

### Roxburgh Dam Flood Control Works

June/July 2003

**L**owery Supa Cutters were engaged for the lowering of flood control gate piers and removal of counterweights for the installation of hydraulically operated mechanism. It was identified as a significant risk that the flood control structure atop the Roxburgh Dam could fail in the event of a seismic occurrence. The supporting piers and their counterweights required lowering and removal before a new truss and hydraulic mechanism could be installed. Of the 3 spillways, 2 must always be able to operate so work has to be staggered to allow this to happen.



Three counterweights needed to be removed, each 2.4h x 1.5w spanning the 15.5m wide spillways weighing 140 tonnes. The 4 piers were a complicated "H" section with machinery platforms and walls cast integrally on the top, 7.4 meters was to be removed to lower them to the required level.

Finally a series of holes up to 12m deep were to be drilled to fit the new trusses. In all approximately 1000 tonnes was to be removed in two separate visits. The first to take down 2 counterweights and 2 piers, the other c/weight and 2 piers on the subsequent visit.

The counterweight removal process required the installation of a support structure to the central gate weight, wiresawing the weight into 20 tonne pieces and craned down. Rated lifting plates were attached to each block using expanding mechanical anchors and the crane used a pair of balanced strops to equalise lifting loads.

A temporary control ram was put in place then the second weight was removed in the same manner.

The piers could now be addressed. They were modified using 2 wiresaws mounted on top and cutting below themselves into 16-20 tonne pieces. By using a series of pulleys it was possible to first cut horizontally then turn the cutting plane 90 degrees and draw the wire up vertically. This technique meant that the cut blocks could be accurately calculated to suit the lifting capacity of the crane thereby reducing the cut area to the optimum. Each predetermined layer was cut off in this fashion and the wiresaw lowered to the next level until completion.

Once the piers were down, drilling could commence. Two three phase drilling machines drilled 76mm diameter holes up to 12m deep for anchor bolts. The drill bits were continuous barrel screw type that included core catchers to reduce down time and enable drilling to continue almost non stop. When depth was attained, a lifting eye was attached and to the drill string and removed with the crane.

#### Where

- Roxburgh Dam - Central Otago, South Island, New Zealand

#### Machinery Employed

- 2 x Holer DS-WS 15 Wiresaws
- 2 x Hydrostress 2m drillrigs c/w Weka DK-52 drill motors

#### Diamond Tools

- 54m x 11mm diamond wire (Holer NZ)
- 40-76mm diameter drill bits up to 12m long

