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SECTOR BROCHURE

# Healthcare & Laboratories

*Fiona Stanley Hospital — Perth, WA, Australia.*



FIONA  
STANLEY  
hospital

**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.



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# Healthcare

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**As healthcare evolves, emerging technologies and treatment methods present challenges that demand innovative design. Flexibility is essential, enabling hospitals and healthcare centres to adapt without requiring structural changes as medical practices advance.**

The true measure of a hospital's success isn't its bed count — it's the volume of patients it can treat. Efficiency is key — and the ability to treat more patients within the same structure is the real metric for performance.

Hospitals and healthcare facilities are typically designed for a 70 year lifespan, with the expectation of at least three major refurbishments — reflecting the sector's priorities of durability and future-proofing.

Healthcare continues to evolve at pace — driven by groundbreaking technologies, advancing models of care, evolving services, and rising demand. Facilities must be able to adapt to these changing parameters safely, affordably, and efficiently. A facility that is malleable to change is the core tenet of effective healthcare infrastructure.

*New Melton Hospital —  
Melton, VIC, Australia.*



**At BG&E, we design structures that facilitate radical changes in treatment time and patient throughput over the course of their lifecycle. From structural and civil engineering to materials and durability services, façade consulting, and geotechnical services — we deliver dependable, flexible, and reusable infrastructure that can adapt to advancing medical practices without requiring structural changes.**

Healthcare infrastructure encompasses a wide range of facilities and models:

- Hospitals — from major acute hospitals to small regional and rural hospitals.
- Specialist facilities — including cancer treatment centres, children’s hospitals, and mental health units.
- Healthcare related research facilities and laboratories.
- Hospital precincts — including car parks, central energy plants, logistics hubs, and other supporting structures.
- Emergency access infrastructure – including rooftop helipads and ambulance bays.
- Post-pandemic infection control and isolation facilities.

The healthcare sector is also highly localised. The country — and even the state — where a project is being delivered can dramatically shape outcomes. Regulatory requirements, funding models, and the client (public, private, or partnership) all vary widely. With on-the-ground teams in the geographies we operate in, BG&E leverages deep local knowledge to deliver compliant and cost-effective infrastructure.

*Queen Elizabeth II Jubilee Hospital —  
Brisbane, QLD, Australia.*



# Cross-Disciplinary Collaboration

BG&E stands out for the seamless collaboration of our in-house technical teams. This allows us to deliver optimal designs in terms of buildability and the final product for new healthcare facilities of any scale, as well as thoroughly understand existing structures for refurbishment, extension, and asset management.



Façade



Timber



Geotechnical



Construction  
Engineering



Structural  
Engineering



Digital  
Engineering (inc.  
BIM & GIS)



Materials &  
Durability



Flooding &  
Hydrology



Civil  
Engineering



*SJK Midland Private Hospital —  
Midland, WA, Australia.*

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# Key Considerations

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**BG&E brings extensive experience in managing the structural complexities associated with the scale and specialised functional requirements of healthcare infrastructure.**

## VIBRATION PERFORMANCE

Healthcare facilities require strict control of vibration to ensure human comfort and protect the operation of sensitive clinical areas and equipment.

BG&E applies detailed vibration analysis for clinical and surgical spaces, including sensitivity studies of mass, stiffness, restraining elements, and excitation variability. Each floor level is analysed with respect to vibration performance to confirm compliance with technical and functional performance criteria.

## FUTURE FLEXIBILITY

Hospitals must adapt to evolving healthcare practices, technologies, and treatment methods without requiring major structural changes.

BG&E works closely with architects, developers, and clients to embed flexibility in the structural design. This includes optimising column placement, design loading considerations, and change of function or re-planning, particularly future wet area set downs and future floor and wall penetrations.

### BUILDINGS OF SCALE

Large hospital structures require movement joints to minimise the effects of movements and accommodate volume changes over the building's life cycle caused by shrinkage, temperature variations, creep, axial shortening, and settlement. Without careful design, these uncontrolled movements can lead to excessive cracking and unserviceable deflections.

BG&E uses full analytical modelling to understand and design for stresses and movements resulting from straining actions. This approach reduces the number of movement joints, reducing the need for additional structural framing and shear walls, and limiting maintenance issues affecting the structure, architectural fabric, and façade system.

### TEMPORARY WORKS & CONSTRUCTION ENGINEERING

The successful delivery of healthcare infrastructure projects depends on practical, buildable solutions that support complex construction programs.

BG&E's in-house Construction Engineering team has extensive experience delivering large-scale projects on D&C delivery models, enabling us to anticipate construction and logistics requirements and implement practical design solutions.

*Midland Public & Private Hospital —  
Midland, WA, Australia.*



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The SYSTRA Group — a global engineering and consultancy leader with 11,000 people worldwide — is now strengthened by BG&E’s international buildings capability, complementing SYSTRA’s long-established expertise in transport and mobility infrastructure.

Building on BG&E’s reputation as a leading structural engineering practice delivering iconic, award-winning projects, the Group provides building solutions across complex and commercial developments, healthcare, education, data centres, adaptive reuse, and transport-related facilities worldwide.