

Project:

Gosowong Gold Mine Project

Location:

Halmahera island, province of North Maluku, Republic of Indonesia

Project completed:

2014-2020 (estimated)

Owner/s:

PT Nusa Halmahera Mining

Applicator/Contractor:

PT Nusa Halmahera Minerals
(75% Newcrest Mining Ltd,
25%
PT Aneka Tambang Tbk)

Designer/Architect/Specifier:

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Market sector:

UGC sprayed concrete
Admixtures

Products used & amounts:

MasterGlenium SKY 8770
MasterRoc HCA 10
MasterRoc MS 610
MasterRoc TCC 735
MasterRoc SA 167 Sales

Gosowong Gold Mine Project

Improvement on sprayed concrete for ground support



Sprayed concrete (shotcrete) trial at Kencana and Toguraci underground mine, Gosowong gold project

The background

Gosowong is owned and operated by PT Nusa Halmahera Minerals (PTNHM), an Indonesian company owned by Newcrest Mining Ltd (75%) and PT Aneka Tambang Tbk (25%). It is located on Halmahera Island, in the North Maluku Province of the Republic of Indonesia, approximately 2,450 kilometres north east of the national capital, Jakarta. Gosowong commenced operations in 1999 and its primary products are gold and silver. The processing plant at Gosowong has capacity to process 800,000 tonnes per year using a primary jaw crusher followed by SAG and ball mill circuits prior to final smelting of the gold/silver ore..

The challenge

Gosowong gold project has two main underground mines: Kencana and Toguraci. Conditions in the mines vary significantly throughout the underground workings. Kencana underground has zones of very soft and fractured rock with potential for high deformation rates and drive squeezing. Toguraci underground generally has a more competent rock mass although the deeper parts of the mine experience high substrate temperatures associated with geothermal conditions (substrate surface temperature 60-70° C). Previously, the normal sprayed concrete mix design could not achieve 32 Mpa at 28 days or 1 Mpa in 1 hour as required by the design specifications due to the heat and application issues.

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Our solution

Master Builders Solutions were engaged to undertake a technical review of the shotcrete mix compatibility in conjunction with the raw materials and underground environmental conditions.

A sprayed concrete solution from Master Builders Solutions was developed consisting of suitable admixtures combined with a tailored training package for operators, supervisors, and engineers.

The improved product coupled with specific training requirements has benefited PT NHM, assisting operators to achieve a high-quality sprayed concrete at design thicknesses (100mm) in a single pass. The shotcrete improvements have led to a more effective and efficient ground support system and a safer underground working environment.

Our special admixtures:

- Internal curing agent, MasterRoc TCC 735 helps to achieve significantly stronger cured concrete strength in high temperature environment.
- Hyperplasticizer, MasterGlenium SKY 8770 significantly improves workability even with poor quality sand.
- Hydration Control Admixture, MasterRoc HCA 10 helps to maintain workability for long time periods.
- Densified silicafume, MasterRoc MS 610 helps to improve cohesiveness and workability of sprayed concrete mix
- Alkali free accelerator, MasterRoc SA 167 significantly boosts early strength development, assisting with poor ground control and allowing mine production cycles to commence sooner.

The customer's benefit

By solely using Master Builders Solutions, PT. NHM has been able to improve production, safety and underground geotechnical stability at the same time. Benefits include:

- Reduced rebound & wastage
- Reduced rehabilitation/rework requirements
- Reduced machine downtime due to pipe blockages
- A stronger better performing mix gives a safer working environment and improves productivity of mines

Customer testimonial

The Master Builders Solutions technical team listened to our needs, considered the options, and then set out in full partnership with us to develop a better system overall. Given our remoteness on an island in Eastern Indonesia, it was crucial to get the full support and commitment that Master Builders Solutions provided us with (Tony Sprague – Principle Geotechnical, Newcrest)

Projects facts at a glance

- Master Builders Solutions has supported Gosowong project since 2007 by providing high quality shotcrete admixtures for Kencana and Toguraci Underground development. Since early 2014, PT. NHM commended a more compatible shotcrete mix using solely Master Builder Solutions admixtures.

Master Builders Solutions by MBCC Group

The Master Builders Solutions brand expresses MBCC's expertise in providing customized chemical solutions for new construction, maintenance, repair and restoration of structures.

Master Builders Solutions is built on the experience gained from more than a century in the construction industry. At the core of the Master Builders Solutions brand is the combined know-how and experience of a global community of MBCC construction experts, who connect with you to solve all of your construction challenges.