



LAKE MANCHESTER DAM

Lake Manchester Dam is located 40km west of Brisbane and recently received significant works as part of a flood security upgrade. The mass concrete dam was constructed in 1916, and current Australian guidelines required significant strengthening to meet modern standards.

Structural Systems was appointed to provide the fabrication and installation of the ground anchors. The project was run as a sub-alliance with the Brisbane Water McConnell Dowell Alliance to provide a seamless working environment. In total, 69 ground anchors were installed, 47 of which were vertical through the crest of the dam and 22 at the toe including the worlds largest inclined permanent ground anchors. Most of the anchors were of a 65 strands, which equates to a final load of 1,219 tonnes. In total, nearly 80,000 tonnes of force was applied to the dam via the ground anchors. The average anchor length on the crest was 76m, with anchors up to 100m long.



The mass concrete dam wall was up to 40m high, with suitable bed-rock 40-50m below the wall. The 65 strand anchors had a 14m bond length at the end of the anchor to transfer the load to the surrounding bed rock.

The anchors were fabricated on-site about 200m from the dam wall. When ready to install, the anchors were loaded onto specially designed trolleys that can transport 100m+ anchors to the hole for installation. The toe anchors were installed with 250t cranes which were available on-site. However, the longer crest anchors (over 50m), were installed using a tendon installation frame, referred to as the 'Dinosaur', and a 17t braking winch. After installation, the anchors were grouted and cured for 21 days, after which stressing could take place. Following stressing and monitoring, the anchors were capped and sealed using several anti-corrosive and sealed barriers to ensure a high quality system with 100+ years working life.

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Project Data Sheet

Year:
April 2007 to
February 2008

Location:
Lake Manchester, QLD

Principal:
Brisbane City Council

Project Manager:
Brisbane Water

Contractor:
McConnell Dowell

Division:
Structural Systems Civil

Scope:
Supply and Installation
of Permanent Ground
Anchors

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