



TTW

ENGINEERING SOLUTIONS

Your Partner in Engineering

EXPLORE

OUR PEOPLE

Dick Taylor said it best when he said "Our work is only as good as the minds behind it"...

OUR WAY

The TTW Way has guided us to success for over 60 years forms the foundation of our culture

SUSTAINABILITY

Designing for the future is a way of life at TTW where we embrace our responsibility to embed sustainability

STRUCTURAL ENGINEERING

Structural engineering is where it started for TTW and our name is synonymous with quality and innovation

CIVIL ENGINEERING

Our civil team has a strong reputation for pragmatic advice and creative solutions

TRAFFIC ENGINEERING

Our traffic team are more than analysts - they study behaviors and provide insightful solutions

FAÇADE ENGINEERING

The award winning TTW façade team works in collaboration with our other departments to add-value

CONSTRUCTION ENGINEERING

Our construction engineers bring the structural vision to life with invaluable temporary solutions

APPLIED SCIENCE + ENGINEERING

Our Applied Science and Engineering team uses and develops the most advanced analytical tools available

DIGITAL ENGINEERING

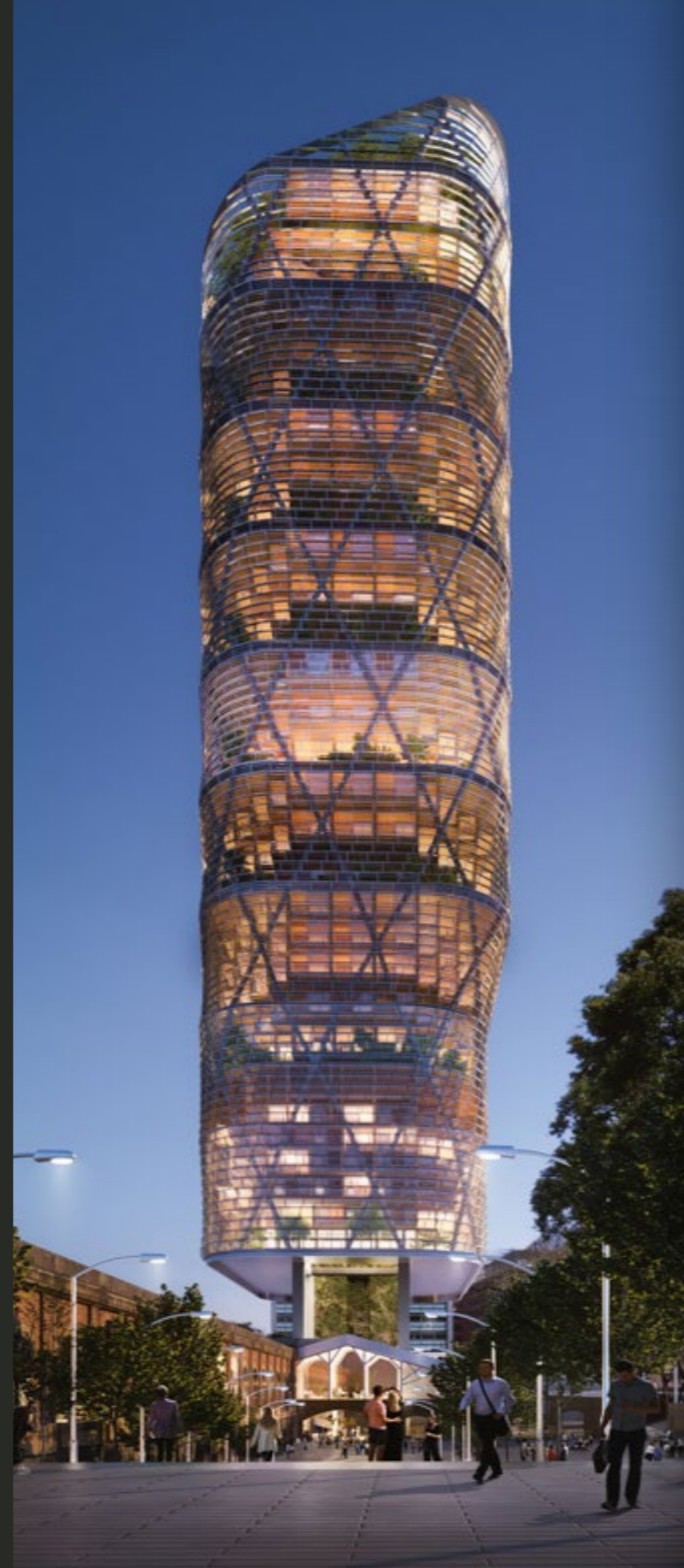
Our digital team uses advanced technology to improve and streamline project outcomes

PHYSICAL SECURITY

Some facilities require more protection than others and TTW is able integrate these features into our designs

HERITAGE ENGINEERING

Our heritage engineering are renown across Australia for providing invaluable advice and practical solutions.



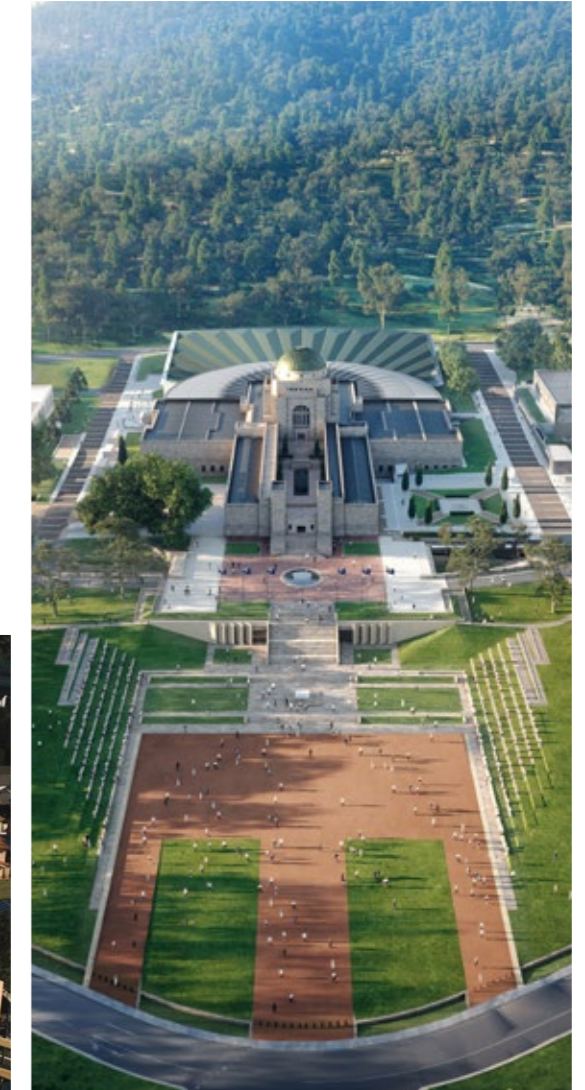
OUR STORY

As **award-winning consulting engineers**, for over 65 years we've partnered with architects, developers, builders and project managers to tackle the **most complex projects** and engineer their vision.

Focusing on our clients goals, we have a proven ability to produce innovative, economical and elegant designs in the public and private sector. Our solutions are enhanced by our personal approach and integrated teams, utilising our technical expertise to find the best outcomes for our client whilst employing advanced engineering techniques for modern materials.

As a privately-owned company working not only in Australia, but internationally, with offices in Jakarta and Singapore, we offer the benefits of scale with disciplines successfully delivering significant projects through structural, civil, traffic, façade, and construction engineering services.

We believe the value and experience that TTW can bring to a project can significantly improve the outcomes for the project from a design, development, construction and operational perspective.



Australian War Memorial \ Canberra ACT

A TECHNICAL AND HOLISTIC APPROACH

Our engineers welcome the challenge of realising visionary and sustainable design into efficient, elegant and functional solutions.

We adopt a highly collaborative approach with the project team to ensure our designs are of the utmost integrity whilst developing a comprehensive understanding of project requirements.

TTW is committed to developing and investing in the most advanced and innovative technologies available. Through our combined creativity, experience and innovation with modern engineering techniques and materials we develop solutions that achieve aesthetics, practicality and sustainability goals.

Together, our teams deliver improved project efficiencies, cost reduction and risk-mitigation, plus wider design freedom to bring our client's vision to life.



OUR WAY

What sets TTW apart is the integrity of our people combined with our small-business culture, no matter how much we've grown over the last 65 years.

We champion diversity and new ideas,

encouraging our engineers to continually think outside the square – to attack challenges head-on with ingenuity and seek clever ways to deliver solutions.

Our founding partner Dick Taylor began the tradition in 1958 of working closely with architects, project managers and builders to deliver high quality designs for the built environment.

The traditions that Dick brought to our organisation still hold strong today with the business continuing successfully in his footsteps. Our business continues to push innovation in new materials and technologies. We continue to place a high importance on the development of our staff and recruiting the best local and international talent to be part of our business.

Below \ Founding partners Dick Taylor, Alan Whitting, Jock Thomson, Denis Pearson and Geoff Markham.



WHAT COLLABORATION MEANS TO US

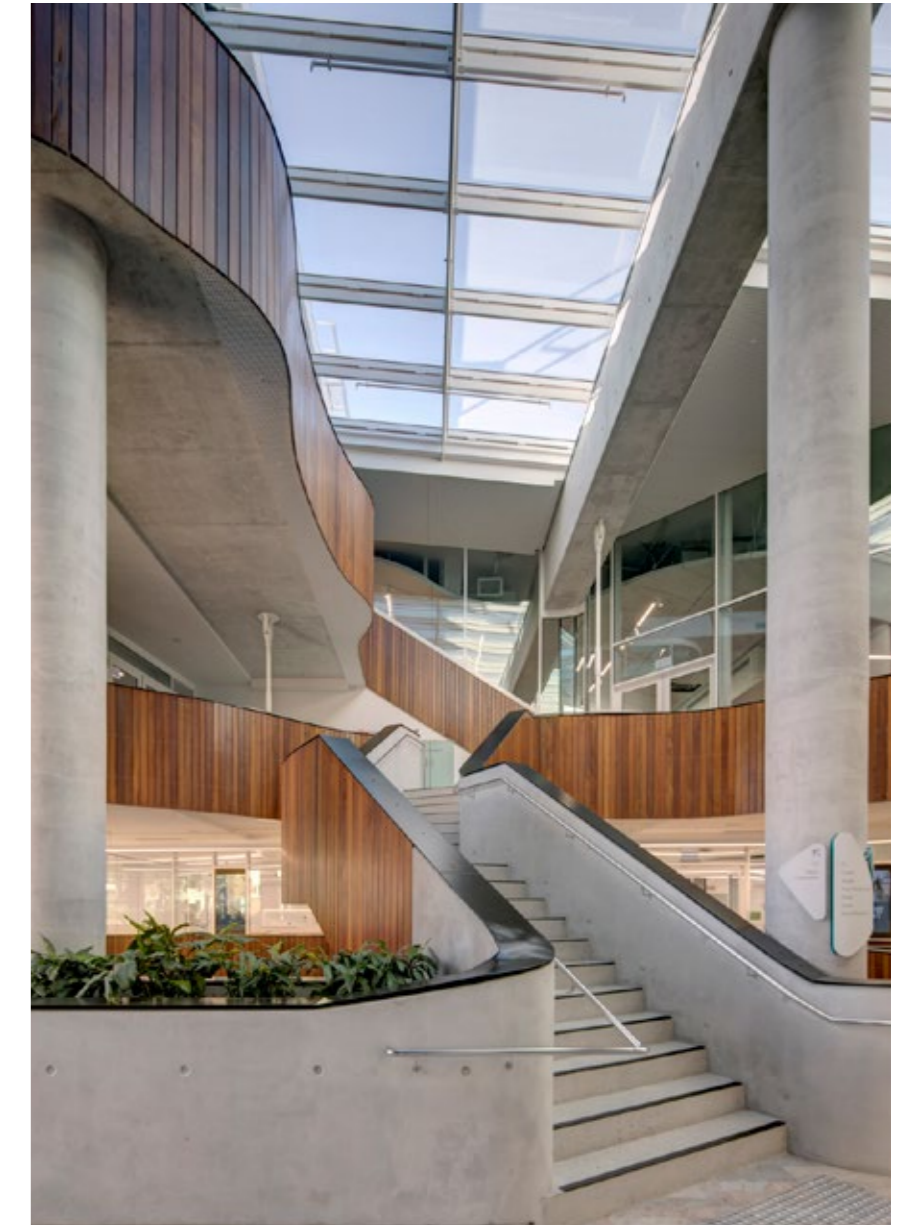
As a business, we strive to find the balance between successful outcomes for our clients and creating a working environment that attracts the best people.

Working collaboratively is a foundation of the TTW Way and it is the embodiment of our multi-disciplinary approach. It allows us to blend all our capabilities and skillsets in a innovative environment, with the goal of achieving best outcomes for our clients.

In order to achieve integrated solutions to our projects, our approach to project management is based on four principles of consultation, collaboration, integration and innovation.

To meet the evolving needs of clients, employees and the environment, TTW adopts a holistic approach to all projects. By involving our in-house specialties early in the project lifecycle, we are able to mitigate any ripple-down impacts and use their knowledge to created innovative solutions.

Wenona STEM Centre and Sporting Facility \ World-class multilevel building designed to seamlessly link to existing structures



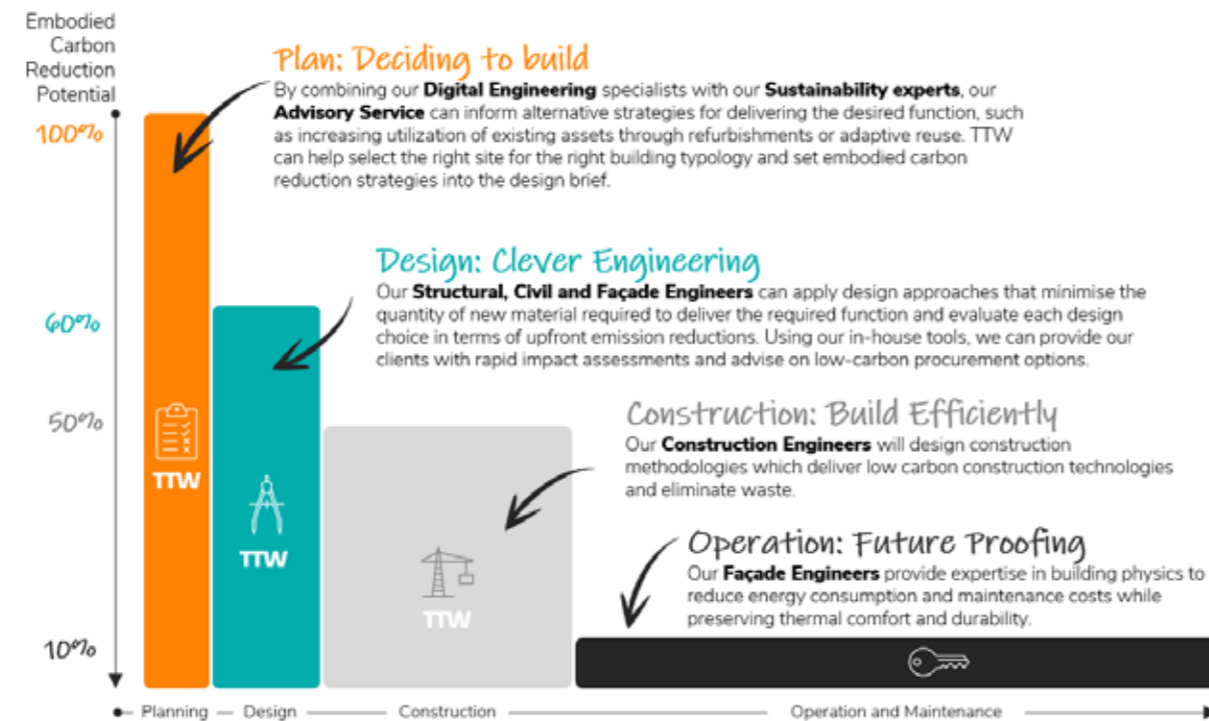
SUSTAINABILITY

We acknowledge the increasing importance of sustainable design and the need to provide support and industry leadership, so we are on a journey - embedding sustainability across all decisions throughout our business.

With a global push towards decarbonisation, the increased requirements from Government legislation, organisational goals and environmental initiatives will require a significant reduction in the embodied carbon in the built form. This creates an opportunity for designers to innovate and provide data-driven solutions to the global problem.

Without an industry standard to measure embodied carbon, TTW sees this as an opportunity to make a positive environmental impact by advising clients with strategies to reach their carbon reduction goals across the lifecycle of a project.

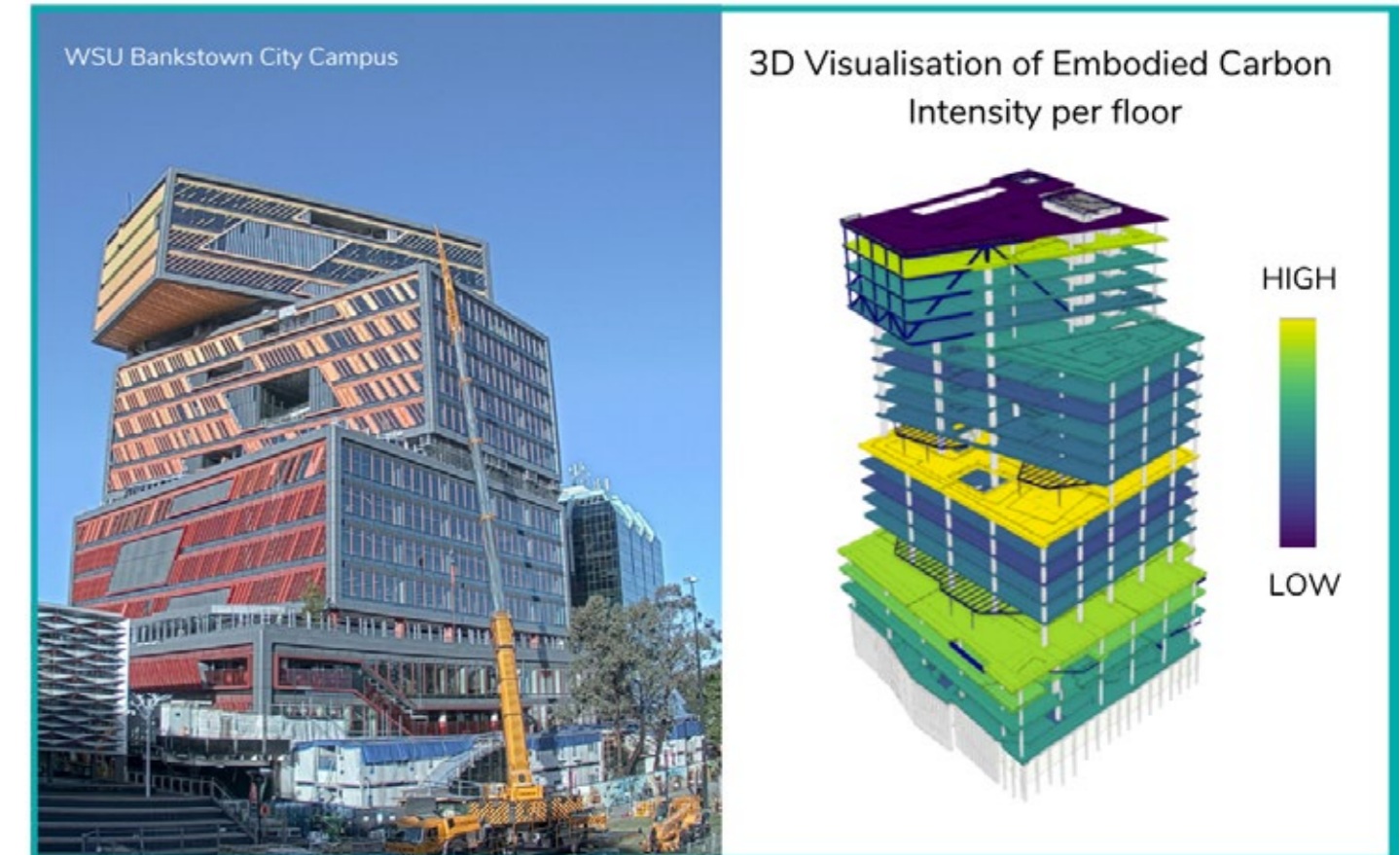
How our embodied carbon expertise benefits you throughout the project lifecycle.



We can rapidly visualise construction related emissions throughout the lifecycle of your project and proactively address your carbon reduction challenges.

Our Sustainability and Digital engineering teams have developed an in-house Embodied Carbon Calculator that allows our engineers to calculate, compare, benchmark and visualise the embodied carbon emissions on your project.

Our calculator takes BIM data to visualise A1-A3 embodied carbon data so our engineers can customise material properties, such as concrete strengths and reinforcement rates, along with the specification of different products. Design teams can then utilise our data and visualisations to collaborate with all stakeholders and consultants and identify at inception phase, cost-effective strategies for reducing embodied carbon emissions.



STRUCTURAL ENGINEERING

Our Structural Engineers strive to provide **efficient, elegant and functional** solutions.

Our design process is personalised for every project and we use our wealth of knowledge to help find cost-efficient solutions to solve complex problems.

The structural team's ability to deliver meaningful designs is underpinned by the hands on service and technical approach lead by our senior management.

Our clients vary from Governments, Developers, Builders, Architects, Project Managers and Manufacturers. Whilst every project is unique, we deliver consistency through a common set of successful principles.

We embrace technology and have a commitment to innovation which allows us to deliver on design commitments while improving project outcomes, reducing the risk on-site and streamline delivery by assisting builders with construction challenges.

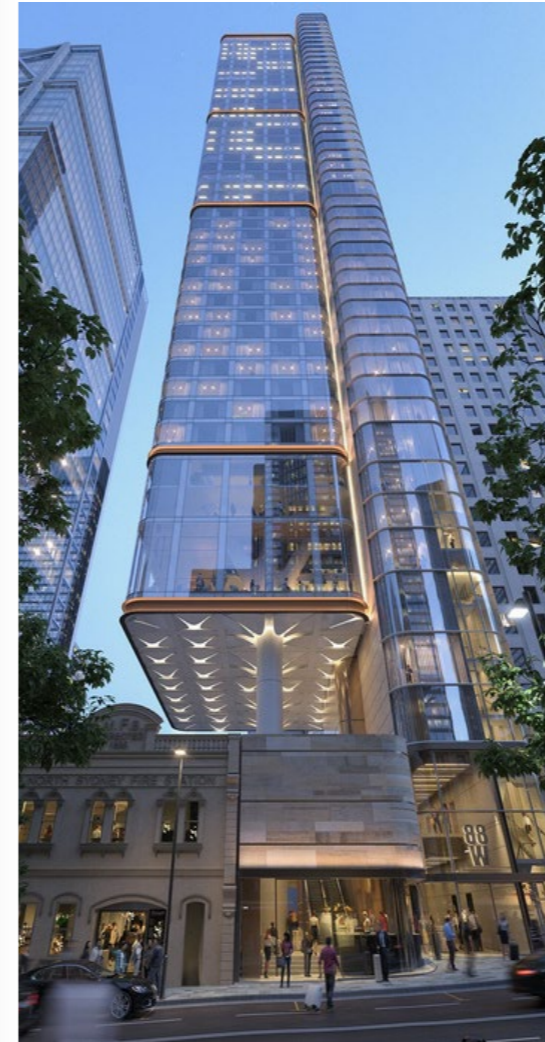
We have earned a reputation for smart and practical engineering design that balances the asset owner's expectations with strategies for contractor success.

Left: Canberra Hospital Expansion \ \$500M state-of-the-art emergency, surgical and critical healthcare facility.

Right: The Jakarta National Mosque \ A circular mosque with 70-meter diameter twisted dome.



Australian War Memorial New Southern Entrance \ Underground education and exhibition facilities including glass oculus. Photo by Thurston Empson.



88 Walker \ A stunning Hotel and Commercial side-core skyscraper occupying air space above Sydney's heritage Firehouse Hotel



Iglu Russell Street \ A 28-storey student accommodation building in the heart of Melbourne. Photography by Kane Multimedia.

Discipline Expertise

We can provide the following structural engineering expertise:

High Rise and Long Span Structures

Structural Dynamics and Occupant Perception

Advanced Structural Simulation

Building Materials Selection & Carbon Analysis

Wind and Seismic Engineering

Shallow Tunnelling and Deep Basement Design

Adaptive Reuse and Asset Redevelopment

Performance Based Solutions

Design for Manufacture and Assembly

Temporary Structures

Forensic Engineering

CIVIL ENGINEERING

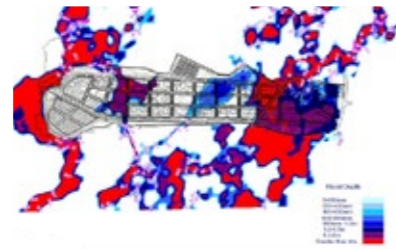
Our Civil team finds **pragmatic solutions** that have the balance of the innovative, economic requirements and statutory compliance that will solve almost any construction problem.

We provide civil engineering services from feasibility through planning, design and construction - with ongoing management and advice where requested for the operating life of a project. With a focus on our client's objectives, our in-depth knowledge and guidance of approval processes ensures that project goals are met.

We advise our clients on the designs and investment of efficient systems and infrastructure for their needs.

SPECIALTY Flood Management

We integrate Flood Management Solutions into our civil designs to guide the built form of a development. Utilising leading technology and software combined terrain mapping, we simulate flood extents and consequences scenarios for our clients.



Bowen Place Crossing, ACT \ Award-winning pedestrian and cyclist crossing

Campbell's Stores & Campbell's Promenade \ Transformation of prominent heritage site with complex design requirements and archaeological significance. Photo by Timothy Kaye



New Maitland Hospital Development \ A substantial civil works package was required to ensure site access, roads and parking and drainage from the site.

Discipline Expertise

We can provide the following civil engineering expertise:

Master Planning

Flood Management

Pavement Design and Geometric Layout

Urban Drainage Design

Residential and Industrial Subdivision Design

Modelling and Stormwater Catchments

Arterial Road and Pavement Designs

Major Sector Development Design

Streetscape Design and Documentation

TRAFFIC ENGINEERING

Our Traffic team **investigate options** which involve design work to ensure the most optimum and practical outcomes.

Our expert engineers work closely with new and established clients to develop plans for managing traffic and mitigating disruption during on site works, with an aim to minimise risk, delays, and inconvenience to users.

Working on a diverse range of technical and complex projects, our team is utilising the latest technologies and implement smart traffic methodologies to find the best design outcomes and cost efficiencies. Our engineers are also focused on identifying and developing strategies to improve usage of sustainable and healthy travel modes.

Lakeside Joondalup \ Detailed master planning was required to accommodate over 5,000 car spaces, a multi-deck car park and access to a major train line at one of Perth's largest shopping centres



Smalls Road Public School \ Establishment of a Holistic School Transport Plan with SINSW, creating a framework for continual transport improvements



The Canopy, Lane Cove \ TTW provided structural, civil and traffic services for the Canopy in Lane Cove, NSW. This project replaced an existing car park with a new village green, playground, restaurant precinct

Discipline Expertise

We bring creativity and innovation to projects from planning through to design and implementation, offering but not limited to supporting our clients with traffic engineering services:

Traffic Impact Assessments

Intersection Modelling

Road Safety Audits

Design Advice

Construction Traffic Management Plans

Sustainable Transport Plans



Our Façade team excels at delivering **award-winning**, robust, light-weight façades that bring to life the public face of a building.

Translating the architectural design intent, integrating the local surroundings, as well as the building's functions, is a first step from architectural expression to a realised façade.

We understand that the façade's core purpose is to keep the building and its user warm, cool, dry and safe while retaining natural light and views. Our engineers strive to incorporate all of these competing elements while ensuring that the design is structurally sound and holds long-term sustainability.

With in-depth technical experience, we are able to support our client's goals by improving the overall efficiency of a structure through innovative and progressive engineering solutions and documentation.

Bunjil Place \ Award-winning complex timber gridshell, the first of its kind seen in Australia



Polaris \ The unique crystalline Façade provides maximum sunlight and clear sightlines in a distinctive envelope canopy

UNSW Material Science and Engineering Building \ 9-storey building enveloped by a high performance glass Façade with glass reinforced concrete masonry blades to provides solar shading

Barwa, Qatar \ A glass and travertine stone façade, where the glass is protected from the high heat exposure by metal screening inspired by the traditions of the precinct.



Discipline Expertise

We can provide the following façade engineering expertise:

Structural Performance

Thermal Performance

Sustainability and Durability

Optimisation and Rationalisation

Complex Geometry

Development and Testing

Preservation/Conservation

Physical Security

Weatherproofing

Façade Detailing

Façade Development and Testing

Cost and Value Engineering

CONSTRUCTION ENGINEERING

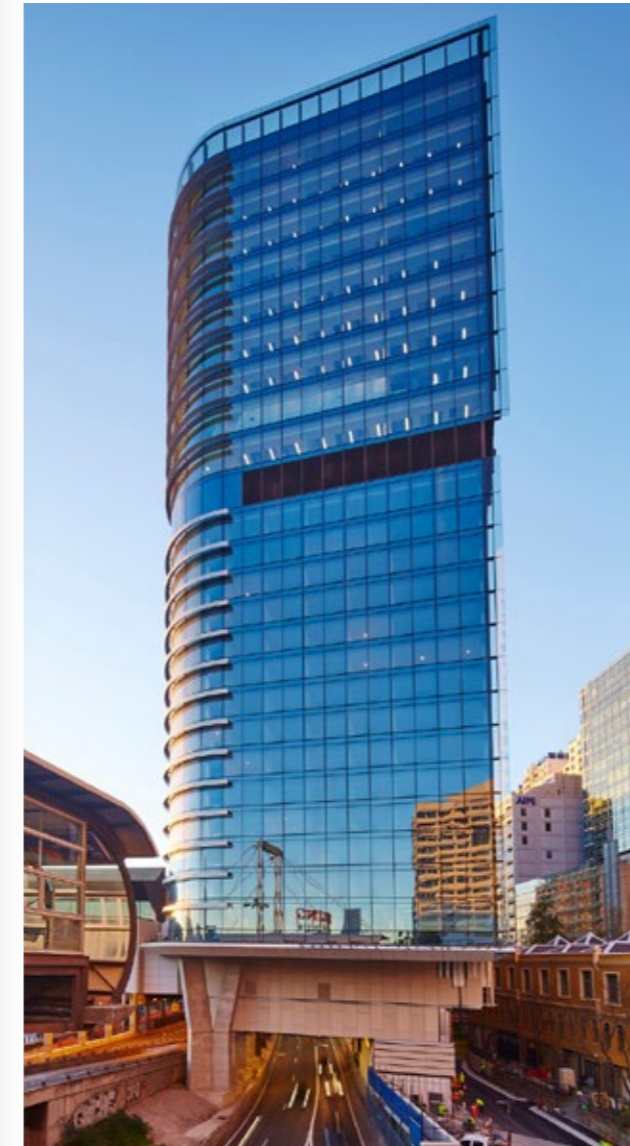


We are specialists in developing **construction methodologies**, where we balance an understanding of the supply chain, critical path, the design process and the critical aspects of the completed project.

We work closely with our clients to understand and breakdown the engineering constraints of the project, and maximise opportunities to improve efficiency in project delivery, cost and reducing risk through sound engineering practices.

Our team understands the importance of risk reduction during construction and deconstruction design works and we ensure that our documentation is clear in outlining any risks to the project team.

Shell House \ Shell House is one of the tallest retained heritage façades in the world and the temporary works one of the most complex projects of its kind



Hyatt Regency Hotel \ Situated over the Western Distributor motorway, the success of this project relied on close collaboration to ensure constructibility of design within a highly constrained environment



Greenwood Hotel \ Temporary works to support the preservation of the historic Greenwood Hotel during the construction of Sydney's Greenwood Plaza

Discipline Expertise

We can provide the following construction engineering expertise::

Construction Methodology Development

Temporary Works Planning and Design

Façade Retention

Basement Retention

3D and 4D Simulation of Construction Staging

Deconstruction and Demolition Analysis + Design

Equipment Analysis and Design

Structural Assessment and Repair

Added-value with Integrated Heritage Expertise

APPLIED SCIENCE AND ENGINEERING

Our specialist Applied Science and Engineering team use the most advanced analytical tools available to **solve complex engineering** problems.

Engineering is an industry which is inherently innovative - however it is also an industry that depends on certainty. In order to allow our engineers to come up with innovative solutions, we need to be able to provide certainty that the solutions will work in a variety of conditions.

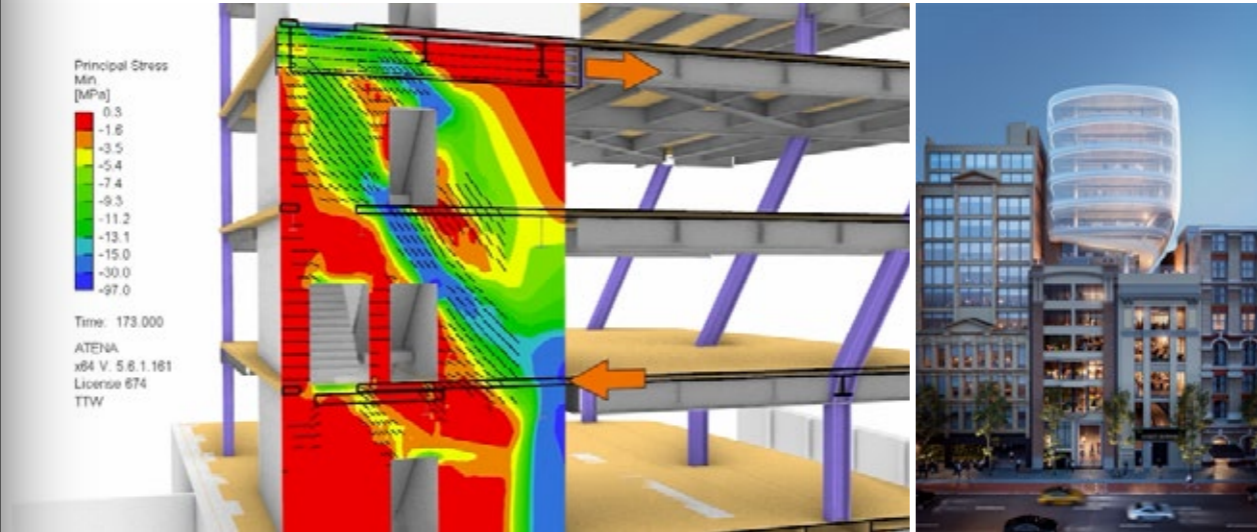
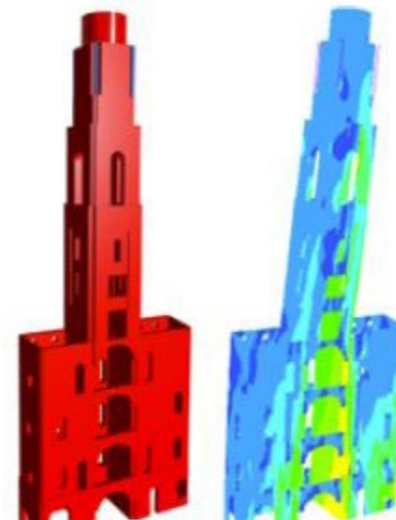
This is where our Applied Science and Engineering team comes into play. They work alongside our TTW project teams to develop, optimise and evaluate complex engineering solutions.

Using a range of high-end software and methodology developed in-house they examine our clients' challenges and develop high performance engineering solutions.

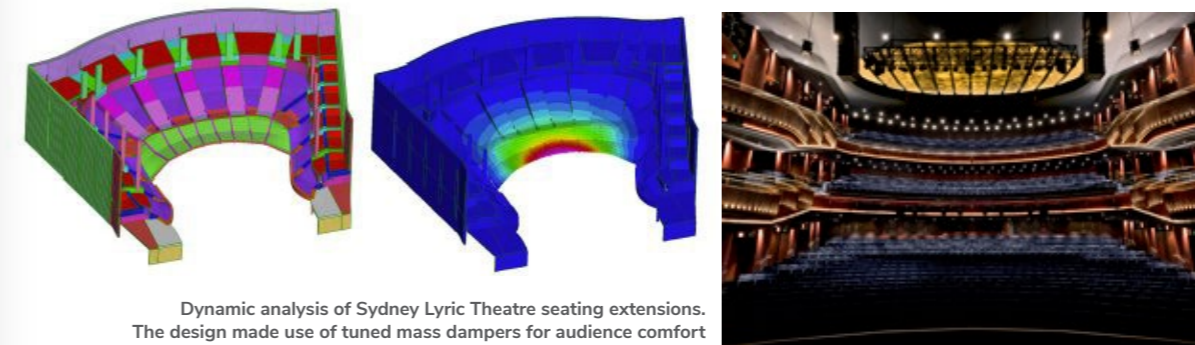
Our team spearheads our extensive research and development initiatives across the business and works with design standards and legislative groups to ensure that our industry is in line with international best practice.



Seismic analysis of Department of Lands Building and clocktower



Shear Capacity \ In-plane shear capacity of reinforced concrete shear walls with openings carrying horizontal transfer forces from raking columns, including concrete strut loads paths, reinforcement stress and full collapse load capacity



Dynamic analysis of Sydney Lyric Theatre seating extensions. The design made use of tuned mass dampers for audience comfort

Discipline Expertise

We are an experienced team of engineers and analysts in the fields of Finite Element Analysis (FEA), vibration and dynamics, and advanced materials modeling. We bring expertise in a range of key areas of analysis-led design, multiphysics and structural simulation, including the following:

Seismic Performance and Retrofit

Advanced Structural Analysis

Thermal and Fire

Ground-Structure Interaction

Structural Stability and Robustness

Fatigue Analysis and Design

Vibration and Dynamics Analysis

Concrete Behavior and Research

Forensic Engineering

Impact and Blast

DIGITAL ENGINEERING

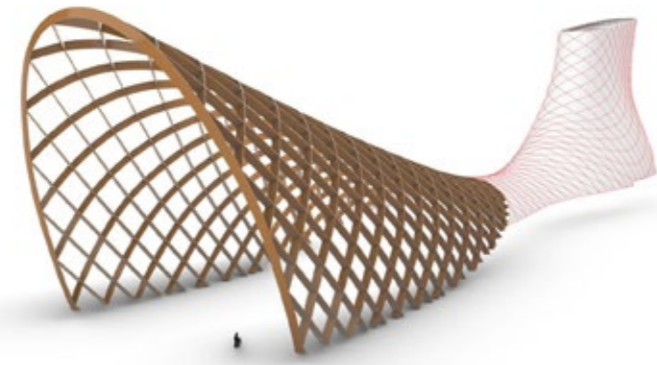
Digital engineering allows our engineers to **explore possibilities** and develop innovative solutions in a **cost-effective virtual environment**.

Our engineers are industry leaders in integrating technology into design solutions and work closely with clients, architects, and contractors to make their most ambitious designs a reality.

Working alongside our engineers, our digital team identifies opportunities where technology can be applied to provide clients with improved project efficiencies, cost reductions, risk-mitigations and delivery outcomes.

By integrating digital solutions from the beginning of a project, we are able to actively promote innovation by allowing engineers to push the boundaries of design, materials and applications in a risk-free environment.

Because of our overarching integrated approach across our core disciplines, all our clients can benefit from our digital expertise and access the positive outcomes they provide.



Westgate Tunnel \ A landmark timber gridshell over freeway tunnel portal celebrating Aboriginal heritage and culture.



Wynyard Walk \ Sydney's revolutionary urban link, connecting Wynyard - Sydney CBD - Barangaroo



FOCUS CBD Planning Platform

Our **TTW CBD Planning Platform** identifies sites or amalgamation of sites with high commercial viability. The tool uses large amounts of data and applies local development controls to generate potential building envelopes. This functionality is used to identify multiple site configurations that benefit from changes in planning controls or that fulfill parameters relevant to the client.

Once a building envelope is selected, our platform is capable of generating initial layout of commercial buildings for feasibility studies.

This layout is coupled to our core optimiser, which size walls and other structural elements while aiming to maximise the building's NLA and structural efficiency. Finally, an automated report is created detailing the findings of the study.

Discipline Expertise

Our digital team applies our expertise to find solutions to well defined problems with a focus on reducing repetitive tasks. They optimise problems, work in large scale and deliver deployable solutions covering:

Workflow Interoperability

Optimisation

Complex Geometry

Design for Manufacturing and Assembly

Product Development

Planning and Land Acquisition

Carbon and Sustainability Accounting

Structural Dynamics

Algorithm Design

PHYSICAL SECURITY ENGINEERING

Our engineers hold significant experience with **protective design** and **perimeter defence**.

With our sophisticated analysis tools and techniques, we provide practical solutions to building protection.

We are able to provide advice, design and specification services for new and existing buildings, so that they can be enhanced to mitigate the effects of intruders, vehicles, ballistics and explosions.

The involvement of security specialist at the planning stage of projects mean that areas like building setback, orientation can be incorporated into the architectural design. These features can be project critical and are more challenging to implement at later stages.

Working with both government and non-government clients, we have the expertise to advise on material selection for optimal resistance, the design and specification of active and passive barrier systems, intruder resistant facades and walls, as well as anti-climb perimeters.

Australian Embassy, Bangkok \ Driven by stringent physical security requirements, TTW used in-house Air3D blast modeling, to design blast-resistant façade, walls, doors and windows



Discipline Expertise

Some of these area's TTW can provide guidance include:

Building Site Setbacks and Orientation

Perimeter and Control Barriers

Hostile Vehicle Mitigation

Building Material Advice

Hardening of Façade Elements

Structural Damage Assessment for Defined Threats

HERITAGE ENGINEERING

We are skilled in the **protective care, conservation and adaptive re-use** of heritage buildings and structures.

Our specialist engineers provide strategic advice to our clients to ensure the right balance between conservation of heritage materials, structure and functionality, whilst employing the latest technology.

We work with high performance materials to increase longevity and lower maintenance costs.

Integrating our Heritage and Advanced teams, we are able to produce designs which comply with the requirements of the latest building codes whilst remaining complementary to the historical nature of a structure often eliminating the need for extensive strengthening works.



50 Martin Place \ This iconic building showcases innovation and creativity in engineering solutions, and is considered a masterpiece of sustainable innovation with its maximum Green Star rating



Hyde Park Barracks \ Engineering a lift into a UNESCO World Heritage-listed building



Discipline Expertise

We can provide the following heritage engineering expertise:

Historical Materials

Construction Methods

Engineering Conservation

Reuse and Adaptation of Existing Structures

Structural and Façade Diagnostics and Repair

Performance Solutions

BRISBANE
CANBERRA
JAKARTA
MELBOURNE
SINGAPORE
SYDNEY

TTW

