Gall Zeidler Consultants
Geotechnics | Tunnel Design | Engineering

Alto Maipo Independent Design Verification (IDV) Engineer
Alto Maipo SpA

Location: San José de Maipo, Chile

Date: 2015 - Present

Structure: Water conveying tunnels and powerhouse caverns, intakes, slopes, discharge tunnels, shafts

Length: Approximately 41 mi (66 km) of TBM and Drill & Blast tunnels

Cross-Section: Circular / horseshoe / ovoid tunnels with diameters ranging from 4.5 to 7.7 m (15 to 25 ft)

Geology: Stratified sedimentary and volcanic / volcaniclastic rocks (limestones, shales, sandstones, conglomerates, gypsum, andesites, tuffs, volcanic breccias) intruded by andesitic and dacitic veins and dikes and small intrusive granodioritic bodies

Cost: US $3.05 Billion

Client: STRABAG SpA

Owner: Alto Maipo SpA

Independent Design Verification Engineer:

The Alto Maipo Hydroelectric Power project comprises the design and construction of two run-of-the-river hydroelectric plants arranged in hydraulic sequence located in the high-altitude area of the Maipo River basin, 50 km (9.3 mi) southeast of Santiago, Chile in the municipal district of San José de Maipo.

The project will capture flow from the Colorado river basin in the north and the Volcán and Yeso river valleys in the south. The majority of the works will be underground, including powerhouse caverns, headrace and tailrace tunnels, access tunnels, surge and pressure shafts, intake and discharge tunnels, slopes, shafts constructed via raised boring method (RBM), and other water adduction systems. The tunnels of the project will be excavated mostly in volcanic and volcaniclastic rocks under high hydrostatic pressure and ground cover reaching 2,000 m (6,500 ft). The two largest structures will be Powerhouse caverns. The Las Lajas Powerhouse cavern will be 80 m (260 ft) long with a cross section of 20 m width x 36 m height (65 x 120 ft) – see Figure 2, and the Alfalfal II Powerhouse cavern will be around 70 m (230 ft) long with a cross section of 25 m widt x 30 m height (80 x 100 ft).

Upon completion, the power plants will be capable of generating a combined total output of 531MW of electricity.

Gall Zeidler Consultants (GZ) is acting as the Independent Design Verification Engineer, tasked with reviewing and approving project designs, including tunnels (drill & blast, TBM) and caverns, reviewing geological/geotechnical conditions, and a review of the detailed design for the Mechanical, Electrical and System Control Instrumentation, and Communication Systems.

Figure 1. Drill & Blast Alfalfal Tailrace Tunnel L10-A1.

Figure 2. Powerhouse Cavern Las Lajas.