

SECTOR BROCHURE

# Adaptive Reuse

BG  
& E  
Part of SYSTRA

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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.*

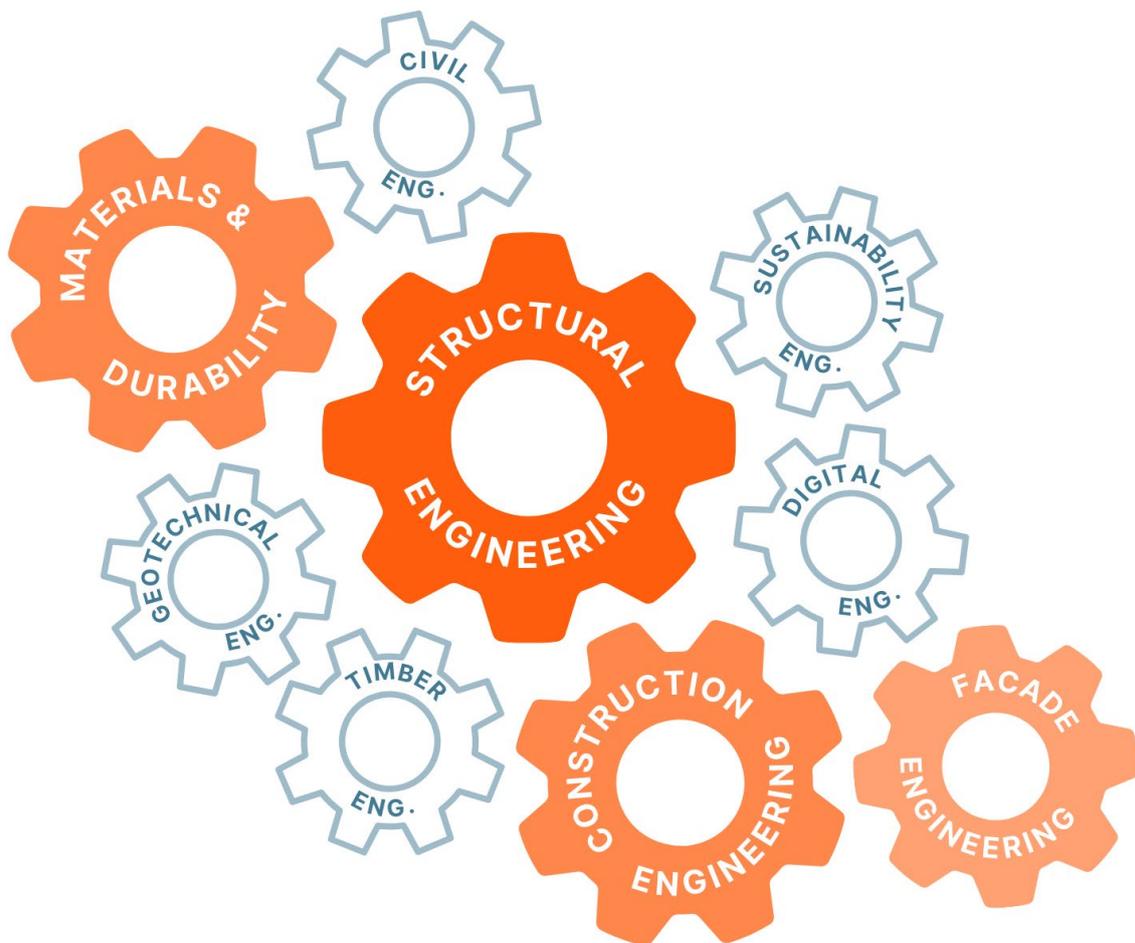


■ SEAMLESS INTEGRATION

# Driving Innovation Across Disciplines

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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?



**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 extension



**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

BG&E ADAPTIVE REUSE

“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.

BG&E ADAPTIVE REUSE



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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.