

C6 Tunnel Rehabilitation Design Rio Tinto Kennecott Utah Copper

Location: Bingham Canyon Mine - Salt Lake City, UT

Date: 2014 - 2015

Structure: Mining Tunnel with conveyer belts transporting crushed copper ores

Length: 15,000 feet (4,570 meters)

Cross-Section: 18 feet wide x 24 feet high (5 meters wide x 7 meters high)

Geology: Latite Porphyry

Cost: --

Client: Rio Tinto Kennecott Utah Copper

Owner: Rio Tinto Kennecott Utah Copper

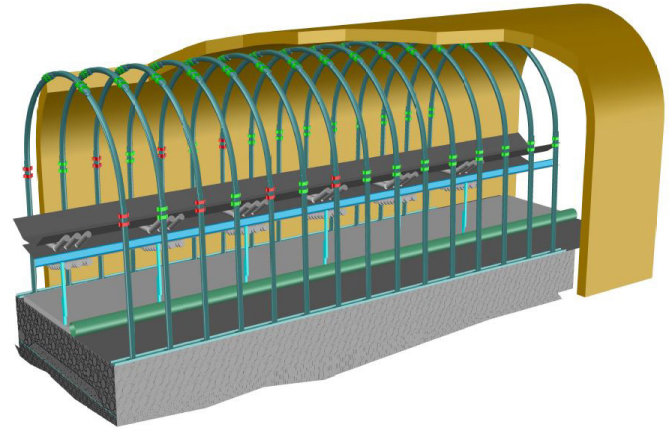


Figure 1. 3D perspective view showing Yielding Steel Sets and Conveyor belt arrangements

Tunnel Rehabilitation Design Services:

The Bingham Canyon Mine is an open pit copper mine near Salt Lake City, Utah, USA, and is operated by the Rio Tinto, Kennecott Utah Copper (RTKC). The area around the Bingham Canyon mine is a historic mining district dating back over 100 years. Several old underground mines exist in and around the open pit area. Some of these tunnels are still utilized by RTKC for conveying purposes.

The C6 tunnel is an approximately 3-mile long tunnel built in the 1950s, which connects the mine to the processing plant, conveying approximately 70,000 TPD of ore. The tunnel currently rests underneath the active mining zone and is highly susceptible to transient stresses and an increased rate of deterioration induced by fault crossing and ongoing slope movements. Significant damage was reported within a 1200 ft portion of the tunnel that included cracks and spalling in the concrete liner, which made the tunnel inaccessible.

Gall Zeidler Consultants (GZ) provided Tunnel inspection and rehabilitation of the ground support system to restore access to the tunnel which included a design of yielding support system. GZ also developed a two year Ground Control Management Plan, including Monitoring and Instrumentation program and Trigger Action Response Plan to monitor tunnel structural integrity in response to future mining activities.



Figure 2. Yielding Steel sets with Bullflex hoses Installation during Tunnel Rehabilitation