

Client

City of Hollywood
(MBC subconsultant to Poole
and Kent Company of
Florida).

Scope of Services

Overall design management
and coordination,
mechanical, civil, and
structural design, permitting,
shop drawing review, and
construction administration.

Contact

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Start Date

11/2008

Completion Date

12/2011

Construction Cost

\$10,438,709

Key MBC Staff

Frank A. Brinson, P.E.
Audra McCafferty, P.E.

Key Features

Rehabilitation and service
upgrade of the exiting Union
Carbide pure oxygen
generation system for the
wastewater treatment
process. Major components
include new main air
compressors, cooling tower,
ambient air vaporizers, cold
box valves and heat
exchangers, expansion
turbine replacement, and
rehabilitation of liquid oxygen
(LOX) tanks.

Southern Regional Wastewater Treatment Plant Oxygen Generation System Upgrade Design-Build Hollywood, Florida



Background

The City of Hollywood owns and operates the Southern Regional Wastewater Treatment Plant (SRWWTP), which utilizes a pure oxygen activated sludge process rated at 48.75 million gallons per day (mgd). The oxygen generation system is one of the key components of the plant. This system was originally constructed in 1975 by Union Carbide, and required upgrades due to capacity and reliability limitations.

To upgrade the oxygen generation system, the City desired to replace the existing 1,250 horsepower (HP) main air compressors with three 900 HP units to allow for energy savings as well as improved reliability. The cold box houses several heat exchangers used for the cryogenic process. The main reversing heat exchanger was tested in June 2004, and it was determined that this unit required replacement.



Replacement of other associated components were also incorporated into the scope, including the cooling tower and cooling water pumps, antiscalant and biocide feed systems, ambient air vaporizers, as well as the instrument air compressor.

In December 2007, the City of Hollywood requested qualifications from qualified Design-Build teams to provide design, permitting, and construction of the proposed improvements. In January 2008, the City selected the Design-Build team of McCafferty Brinson Consulting, LLC (MBC), the Poole and Kent Company (Contractor), Norman F. Bray Electrical Engineers, and Air Products and Chemicals, Inc. to complete the project. The team began design of the project in November 2008.

The Project



The scope of the design-build contract included preliminary and final design, permitting, and construction for the following project components:

- Replacement of the dual 1,250 HP air compressors with three 800 HP units to allow for energy savings as well as increased reliability, and installation of a metal canopy over the new compressors.
- Rehabilitation of the two existing LOX storage tanks and piping.
- Rehabilitation of the existing cryogenic oxygen generation system, including rehabilitation of the cold box, replacement of the existing reversing heat exchanger, switch valve assembly, and expansion turbine, and replacement of the existing cooling water tower and cooling water pumps with a new cooling water tower, complete with an antiscalant and algaecide system, cooling water pumps, and associated piping, fittings, valves, gauges, and miscellaneous appurtenances.
- Installation of three new ambient air vaporizers and a new instrument air compressor.
- Miscellaneous improvements, including replacement of the existing dual element thaw heater and replacement of the existing valves on the nitrogen gas. Miscellaneous site work (service road paving and/or overlay, addition of sidewalks, equipment pads, etc.) and associated mechanical, structural, electrical, and instrumentation and control improvements.



The project was completed in December 2011.