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DISCIPLINE BROCHURE

# Water Infrastructure

*Harding River Water Treatment Plant — Karratha, WA, Australia.*





BG&E is an international civil and structural engineering consultancy recognised for delivering **innovative, award-winning designs** that prioritise practicality and constructability.

With a team of more than 800 people across 16 offices — spanning Australia, New Zealand, South East Asia, the United Kingdom, and the Middle East — we deliver the highest standard of service across our disciplines.

Clients consistently return to us for our responsiveness and proven ability to provide tailored solutions on complex and challenging projects. This is reflected through industry recognition, client commendations, and numerous awards.

In 2025, BG&E joined forces with SYSTRA, a global leader in public transport and mobility engineering. This partnership expands our technical capability, strengthens our international networks, and support long-term growth across major infrastructure markets and the complex buildings sector.





*Northern Water Treatment Plant —  
Woleebee, QLD, Australia.*

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# Water Infrastructure

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**BG&E has recently contributed to some of Australia's largest water infrastructure projects. Through our involvement, we have further developed efficient and effective design practices that reduce capital expenditure and ensure timely delivery.**

We assist clients throughout the entire project lifecycle — from planning to commissioning — across a spectrum of projects. This includes designing new facilities, modernising, and rehabilitating existing structures, or extending networks.

BG&E Water Infrastructure understands the requirement for effective and efficient discipline integration. Our civil and structural teams have extensive experience in managing the integration of all technical disciplines such as process, mechanical, electrical, hydraulic, instrumentation and control to achieve an efficient water infrastructure design.

Additionally our BIM specialists have extensive experience and expertise in data management and model integration.

Constructability, value engineering and optimal outcomes are factored into designs from inception. We have worked extensively in Design and Construction (D&C) environments and therefore have a complete understanding of contractor requirements.



Our team offer a comprehensive range of services for various projects, including:



Dams



Sewage Treatment  
Plants (STP's)



Reservoirs



Water Supply Pipelines  
& Pump Stations



Sewage Pipelines  
& Pump Stations



Water Treatment  
Plants (WTP's)



# Our Capabilities

## WATER TREATMENT PLANTS

Civil and structural detailed design for various water treatment systems, such as coagulation, sedimentation, filtration, disinfection, and advanced treatment methods, to remove contaminants and ensure compliance with water quality standards.

## WASTEWATER TREATMENT PLANTS

Civil and structural detailed design solutions for various wastewater or recycled water treatment systems using technologies, including activated sludge, biological nutrient removal, membrane filtration, and tertiary treatment processes, to treat wastewater to required quality standards to be discharged or reused/ recycled.

## WATER SUPPLY SYSTEMS DESIGN

Designing water supply systems, including the civil, structural, and mechanical design of pipelines, pumping stations, and storage tanks, to ensure reliable and efficient water distribution to consumers.

## WASTEWATER COLLECTION & TREATMENT

Designing sewer systems, including the civil and mechanical design of gravity and pressure mains, lift stations, and treatment facilities, to effectively collect, convey, and treat wastewater before discharge. This includes mechanical and electrical upgrades to existing systems.







#### GEOTECHNICAL ENGINEERING

Geotechnical engineering investigation, design, and interpretation to facilitate design and provide advice on the conditions that the contractor will need to allow for during construction. BG&E have extensive experience with designing with challenging geotechnical conditions.

#### HYDRAULIC MODELING

Perform hydraulic modeling using software such as EPANET, WaterGEMS or SWMM to simulate water and wastewater flow, pressure, and quality within distribution and collection networks. The hydraulic modelling can assist in pump selection, optimising pumping systems to meet hydraulic requirements, minimize energy consumption, enhancing system reliability and identifying the priorities for any system network upgrades.

#### STORMWATER DESIGN & MANAGEMENT

Flood modelling and stormwater management design to assist in the design of stormwater drains, culverts, detention/retention ponds, green infrastructure to manage stormwater runoff and reduce flooding risks.

#### ASSET MANAGEMENT

Provide asset management services and advice, including condition assessment, lifecycle costing, and prioritization of maintenance and rehabilitation activities, to optimize the performance and lifespan of water and wastewater assets. This includes assessing the materials specified in the design meet the infrastructure design life.

#### EMERGENCY RESPONSE & CONSTRUCTION STAGE PLANNING

Develop emergency response plans and procedures to address water and wastewater system failures, natural disasters, and other emergencies, ensuring continuity of service and protection of public health and the environment. This includes working with contractors and utilities to provide construction staging advice to facilitate construction.

# Interdisciplinary Collaboration

BG&E leverage the expertise of our specialists across various technical disciplines to seamlessly deliver a diverse range of services for water infrastructure projects.



## CIVIL ENGINEERING



## CONSTRUCTION ENGINEERING

Including temporary works design, construction supervision, and WH&S specialists.



## DIGITAL ENGINEERING, DESIGNERS & DRAFTING



## HYDRAULIC & PIPELINE ENGINEERING



## GEOTECHNICAL INVESTIGATION

Including landslide stabilisation and foundations materials engineering.



## MATERIALS & DURABILITY ENGINEERING

Including structural condition assessments.



## STRUCTURAL ENGINEERING

Including complex water retaining structures.

# Why BG&E?



## LARGE-SCALE EXPERTISE

Significant expertise in large-scale Water Infrastructure projects. Our team is well-versed in D&C environments, we understand Contractor requirements, prioritising constructability and value engineering from project inception.



## CLASH DETECTION

Our team is highly experienced in the identification and management of clash detection of services and infrastructure, using advanced tools to detect and report clashes early. While many BIM softwares offer clash detection, our expertise reveals that they often produce confusing and contradictory reports with phantom clashes. Our specialists tailor clear and accurate clash detection reports, assigning clashes to owners for accountability in resolution.



## CONSTRUCTION ENGINEERING SERVICES

BG&E is a leader in the development of a wide range of construction techniques, including design solutions for the heavy lifting of oversized precast structures, temporary works, and temporary restraints and supports, as well as the strengthening of existing structures for construction loadings.



## SPACE-CONSTRAINED SITES

Extensive experience working in space-constrained sites, where existing assets are to remain operational during the commissioning and construction.



## PROJECT MANAGEMENT FRAMEWORK

We implement a Project Management Framework (PMF) that ensures a high-quality project management lifecycle for our projects. We take pride in delivering projects as per the agreed program — we adopt a 'no surprise' approach to project delivery.



## MATERIALS & DURABILITY

BG&E has a professional team of engineers, materials scientists, and project managers — experienced in delivering design and construction stage materials-related support to clients throughout the construction industry.



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At BG&E, we are united by a common purpose — we believe that truly great engineering takes curiosity, bravery and trust, and is the key to creating extraordinary built environments.

Our team of more than 800 highly skilled people, in offices across Australia, New Zealand, Singapore, the United Kingdom and Middle East, design and deliver engineering solutions for clients in the Property, Transport, Ports and Marine, Water, Defence, Energy and Resources sectors.