

Wolf Creek “Find and Fix” Design-Build I/I Reduction

Fulton County, Georgia



BCC's innovative “find and fix” methodology realized a rainfall-induced I/I reduction of 30 to 40 percent, as well as a \$4 million capital cost savings/plant capacity expansion deferral, saving the county and its ratepayers \$1 million.

BCC's Role in Project

Design-Builder

Project Value

Total: \$2,850,000 million

Project Dates

Start: February 2005

Completion: May 2006

**Brown and Caldwell is the
parent company of
Brown and Caldwell
Constructors (BCC)**

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The Wolf Creek Inflow and Infiltration (I/I) Reduction project was part of an innovative and critical multi-year program to rehabilitate nearly 2,000 miles of sewer lines within Fulton County. The project included: assessment, repair prioritization, sewer repair and documentation of I/I reduction; thereby, meeting a consent decree deadline, reducing SSOs, improving water quality, delaying costly plant expansions, and satisfying anticipated regulatory requirements within the CMOM framework. As part of this program, Brown and Caldwell Constructors (BCC) performed three of these contracts: Morning Creek Phase I I/I Reduction, Morning Creek Phase II I/I Reduction, and Wolf Creek I/I Reduction.

Design-Build and Find and Fix Approach Allowed for Fast-Track Completion

The traditional approach for I/I projects is to conduct comprehensive sanitary sewer evaluation service (SSES). Typically, separate contracts are required to first evaluate the system in a comprehensive manner, and second to conduct rehabilitation and repairs across the whole system. BCC used an alternative design-build “find and fix” approach that **allowed the County to work with one entity for both engineering and construction, and as a result get project results more quickly.**

BCC provided the engineering evaluation and prioritization of the sewer repairs and rehabilitation, while directing contracting partners. These subconsultants used a full range of sewer repairs and rehabilitation methods including CIPP lining of sewers and manholes, manhole raising, sewer replacement, spot repairs and improving access to easements.

Scope and Methodology

The Wolf Creek basin is a subbasin of Camp Creek, a major tributary to the Chattahoochee River. The Wolf Creek subbasin covers approximately 10 square miles and consists of Camp Creek sewer basins CC12 and CC17. This basin contains approximately 41 miles of sewer pipe

ranging in age from new to more than 30 years old, and ranging in size from 6 to 30 inches in diameter. The area has approximately 1,100 manholes.

The 15-month project began with 2 months of desktop and on site investigation and led the design team to significant finds of I/I. Closed circuit television (CCTV) video logs were analyzed, smoke testing was performed and manholes were inspected to determine the greatest contributors to I/I in the system.

Aboveground surveys of non-trunk manholes were conducted to determine those which would receive further detailed inspection. All manholes along the creeks (main trunk line) were visually inspected, aided by a pole-mounted camera. Questionable manholes were chosen for smoke tests and suspect pipelines were inspected via closed circuit television (CCTV). A cost benefit analysis was performed to determine which of the inspected manholes and lines would be repaired.

The majority of investigative efforts focused on the main trunk line and larger-diameter sewers (24 to 30 inches) within the 100-year floodplain. Manholes and sewer lines recommended for repair, as well as ancillary work associated with the repairs (i.e., bypassing roads, etc.), were submitted to Fulton County for approval.

Construction repairs included: raising 39 manholes, replacing 59 frame and covers with monolithic frames and covers, CIPP-lining 64 manholes, performing six mechanical spot repairs and one external point repair, and CIPP-lining 5,154 feet of large-diameter pipe (24- and 30-inch).

In addition, BCC used InfoNet to integrate GIS, CCTV, smoke tests, manhole surveys and inspections to quickly identify needed repairs. **Because InfoNet is a GIS-based decision support tool, it assisted BCC in developing specific work orders for repairs noted and it helped prioritize those efforts. InfoNet sped up analysis, thus saving costs.** It also integrated with hydraulic models such as InfoWorksCS, which was also used to quantify the I/I before and after repairs, and thus assess performance.

A 35 Percent I/I Reduction and \$1 Million Savings

An analysis was performed to compare the wet weather peak flows before and after the I/I program. Flow data from the CC12 flowmeter and rain gauge data were analyzed to determine the peak hourly flows and corresponding 24-hour rainfall. Prior to repairs, 2 years of flow data indicated 12 significant storm events of over 0.5 inch or greater. After repairs, three significant storm events of over 0.5 inch or greater were indicated. **Analysis of the data showed a reduction of approximately 650,000 gallons per day, or 35 percent, in rainfall-induced I/I.** The total project cost was \$2.85 million.

Benefits:

- 30 to 40 percent reduction in rainfall-induced I/I
- Reduced risk of sanitary sewer overflows
- Increase in capacity of Camp Creek WWTP
- Project saves ratepayers \$1 million
- Fast-track approach allowed repairs to commence 2 months from notice to proceed