



## KiD2 at Aitik raises the bar for very large mine crushing stations

Posted by Paul Moore on 19th February 2019



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The KiD2 open pit crushing project at Boliden's Aitik copper operation in northern Sweden just south of Gällivare is one of the largest and most complex ever constructed – it is now complete after just under two years of construction, and Boliden Aitik recently inaugurated the new crushing facility after a testing period. The enormous crushing station represents another step towards Aitik's development through increasing ore output and establishing a more stable production apparatus. The facility is part of an expansion plan that will see production increase from 36 Mt to 45 Mt of copper ore per year starting in 2020.

The new crushing plant offers both superior safety and productivity and is hailed by Boliden as "a crusher for the future." Uniquely, much of KiD2 is hidden from view. The pit view is just the tip of the iceberg of the whole structure which is 74 m in height. General Manager, Boliden Aitik, Hans Jönsson, told *IM* that KiD2 is not built into the pit wall per se, but the framework is a concrete construction built on solid bedrock and then crushed rock is filled up around that construction. The reason for doing this is to avoid unwanted vibrations, which have been an issue with one of the other in-pit crushers at the mine in the past. He told *IM*: "KiD2 has a totally different design. It's a more stable concrete construction. The trucks dump the ore in a bin directly above the crushers. There is no apron feeder from the dump pocket to the crusher. The most severe problems we have had with the old surface crusher designs are vibrations in the framework and low availability for the apron feeder. This has been eliminated."

It is a fixed construction, but the crushers can also if needed be moved in the future. KiD2 will mean Boliden Aitik along with the two existing in-pit crushers will be able to handle the existing production plans up to 45 Mt/y. However, KiD2 can handle as much as these two together, so will account for roughly 50% of total production. Boliden said that Metso was chosen as the major solutions supplier via the normal procurement process; evaluating technique and price; but several other suppliers and contractors were involved. However, the final design and supply of the main core items was from Metso which delivered the two primary crushers, two feeders and the conveyors.

The construction has involved over 1 million m<sup>3</sup> of soil and 120,000 t of rock excavation using one of the mine's PC5500 Komatsu hydraulic excavators. The crusher building is also one of the strongest ever built, housed in 30,000 m<sup>3</sup> of concrete with 4,000 t of reinforcement rebar. Some 1.5 million m<sup>3</sup> of rock was refilled to provide the building with the stability it required. More than 120 suppliers and 600,000 working hours were involved as well as 100,000 management and engineering hours.

Construction started back in July 2016 with first blasting and completion taking less than two years. To keep time with the schedule, the project planning work and design was carried out in parallel with the actual construction, meaning high demands on coordination and requiring very focussed project organisation while working safely at the same time. September 2017 saw the start of structural steel installation and then the installation of the two huge Metso SUPERIOR 60-110E primary gyratory crusher parts such as the spider, mantle and concave as well as the crusher shells themselves. The two large Metso apron feeders that deliver crushed ore to the Metso conveyors are driven by Bosch Rexroth Haggblunds hydraulic direct drives for optimum reliability and control. Other Metso equipment supplied includes rock breakers, chutes, spare and wear parts and the company also handled much of the engineering and installation. The conveyors feed the ore direct to the concentrator plant. Exposed parts such as chute linings are protected by the toughest SSAB Hardox steel plate. Process control and automation are at the heart of the crushing station operations.

In February 2018, the plant was first delivered to the mine production team then, in April 2018, construction was officially completed, followed by a test run. KiD2 is direct loaded by the mine's fleet of Caterpillar 310 t 793C, 793D and now also 345 t 795F AC trolley assist trucks. KiD2 is designed to handle large volumes of rock being continuously delivered 24/7, with each crusher capable of handling almost 9,000 t/h.

The latest 3D modelling technology was used for all parts of the design and construction, down to the smallest details. To minimise disruptions to production, KiD2 was designed with ample space, excellent access and smart technology solutions to facilitate service and maintenance procedures. For example a mobile service trolley is used to support service tasks below the primary gyratory crusher. Accessibility in and around the infrastructure has been improved by ensuring that the service and access roads join directly with the main levels of the crushing plant. Also, replaceable parts and high tech equipment help minimise disruptions to the process flow.

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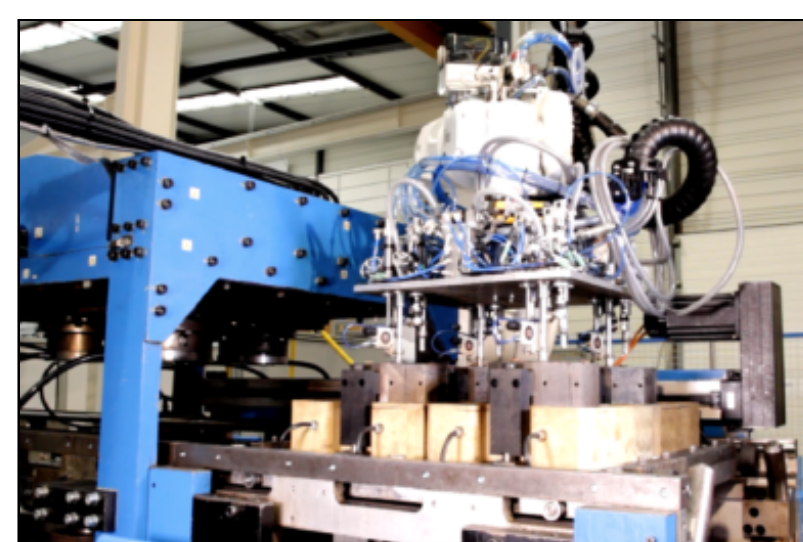
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