

## Downtown & Seaholm Tunnels “A Smart Tunneling Solution for Austin”

While construction of the Downtown Tunnel was underway, it was realized that there was a possibility that a single contractor could be employed to build both the Downtown Tunnel and a deep tunnel option for the Seaholm Project. Brierley Associates personnel worked closely with Parsons, Dannenbaum Engineering, and personnel from the contractor (SAK/Quest) to redesign the Seaholm Project so that the Deep Tunnel could economically be completed as part of the same tunnel excavation as the Downtown Tunnel.

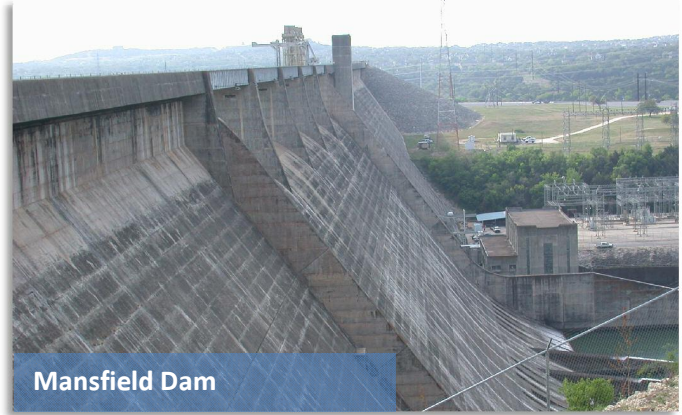
**Meeting the Challenge** - Working in the heavily populated area of downtown Austin presented many challenges for both the contractor and designers. The most prominent challenge is the extremely low rock cover (3-4 feet) which the TBMs need to pass for both tunnel alignments. As part of the mitigation for the potential low rock cover, the contractor proposed lowering a portion of the Downtown Tunnel to provide extra rock coverage at the crown. This concept was adopted and the tunnel redesigned with a lowered alignment.

### Project Highlights

- Both the Seaholm Deep Tunnel and Downtown Tunnel form a rough ‘U’ shape around Austin
- 4 finished Access Shafts and 1 Existing Shaft
- 18,600 feet of large-bore tunnel
- Interior carrier pipes of varying diameters
- The decommissioning of two lift stations
- The Downtown Tunnel will improve wastewater collection for both downtown and south Austin areas and will prevent sewage overflows.
- Seaholm Tunnel - 1,900 linear ft of new 36-inch wastewater line

### Brierley’s Current Texas Projects

Boyce Lane Transmission Main  
Fayette Power Project Ash and Reclaim Ponds  
Ft. Worth/Dallas Integrated Pipeline Project  
Golf Course Interceptor Tunnel  
Guadalupe River Bank Stabilization  
Lower Harris Branch Wastewater Improvements  
SAWS Central Watershed Project  
SJRA Groundwater Reduction Program Transmission Mains  
Spicewood Springs Pump Station Utility Improvements  
Water Treatment Plant No. 4



## Mansfield Dam Stability Assessment

Mansfield Dam, located on the Colorado River near Austin, impounds Lake Travis and serves as a major flood control structure, provides hydropower, supplies fresh water, and serves as a recreational area.

The dam consists of 2,400 feet of a central concrete gravity section flanked on both sides with a total of 2,600 feet of zoned earthfill wing dams. The maximum height of the dam is 278 feet and was designed by the United States Bureau of Reclamation (USBR). The dam was constructed in two stages between 1935 and 1942 by both the Lower Colorado River Authority (LCRA) and the USBR. The USBR was prominently involved in the operation and maintenance of Mansfield Dam until 1997 when the LCRA assumed full ownership. Subsequently, the LCRA authorized a preliminary stability assessment of the central concrete gravity section which included gathering site specific information regarding foundation uplift pressures, foundation strength parameters, material characterization, and hydraulic performance.

Brierley Associates personnel worked closely with the prime consultant, Freese and Nichols, Inc., to develop and implement a geotechnical investigation plan to obtain the necessary information for stability analyses of the concrete section of the dam. The investigation included:

- Core borings located in the upstream and downstream drainage galleries within the dam
- Packer-pressure tests
- Slug tests
- Installation of vibrating wire piezometers in the completed borings

The field work was conducted by Nicholson Construction Company and Fugro Consultants, Inc., who also conducted conventional laboratory tests on the dam concrete and bedrock limestone formation. Specialized direct shear tests of the concrete, limestone, and concrete/limestone contact at the base of the dam were conducted at the University of Texas at Austin Geotechnical Engineering Center.