



Spillway gates & outlet works

Identifying needs

Spillway gates and outlet works are an integral part of any dam design.

When a dam with a gated spillway is designed, an options study to select the most appropriate gate type to suit the specific needs would normally be done. Gate characteristics such as reliability, cost, function, maintenance and operational requirements and durability are considered, after which the most appropriate type of equipment is selected.

Outlet works are used to release a controlled amount of water from a dam or reservoir for irrigation, power generation, water supply or flood control. The layout and size of an outlet work depends on the type of dam being designed and the purpose for which the water is required.

To address a client's needs in relation to gates or outlet works, GHD offers a range of in-house skills drawn from its team of experienced dam engineers including:

- Scoping, planning and concept development;
- Detail design of new and replacement equipment;
- Dam safety inspections;
- Condition Assessments;
- Operational Preparedness Testing;
- Rehabilitation Advice;
- Project management, manufacturing inspections and construction supervision.

Solutions

GHD applies its client relationship focus and works closely with client representatives to determine the key concerns,

constraints and issues affecting the project. This allows GHD to better understand the dam owner's requirements and enables a customised solution to be offered.

Be it equipment inspections, condition assessments or operational preparedness testing, our experienced dams engineers are supported where necessary by specialist disciplines including materials technologists and corrosion engineers.

Designs are backed by our extensive knowledge and experience of hydraulic steel structures. Whether it is refurbishment/rehabilitation or new designs of gates, screens, baulks, grapples or complete outlet works, these are produced to Australian (or international) standards, codes and best practice. When required, Computational Fluid Dynamics modelling is used to determine forces on the structures and exported for Finite Element Analysis on the structure. All equipment is modelled in three-dimensions from which final drawings are produced.

Benefits

GHD's extensive experience in the dams environment allows us to draw on a wealth of experience to satisfy specific project objectives. This combined with the use of computer aided analysis tools and 3D modelling of the equipment enables the preparation of a holistic solution.

Experience

GHD has been working on dams since the company's birth almost 90 years ago. Today we have a large dedicated dams team globally and the largest such team in Australia.

Some of the recent projects GHD was involved with are described below.



Awoonga Dam Valve Refurbishment Project – Gladstone, Queensland, Australia

GHD was engaged to develop a strategy to allow GAWB to refurbish the outlet tower valves within discreet 12 hour shutdown periods, when water was not extracted through the tower. The engagement was extended to include technical advice and superintendence during the project implementation.



Cairn Curran Outlet works Upgrade – Maldon, Victoria, Australia

GHD was engaged by G-MW to provide technical input for the Dam Outlet works upgrade project. This included redesign of the corroded guides on the guard gates and main rails and improving the gate storage system to address a number of OH&S issues. The engagement also included upgrading the electrical and control system for the gate hoist. Other work on this project involved the design of the replacement bypass pipework, refurbishment of the DN 750 gate valve and replacement of the needle valve for irrigation releases.



Scrivener Dam Anchor Bolt Remediation Project – Canberra, Australia

GHD was engaged to manage the design of an anchor bolt replacement system for the spillway flap gates on Scrivener Dam. This engagement has been extended to the project management of the construction phase. GHD is also represented on the Technical Review Panel for the project.



Lake Victoria Outlet Regulator Remediation – South Australia

GHD was engaged by South Australia Water to prepare a concept design for the remediation of the outlet regulator of Lake Victoria. The project included a condition assessment of the existing gates and hoist equipment for possible re-use in the remediation option. The appointment has been extended to the detail design of the recommended remediation option.



Enlarged Cotter Dam Diversion Gate Design – Canberra, Australia

GHD, as part of the Bulk Water Alliance, was responsible for the detailed design of the Enlarged Cotter Dam. This included the design of the diversion control gate, factory inspections and installation supervision.



Other projects included:

Modification of outlet tower for multilevel off-take, - Lake Bellfield (GWMWater, Vic)

Operational Preparedness Tests of critical equipment, - Cataract & Cordeaux (SCA, NSW)

Spillway Gate FEA for static and dynamic loading - Cairn Curran radial gates arms and trunnions

Refurbishment of Outlet Valves, - Ord Dam (Water Corporation, WA)

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

