

SECTOR BROCHURE

Heritage

*St Mary's Cathedral -
Perth, WA, Australia*

OPPORTUNITIES
THROUGH
EXCELLENCE

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BG
&E



About Us

BG&E is a globally renowned structural and civil engineering consultancy celebrated for its innovative, cost-effective, and award-winning designs.

With a dynamic team spanning 15 offices worldwide - including Australia, New Zealand, South East Asia, the United Kingdom and Middle East - we unite local and international professionals to deliver practical solutions with a strong focus on constructability.

Our Clients consistently return to us, attesting to our exceptional service, responsiveness, and track record for delivering tailored solutions for technically challenging projects. The quality and scope of engineering awards we've received acknowledge our diverse industry contributions and the exceptional quality of the services we deliver across a host of regions, disciplines, and sectors.

Introduction

Our heritage practitioners have a specialist skill set suited to the complex projects we deliver. Our heritage team includes structural engineers, materials and durability scientists, timber specialists, construction engineers, facade engineers, and sustainability consultants across Australia, New Zealand and the United Kingdom.

We work collaboratively with heritage consultants, architects, developers, project managers, and builders to deliver award winning projects. Our heritage expertise includes:

- Conservation, including maintenance, preservation, restoration, reconstruction, adaptation, and interpretation.
- Retention, reintroduction of a use, and adaptive reuse.
- Monitoring, testing, and investigations.
- Interface and interaction of new developments with heritage fabric.
- Assessment for building code compliance, proof of compliance through monitoring, testing, investigations, and analysis, and modification to achieve compliance.

Our practice adheres to the International Charter for the Conservation and Restoration of Monuments and Sites (Venice Charter), Australia ICOMOS Burra Charter, and ICOMOS New Zealand Charter. If interventions such as structural strengthening are required, we design them to be reversible, readily identifiable as new work, and respect and have minimal impact on the cultural significance of the place.



WA Museum Boola Bardip -
Perth, WA, Australia

Our Multi-Disciplinary Approach to Heritage

Equipped with an extensive range of in-house engineering disciplines that complement each other, we are strategically positioned to provide top-tier design solutions for Heritage projects.



STRUCTURAL
ENGINEERING



MATERIALS &
DURABILITY



CONSTRUCTION
ENGINEERING &
TEMPORARY WORKS



FAÇADE



TIMBER



SUSTAINABILITY

Our Services



STRUCTURAL ENGINEERING

Our team of chartered structural engineers includes trained heritage practitioners, fully accredited members of ICOMOS, and professionals with graduate degrees in structural analysis of monuments and historical constructions. Our team performs structural condition assessments, prepares feasibility studies in conjunction with the project team, and assesses structures for loading capacity.



Royal Exhibition Building
Melbourne, VIC, Australia

The basis of our approach to the assessment of a heritage building starts with the accurate characterisation of loads, including the determination of original design loads and, if needed, management of wind tunnel testing. We accurately characterise material properties, with the involvement of our materials and durability team and timber specialists. These two steps are fundamental to a successful project outcome, as underestimation of material strength using default textbook properties or overestimation of loads often results in unnecessary strengthening works.

We accurately analyse the structure using finite element analysis. When required, non-linear analysis using DIANA, an advanced finite element software, is undertaken. With our expertise, the strengthening of unreinforced masonry for achieving code compliance under seismic loads is often either not required, or minimised.

We are experienced in the assessment of heritage structures for compliance with the National Construction Code and Australian Standards. In addition to engineering analysis, in unique cases, we use load testing to verify structural capacity.

If structural strengthening is required, our structural engineers provide multiple design solutions that are, wherever possible, reversible, of minimal impact, and readily identifiable as new work, in adherence to the local ICOMOS Charter.

We provide full site phase support by a chartered engineer, including timely workshopping of design alternatives to resolve unexpected site conditions.



CONSTRUCTION ENGINEERING

Our construction engineering team engineers the sequence of modifications to heritage buildings and designs the temporary works required to enable the demolition and construction.

Our services include demolition sequencing, staging new construction, animations, temporary façade retention systems, monitoring systems, temporary shoring and underpinning, hoarding and scaffold systems, plant and equipment design, and loading assessments.

We design a solution that is specific to the constraints of the site and maintains the integrity of heritage items whilst concurrently facilitating the critical path of construction for the new structure.



FACADES

Our facades consultants have been involved in several heritage buildings and remedial projects of a variety of scopes, from investigating issues such as leaks and corrosion to material compatibility, renovation and remediation, and replacements. Our key strengths can be summarised as follows:

- Our experience is spread across numerous projects of varied types, sizes, and functions.
- Our experience in the design and specification of façade systems allows us to evaluate system performance from an early stage in the design process, taking into consideration acoustic detailing, thermal performance, structural movements, and construction issues.
- In-depth understanding of material science, long-term durability of façade elements, and maintenance cost.
- We work closely with all major façade contractors and have a good appreciation of their capacities, quality processes, and design methodology.
- We can evaluate the existing façade concept and identify cost-effective methods of enhancing the design where required to enhance performance, taking into consideration logistics and construction sequences
- Equipped with a multi-disciplinary team of façade specialists consisting of engineers, architects, facade designers, materials scientists, and building physics experts to cater to the challenging requirements of our façade work.



Chancery Chambers -
Melbourne, VIC, Australia



*Mudgee Art Gallery -
Mudgee, NSW, Australia*



SUSTAINABILITY

Our sustainability team facilitates the restoration and maintenance of heritage structures through a range of services and strategies.

We offer tailored strategic advice on sustainability considerations for our projects by supporting Clients, industry partners, and fellow sustainability professionals in understanding the constraints and opportunities of each project and developing a pathway for the team to achieve enhanced sustainability outcomes. This tailored approach to sustainability is well suited to the unique project challenges arising in heritage buildings. If rating schemes apply, the approach needs to be carefully planned when the project is not 'business as usual'.

We recognise that a high level of involvement and integration with project design teams and stakeholders is integral to successful sustainability outcomes. Our commitment is to be a part of the team – fostering collaboration and enabling the best possible result.

We take a top-level holistic approach early in the project before getting into details - enabling a comprehensive understanding which then facilitates tailored strategies and solutions. By understanding the project and Client's priorities in this way, we can then direct our resources more effectively to progress the opportunities that will make the most difference.

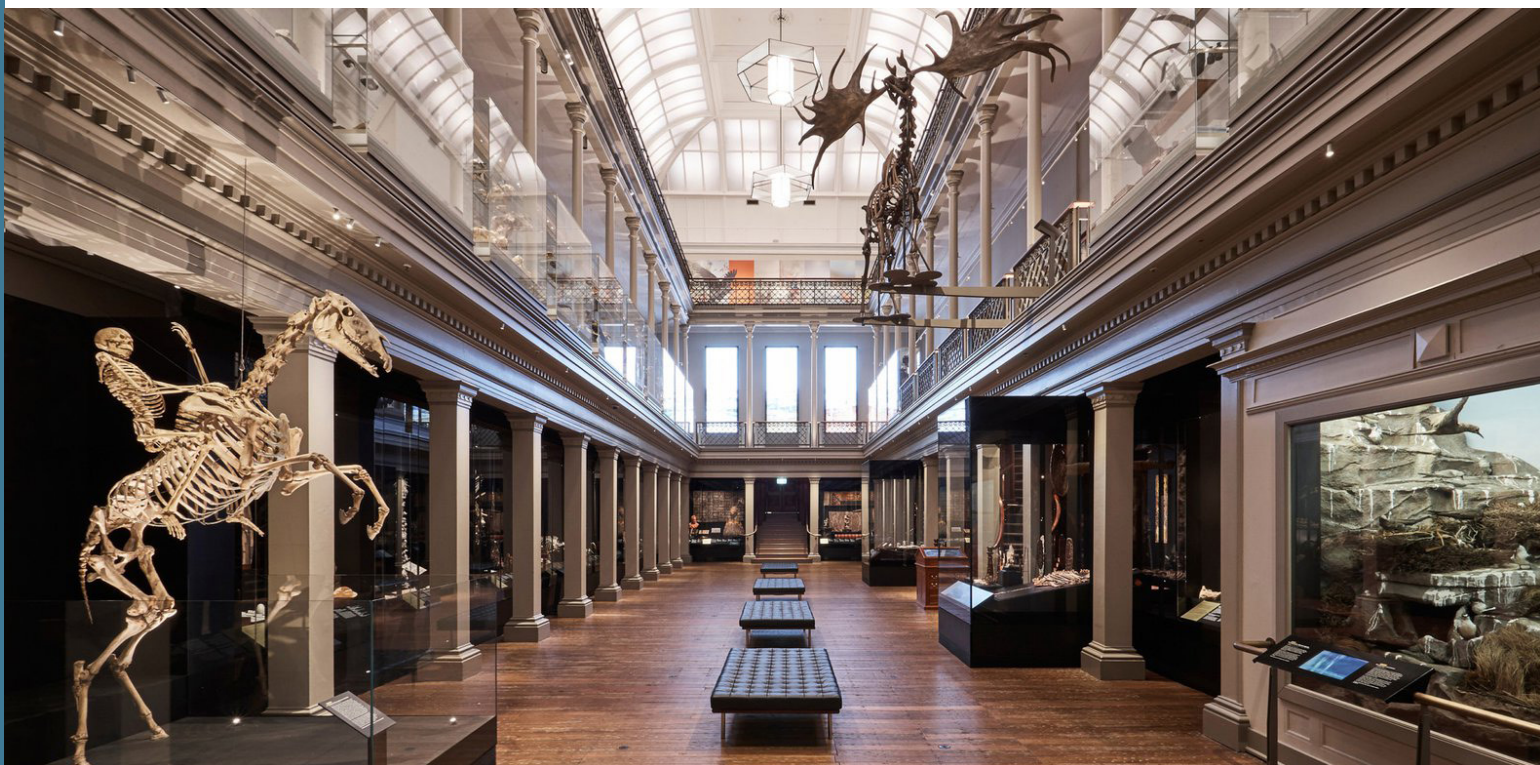
 **TIMBER**

Our team of timber structural engineers and science engineering experts specialising in the preservation and maintenance of heritage buildings. Our primary focus is on ensuring the longevity and structural integrity of historical structures, acknowledging their architectural significance.

Our services encompass a wide range of solutions for heritage building owners and custodians:

- Meticulous timber condition assessments: utilising advanced non-destructive testing methods to evaluate the structural health of timber components and to identify potential areas of concern.
- Historical research: delving into archives and historical records to uncover the original construction techniques and materials used in these structures, providing valuable insights for preservation.
- Restoration and replication: with a particular emphasis on recreating intricate timber elements such as mouldings, beams, and trusses, to preserve the historical accuracy and authenticity of these features.
- Preservation plans: custom-developed to meet the unique needs of each heritage building. These plans outline ongoing maintenance schedules and strategies aimed at safeguarding timber components from deterioration.
- Timber treatment and conservation: employ advanced techniques and non-toxic wood preservatives while adhering to heritage conservation standards.
- Structural reinforcement: providing expert solutions to enhance load-bearing capacity while respecting historical authenticity.
- Consultation and compliance services: ensuring that all preservation work aligns with local heritage guidelines and regulations.

Long Gallery, Australian Museum - Sydney, NSW, Australia



Why Work With Us?

Certainty of Delivery

Our commitment to meeting program obligations is underpinned by our early resource allocation, a 'best for project' approach, and strong collaborative relationships with all stakeholders, ensuring Clients can trust in our commitment to meet program obligations.

Innovative Engineering

We are renowned for our innovative design work, and our fundamental consideration is constructability, reducing construction time, and ensuring solutions align perfectly with a project's functional objectives and brief. Every solution we deliver is bespoke and 'best for project', rather than easiest for BG&E.

No Geographic Constraints

BG&E boasts a unique advantage: we can tap into engineers from various disciplines and select the most qualified individuals for the job, regardless of which office they sit in, ensuring seamless execution without state-based subcontractor constraints.

Temporary Works Design

Our specialist construction engineering and temporary works design group seamlessly integrate temporary works design into the detailed design. We believe this approach is more cost effective and reduces risk.

Value Engineering

In addition to delivering efficient cost-effective design, our structural and materials expertise is available to 'value engineer' and peer review all aspects of projects on which we work - optimising project costs while maintaining the highest quality standards.



*Oxford Street Hotel - Sydney,
NSW, Australia*

Collaborative Relationships

Fundamental to our success is an ability to work collaboratively with our Client, design services sub-contractors, project managers, design managers, consultant firms and other stakeholders for the benefit of the project.

Responsiveness

Our business and reputation are built on our unwavering commitment to responsiveness, in recognition of its importance to Clients. We're committed to long-term partnerships and supporting your future endeavours.

Commitment to Quality

Quality is a non-negotiable for our team – we are meticulous in our work and ensure all elements of a project meet the highest quality standards. To achieve this, we implement a Quality Assurance Plan for each Heritage project.



*Olderfleet -
Melbourne, VIC, Australia*

Who We Work With



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 1100 highly skilled people, in 15 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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