Advancing the Engineering Profession

In our day to day lives it is easy to forget that we have one of the most advanced state-of-the-art civil engineering projects in the world going on in our own back yard (literally, for some of us). The Central Artery/Third Harbor Tunnel is such a long-term project that we sometimes lose sight of its accomplishments. With a project of this size, there are certainly many stories to be told. In this special focus issue of *Civil Engineering Practice* we chose to concentrate only on those having to do with underground construction since it is the predominant effort to date. In this issue we hear from some of the designers of the project and how they have dealt with the design and construction of the project's underground components. Future issues of *Civil Engineering Practice* will offer accounts that cover other aspects of the project.

The Boston Transportation Planning Review first proposed depressing the Central Artery back in 1972 and linking it to the construction of a third harbor tunnel. Since then, planners, engineers and public officials have crafted the project into what it has now become. The elevated Central Artery — built in the 1950s — is being replaced by a cut-and-cover tunnel that will run from the existing Dewey Square Tunnel at South Station to Causeway Street at North Station in downtown Boston. A dramatic cable-stayed bridge will complete the journey of Interstate 93 across the Charles River northward into Charlestown. The Third Harbor Tunnel, now known as the Ted Williams Tunnel, was opened to traffic in 1995. This extension of Interstate 90 provides additional access to Logan Airport and siphons some of the traffic away from the Central Artery.

The project has given the engineers the opportunity to explore new territory and to develop new engineering and construction methods. Expanded computer capabilities and unique project requirements have encouraged the development of many innovations as well as new design theories and construction techniques. Slurry wall design and construction methods have been advanced that minimize negative effects on surrounding buildings. Innovative underpinning techniques have been developed for the staged construction of the depressed roadway underneath the operating elevated roadway. Trenchless construction methods for installing underground utilities have been implemented to minimize surface disruption and to avoid conflict with other utilities. Instrumentation technology has been developed to monitor soil deformation and its effects on adjacent buildings.

It is fitting that this project is being constructed in Boston, the home of so many geotechnical engineering pioneers. Names such as Karl Terzaghi, Arthur Casagrande, Ralph Peck, William Lam

and Robert Whitman have become familiar mentors to engineers across the nation. Many new legacies are being established by virtue of this project.

With the opening of the Third Harbor Tunnel, the engineering community can now see portions of this project being completed and put into operation. The construction of the depressed artery that is now occurring in the heart of Boston gives further evidence of our efforts. As portions of the project are successfully completed, they are studied to verify that the assumptions and theories used in their design are correct. The work on this project adds to the development of engineering science every day.

The articles that follow represent the stories related by your peers, describing some of the challenges that they faced and how they surmounted them.

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