



Arthur Creek Dam Crest Upgrade

Client:
TFS Corporation Ltd

Location:
Kununurra WA

Construction Period:
Oct 15 – Dec 15

Project overview

Arthur Creek Dam is located approximately 68 kilometres South West of Kununurra in the Kimberly region and was constructed in 1971 for Goddard of Australia Pty Ltd. At the time it was one of the largest private water supply schemes in the state. Following a condition assessment by the client's engineer, it was discovered that the rockfill earth wall embankment was in need of an upgrade. This would allow for the raising of the crest level to increase holding capacity, rebuilding the existing top section which was of unknown quality and would strengthen the structure against wave action during a cyclone event.

DM Civil worked closely with the client and the consulting engineer, GHD Pty Ltd, to provide a constructible solution to rebuilding and relining the existing dam wall. The initial task was to provide additional rockfill to the upstream face of the dam wall to satisfy a new cross-sectional dimension in preparation for future raising of the crest level. This rockfill was to be topped with wave protecting larger (zone 3C) rock spalls for wave protection from cyclone events.

The Upstream works required the placement of additional rockfill at the lower level to strengthen the existing wall with wave protection up to the height of the future rebuild level which will require the crest to be cut down and rebuilt.

Significant achievements and benefits

To supply the rock material, a suitable quarry site was surveyed on site some distance downstream of the dam. 30,000 cubic metres of rock was drilled and blasted to produce a supply of product ranging from filter material (zone 3A and 3B) up to 1.2 metre diameter wave protection spalls (zone 3C).



The quarrying works required adherence to strict blasting procedures due to the close proximity of a functioning dam wall. Blast Management procedures were formulated to ensure that maximum vibration limits were not exceeded. This required strategically placed monitors to record actual levels which were tabled in the MDR. Security and safekeeping of explosives was a high priority and these materials were guarded around the clock from the time of despatch. Exclusion zones were designated and pre-blast vicinity checks were carried out for each blast.

The remote location of the dam required careful planning and logistics to ensure that all required plant, equipment and materials were delivered to site in time for each activity. The cost of freight to Kununurra and the availability of items in town meant most equipment was transported from Perth on a three day service that ran at a frequency of once per week. Forward planning ensured that the lengthy transport delay was factored into deliveries and did not affect the programme.

A restriction to works in the Kimberley region is the arrival of the wet season, generally beginning in December and carrying through until early March. By maintaining the access track with daily grading and topping up of low areas with blast fines, early rain events did not interrupt production. The final placement of wave protection rock spalls took place as the season closed in, which demonstrated the importance of the earlier work on the track to maintain schedule.

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Forward planning and proactive site management produced a better than expected result for the upstream batter contract. This allowed time for grouting works originally planned for future stages, to be carried out ahead of schedule with a cost under-run to ensure client satisfaction.

Contact DM Civil to discuss your water infrastructure projects.

GUARANTEED PERFORMANCE

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