



BRIGHT LIGHTS, BIG SEWER

PARADISE WHITNEY INTERCEPTOR PROJECT IN LAS VEGAS INCLUDES 25,000 FT OF TRENCHLESS CONSTRUCTION

The name “Las Vegas” conjures images of the famous Strip with its high-rise hotels, casinos and blinking lights. Tourists from all over the globe flock to the city to take in world-class entertainment, gaming and dining.

But outside the Strip, Las Vegas looks pretty much like any other U.S. city with quiet streets framing single family homes connected to thoroughfares with shops, restaurants, parks and schools. In order to support the development outside of the Strip, the Clark County Water Reclamation District (CCWRD) strives to ensure the reliability of the sewer system

through a program of rehabilitation and new construction.

One of the district’s major undertakings right now is the construction of the Paradise Whitney Interceptor (PWI). The PWI is a multi-year project that consists of 13 miles of large diameter pipeline constructed from Valley View Boulevard and Serene Avenue in the southwest valley to Nellis Boulevard and Flamingo Road in the southeast valley. The project alignment is generally southwest to northeast in the area to south of the Strip and McCarran Airport.

Portions of the collection system in the

THE CONTRACTOR USED AN AKKERMAN SLURRY MTBM IN ADDITION TO CONVENTIONAL EPBs FROM PIPE JACKING UNLIMITED. PICTURED WITH THE NEWLY DELIVERED MACHINE ARE (FROM LEFT) BEZAD BASIRI (THOMPSON PIPE), CHRIS SIVESIND (AKKERMAN) AND BOB MARSHALL (FRONTIER-KEMPER).

project area are at, and even above capacity. The project will ensure adequate capacity and a more reliable system into the future.

The project will be constructed in three segments:

Eastern Segment (Project No. 669): The eastern segment, currently under construction, includes 5 miles of 54-, 60-, 66- and 72-in. diameter pipe within Nellis Boulevard, Hacienda Avenue, Lamb Boulevard, Oquendo Road, Pearl Street and Patrick Lane. It also includes installation of the sewer within the Grapevine Springs Park boundary. The



THOMPSON PIPE GROUP IS SUPPLYING THE FLOWTITE FIBERGLASS PIPE FOR THE PROJECT.

designer was Carollo Engineers with input from Brierley Associates.

Central Segment (Project No. 668): The central segment, also under construction, includes 4 miles of 60-in. diameter pipe within McLeod Drive, Sunset Road, Eastern Avenue, Warm Springs Road, Tamarus Street and Eldorado Lane. This segment will also include installation of one mile of 12- and 15-in. diameter pipe within Eastern Avenue and Big Top Drive. The designer for this segment was Black and Veatch.

Western Segment (Project No. 670): The western segment, which was scheduled to begin in 2015, includes 4 miles of 48- and 54-in. diameter pipe within Eldorado Lane, Bermuda Road, Wigwam Avenue and Valley View Boulevard. It also includes approximately 1 mile of 15-in. diameter pipe within Las Vegas Boulevard and Ford Avenue. There will also be sewer work along Fairfield Avenue, Robindale Road and Gillespie Street. This majority of this project is open cut. The designer was MWH.

Projects 668 and 669 combined comprise 55,000 lf of pipeline, including 25,000 lf of trenchless construction, mak-

ing it one of the most significant trenchless new installation programs in terms of footage undertaken in the United States. The trenchless portions of both projects are being completed by a joint venture of Pipe Jacking Unlimited Inc. and Frontier-Kemper Constructors Inc.

"This project and the 25,000 lf of trenchless work is very significant, especially considering how slow the trenchless new installation market had been over the past few years," said Robert Marshall, project manager for Frontier-Kemper. "Many fine, experienced companies have far too much equipment parked in their yard. Hopefully this marks an upward trend."

Many challenges existed, including working in residential and commercial areas along heavily traveled roads with varying ground conditions. The ground varied from very soft, saturated material to hard materials, including full face caliche in excess of 5,000 psi that required the use of disc cutters. Groundwater was also an issue throughout. Because of the variability, Pipe Jacking Unlimited/Frontier-Kemper performed some additional geotechnical investigation to better identify conditions.

The logistical challenges were also sig-

nificant. "Satisfying two prime contractors and their schedules, while maintaining and coordinating three tunnel headings with four separate crews stretched out over nearly 12 miles of project was a challenge in itself," Marshall said.

For the trenchless installations, Pipe Jack Unlimited/Frontier-Kemper used a combination of earth pressure balance machine (EPBM) and slurry microtunnel boring machine (MTBM). The EPBMs (60-, 66- and 72-in.) were designed and manufactured by Tony DeAguiar and Pipe Jacking Unlimited while the MTBM (60-in.) was manufactured by Akkerman Inc.

The SL60 MTBM from Akkerman includes a 250-hp drive train as opposed to a standard 150-hp drive train. "Having more horsepower allows the machine to work in more challenging geology and on longer drives," said Chris Sivesind, Sales Engineer for Akkerman. "The other benefit is that the customer has a great degree of flexibility on future projects; having the higher horsepower allows for a larger increase kit to be fitted on the machine so that a much larger diameter than 60 in. can be installed."

The MTBM has an automatic lube can

just behind the main shield that allows for continuous timed bentonite to be pumped on the entire circumference of the tunnel, leading to reduced jacking loads.

Additionally, Pipe Jacking Unlimited/Frontier-Kemper used a slurry separation system from Derrick. All of the trenchless pipe installed was Flowtite fiberglass reinforced pipe (FRP) manufactured by Thompson Pipe Group.

Project 668 – the Central Segment – was awarded to prime contractor Contri Construction, which is completing the open-cut sewer installation as well as the access pit construction for tunneling work. The open-cut work comprises 9,350 lf of 60-in. FRP at depths of 20 to 28 ft, and 7,000 lf of 8- to 27-in. sewer at 8 to 20 ft deep.

The trenchless portion of 668 comprises 10,160 lf of 60-in. direct jack Flowtite by EPBM and MTBM and 1,460 of 76-in. casing for 60-in. FRP, installed by EPBM. The combined 11,620 ft of installations were completed in 16 drives in depths ranging from 20 to 45 ft deep.

Additionally, Pipe Jacking Unlimited/Frontier-Kemper installed 600 lf of 16- and 27-in. FRP via auger boring (using 32- and 42-in. auger boring machines). In total, four auger bores were completed at depths of 10 to 18 ft deep.

Project 669 – the Eastern Segment – was awarded to Las Vegas Paving Corp., which again was responsible for open-cut installations and pit construction. The trenchless portion of this segment, which was closest to the treatment plant, included 6,730 lf of 60-in. fiberglass pipe via microtunneling (nine drives); 2,873 lf of 66-in. fiberglass pipe via EPBM (four drives); 2,648 lf of 72-in. fiberglass pipe via EPBM (four drives); and 1,220 ft of 76-in. casing by EPBM (one drive). This segment included 5,800 lf of compaction grouting for ground improvement, which was performed by Malcolm Drilling.

“We are excited to be the construction partner supplying FRP to one of the largest and most significant trenchless projects in decades. We believe this shows the continued acceptance of FRP as a viable jacking product and the commitment of both CCWRD and the engineering team to a strong and sustainable infrastructure,” said Mike Leathers, Executive Vice President of Thompson Pipe Group.

For CCWRD, the benefits of trenchless construction became apparent. In fact, two portions of the project were changed from open cut to trenchless to minimize traffic disruption and impacts on residents. These included a single 830-lf drive on Warm Springs Road and three drives totaling 2,700 lf along East Eldorado Lane.

“The CCWRD has been an excellent owner to work for,” Marshall said. “When issues arise, they are addressed promptly and as a team we work through them together to find the best solution for the project without posturing or wasting time. The sign of a good working relationship isn’t only when things go as expected, the true test is how everyone works together when there is an issue, and I can say that the CCWRD, Las Vegas Paving, Corp. and Contri Construction team that we are a part of is one of the best I have worked with in many years.”

THE PARADISE WHITNEY INTERCEPTOR, CONTRACTS 668 AND 669, COMPRISE MORE THAN 25,000 LF OF 60- TO 84-IN. PIPELINE CONSTRUCTION IN VARIABLE GEOLOGY WITH DEPTHS REACHING 45 FT.

