

MOLLEE WEIR FISHLOCK AND REGULATOR UPGRADE

PROJECT DETAILS

ASSET OWNER/OPERATOR: WATERNSW

CLIENT: GEOTECHNICAL ENGINEERING PTY LTD

LOCATION: NARRABRI, NSW

DATE: OCT 2013 – OCT 2014

PROJECT VALUE: AUD6MILLION

REFERENCE:

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DESCRIPTION

Geotechnical Engineering Pty Ltd was awarded the construction contract for WaterNSW's Mollee Weir Upgrade. As a subcontractor, AWMA was commissioned to design, manufacture and install fishway and regulator gates as part of the Keepit Dam Safety Upgrade Fishway Offsets Project.

This project required water control infrastructure that could sustain high frequency fish lock gate operation, as well as a regulator gate to attract fish, and pass environmental and low flows as required. All water control equipment can be linked to WaterNSW's SCADA system for remote monitoring and operation.

PRODUCT

AWMA were engaged to design, manufacture, supply, install and commission a custom overshot regulator gate and fishlock gates including:

- 1 off 4500mm wide x 4400mm high 316 stainless steel dual leaf overshot roller gate with cable actuation system
- 1 off 500mm wide x 3000mm high 316 stainless steel AWMA TLF-SP with hydraulic linear actuator (Fishway Entry 1)
- 1 off 500mm wide x 4750mm high 316 stainless steel dual leaf AWMA TLF-SP with hydraulic linear actuator (Fishway Entry 2)
- 1 off 1000mm wide x 4425mm high 316 stainless steel AWMA TLF-SP with hydraulic linear actuator (Fishway Exit)
- 1 off 4600mm wide x 4500mm high aluminium segmented stoplogs with self-engaging lifting frame and channel mounted stainless steel side frames
- 1 off 2000mm wide x 4600mm high aluminium stoplog with embedded stainless steel side frames

SERVICES

AWMA provided 100% of the design, manufacture, installation and commissioning process to the total value of AUD600,000.

Additionally, AWMA provided extensive documentation, training and support.

As with all design and construct contracts, AWMA regularly liaise with the asset owner (in conjunction with the head contractor) to ensure all parties were satisfied with final design scope and specifications.

MANAGEMENT

Early Contractor Involvement:

Initial site visits by AWMA sales and engineering staff to contribute to conceptual design development (12 weeks).

Design and Drafting:

AWMA in-house engineering team (6 weeks)

Manufacture:

AWMA in-house manufacturing team including purchasing, fabrication, QA, administration (8 weeks).

Installation:

Mobilisations by the installation team as per program schedules.

Commissioning:

AWMA Operations Manager (1 day).

Documentation:

Including Safety In Design, ITP, QA, MDR, O&M Manuals, Installation Manuals etc, managed by AWMA in-house administrative and QA departments.

Training:

Onsite by our Operations Manager (1 day), plus documentation and on-phone support as required.

DELIVERY

AWMA successfully delivered the project on-time and without variation.

INNOVATIVE SOLUTIONS

This project presented a number of initial design concerns regarding the potential wear of equipment, maintenance requirements and subsequent whole of life costs. To address these issues, AWMA developed a cable drive system for the regulator gate based on the mechanics of the proven AWMA LayFlat gate.

The dual leaf stainless steel DLF roller gate is 4.5m wide x 4.4m high and has been designed to withstand 5m of static head pressure plus debris loading. AWMA's innovative design effectively eliminates wearing parts from the actuation system, significantly reducing the whole of life costs and maintenance requirements. The cable driven system is powered by an electric actuator.

AWMA TLF and DLF gates were utilised for the fishway entry and exit. They were all fitted with hydraulic linear actuators and position controllers, allowing full SCADA integration. These fishway control structures are specifically designed for high frequency operation with the gates fully opening and closing up to 24 times a day. This application demands precise manufacturing tolerances and inherently low friction sealing designs coupled with low maintenance due to the location of the fish lock. The control gates and the cylinders were both constructed from grade 316 stainless steel. The largest cylinder has a 4400mm stroke, delivers up to 5tn thrust, uses biodegradable oil, features integrated controls and is fully banded.

RELEVANCE TO FUTURE PROJECTS

The Roller Gate design utilised for this project successfully proved the maintenance free bearing materials.

The gate operates frequently in harsh river conditions with debris and abrasive silt loadings.

Regular operation proves the bearing material, seal materials and winch design, which would rarely be in use under 'normal', low duty cycle, roller gate applications.

The roller gates featured, 316 stainless steel and also super duplex stainless steel.

The aluminium segmented stoplogs feature AWMA's self-engaging lifting frame that insert and remove the lower stoplog section when submerged under 6m of water.

Essentially this site can be seen as a fast tracking 'proving ground' for innovative design concepts and build qualifications.



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