growth in the area.

Cost Savings

Because wastewater chemical vapors can be corrosive to carbon steel, galvanized steel and even some plastics, project contractor Quest Civil Constructors Texas LLC was challenged with employing the safest yet most economical materials possible for the tunnel's comprehensive ductwork system. They chose fiberglass reinforced plastic (FRP) for its light weight, durability and cost savings. FRP provides longevity through acidic, alkaline and waste gas streams. In addition, the material's reduced long-term fouling offers lower fan power, maintenance and repair costs, resulting in a potential savings of millions of dollars over the lifetime of the wastewater system.

Long Life-Cycle

ECS manufactured more than 1,000 ft of fiberglass ductwork at its 100,000-sq-ft facility in Belton, Texas. The round ductwork was wound with continuous glass filaments using a computerized winder. The fiber was impregnated with AOC's Vipel K022, a corrosion-resistant vinyl ester resin. Known for its mechanical properties and resistance to chemicals and heat, the resin is suitable for moldings that are subjected to particularly high temperatures as well as corrosive sewer gases such as hydrogen sulfide, sulfuric acid, methane and digester gas.

The use of Vipel-impregnated FRP resulted in good chemical and temperature capability, while the filament reinforcing mechanically strengthened duct components. The ductwork ranges in five sizes from 12 to 72 in. in diameter. Approximately half of the ductwork is buried belowground, withstanding thousands of pounds of high-density traffic driving over the site. The aboveground ductwork was suspended by concrete supports. Additional accessories of the project included field joint kits, flexible connectors, control and backdraft dampers, bolt gaskets and two fiberglass exhaust fans rated at 40,000 cu ft per minute.

Unparalleled Service

To help ease installation, ECS prefabricated and sub-assembled the duct system at its facility, then shipped it to Austin, about an hour away. A field crew of five from ECS traveled to the construction site and handled all the field layup.

"We work in a controlled environment in the shop, but in the field you are open to the elements," said Jeff Jones, president of ECS. "Some of the days we were in Austin were cold and others were really hot. We had to adjust promotion levels and add inhibitors to work with the resin long enough to do a quality job under tough conditions."

AOC's Scott Lane, product leader, offered technical assistance that helped ECS reformulate the resin. Eric Stuck, AOC sales representative, also assisted ECS in meeting the demands of this material-intensive project.

"With the long runs and thick pipe, we went through material much faster than normal, and AOC was very good at meeting this fluctuation in demand," Jones said. "If we ran out of resin on this job, it would have put the project to a halt. AOC got materials here when we needed them. They were fantastic to work with."

Installation of the odor control system was completed in January 2013. WWD

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