

ORCA QUARRY

MULTI-PLATE RECLAIM TUNNEL

Polaris Minerals Corporation, based in Vancouver, British Columbia, is focused on supplying construction aggregates from Vancouver Island, BC, to coastal urban markets on the western seaboard of North America. The Orca Quarry, which is designed to produce 6 million tonnes of sand and gravel per year, is located on the east coast of northern Vancouver Island, 3.8km west of Port McNeill, British Columbia.

Owner

Orca Sand and Gravel Ltd.
Polaris Minerals Corporation

Installer

Connal Enterprises Ltd.

Design Consultant

AMEC

Location

Port McNeill, British Columbia





Special Design Features

To allow sand and gravel to enter the reclaim tunnel, AMEC specified twelve 1.067m x 1.067m hopper openings along the crown of the structure. To reinforce these openings, Armtec designed and supplied galvanized steel frames that were assembled and welded on-site.



TUNNEL DESIGN

To permit the loading of the sand and gravel onto freighters via a conveyor system, the aggregate needed to be stockpiled above a reclaim tunnel—this is where the Armtec story begins. In the design stages of the project a year prior to construction, Armtec provided design and budget information to AMEC for the specified 3.67m diameter Multi-Plate Round Structure under two sand and gravel piles, each having a height of 31m.

To support this significant dead load, the resulting 264m long Multi-Plate Round Structure was designed in the heaviest wall thickness possible (7mm) with a custom punched bolt pattern (2 bolts per corrugation). To permit emergency egress from the tunnel, Armtec designed and supplied a 1.0m diameter Hel-Cor CSP escape tunnel mid-way along the Multi-Plate Structure.

CONSTRUCTION

Prior to construction, Armtec Engineers conducted a pre-construction meeting to review plate assembly and backfill specifications and walked the site. Within four weeks, plate assembly was completed by the six-person crew using a telescoping crane. The owners completed the backfill installation of the structure with pre-approved on-site granular materials.

CONCLUSION

From pre-design work to manufacturing and start-up assistance with numerous site visits by its Engineers, Armtec provided a complete cost-effective solution for this mining application.

“The Armtec team proved responsive and dealt promptly and effectively with engineering design issues as the project evolved.”

“Delivery of the Multi-Plate tunnel components was timely and in accordance with our agreed schedule. I was very pleased with all aspects of the relationship with Armtec.”

Herb Wilson, Vice-Président, Polaris Minerals



Armtec is a leading infrastructure and construction materials company combining creative engineered solutions, relevant advice, dedicated people, proven products and a national presence with a local focus on exceptional customer service.

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