



Dam Construction Phase Services

Identify the need

With the design of new dams, or the upgrading of existing facilities, the success of these project requires an appropriate design to be developed and for the design intent to be met during construction.

The nature of dam projects, with a heavy dependency on the foundation, site materials and other site constraints, could mean that site conditions identified during the construction phase may not always be consistent with that assumed in design. It is essential for anomalies to be identified and for those implications to be considered and addressed in consultation with the designer. Involvement of the design team during the construction stage is an essential final phase of the dam design process, which is recognized by several international organisations.

In addition to the technical requirements pertaining to dam safety and functionality, is the need to be able to respond to the requests for additional information or clarification required by the construction contractor or dam owner. The sound understanding of the dam design team enables increased flexibility and nimbleness in decision making, which can be of significant benefit to contractor and owner alike as potential construction efficiency improvements can be realized.

Respond to the need

In view of the specialist skills required, particularly for large construction projects, specific services such as site supervision, project management and contract administration are often required. Provision of these services by a reputable third party may influence project outcomes and provide confidence to other stakeholders such as lending institutions.

Our background in dam design and construction enables us to identify risk areas for management both through careful structuring of the contract and administration of that contract. Our people have a depth and breadth of skills and knowledge specific to large dam projects.

Experience

We have one of the largest dedicated dams engineering teams across the globe, employing more than 70 practitioners. We provide construction stage services on over one hundred dams, in a range of different roles, from owners engineer on construct only contracts to teaming in alliances.

Our team is supported by other specialists in project management and related fields, including claims adjudication, expert witness and quantity surveying which places us in a unique position to provide complete project management and contract administration services.

Service offering

Our team provides the full range of dam construction stage services including:

- Technical design support
- Construction supervision
- Project Management and Contract Administration
- Acting on behalf of the dam owner (Owner's Engineer)
- Provision of design services to Contractors.

GHD works closely with clients responding to their needs for new dams and upgrades. We provide tailored solutions to a number of challenging requirements on various projects. Examples of dam construction projects in which we have been involved include:



Enlarged Cotter Dam – Australian Capital Territory, Australia

The Enlarged Cotter Dam is the highest RCC dam built in Australia. The project included design and construction of a new RCC dam immediately downstream of the existing Cotter Dam to increase the storage capacity from 4,000 ML to 78,000 ML. The main dam is an 87m high RCC gravity dam, with a crest length of 330 m and 380,000 m³ of RCC. GHD undertook the concept design, site investigations, detailed design, aggregate investigations and RCC mix design, spillway design including computational fluid dynamic and scale physical modelling and overseeing of the dam's construction via the alliance framework.



Eildon Dam- Victoria, Australia

The Eildon Dam Improvement Project was a \$52.5 million upgrade of the 80 m high, 3,300 GL capacity Eildon Dam, undertaken to secure the future of the dam. The works involved: reconstruction of the crest and downstream shoulder of the dam and raising of the crest by 4 m; post tensioned anchor works in the chute downstream of the spillway to strengthen the chute floor to cope with extreme floods. GHD undertook the design and provided construction support on the Alliance that delivered the upgrade project.



Ross River Dam Upgrade – Queensland, Australia

The Ross River Dam was completed in the 1970s as a combined water supply and flood retention project. The dam was 24 m high and 7700 m long with a combined central clay core rockfill section transitioning to a zoned earthfill embankment and free overflow spillway weir section with downstream energy dissipator. The dam was upgraded using a risk-based design justification which included the provision of downstream filters, raising the embankment crest and installation of radial gates to increase the storage capacity and for flood mitigation. GHD were the Principal's delegated authority for management of the construction contract and provided construction QA supervision and technical assistance.



Kinta Dam- Malaysia

The Sg Kinta Dam project consisted of the design and construction of a new RCC dam on the Sungai Kinta with a reservoir storage volume of 29,900 ML. The dam is a 90m high RCC gravity dam, with a crest length of 980 m and an RCC volume of approximately 900,000 m³. The scope of GHD's services included feasibility study and concept design, review of hydrology, design of the dam and all associated structures, quarry development, RCC mix design, tender phase assistance and construction supervision.



Porters Creek Dam – New South Wales, Australia

Porters Creek Dam is a post tensioned concrete gravity dam that was constructed in the late 1960's. The dam does not meet modern dam safety requirements and with concern over the longevity of the aging anchors the dam was upgraded. The upgrading involved concrete buttressing of the existing gravity dam and construction of filters on the flanking embankments. GHD undertook detailed design and will provide technical support during construction, together with Project Management of the construction contract.



Quipolly Dam – New South Wales, Australia

Council upgraded the 21 m high embankment dam to address deficiencies in regard to spillway capacity and risk of piping in the embankment. The storage capacity of the dam was increased by 50% at the same time. GHD prepared concept and detailed designs for the upgrade works, including review of hydrology, geotechnical investigations, detailed design. GHD also provided tender stage services prior to appointment of the Contractor and site technical support and contractual advice to the Dam owner during construction.



Eraring Attemperating Reservoir – Eraring Power Station Dora Creek, NSW

Eraring Attemperating Reservoir is a 26 m high off river storage used to store saline water for use in the cooling process for Eraring power station to maintain peak production during the hot summer months. An extensive clay lining and under-drainage system ensures that pollution of groundwater by the saline water in storage does not occur. GHD undertook concept design, site investigations, detailed design and provided construction stage support.



To contact our dams service line professionals, visit www.ghd.com/dams

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