Trans Hudson Express Tunnels
New Jersey Transit Authority

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Location:	Newark, New Jersey to Manhattan, West Side, New York, New York
Date:	2006 – 2010
Structure:	Cross-Passages Between Running Tunnels, Stub Tunnels
Length:	Height: 15.6 - 18.6 feet (4.8 meters - 5.67 meters)
Cross-Section:	Width at Springline: 18.9 feet (5.7 meters) Height: 18.9 feet (5.7 meters)
Geology:	Hudson River Bed Consisting of Soft Soils; Water - Saturated
Cost:	Approximately $8.7 Billion
Client:	Parsons Brinckerhoff
Owner:	New Jersey Transit Authority (NJT)
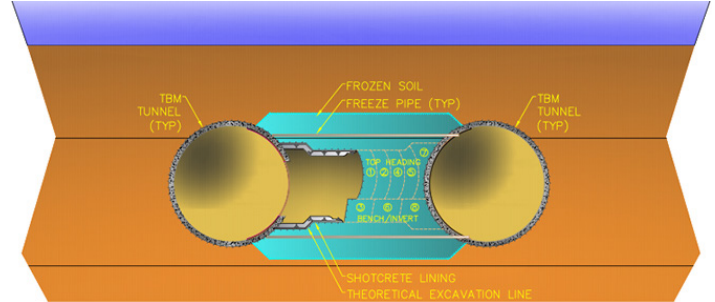
Figure 1. Trans Hudson Express (THE) cross passage ground freezing, excavation and support schematic.

Design Services for SEM Stub Tunnels and Cross Passages:

The Access to the Region's Core (ARC) Project's main goal was to provide additional rail capacity from northern New Jersey to Manhattan. The project included new railway terminals and caverns under 34th Street in Manhattan between 6th and 8th Avenues, and two new tunnels, each approximately 1.5 miles (2.4 kilometers) long, under the New Jersey Palisades and the Hudson River.

Gall Zeidler Consultants (GZ) provided engineering and design services for tunnel segments and all underground structures to be constructed using Sequential Excavation Method (SEM / NATM). These segments included start and reception tunnels for the Hudson River Tunnel Boring Machine (TBM) in New Jersey and Manhattan and the cross-passages between the main tunnel tubes beneath the Hudson River. Tunneling for the cross passages required a systematic pre-support process by ground freezing.

On the Manhattan side, it was planned that the Hudson River Tunnel Cross Passage will be constructed in mixed face conditions. The soft river deposits were to be pre-stabilized using ground freezing techniques. The initial tunnel support was to consist of a reinforced shotcrete lining followed by PVC membrane installation for waterproofing and shotcrete or cast-in-place concrete for the final cross passage lining.