

EXTRACTIVES - QUARRY OPERATION

Highwall failure causing death

WHAT HAPPENED?

A quarry operator operating a 65 tonne excavator was removing lime rock from a quarry face when a rock fall occurred and he and the vehicle were buried under approximately 1,000 tonnes of material. The operator was in the excavator's cab at the time of the incident. The excavator operator was the site manager and did not have a quarry manager's Certificate of Competence.

HOW DID IT HAPPEN?

The excavator was free-digging the lower portion (muddy limestone) of the eastern slope. Based on excavator bucket marks along the eastern slope, this was standard excavation practice in the period immediately preceding the incident.

The rock fall was caused by the undermining of the lower muddy limestone. The upper sandstone rock was too hard to free dig, and the upper portion of the slope was too high for the excavator bucket. The height of the slope at the site of the incident is approximately 26 m and not 'benched'.

North of the incident site, along the eastern wall, there was evidence that the same type of failure had previously occurred at the quarry.

COMMENTS

Designing a quarry to enable safe product extraction is a fundamental principle of an extractives operation. This can be achieved by:

- > undertaking a geotechnical assessment to identify the geotechnical properties of the material being excavated
- > establishing overall slope design with an appropriate factor of safety



- > designing of bench heights and widths
- > optimised orientation of rock faces to minimise rock falls by identifying failure modes
- > design enough space for windrows, rock traps and roads
- > ensuring excavators and other equipment are appropriate for the specific quarry layout.

WHAT CAN BE LEARNT FROM THE INCIDENT?

Quarry operators should adopt quarry design principles outlined in WorkSafe New Zealand's Good Practice Guidelines for *Health and Safety at Opencast Mines, Alluvial Mines and Quarries*

These guidelines recommend how to establish a safe quarry design as well as safe heights for quarry faces.

MORE INFORMATION

Quarry operators are encouraged to visit the WorkSafe website: worksafe.govt.nz for more information about quarry regulations and managers certificate of competencies.

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