

**CASE
STUDY**



**PROJECT
SNAPSHOT**

PROJECT OWNER
NASA JSC

CONTRACTOR
Cobb Fendley Engineers

SUB-CONTRACTOR
Vortex Services - Southwest Division

PROBLEM
JSC's aging concrete sewer pipes and manholes had deteriorated over time and required rehabilitation services.

SOLUTION
Rehabilitated 19,491 LF of sewer lines using CIPP lining and 7,333 LF via pipe bursting. Then restored 277 manhole structures by spray-applying GeoKrete® structural geopolymer.

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Sanitary Sewer Rehabilitation at NASA's Lyndon B. Johnson Space Center

NASA FACILITY SEARCHING FOR SEWER REHABILITATION SERVICES

**VORTEX
PRODUCTS
USED**

1 GeoKrete®



THE CHALLENGE

In early 2018, NASA's Lyndon B. Johnson Space Center (JSC) decided that its aging infrastructure needed an upgrade. The iconic facility, which is located just outside of Houston, Texas, is the home of astronaut training and mission control. JSC's concrete sanitary sewer pipe in particular had deteriorated over time due to ground movement, root intrusion, and hydrogen sulfide exposure. NASA chose Cobb Fendley Engineers for this infrastructure rehabilitation job, who then selected Vortex Services to complete the sewer rehabilitation parts of the project. Cobb Fendley subcontracted Vortex Services because of the team's overall experience and ability to implement multiple kinds of trenchless rehabilitation technologies.

Originally, most of JSC's sewer infrastructure was slated for traditional open cut pipe replacement, which required a longer construction schedule. Once the Vortex Services team came on board they recommended the use of several trenchless rehabilitation technologies — including cured-in-place pipe (CIPP) lining and pipe bursting — instead, which would save NASA time, money, and effort.





CASE STUDY



THE SOLUTION

In May 2018, the Vortex Services crew began by installing cured-in-place pipe (CIPP) in 19,491 LF of JSC's 8" - 18" diameter sewer lines, restoring their structural integrity. Next, the team used pipe bursting methods on another 7,333 LF of 6" - 15" diameter lines. JSC also required manhole structure rehabilitation; Vortex Services successfully restored 277 of the facility's manholes by spray-applying them with 1" of Quadex® GeoKrete® structural geopolymer. GeoKrete geopolymer lining reinforces the structures and provides them with increased corrosion resistance.

This job was tricky from the get-go as the Vortex Services team had to work around fiber optic and telecommunications cables that connected mission control to the International Space Station; there was little to no room for error. The crew also had to shift between rehabilitation technologies in the field several times to utilize the most appropriate trenchless method for each situation. NASA assigned more work to this project because the team successfully value-engineered rehabilitation methods.



RESULTS

Despite these challenges, the Vortex Services team's repairs exceeded NASA and Cobb Fendley Engineers' project objectives and extended the amount of sewer NASA originally thought they would be able to rehabilitate. This sewer rehabilitation work was also completed on time and within budget; the original internal quote for this joint venture was \$6.5 million, but the crew finished the job and additional work for about \$5.6 million.

IMPACT

1 Saved NASA time and money by using trenchless sewer rehabilitation methods instead of open cut pipe replacement.

2 Extended the amount of sewer NASA originally thought the Vortex Services team would be able to rehabilitate.

3 The crew finished the job and additional work for about \$5.6 million, well under the original internal quote for this joint venture of \$6.5 million.