

Metro Line 6 Extension Metro de Santiago

Location:	Santiago, Chile
Date:	2012 – Present
Structure:	10 Stations and 15.3 Kilometers of Running Tunnel
Length:	Inter-Station Tunnels: 14.1 kilometers (8.8 miles); Station Tunnels: 1.2 kilometers (.7 miles)
Cross-Section:	In general the Stations are 120 meters long with 4 meters wide platforms on both sides. The inner dimensions are 15.50 meters wide and 11.10 meters high. Running tunnel ranges in height between 6.3 meters and 6.9 meters, and ranges in width between 9.3 meters and 10.2 meters
Geology:	Fill, Gravels, Sandy Gravels, Fine Silts and Silty Clays (Alluvial); Groundwater located below depth of 25 meters (82 feet)
Cost:	Approximately US \$1.036 Million
Client:	Metro de Santiago
Owner:	Metro de Santiago

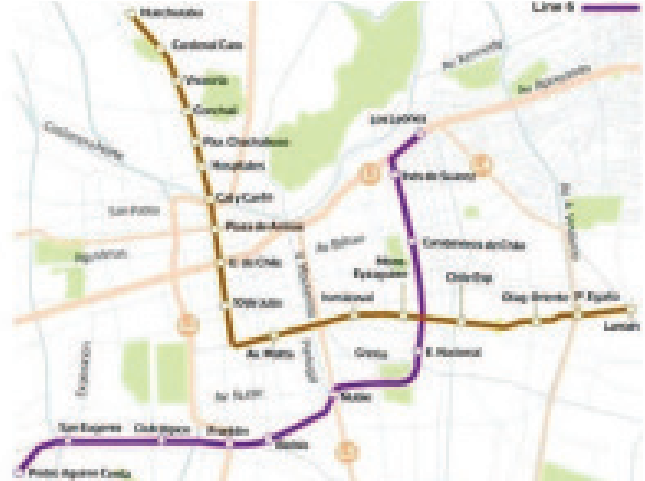


Figure 1. Schematic of Santiago Metro with Line 6 in mauve and Line 3 in brown (Courtesy of El Mercurio).

Metro Line 6 Constructability Review and Evaluation:

Metro de Santiago is currently building Lines 3 and 6, which cover an area of roughly 37 kilometers (22 miles) across eleven districts of Santiago. Line 6 links Avenida Pedro Aguirre Cerda near the former Los Cerrillos Airport, to the planned station of Vitacurra in the municipality of the same name. The excavation and support of these tunnels are generally based on the use of the New Austrian Tunneling Method (NATM). However, there have been proposals to adjust the excavation and support methods in order to improve efficiency and lessen overall construction time. One alternative involves the so-called “Self-Supporting Vault” (SSV) method and includes the installation of a pipe arch umbrella as systematic pre-support. This option is envisioned for the construction of the station tunnels.

During early stages of the design, Gall Zeidler Consultants (GZ) was retained as an expert consultant to review and evaluate the constructability of the SSV method for Line 6, as well as a structural analysis of the inter-station tunnels. Further, GZ also performed an independent quantitative evaluation using 2D FEM analysis.

On 2015, GZ was retained as a technical advisor to support Metro during a contractor’s claim regarding the first two construction sub-sectors. GZ performed a review of the tunnel design, bid documentation, geotechnical information at the moment of the bid and the documentation of the contractor’s proposal and performance to assess the shortcomings that the construction had and support the arbitration process

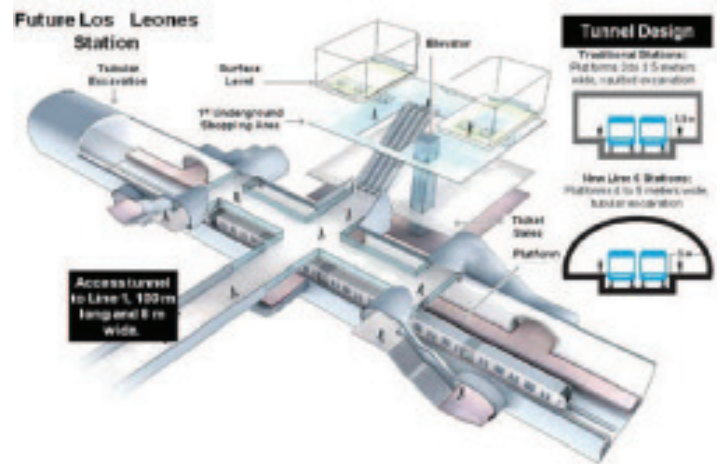


Figure 2. Conceptual rendering of the new Metro Line 6 Los Leones Station (Courtesy of El Mercurio).