

# THE MOST ADVANCED SUBSTRUCTURE DESIGNS AVAILABLE IN AUSTRALIA

Building on nearly 60 years of Structural Engineering excellence, we deliver the very best Substructure Designs in Australia. Our techniques were presented as 2019 Engineers Australia and Concrete Institute of Australia Masterclasses and are recognized as state-of-the-art. Our substructures feature in over 20 completed projects in Western Australia.

## FASTER—CHEAPER—AVAILABLE SOONER

### Accelerated project completion dates

Our top-down construction designs enable above and below ground construction simultaneously, delivering projects consistently earlier than conventional building techniques - ready for tenancy, sale and trade.

### Reduced overall project costs

With substantial reduction in material use and formwork over conventional methods, we deliver great capital savings alongside substantial reductions in holding costs. These savings have made projects viable to construct by meeting overall finance caps.

## CASE STUDY 1

### SKYE ONE SEVEN APARTMENTS, EAST PERTH (2019)

Advanced Substructures was asked to redesign the substructures for this luxury 7 storey apartment building with 2 basement levels. Using top-down construction with a first-time build team, the project achieved **time savings of 15 weeks** on the projected build time (from an anticipated 60 to 75 weeks) and **structural cost savings of \$720,000** (on a built cost of \$13.6 million). Larger footprint projects give even larger advantages.



## CASE STUDY 2

### COCKBURN CENTRAL SHOPPING CITY STAGE 3, SUCCESS (2016)

Our evolution of top-down construction delivered **total cost savings of \$26 million** over traditional construction methods, a major reason for the authorisation of construction by the client. Advanced Substructures' pioneering design delivered the overall project to tenancy **4 months faster than anticipated**, enabling Christmas Trading at the expanded Shopping Centre. This project was the winner of the Master Builder's Excellence in Construction National Award for Best Commercial Centre under \$100 million in 2017.



## TESTIMONIAL

### Cockburn Gateway Shopping City Stage 3 project

"Successful, in a word. It saved us probably 4 months in construction time hence that turned into several million dollars worth of savings, so that was very successful. The client was very happy."

**Ken Musto, Partner, Buchan Group**

## ELIMINATING THE DETAIL DESIGN GAP

"Specialist to detail" is the instruction on many Structural plans for the most critical elements of substructures including piling, joints, waterproofing, and post-tensioned concrete design. The detail gap is often unknown to clients and is often left to the builder to resolve, and is one of the primary causes of basement and foundation failure in the construction industry.

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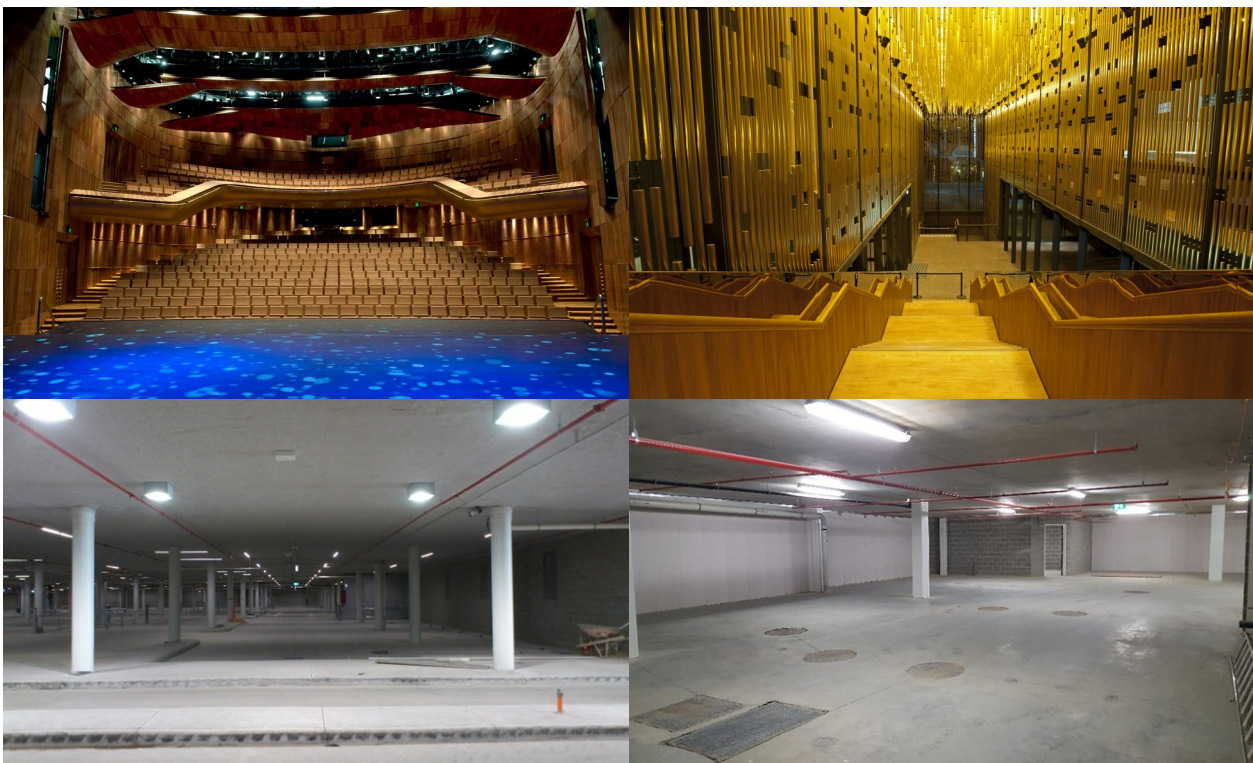
Airey Taylor Consulting provide the detailed Engineering design of all critical elements and their interface. Our designs are fully documented to a level that builders and subcontractors can build directly from our plans with confidence. Builders using our techniques for the first time have achieved National Excellence in Construction Awards on these projects.

## CREATING BIGGER AND BETTER SPACES

**Maximised use of available space** – our substructures can be built right up to the underground boundary creating optimum use of the available space, without intrusion above or below ground on neighbouring properties.

**Innovative building potential** – our system creates spaces suitable for purposes ranging from shops and cafes, sports and entertainment or other commercial purposes – making unique buildings that are highly attractive to clients, such as the State Theatre Centre of WA, winner of Best Engineering Project in Australia in the year of completion (below).

**Narrow and efficient internal columns** — our Patented Piles to Pillars system achieves perfectly straight, narrow steel columns with full sized piles continuing to extend beneath the bottom slab. They maximise the usable space while providing full structural support for both substructures and superstructures. We consistently achieve full load bearing pillars that are only 300 – 400 millimetres thick that are optimised for fire protection without cladding (bottom).





## MINIMISING CONSTRUCTION RISK

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**Provide best-in-class function for wet sites** – Our designs minimise dampness and water ingress risks. Our system uses unique joint design and material knowledge to create best in class waterproofing even far below the water table. This is achieved without the use of a vapour barrier or a waterproofing membrane.

**Elimination of anchoring, propping, and sheet piling** — our system removes the requirement for disruptive and costly measures that damage neighbouring properties.

**Minimised construction footprint** – all substructure work can occur within the footprint of the building and under a concrete cover. This further eliminates vibrations and reduces traffic, dust, noise and other disturbances during the creation of your project.

**Substructure use in sensitive locations** – with a proven track record of delivering on sites co-located with Heritage buildings, we enable you to use innovative and effective designs others deem “unbuildable” or risk laden. Substructure creation becomes possible in crowded urban locations without danger to surrounding buildings, roads and accessways.

### **CASE STUDY 3 - MAKING THE IMPOSSIBLE POSSIBLE CHURCH HOUSE, PIER STREET, PERTH (2017)**

Airey Taylor Consulting were asked to redesign these substructures after contractors indicated the project was unable to be completed safely. The two and a half levels of basement were to be placed in three and a half meters of water with contiguous piling and a high risk of water ingress.

Surrounded by Heritage buildings, operating businesses, and council works, the existing design also called for sheet piling to be used adjacent to these sensitive sites with an extreme risk of vibrational and other damage.

By redesigning for a top-down construction approach using diaphragm walling, Airey Taylor's design enabled construction 100mm away from the oldest brick building in Perth, the Deanery (right) without damage. The diaphragm walls and other waterproofing techniques delivered the required basement space without leakage on completion.

Site access was also limited to an adjacent laneway, and one car width access was required to be free during all construction for the use of the adjoining commercial buildings. Restoration of the full dual accessway for the use of the Old Treasury Building (Como Treasury Hotel) was required within three months of commencement.

The solution of phased construction of the ground floor slab in a series of eight pours with top-down construction opened full use of the laneway after only a month – while all construction was limited to the site footprint (right) with dust and other environmental hazards to the area from excavation contained under the top slab.

Airey Taylor Consulting's redesign made the project viable to construct and Church House won Best in Class in the National and State Master Builder's Excellence in Construction Awards in the year of completion.



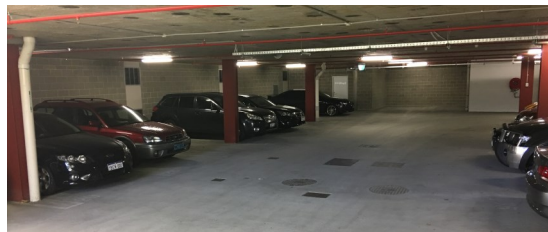
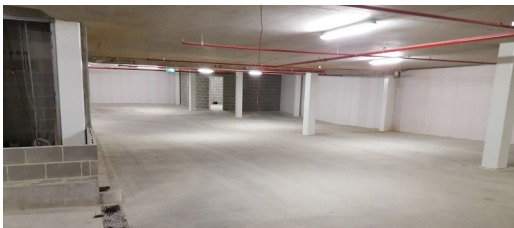
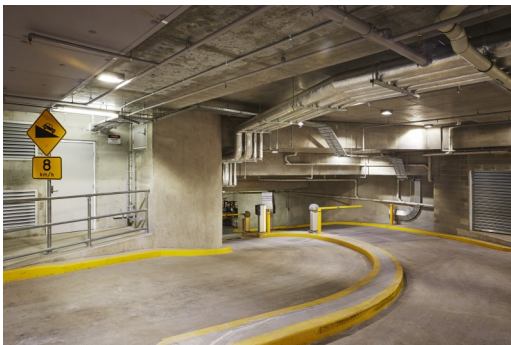


### PRIVATE RESIDENCE, BANOOL CRESCENT, CITY BEACH

Airey Taylor Consulting's basement design enabled the placement of a full height basketball court underneath this new upmarket home in Perth's beachside suburb. More details available soon.

### SKY HOMES, BEAUFORT STREET, INGLEWOOD (below and left)

The design for the single level basement under four storeys of apartments on a wet site was expanded by fifteen parking bays and minimised dewatering and formwork on the site, accelerating the construction schedule by a programmed 10 weeks and integrating safely with a Heritage feature and local planning.



## VALUE ENGINEERING AS VALUE PROPOSAL

Airey Taylor Consulting offer Substructure Design as a distinct entity to Superstructure Design and can collaborate with incumbent Engineering teams. We can also quickly assess existing substructure designs to identify potential savings or improvements.

If a project is suitable for the use of our systems and will create significant benefit, we offer our redesign services for a percentage of the identified cost saving without other fees. The cost saving is independently assessed by Rawlinsons (WA) Quantity Surveyors. This minimises exposure and risk for projects with completed substructure designs. We have access to subcontractors and builders who can implement our designs.

For more information on our services, please contact :

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