



Advanced Technology Environments

www.beca.com



About Beca

Beca is one of Asia Pacific's leading engineering and related consultancy services groups, specialising in the design and management of projects. From prestigious landmark developments to functional and environmentally sustainable projects, Beca has extensive multi-disciplinary experience across a diverse range of industries and sectors.

Our employees number over 2400 and are based in our primary hubs in the main centres of New Zealand, Australia and Singapore. We also have offices in China, Indonesia, Myanmar, Dubai, Chile, and several Pacific islands.

With such a spread of resources and diversity, Beca can draw on a rich pool of specialist knowledge and experience. Our services include civil, structural, geotechnical, environmental, electrical, mechanical, chemical engineering and allied disciplines such as traffic and transportation, surveying, geology, quantity surveying, valuation, asset management, plant inspection, economics and cost control.

Beca continues to seek out new and exciting project opportunities throughout the world. We have extensive experience in the provision of consulting services in the developing countries of the Pacific, and are increasingly involved in major developments in the fast-growing cities of the Middle East and China. As we forge new relationships and partnerships throughout the world, Beca is actively planning for continued success and growth worldwide.

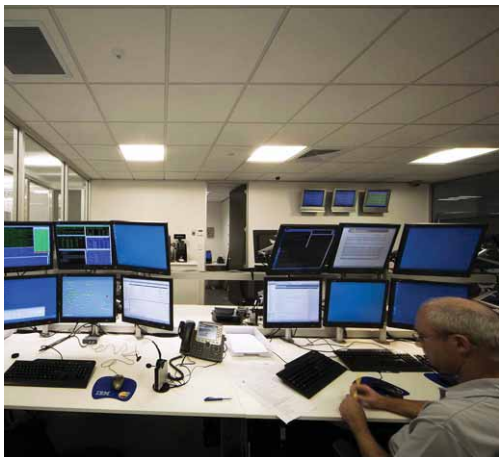




Advanced Technology Environments

Companies today are presented with a vast array of technology solutions. Sometimes these "solutions" are only a quick fix for one area of the business. Due to client demand, Beca now offers an advanced technology environment "one stop shop" that will assist businesses by providing an independent, integrated solution to their business requirements. This service utilises Beca's extensive industry experience and knowledge of the latest building technology and network information systems.

Our approach is to assess client needs in order to future-proof decision making. From there we can select and design the solution most appropriate to meet those needs and advise on procurement methods and contracting. We can assist in the evaluation of proposals and manage and administer specialist suppliers.



The Beca Advantage

All design disciplines in house

The Beca advantage is the involvement of all design disciplines in an integrated planning process led by specifically experienced engineers, architects and design managers.

Specifically experienced engineers

Our approach offers value born from the involvement of a highly experienced team of engineers working alongside specifically experienced architects skilled at rapidly and interactively distilling the client requirements into concise documentation.

Cost management expertise

Beca has an understanding of the costs associated with advanced technology environment installations and can offer financial guidance at the early stages of project conception to influence the development of a design that meets budget expectations.

Reputation For Delivery Excellence

Beca Buildings draws on the experience and expertise of some 300 buildings specialists and over 2000+ Beca consultants worldwide. This large skill base means that we can meet client needs on every level, delivering large and complex projects within challenging timeframes.

Benchmarking

Each critical milestone of a Beca Buildings project is peer reviewed by senior designers and principals within Beca. These people bring significant international experience and knowledge of global trends to the review process.



Planning and Design

The planning of technology driven facilities requires the input of experienced engineers and architectural designers who can understand and visualise the end product. The planning of space arrangements for computer, electrical and mechanical plant are often of critical importance in creating cost effective facilities and the connectivity and visual treatment of spaces predicated the operability of the facility. We are proud of a reputation for creation of spaces that are cost effective, easy to operate, utilise sustainable design principles and result in enhancement of the local built environment.

Design Programme Management

Beca's project management team includes programming specialists that provide the design team with the essential time and duration inputs required to complete projects to time targets.

Beca can select from a range of management tools to facilitate programme management, but the value lies in the experience of our people at delivering technically and strategically complex projects.

Architecture

Beca Architects' core business is the design of technology driven projects in telecommunications, information technology, industry and education. Our team is proud of our achievements in creating user friendly and people sensitive industrial environments that are functional and cost effective. The Beca team involves our clients in extensive collaboration to articulate options and establish desires and needs.

Interior Design

Integrating the human aesthetic and ergonomic needs with the technical demands of science and technology distinguishes our work. We design interiors that foster performance and assist an organisation's talent in realising their potential. Clients can "walk through" computer simulations of their interior spaces to review designs before they are built. Collaboration with our technical specialists in selecting sustainable and healthy materials assures a long-lived and safe interior for your project. Our comprehensive design and management skill enables you to continue your core business while we focus on meeting your needs.



Environmentally Sustainable Design

Sustainability is an integral part of the building design at Beca. We offer capability and experience with managing the Green Star rating methodology (Australia and New Zealand) and have engineers experienced with the UK based BREEAM rating systems and the US based LEED® system. As our accredited professionals have worked on award-winning green buildings in Singapore and New Zealand, your project will be benchmarked or rated against the best in the world. We will provide support to your company's sustainability objectives and assist you to achieve life cycle cost savings that form the core of the sustainability drive.

Physical and Electronic Security

Beca has extensive experience in the advice, design and construction of high security facilities.

Our experience is derived from extensive work in the gaming, airports and corrections institutional environments, which demand attention to detail and reliability and are under constant external scrutiny. The physical aspects of a building design greatly impact the staff safety and equipment security of a completed facility. We can involve a Beca physical security specialist in the design team to identify and mitigate security risk simply and cost-effectively, using recognised threat and risk assessment techniques.

Construction Programme Management

Beca programming specialists provide construction phase strategic thinking from an early stage in the project to enable design to be packaged to suit construction timing. This may include staged construction, integration with operating facilities, complex timing or access limitations and sequencing issues. Our specialist will work with your business units to formulate a programme that meets individual business goals and creates your desired outcomes. Programming can be flexible enough to allow change to accommodate needs of fast moving enterprises. The programme can provide linkage to capital expenditures and cash flow during the course of a project.

Project Management

Beca offers comprehensive project management expertise, developed on many large scale international projects. Our services include feasibility studies, site selection advice, town planning and resource management services, site design and prototype development.



Engineering

The performance requirements of a modern high technology building, including design for sustainability and flexibility, demands a thoughtful integration of structure, equipment, services and architecture. Beca can provide an integrated design team of architects and engineers that advise and guide the design process to efficiently achieve optimal design solutions. Beca engineers are at the forefront of building design internationally and are skilled at incorporating the latest technology solutions into building designs to provide high quality energy efficient environments. Beca architects and engineers work together in the same office to create your vision and encompass your specific needs into an integrated design.



Mechanical Engineering

Mechanical engineering design is intimately associated with occupant experience of the built environment and is of great importance to the planning phase of a new building project. Our engineering team is founded on the collective wisdom and experience of our mechanical engineering team. Beca has experience in building mechanical systems gained in commercial office buildings, laboratories, clean rooms, operating theatres, museums, universities, data centres, and pharmaceutical facilities. Our experience includes master planning, new and refurbishment projects, institutional campus design along with infrastructure and central plant design.

Specific services include the design of:

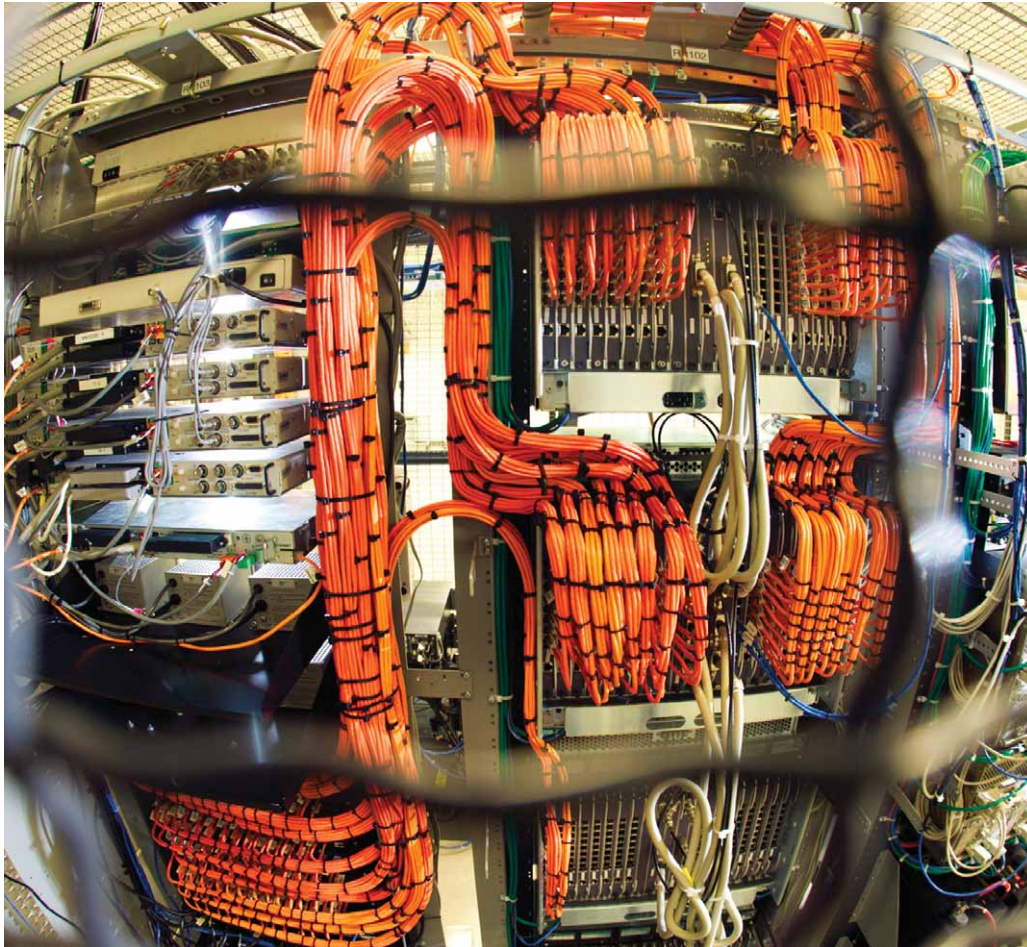
- Heating ventilation and air conditioning (HVAC)
- Plumbing and drainage, including potable water, hot water sanitary sewer and storm water
- Ventilation systems, ductwork, filters and fans including outdoor air and exhaust systems
- Fire protection design, including sprinkler systems and gas flooding systems
- Acoustics engineering, including noise and vibration control and sound attenuation
- Energy utilisation
- Environmental modelling using Computational Fluid Dynamics (CFD) techniques

Electrical Engineering

The Electrical requirements of high technology facilities can be very intense and usually form the platform for success of the business operation. Beca electrical design capability includes specialists in each field to provide internationally benchmarked solutions to the most demanding design brief. Beca can provide design of electrical distribution systems that meet your capacity, reliability and flexibility requirements.

Specific services include the design of:

- Power supply systems, including utility HV supply, substations and site/campus distribution
- Emergency power systems, including generation and power quality control
- Earthing systems, including technical earthing
- Lightning protection
- Lighting system design, including aesthetic and technical aspects
- Uninterruptible power supply systems, including batteries systems
- Communications systems backbones and systems integration
- Security systems, closed circuit cameras, access control and biological recognition systems
- Remote monitoring
- Commissioning management and diagnosis



Civil Engineering

Our civil engineering services can provide integration of the building design with the development of the surrounding site.

Specific services include the design of:

- Geotechnical advice relating to building platforms and site features
- Ground heat transfer advice regarding use of earth as heat source/sink
- Storm water management including sustainable design and landscaping interfaces
- Sewage systems
- Underground services ducting reticulation to meet building services requirements
- Site access roads, parking and grading

Structural Engineering

Beca's structural engineering skills are widely recognised and respected. Our engineers have experience on a vast range of structures from bridges and steel mills to high-rise commercial buildings, hotels and towers, including the Macau Entertainment Centre Tower and Auckland Sky Tower. Beca has the capability to support the architectural team with design of the fundamental backbone of the building structural frame, along with specific and cost efficient details for the intimate structural details required to make your building a success.

Environmentally Sustainable Design (ESD)

Our ESD services team provides skills and capability to carry out analysis and evaluation for building design options.

The ESD team can provide services for:

- Computer analysis and life-cycle modelling of mechanical systems
- Computer analysis of natural and artificial lighting
- Airflow and air distribution modelling
- Green Star or LEED® Certification

Cost Engineering

Beca's cost engineers provide critical input from concept development through to construction, managing a cost target and compiling estimates to assist design decisions. Cost engineers can be involved through the construction period to monitor and provide control of capital expenditure along with payment certification processes.



Australia

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Singapore

