SECTOR BROCHURE

Adaptive Reuse

BG&E
Part of SYSTRA

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.

TNT Apartments — Redfern, NSW, Australia.

Adaptive Reuse

333 Kent Street —
Sydney, NSW, Australia.

Adaptive Reuse is one of the most effective ways to both reduce embodied carbon in construction and adapt our built environment to changing demands.

Sustainable development encompasses principles and practices such as high energy efficiency, net-zero impacts, and embracing circularity with minimal material use. The adaptive reuse of existing buildings is integral to this holistic approach, creating future-proof built assets while upholding community values.

Given that the building and construction sector accounts for nearly 40% of the world's greenhouse gas emissions, it is no surprise that the industry is increasingly embracing adaptive reuse to meet net-zero goals and sustainability pledges. This shift is driven by the commitments outlined in the Paris Agreement, adopted at the United Nations Climate Change Conference (COP21).

In Europe, we are witnessing a transformation in the way the built environment is developed. Over the last few years, Nordic countries and the UK have enacted legislative changes that encourage the adaptive reuse of buildings, with traditional demolition-and-rebuild development proposals only being approved if there is no case for the upcycle of the existing structure.

In the Asia-Pacific region, the trend toward adaptive reuse is gaining momentum, and BG&E is at the forefront of this movement.

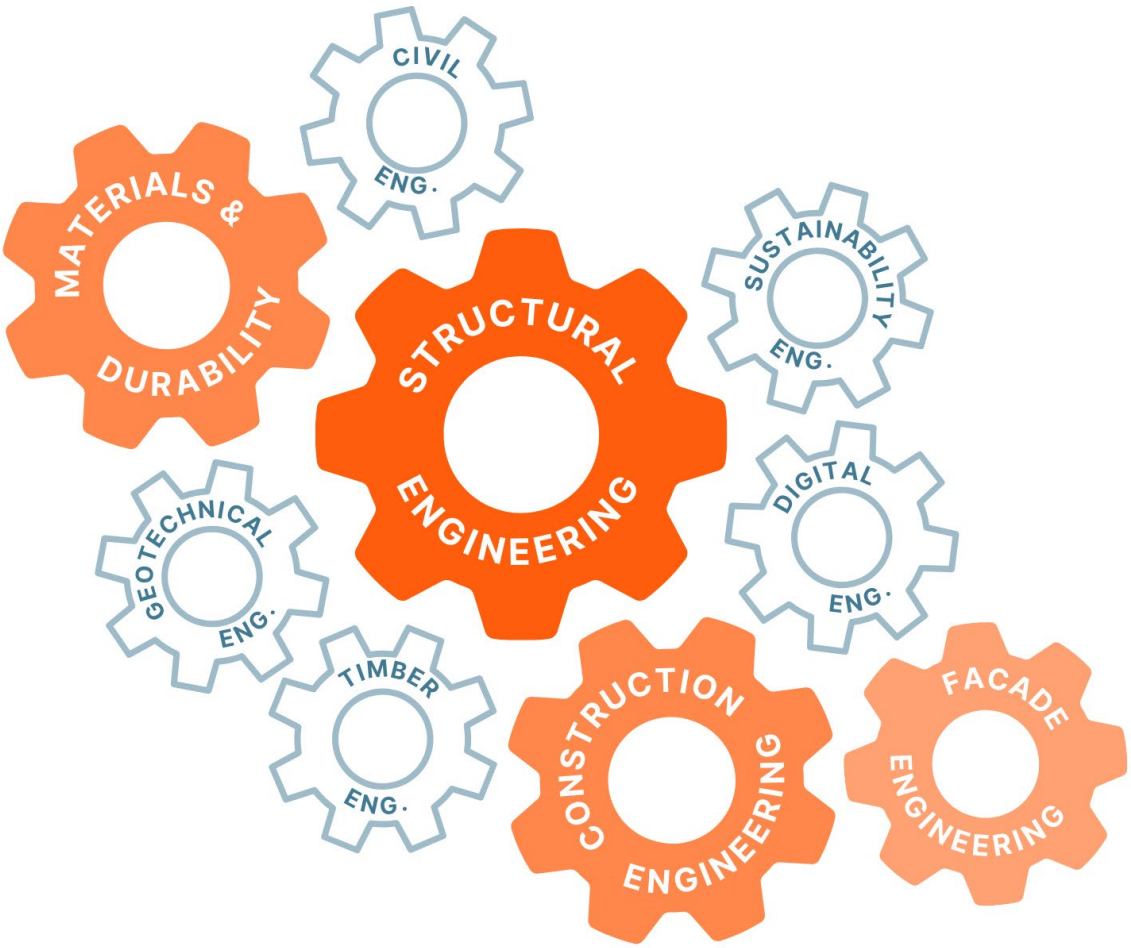
Our unique ability to leverage our in-house Structural Engineering, Materials and Durability, Construction Engineering (Temporary Works), and Façade disciplines — combined with decades of experience in successfully delivering adaptive reuse projects, has earned us recognition as industry leaders in the adaptive reuse sector.

Mudgee Arts Precinct — Mudgee, NSW, Australia.

SEAMLESS INTEGRATION

Driving Innovation Across Desciplines

What sets BG&E apart is the cohesive collaboration of our in-house technical disciplines — which enables us to thoroughly understand existing structures and deliver optimal designs in terms of buildability and the final product.



Why Adaptive Reuse?

Adaptive reuse is rapidly gaining momentum as it aligns with global sustainability trends by cutting carbon footprints, minimising waste, and repurposing materials efficiently — all while saving costs and preserving and revitalising iconic structures.

Reduces a project's carbon footprint by minimising waste, saving energy, and conserving resources.

Retains and increases a structures height, which is not always achievable with the traditional demolition-and-rebuild method.

Minimises costs by reducing waste removal to be transported and disposed, materials expenses and total construction time.

Adheres to circular economy principles, reusing building materials like glass, sprinkler piping, mechanical ducting, and façade materials.

Preserves the cultural, heritage, and historic value of significant structures — maintaining the character and social value of old buildings.

Adding value to existing structures and providing flexibility to asset holders depending on the changing needs of clients and communities.

The Project Lifecycle

FEASIBILITY STAGE

- Address site constraints and optimise structural efficiency.
- Provide façade remedial and re-cladding advice.
- Develop heritage façade retention strategies.
- Provide sustainability advice and implement embodied carbon reduction strategies.
- Offer structural design consideration advice to future-proof buildings and maximise layout flexibility.
- Utilise BIM for integrated design processes and whole life cycle asset management.
- Advice on certification strategies.
- Conduct asset performance and remaining life assessment.
- Identify dilapidation remediation strategies.

TESTING & CONDITION ASSESSMENT

- Develop a material testing plan (including non-destructive and destructive materials testing).
- Assessment of existing structural capacity and load-rating.
- Minimise foundation upgrade via detailed geotechnical investigation.

DESIGN

- Structural and construction engineering (including permanent and temporary works design).
- Strengthening complex foundations and structures using state-of-the-art technologies.
- Achieving seismic compliance and re-certification of the refurbished building.
- Assessment of timber and façade (including fire protection).
- Design for durability.
- Design to comply with the latest standards and regulations.
- Tailor construction methodologies for a fast-tracked program.
- Re-cladding and weatherproofing principles design.

CONSTRUCTION

- Constructability staging advice to connect retained structures with new buildings.
- Localised demolition sequencing.
- Excavation support.
- Advice on structural monitoring.
- Full scope of construction phase services, including site supervision).

OPERATION & MAINTENANCE / DECOMMISSIONING

- Post construction building response and movement monitoring.
- Structural defects assessment and ongoing asset management.

LEGEND

- Structural
- Construction Engineering
- Sustainability
- Façade
- Materials & Durability
- Digital Engineering & BIM
- Geotechnical
- Timber*
  *up to "approved for construction" submission only

Why BG&E for Adaptive Reuse?

Adaptive reuse is rapidly gaining momentum as it aligns with global sustainability trends by cutting carbon footprints, minimising waste, and repurposing materials efficiently — all while saving costs and preserving and revitalising iconic structures.

Seamless integration of our technical discipline teams with our Buildings team, enabling the delivery of projects from testing and design to execution and asset management.

In-house Digital Engineering capabilities, which allow us to use tools such as digital twins to stimulate the construction phase, including total building movement.

Longstanding partnerships with asset owners, fostering a deep understanding of their operations both nationally and abroad.

Extensive technical experience, backed by a **proven track record** in the field.

Seasoned experts with 20+ years of experience in their respective fields and regions.

High level of responsiveness, confirmed by client feedback.

Our Broad Profile

Paddy's Market
2000, NSW
Major retail redevelopment

M Central
2000, NSW
Carpark to apartments

Old Swan Brewery Redevelopment
2001, WA
Industrial to residential

2000

UTS Peter Johnson Building
2006, NSW
Upgrade and extension to student housing

Broadway Shopping Centre
2005, NSW
Major retail upgrade and extension

Birkinhead Shopping Centre
2004, NSW
Major retail upgrade

2005

St. Mary's Cathedral
2006, WA
Major upgrade and extention

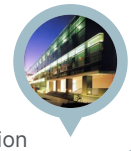
National Hotel, Fremantle
2007, WA
Asset refurbishment

District Courts Building
2008, WA
Major infrastructure redevelopment

WA Museum Upgrade
2013, WA
Museum upgrade and extension

32 St Georges Terrace
2012, WA
Commercial redevelopment

UNSW Sir Robert Building
2009, NSW
Education facility upgrade and extension



2010

Plumbers Workshop
2015, NSW
Industrial to residential

TNT Towers
2016, NSW
Office to residential

Blue Lavender Bay
2018, NSW
Commercial to residential

2015

The Doulton
2022, UK
Commercial to residential

QQT
2022, NSW
Commercial upgrade and extension

Mudgee Art Gallery
2019, NSW
Commercial to gallery

2020

333 Kent Street
2022, NSW
Industrial to commercial

Renaissance Hotel
2023, UK
Hotel to mixed-use residential

Rosebery Engine Yard
2024, NSW
Industrial to mixed-use commercial

2025

“QQT has been a significant engineering achievement, Multiplex and BG&E have worked collaboratively together over the last four years to overcome a multitude of engineering challenges. BG&E are a solution-oriented engineering firm with a can-do attitude. Their approach to problem solving, combined with their engineering expertise, has enabled Multiplex to successfully deliver QQT. I recommend BG&E as an engineering firm of considerable skill and capability.”

ROBERT KIELY
Senior Design Manager, Multiplex Australasia

CTBUH, winner: 2023 Award of Excellence — Best Tall Building 200-299 metres.

WAF (Lisbon), winner: 2023 UK, Buildings — Office Award.

German Architecture Museum (DAM) and DekaBank (Germany), winner: 2022/23 International High-Rise Award.

IABSE, winner: 2023 Gold Star Award & Rehabilitation Category.

MIPIM Awards (Cannes), winner: Most Innovative Built & Natural Environment Consulting Firm.

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.

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