PROJECT PROFILE
N17A099

mainmark

Mainmark Develops Bespoke Solution to Stabilise Underground Mine Crusher

INDUSTRY
Mining

STRUCTURE
Mine Crusher

PROBLEM
Unstable Equipment

LOCATION
NSW, Australia

DURATION / YEAR
1 week / December 2017

TECHNOLOGY
Grout packing and resin injection

BUSINESS UNIT
Mainmark Australia

Summary

At a mine site in far west New South Wales, Mainmark was contracted to stabilise mine crushing equipment situated in a confined area 875m below the surface of the mine.

The cast iron crusher, manufactured and installed in the 1950s, was positioned on a metal baseplate and encased in a secondary support structure above concrete footings.

The machine processes bulk excavated minerals below the ground into smaller more manageable pieces, which are then conveyed to the surface for further processing. Over the course of its operation, the crusher had developed a rocking motion, with the whole base and secondary support structure lifting up and down when in use. It was feared that the movement would eventually break the crusher.

Mainmark worked closely with a team of resin supply specialists to formulate a customised product solution and application methodology to provide the necessary stabilisation and support.

A combination of grout systems including dry pack materials and resin injection was utilised to address stability around the support structure and baseplate.

The project required treatment equipment and materials to be positioned within accessible range of the crusher location, and for works to be completed within a limited shutdown period at the mine.

Mainmark's specialist grout solution was efficiently and successfully applied, eliminating the rocking motion of the crusher to reduce the possibility of damage or equipment failure over time.

Objectives

The objective of the project was to stabilise the crusher by providing the necessary support between the steel baseplate and surrounding concrete structure. The solution needed to be installed within the pit area, located 875m below ground, under a heavy piece of equipment. All the work had to be completed in a short timeframe to minimise the shutdown period.

Technically, the solution required products of suitable strength, with short cure times, that could find their level in a confined access environment. Additionally, the specified products needed to be unaffected by the oil bath surrounding the crusher.

Solution

As the primary contractor, Mainmark consulted closely with the client and visited the site to carry out a full assessment.

Mainmark partnered with Building Chemical Supplies (BCS), to formulate a bespoke solution that would deliver the required high-strength bearing capacity between the crusher's baseplate, the secondary support structure, and footings.

High-pressure water and detergent systems were used to prepare the surfaces and remove the oil bath surrounding the crusher, ahead of the placement of the chosen grout systems. The crusher was also stripped down to enable access to the treatment area.

A combination of pack grout and resin injection was used to remediate the site. High-strength dry pack non-shrink grout was placed around the perimeter of the base and under the secondary support structure to an area of 5.2m^2. Then, high-strength resin application via packers drilled to the perimeter of the steel baseplate addressed an area approximately 9.3m^2 under the crusher base and the pit below.

Several concrete fractures caused by unsuccessful, historical attempts to remove the crusher's anchor bolts were also sealed and re-bonded.

The work was completed within a one week period, minimising the mine's shutdown time. The client reported the rocking motion had ceased, describing the outcome achieved as a 'top job' that they wished they had undertaken sooner.

The oil bath surrounding the crusher needed to be removed before Mainmark solution could be applied