Demolition with KEMROC rotary drum cutters

MAKING SPACE FOR THE NEW EXHIBITION BRIDGE IN LEIPZIG

In Leipzig, the historical "Messebrücke" or Exhibition Bridge was replaced by a modern concrete structure. The support pillars of the old bridge have now been demolished. Specialists from STRABAG used two hydraulic excavators fitted with KEMROC rotary drum cutters to do the work. In this way, they avoided using breakers or shearers, and thus any possible damage to the new bridge from vibration. Work could also proceed safely, without any danger to nearby railway tracks and passing trains.

In Leipzig (Germany), a bridge for pedestrians and cyclists will soon be completed and once again connect the Alte Messe to the Wilhelm-Külz-Park with its famous Völkerschlacht-Denkmal (Battle of the Nations Monument). The original bridge which passed over a four-track railway line was built in 1912. One hundred years later it had to be demolished since the upper structure couldn't be renovated economically. Demolition of the bridge was completed in 2016 and the abutments by autumn 2019. The supporting pillars were left in place. They should hold the shoring while constructing the new bridge. Once the modern concrete replacement was built this year, it was time to remove the old supporting pillars. The main contractor, GLASS Ingenieurbau Leipzig GmbH subcontracted the work to the specialists of STRABAG AG, Leipzig Division. They were to face very difficult conditions as the railway lines were in very close proximity.

The classical use of a hydraulic excavator with a breaker was impossible for two important reasons. Firstly, a low-vibration method had to be used because damaging vibration could be transmitted through the existing overburden to the new structure. Secondly, large pieces of concrete produced by a breaker could fall onto the four adjacent railway lines with consequences to safety and damage to tracks. Demolishing the pillars with shearers was also ruled out due to their dimensions which were 26 m long, 1.8 to 2.8 m wide and from 7.2 to 7.5 m high, far too large for the jaw sizes of conventional shearers. Therefore the only practical solution was to use a hydraulic excavator with a rotary drum cutter attachment.

Patrick Israel from local KEMROC dealer TBH Thüringer Baumaschinenhandel GmbH & Co. KG together with construction manager Justus Steinert and his colleagues from STRABAG developed a plan for the demolition project. They had to deal with very tight windows of time when the railways were closed to passenger and freight traffic. It was decided to work in parallel with two hydraulic excavators (26 to 27 ton operating weight) fitted with two KEMROC rotary drum cutters (a KR 120 and a KR 150) supplied from the TBH rental fleet.

The new Messebrücke in Leipzig is a bridge spanning four railway tracks. The pillars of the original bridge were demolished after the new replacement bridge had been constructed.

Demolition contractor STRABAG had very tight windows of time to complete the project. They often had to work at night.

Fast, safe and economical

KEMROC rotary drum cutters are frequently used in demolition and tunnelling projects. They are also used in trenching and pipe laying, concrete renovation and profiling, underwater excavation, and quarrying applications. The attachments are made with heavy duty casing fitted with high torque hydraulic motors that generate powerful cutting forces. In Leipzig, however, the KEMROC drum cutters made light work of demolishing the bridge pillars since they were made from stamped concrete.

Demolition work was completed in September 2020. On the side of the bridge facing the local railway tracks, works were carried out between midnight and 4:00 am when passenger traffic was stopped. Freight trains running on the tracks on the other side of the bridge were stopped between 7:00 and 19:00 hrs. The KEMROC drum cutters achieved a surprisingly high production rate, as the site manager Mr Justus Steinert explained while looking back on the project, “Before taking the equipment on site, we did some trials at a location nearby and we estimated a production rate of 4 m³ per carrier per hour. During the actual demolition process, each support pillar had a volume of 390 m³ and we actually achieved a production rate of 6 to 6.5 m³ per carrier per hour.” Records showed that actual pick consumption was around 5 picks per 100 m³ which was, according to the site manager, within reasonable limits.

Summing up, Just Steinert said, “The stamped concrete with strength of around C20/25 to C35/45 provided no real challenge to the milling machines. However, conditions on the site were difficult since the pillars were only 3.5 m away from the railway tracks. Overall, we kept within our target times, with 26 to 30 hours of actual milling time, and we even finished earlier than expected. As far as the costs were concerned, our capital equipment costs were high as renting the milling machines was more expensive than renting breakers. However, for us labour costs are more significant, equipment costs are secondary. With regards to technical support, we have a reliable partner in our construction equipment dealer TBH, with whom we have been already working for a long time.” ▮

Using more machines reduced labour costs. For this project two excavators fitted with KEMROC drum cutters rented from TBH were used.

After cutting a segment free it is pulled down to the floor using the excavator bucket.

Publisher

KEMROC Spezialmaschinen GmbH
Jeremiasstr. 4, 36433 Leimbach, Germany

Phone +49 3695 850 2550
E-Mail info@kemroc.de

www.kemroc.de

KEMROC®
revolution of cutting