
SECTOR BROCHURE

AVIATION

Hamad International Airport – Doha, Qatar.

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**BG
&E**
Part of SYSTRA

AVIATION

We provide consulting, planning, design and project management services to the aviation sector, working within live operational environments to deliver outcomes that are practical to build, minimise disruption to operations, and are safe to operate.

WHAT TO EXPECT



Move Efficiently

Optimised passenger, vehicle and freight flow and integrated multi-modal access.



Enter the Future

EV and emerging transport ready.



Operate Seamlessly

Staged delivery maintaining 24/7 operations.



Align Stakeholders

Airport, airlines, tenants, agencies and contractors.



Build with Certainty

Practical, constructible solutions in live environments.

DIFFERENTIATORS

Agile, collaborative delivery.

A flexible, responsive approach to evolving operational and project needs, with the ability to adapt staging, design and priorities quickly.

Construction-led engineering, not just design.

Integrated construction engineering capability within the delivery model. Designs are developed with real buildability in mind, reducing risk, rework and cost — demonstrated on projects such as Air New Zealand Hangar 7.

Built for live, constrained environments.

A constructability mindset tailored to operating airports, with experience working within tight spatial, operational and safety constraints.

Integrated landside capability.

Capability across all landside elements: kerbside and forecourt, roads and traffic circulation, car parks and access, public transport and intermodal connections, freight and service logistics, utilities and precinct integration, and airport terminal design.

SECTOR CAPABILITIES

CIVIL ENGINEERING

Road & Roadside

Airport access roads, internal precinct roads, intersections, roundabouts, signalised intersections, road widening, bus routes, taxi and rideshare areas, service roads and emergency access routes.

Pavement, Hardstand & Geotechnical

Road pavements, car park pavements, heavy-duty vehicle pavements, bus and logistics areas, maintenance access areas and temporary construction pavements, supported by ground condition assessment, foundation input and pavement material selection.

Drainage & Flooding

Stormwater networks, culverts, detention, flood modelling, overland flow paths and water-sensitive urban design, drawing on our flood management, hydrology and water infrastructure expertise.

Traffic Management

Design and planning of temporary road layouts, construction staging, detours, lane closures, temporary access roads, pedestrian diversions, relocation of bus, taxi and rideshare zones, service-vehicle access and emergency access arrangements.

*Bordeaux Mérignac Airport –
Bordeaux, France.*



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Traffic Modelling & Transport Planning

Vehicle movement, pedestrian circulation, public transport interfaces, drop-off and pick-up zones, car park access, wayfinding interfaces and staging of traffic during construction.

Construction Staging

Practical staging strategies that allow works to proceed progressively while minimising disruption to terminal access, car parks, drop-off and pick-up areas, and internal airport roads.

Earthworks

Earthworks, grading, site levels, drainage, stormwater management, servicing and civil works for major land development, transport and infrastructure precincts.

*Charles de Gaulle Airport Electrification –
Paris, France.*



BRIDGES & CIVIL STRUCTURES

Bridge & Civil Structures

Design of bridges, culverts, walls, and associated structures, from concept through to detailed design and construction.

Gantries, Barriers & Roadside Structures

Sign gantries, traffic infrastructure supports, safety barriers, foundations, protection structures, and civil/structural interfaces.

Constructability & Construction Support

Construction staging, temporary works, site support, and documentation to enable safe delivery in live environments.

Structural Assessment & Asset Management

Inspection, assessment and load rating of bridges and structures, including maintenance, repair, strengthening, and rehabilitation of existing assets.

Pedestrian & Transport Links

Design of pedestrian links, walkways and access structures connecting terminals, car parks, and transport hubs.

Retaining Walls & Earth-retaining Structures

Walls for road corridors, car parks, ramps, underpasses, level changes, terminal forecourts, and constrained landside precincts.

Planning & Feasibility Studies

Early-stage planning, feasibility, and options assessment for bridges and civil structures within landside airport precincts.

*Auckland Airport: Transport Hub 1 (TH01) –
Auckland, New Zealand.*



TEMPORARY WORKS & CONSTRUCTION ENGINEERING



*Perth Airport: Direct Factory Outlet –
Perth, WA, Australia.*

Bridge & Civil Structure Temporary Works

Temporary supports, jacking, access systems, and construction-stage works for bridge and civil structure projects.

Excavation Support & Shoring

Temporary retaining walls, sheet piles, soldier piles, shotcrete, ground anchors, struts and waling systems for basement works, service trenches, underpasses, road lowering, drainage upgrades, and structures built close to live roads or terminal assets.

Demolition & Staged Construction Support

Temporary stability assessments, sequencing advice and structural checks for staged works and modifications to existing assets.

Structural Temporary Works

Planning, assessment, design and construction support for temporary structural systems required to safely build, modify, support, or protect permanent infrastructure during construction.

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Construction-stage Assessments

Checking whether existing roads, bridges, culverts, pavements, retaining walls or slabs can safely support construction loads, including cranes, piling rigs, excavators, haul trucks, concrete pumps, temporary stockpiles and site compounds.

Temporary Pedestrian & Vehicle Structures

Temporary footbridges, access ramps, stairs, gantries, crash decks, protection decks and temporary vehicle crossings, maintaining safe passenger, staff, service and emergency access during construction.

Temporary Propping & Support Systems

Design of temporary supports, framing and bracing systems for structures during demolition, modification, strengthening, or staged construction.

Protection of Life Airport Assets

Temporary protection structures, impact barriers, crash decks, service protection slabs and structural shielding around critical utilities, terminal interfaces, roads, car parks, pedestrian areas and operational airport infrastructure.

Working Platforms & Piling Mats

Design and assessment of temporary working platforms for piling rigs, cranes, mobile plant and heavy construction equipment, including geotechnical interfaces, load cases, settlement, drainage, and safe access.

*Air New Zealand Hangar 4 –
Auckland, New Zealand.*



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*Auckland Airport: Transport Hub 1 (TH01) –
Auckland, New Zealand.*

MATERIALS & DURABILITY

Durability Planning & Design

Evaluation of the design life of civil and structural assets — bridges, walls, culverts, pavements, drainage, concrete and steel — with a focus on material selection, protective measures and detailing to minimise long-term deterioration.

Steel & Protective Coatings

Advice on structural steel durability, including corrosion protection, galvanising, coatings and maintenance for bridges, gantries, barriers, handrails and other exposed infrastructure.

Testing & Investigation Planning

Development of investigation scopes, including inspections, testing, sampling and compliance checks for materials and structures.

Repair & Rehabilitation Strategies

Development of repair strategies for deteriorated assets, including concrete repair, crack injection, waterproofing, resurfacing, corrosion protection and structural strengthening.

Existing Asset Condition Assessment

Inspection and assessment of bridges, culverts, walls, pavements and civil assets to identify defects such as cracking, corrosion, water damage, settlement and material degradation.

Concrete Durability

Specification and review of concrete design, including mix selection, exposure classes, cover, crack control, reinforcement protection, waterproofing, joints and curing, applied to walls, decks, culverts, pits, slabs, and foundations.

Pavement Materials

Selection and assessment of paving materials — asphalt, sprayed seals, concrete and granular layers — for roads, car parks and transport areas.

Construction Quality & Compliance

Review of submissions, test plans, inspections and quality records to confirm compliance with design intent and long-term performance.

Whole-of-life Asset Performance

Advice on durability, maintainability and long-term asset performance, including how design decisions affect inspection access, maintenance frequency, lifecycle cost and operational disruption.

WATER INFRASTRUCTURE

Water Treatment Plans

Planning, design and upgrade support for airport water treatment infrastructure, including system layouts, structures, pipework, and works within operational environments.

Water Supply Systems Design

Design of potable, recycled and fire-water networks across landside airport precincts, including mains, storage, pumps, connections and coordination with precinct infrastructure.

Hydraulic Modelling

Modelling of water, wastewater, and stormwater networks to assess capacity, performance and future demand under peak, storm and development scenarios.

Asset management

Condition assessment, capacity review and lifecycle planning for airport water, wastewater and stormwater assets, identifying ageing infrastructure, risks and upgrade needs.

Wastewater Treatment Plants

Design support for wastewater treatment infrastructure, including treatment structures, pump stations, pipework and staging to maintain service continuity.

Geotechnical Engineering

Ground investigation, foundation advice and geotechnical design for water infrastructure, including excavation support, settlement, stability and subgrade assessment.

Stormwater Design & Management

Design of drainage systems, pits, pipes, culverts, basins and flow paths for roads and precincts, managing runoff while meeting safety and environmental requirements.

Emergency Response & Construction-stage Planning

Planning and engineering support for temporary drainage, bypass pumping and service diversions to maintain operations during construction and emergency works.

*Charles de Gaulle Airport Expansion –
Paris, France.*



STRUCTURAL DESIGN



*Sydney Gateway Stages 1 & 3 –
St Peters, NSW, Australia.*

Terminal & Landslide Building Structures

Structural design for airport terminals, concourses, arrivals and departures areas, car park buildings, and commercial, hotel, logistics, maintenance and airport support facilities.

Refurbishment, Adaptive Reuse & Operational Upgrades

Condition assessment, capacity checks and upgrades of existing assets, including strengthening, alterations and extensions in live airport environments.

Concept, Feasibility & Detailed Design

Early structural advice on grids, spans, systems, foundations, stability, staging and constructability, followed by detailed design of concrete, steel, timber and hybrid structures.

Construction Support, Temporary Works & Digital Delivery

Construction-stage assessments, propping and load checks, supported by materials, durability, low-carbon design and digital coordination to enable safe, buildable outcomes during operations.

FAÇADE DESIGN

Refurbishment, Replacement & Operational Upgrades

Assessment and upgrade of façade systems, including condition reviews, capacity checks and staged remediation works in live environments.

Concept, Feasibility & Detailed Façade Engineering

Early advice on façade systems, support, buildability, access, durability, performance and cost, followed by detailed design and documentation of façade solutions.

Construction Support, Materials & Performance

Construction-stage façade advice, including coordination, materials, durability, movement, waterproofing and access, to support safe, buildable outcomes during operations.

Façade Design for Landside Airport Buildings

Engineering design and technical advice for façades across terminals, car parks, transport interchanges and airport buildings.

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BG&E and SYSTRA joined forces in 2025, combining BG&E's civil and structural engineering expertise with SYSTRA's global capability in public transport, mobility and infrastructure.

With more than 1,000 people across Australia and New Zealand, the partnership strengthens our reach and position in one of the world's most dynamic infrastructure markets.

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