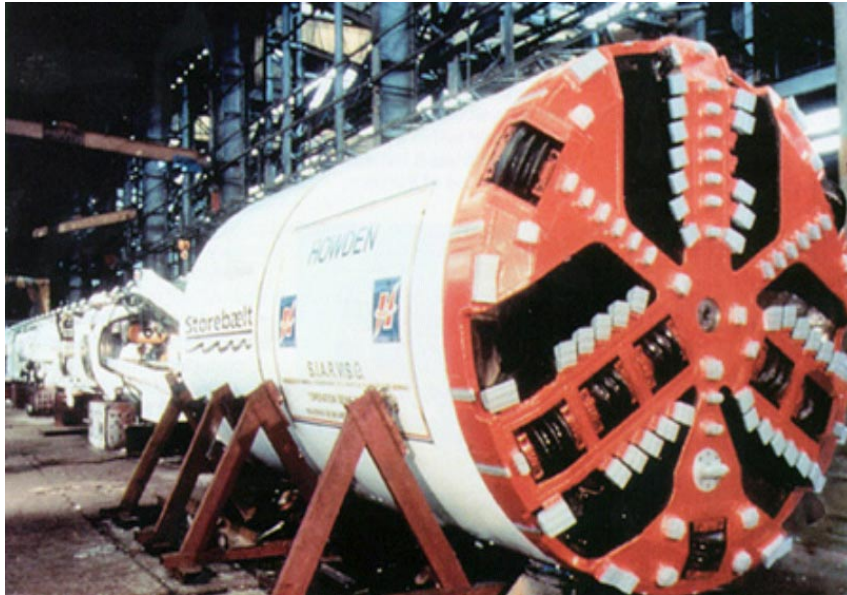


Point Loma Tunnel Outfall, San Diego, CA



Earth pressure balanced tunnel boring machine (TBM).

The Point Loma Tunnel Outfall will convey and discharge to the ocean excess effluent from new water reclamation plants currently under construction or being planned. The outfall will also serve the existing wastewater treatment plant and partly replace the existing near shore outfall, which connects to the new ocean outfall extension completed in 1993. The Point Loma Tunnel Outfall comprises four major components, the headworks, the tunnel, the tie-in structure and marine works.



Pre-cast concrete liner segment.

A vertical riser will be constructed from the seaward end of the tunnel and a 4,000 ft long seabed pipeline laid to join the existing outfall extension. Water depth at the connection is 200 ft.

The Point Loma Tunnel Outfall design contract was awarded to Parsons Brinckerhoff Quade & Douglas, Inc. PB's two major design subconsultants are Engineering Science and WGP Engineering. Ben C. Gerwick, Inc. served as a member of the Technical Review Committee for the design and construction planning for this project, with emphasis on precast liner design and the construction of the riser.

Services Performed:

- **Outfall Structures**
- **Precast Concrete Segments**
- **Technical Review**
- **Riser Construction**

Year of Completion: 1994

Construction Cost: \$55M

Client: Parsons Brinckerhoff
Quade & Douglas, Inc.

The headworks structure, located at the edge of the San Diego River, receives effluent from two pipelines and routes it to the Point Loma Tunnel Outfall. The headworks will include a pair of 13 ft diameter, 22 ft high surge tanks to provide protection for the pipelines and tunnel.

The Tunnel is divided in two sections. The first section of 12 ft diameter extends from the headworks to the Point Loma Waste Water Treatment Plant, a distance of 44,000 ft. Approximately half of this tunnel will be under the ocean. Because of soft, permeable ground conditions on parts of the tunnel alignment, earth pressure balance tunnel boring machines are required. Precast Concrete Tunnel Liner Segments will be connected by bolts to function as a single pass liner system, designed to resist the internal pressure. A second tunnel will then extend seaward under the ocean for 7,000 ft.