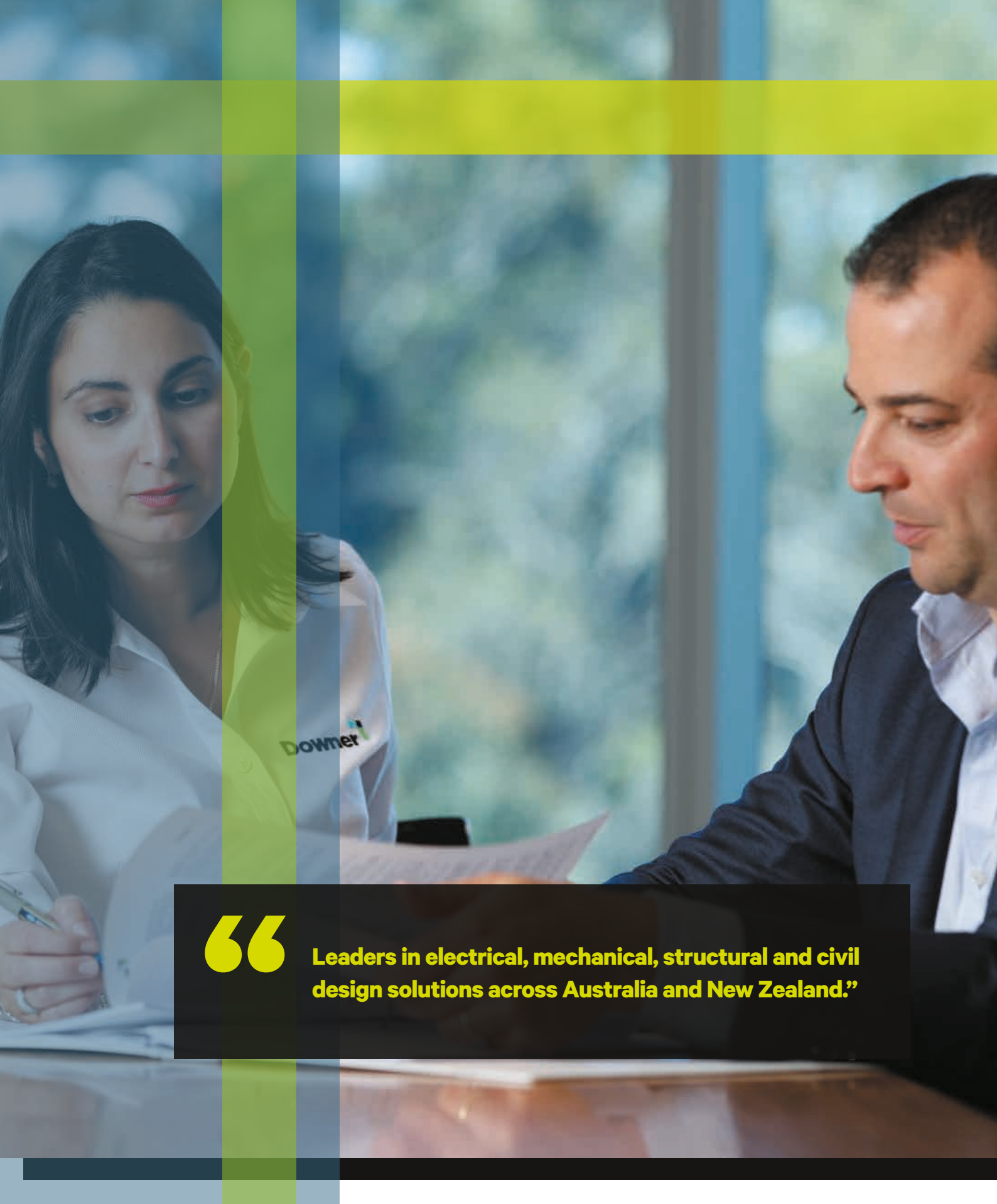




**Your M&E design solutions**

**Downer**  
Relationships creating success

**M&E**  
Design expertise for Infrastructure,  
Industry & Resources  
A Downer Company



“

**Leaders in electrical, mechanical, structural and civil design solutions across Australia and New Zealand.”**

## Delivering superior design solutions

**Whether planning a new project or improving existing facilities and overall plant performance, our design solutions provide customers with a comprehensive range of electrical, mechanical, structural and civil design services.**

With experienced teams located in major regions across Australia and New Zealand, we work with customers operating in a wide range of sectors including: resources; water and waste water; transport; defence manufacturing; power generation; and power transmission.

Our focus on minimising project risks is underpinned by our innovative, cost effective, sustainable and technically proven design solutions that help our customers succeed.

### **Our attention to detail**

**The very first step we take is to listen and understand what success for the project looks like, including the post design implementation for consumers of our engineering outputs.**

We then go out of our way to meet our customers needs ensuring:

- designs are fit-for-purpose, practical to construct, easy to maintain and intuitive to operate;
- design information attends to the differing needs of the constructors and the maintainers of the facilities;

- designs proposed are safe to construct, commission, operate and maintain with the appropriate risk assessment processes being applied; and
- designs are prepared in accordance with the requirements of project budgets and project delivery schedule.

### **Total project solutions**

In addition to professional design services, our fully integrated design and construction capabilities enable us to deliver total project solutions.

**We have successfully delivered numerous turnkey projects ranging from minor plant upgrades to major greenfield and brownfield project installations.**

Our extensive experience in all aspects of Engineering, Procurement and Construction (EPC) project delivery includes project management, design, supply, installation, commissioning and ongoing maintenance and support.

Our project delivery can be executed across a wide range of commercial frameworks, and is supported by our industry-wide reputation for proactively demonstrating alliance principles in fulfilling our contractual obligations.

### **Safety in design**

We have a strong commitment to safety in the delivery of high quality projects. Our engineering design and management systems are fully accredited to AS/NZS 4801:2001 (Occupational Health and Safety) and AS/NZS ISO 9001:2001 (Quality).

These principles are reflected in our Safety in Design processes and procedures and are further supported by our in-house guidelines for the application of relevant risk assessment processes.



## Electrical design services

**Our teams safely and cost effectively deliver a full range of electrical design and engineering services.**

### High voltage and low voltage

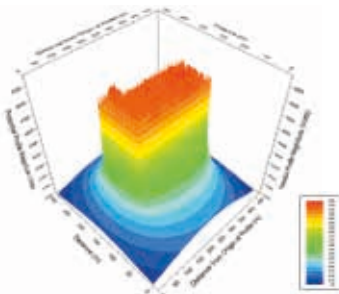
We deliver comprehensive electrical expertise from High Voltage (HV) Systems through to Low Voltage (LV) and Control Systems and Software.

**Our design services include high level system analysis and modelling as well as 'nuts and bolts' construction engineering.**

### General construction and industrial automation

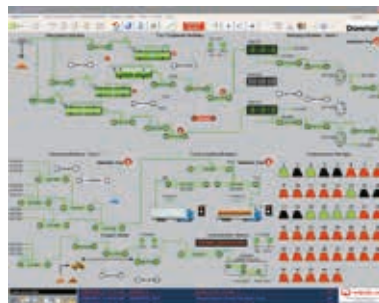
We offer a full range of general electrical design tailored for customer requirements with a focus on safety, constructability and sustainability. Our services include:

- switchboard and motor control centre design;
- instrumentation system design;
- design for variable speed drive and general drive systems; and
- general construction designs (such as cable schedules, cable rack layouts, cable reticulation design).



### Power systems services

- Transmission line and overhead wiring designs
- Substation full primary and secondary system design (indoor and outdoor)
- Contestable works designs for electrical supply authority networks
- Protection design and system modelling
- Earthing system designs and modelling
- Lightning protection design
- Arc flash studies
- Harmonic and power factor correction design and site testing
- Site power quality measurement and assessment
- System testing and commissioning (including protection testing, earth system testing and functional testing of the protection system)



### Control systems services

- Design of the control system architecture for optimal system performance and reliability
- Programmable Logic Controller (PLC) control system design and software
- Supervisory Control and Data Acquisition (SCADA) system design and software
- Telemetry system design and software
- Communications systems and network design and configuration

**We are accredited systems integrators for all major brands of PLC, SCADA and Remote Terminal Unit (RTU) systems such as Schneider, Siemens, Rockwell and GE Fanuc.**

We also have specialist expertise in functional safety systems and the design for hazardous areas.

### Site Support and Commissioning

We deliver complete commissioning services from power systems (protection testing, earthing testing etc.) to control systems testing (automation software commissioning, validation of software functions, ongoing site support). We also support existing site operations through compliance audits, recommendations for upgrade pathways and plant optimisation.



## Mechanical design services

**Our dedicated mechanical design team has experience across a wide range of industries and geographies.**

Our specialist capabilities include:

- condition assessments;
- conceptual and detailed designs;
- mechanical equipment designs;
- equipment specification and selection;
- plant layouts; and
- 3D modelling and drafting.

### Water and waste water

**Our expertise includes the design of large and small water supply, stormwater, irrigation and sewage pumping stations and pipelines, as well as hydraulic analysis, preparation of specifications and commissioning documentation.**

Specialist capabilities include:

- pump station designs - sewage, stormwater, vacuum sewage, water supply, fire system and irrigation;
- pipework layout and support design;
- rising mains and gravity pipeline designs; and
- 3D modelling including 3D scanning.



### Fire protection services

Our in-house specialist capability for the design of fire sprinkler systems (including deluge, drencher and wall wetting systems) and fire hydrant and hose reel systems is well recognised. Our engineers work closely with customers to determine specific hazards and provide a holistic design solution including fire detection methods and specification of any specialist hazard systems such as foam/gas or water mist.

### Ventilation systems

We develop detailed ductwork design for odour control and ventilation systems. The ductwork is modelled in 3D with the system modelled to provide the required flow and air exchange requirements.

### Power generation, oil and gas

Our expertise in thermal power generation and the supply of integrated energy solutions is underpinned by our close working knowledge of the design of heat recovery steam generators/boilers, steam surface condensers, feedwater heaters, deaerators, pressure vessels and piping systems for the power generation and oil and gas industries.

Specialist capabilities include:

- overall plant and component engineering;
- condenser and feedwater heater retrofit/refurbishment design;
- pressure vessels specification and design; and
- plant commissioning and testing.

### Welding

We have significant in-house welding expertise, in particular, welding structures, heavy equipment (for mining and power generation), as well as oil and gas pressure vessels and piping. We assist customers in the selection of suitable processes, preparation of weld procedures, welder qualifications and quality assurance aspects.

Specialised capabilities include:

- chrome-molly materials including P15E(P91);
- quench and tempered materials used in high/low temperature and pressure application; and
- carbon steel and stainless steel material for application in low and high temperature.





### **Materials handling systems**

**We are recognised worldwide for our expertise in delivering the design of a large number of coal projects ranging from 5,500 t/h coal handling preparation plants to smaller scale 400 t/h plants and upgrades.**

Specialised capabilities include:

- ROM dump hoppers and slot bunkers;
- primary crushers and feeders;
- secondary and tertiary sizers and rotary breakers;
- surge bins;
- conveyors design including dynamic analysis and flow modelling;
- stacking and reclaim systems;
- train loading systems;
- blending and handling strategies;
- variability modelling to determine optimum stockpile sizes and configurations; and
- sampling and application engineering for on line analysers.





Moolarben, Australia, 2017





## Civil and structural design services

**Leading the way in civil and structural design services.**

Our expertise covers a wide range of applications including the design of steel, concrete, timber and masonry structures, footings, retaining walls, tunnels, earthworks and drainage structures.

Specialist capabilities include:

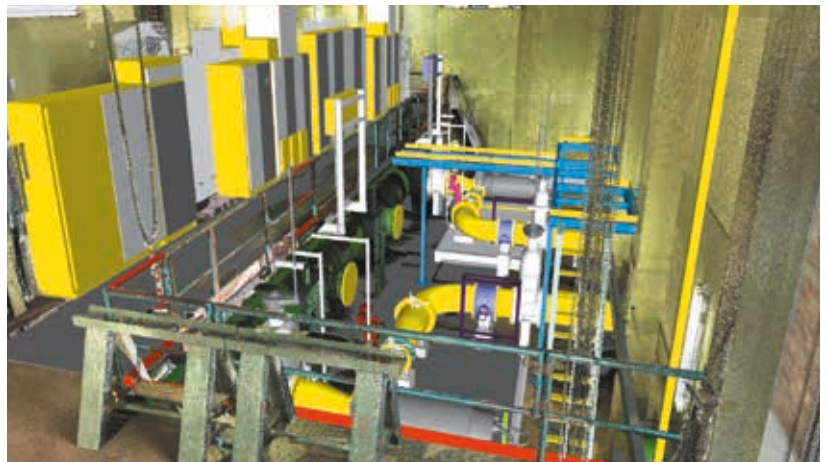
- finite element analysis;
- mobile structures and yard machinery;
- precast concrete solutions;
- lift studies;
- vibrating structure analysis;
- materials handling infrastructure;
- bin and hopper analysis;
- structural integrity and safety audits;

- third party design audits;
- structural repair design; and
- temporary structures.

### 3D site survey and modelling

We use the latest 3D laser scanning technology to provide detailed 3D cloud models that can be used for clash detection, as-built drawing verification and Building Information Modelling (BIM) of existing infrastructure. Additionally, we can integrate 3D laser scans with Map Grid of Australia (MGA) coordinates for spatially accurate surveys.

**The use of this technology for brownfield sites has been shown to provide significant cost savings and a reduced construction risk.**



3D Design - Pumping Station

## Health, safety, and environmental sustainability



**Zero Harm is embedded in our culture and is fundamental to our future success. We are committed to achieving our goal of Zero Harm.**

At Downer, Zero Harm means sustaining a work environment that supports the health and safety of our people, and conducting our operations in a manner that is environmentally responsible and sustainable.

Our Zero Harm culture is built on leading and inspiring, verifying the effective management of risks that have the potential to cause serious harm, rethinking processes, continuously improving our management systems, applying lessons learnt, and adopting and adapting practices that aim to achieve zero work-related injuries and environmental incidents. The feedback we received through our annual employee engagement survey continues to confirm the existence of a strong, inclusive Zero Harm culture within our organisation.

Our approach to Zero Harm and associated performance is a market differentiator for Downer as it enables us to work safely and environmentally responsibly in industry sectors where there are inherent hazardous environments. We firmly believe that any injury or environmental incident is unacceptable and preventable. In everything we do, Zero Harm is always our top priority.

Developing environmentally sustainable solutions for our customers is also a focus for Downer.

Our customers often look to us to deliver best-practice solutions.

**We recognise that working on critical infrastructure is like no other project. This is why our passionate safety culture, refined project management processes and collaborative approach help us deliver services while maintaining the primary focus of Zero Harm.**

Our managers actively empower our people to maintain safe working environments. Achieving Zero Harm requires strong leadership and relentless commitment through:

- **Leadership:** we listen, set clear expectations, develop and involve our people, actively care, and act with integrity;
- **Culture:** we have an aligned set of values throughout our organisation. Our people at all levels are actively involved and accountable;
- **Systems:** our approach is simple, effective, robust and consistent across our business;
- **Hazards:** with a priority focus on critical risks, our hazards are identified, assessed, controlled, monitored, and effectiveness confirmed; and

- **Actions:** we learn from our experiences, and do what we say we will do, translating Zero Harm theory into good work practices.

Each Downer division has in place a Zero Harm management system, certified as a minimum to occupational health and safety management standard AS/NZS 4801 or BS OHSAS 18001, and the international environmental management system standard ISO 14001. We also adhere to other third-party standards and guidelines, as well as customer specific requirements, on a project-by-project basis and ensure that we meet all applicable licence and regulatory conditions. Each management system is reviewed regularly, undergoing internal and external audit to ensure that effective controls are maintained and opportunities for continuous improvement are identified.

We have placed a strong governance charter on Zero Harm to ensure the strategy and performance is developed, monitored and refined. Our Executive Management Team ensures that we have the mandate, systems and processes in place to assist our people to deliver a Zero Harm environment.





## **Our Promise**

To work closely with customers to help them succeed, using world-leading insights and solutions.



[www.downergroup.com](http://www.downergroup.com)  
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