Darlot Gold Mine

Optimising paste fill using MasterRoc MF 505C

Darlot Gold Mine

Project:
Darlot Gold Mine

Location:
Western Australia

Owner/s:
Goldfields

Products used:
MasterRoc MF 505C

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The Background:

Darlot Gold Mine, operated by Gold Fields Australia, is situated 120 kilometers north of Leonora and 58 kilometers east of Leinster in the Yandal Greenstone Belt (Western Australia). Darlot underground complex utilises paste fill to provide static support for all voids in Lode 1. The required paste strength and cement content varies depending on the planned exposure. Curing time is also dependent on the mix used. Historical curing times for undercut and side exposures are approximately 20 days Current practice has paste development for mixes with cement content ≥2.5% undertaken at 4 days after finishing paste fill.

The Challenge:

Darlot required a faster mining cycle to mine the new ore body efficiently. Master Builders Solutions were engaged to assist with the improvement of the paste fill mix utilising chemical admixtures. With an aim that paste development and exposure from stoping may commence sooner or cement content may be reduced. Based on laboratory and site based trial results 505C will be added to all Stage one (plug) pours in Lode 1 going forward; first pour with chemical addition commenced in April 2017.

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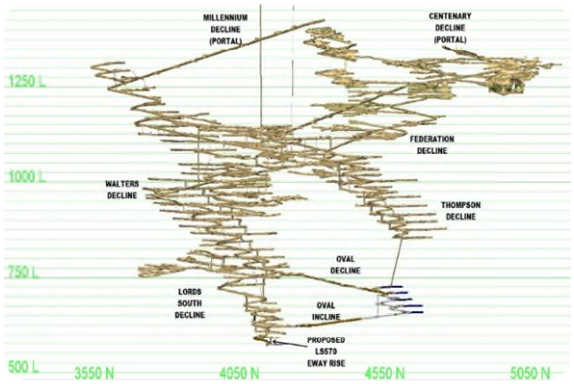
Processing plant at Darlot



Longsection of the mine showing the new orebody called the Oval

Our Solution:

During 2016 – 2017 laboratory and large scale (site based) trials were undertaken using MasterRoc MF 505C with aim of increasing the quality of paste fill, in order that paste development, side exposure and undercut curing times could be reduced and Lode 1 extraction rate increased. The greatest strength gain was observed within the 14 – 28 day undercut curing window, with 400ml per wet tonne chemical addition. Based on trial results to date, the addition of MasterRoc MF 505C to paste fill mix will allow a two-day reduction in undercut curing time compared to LOM plan.

The Customer's Benefit:

- From test results, the addition of MasterRoc MF 505C to paste mix allows for a 2% reduction in water; the optimal dose rate is 400ml per wet tonne.
- Time savings for undercut exposures can be achieved.
- With a 400ml per wet tonne dose rate, dependent on mix used, it should be possible to expose paste one to seven days earlier than the same mix with no chemical addition.
- Increased flowability of the mix is demonstrated through slump results with the addition of MasterRoc MF 505C.
- A reduction in the number of lumps within the paste occurred with the inclusion of the MasterRoc MF 505C.
- Pressures throughout the paste fill line reduced with the inclusion of the MasterRoc MF 505C.

Project Facts at a Glance

- 1 – 7 Days early entry when mining against the paste with MasterRoc MF 505C.
- Ability to transport paste longer distances with the addition of the MasterRoc MF 505C.
- Cement reduction of 1% can be obtained if paste exposure is not time constrainted.
- Strength increase of 16% with the inclusion of the MasterRoc MF 505C.

Master Builders Solutions

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