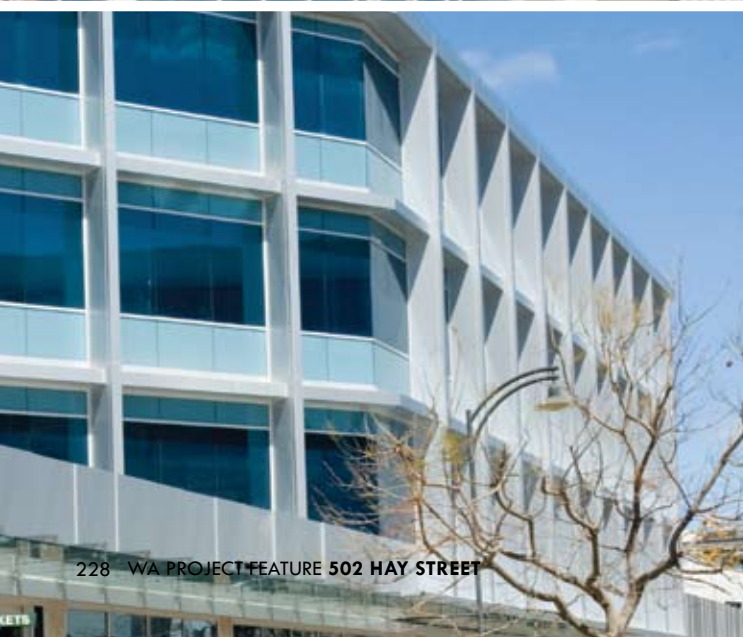


502 HAY STREET

PERTH, WA





GHD OVERCOME CHALLENGES

GHD were not the original structural consultants on the project. At the time of tender, the project had been fully documented and a builder appointed to undertake the forward earthworks contract, which included construction of a 265m long sheet piled wall around the perimeter of the site followed by bulk excavation to foundation level.

Three builders were subsequently invited to submit tenders for the main project. Arccon, one of the invited tenderers, recognised that a conforming bid alone was unlikely to achieve sufficient savings to justify awarding the contract to a new builder. Based on previous highly successful “design and construct” projects with GHD, Arccon engaged the global consultancy to investigate alternative structural floor solutions that would potentially generate sufficient cost and time savings to win the project, and justify re-designing the structure.

The design by architects Bollig Design Group maximised planning flexibility by adopting a 12.6m x 8.2m structural grid module. The tender design for the floor system comprised precast pre-tensioned beams and transverse hollowcore planks with an in-situ topping slab. Site constraints and craneage limitations were a concern as some of the heavier lifts would have been of the order of 30 tonnes.

The challenge for GHD was to find an alternative economic form of construction that minimised potential changes to the architectural and services layouts and structural building module, but generated sufficient structural savings to justify the re-design of the floor system.

After investigating various design options, a 300mm thick partially post-tensioned in-situ concrete slab emerged as a clear choice for the principal construction material. The design approach adopted differs from more conventional post-tensioned design. The post-tensioning was applied in one direction only and provided primarily to control deflections, as opposed to the normal technique of balancing the

dead load, plus a given proportion of the live loading. Also, the level of prestressing was selected to resist the total in-span bending moments, and normal reinforcement provided in the top of the slab to supplement the required larger bending moment capacity over the supports. The tendons were fully bonded, of parabolic profile, and stressed in a single stage from one end.

Assisted by the alternative design prepared by GHD, Arccon were successful in being awarded the contract. GHD were subsequently commissioned by Saracen Properties as structural consultants for the project, including overall responsibility for over-viewing the remainder of the structural design, leading to additional subsequent savings.

Final design of the floor structure was undertaken using a three-dimensional finite element analysis to model the entire slab. This enabled the elastic behaviour of the slab to be more accurately modelled than frequently used frame models. This approach allowed the effects of cracking, shrinkage and creep to be incorporated into the analysis, thereby providing a more accurate assessment of the long term deflections.

The simple low cost system proved highly successful during construction and permitted repeated use of formwork over large areas. There were further advantages gained such as reducing reinforcement congestion, but more importantly, earlier removal of formwork.

GHD PTY LTD
PO Box 3106
Perth WA 6832
t. 08 6222 8222
f. 08 6222 8555
www.ghd.com.au



SUNLITE SHADING

The overhead glazing and stainless steel framing for walkway awnings to the full perimeter of the building and for the entrance canopy at 502 Hay Street were fabricated and installed by specialist contractors Sunlite Australia. The design and specification also required Sunlite to provide stainless steel outriggers, stainless steel spider fixings, AS glass and toughened laminated glass.

Sunlite Australia specialise in façade shading for residential and commercial construction. For owners, builders, architects and designers they create solutions that are practical, aesthetically pleasing and long-lasting.

As well as fabricating and installing fixed overhead glazing for awnings and canopies, Sunlite offer an extensive range of aluminium louvres and shutters, awnings, weather shades, privacy screens and external venetian blinds. Manually and electronically operable control systems can adjust blade angles throughout the day and from season to season. Electronic systems use Somfy motors allowing switch or wireless control, which can also be connected to cbus and smart-wired systems for automatic operation.

Sunlite's louvre systems provide sun, wind and weather protection, help with natural solar control, reduce heating and cooling loads and add value to the overall development. Suitable for a broad range of applications, Sunlite louvres are based on elliptical blade profiles of 60mm, 90mm, 180mm and the 240mm Weathershade blade. These blade profiles are used for privacy screen panels with fixed or adjustable louvres, sliding louvre panels with top and bottom track, window awnings for summer/winter sun control and overhead louvre systems for weatherproofing and solar control systems.

Manufactured from Australian standard aluminium, UV-rated nylon and marine grade stainless steel, with anodised or powdercoat coloured finishes, Sunlite products can be used internally or externally with the confidence that they will stand up to harsh conditions.

Australian-owned and family-operated for 25 years, Sunlite is Perth-based and can supply and install Australia-wide.



SUNLITE AUSTRALIA
144 Welshpool Road
welshpool WA 6106
t. 08 9351 8880
f. 08 9458 5291
www.sunlite.com.au





PROVIDING FIRE SAFETY SOLUTIONS

Saraceni Properties' major new office building at 502 Hay Street is the largest development of its kind in Subiaco. Its scale presented both challenges and opportunities for specialist fire engineers, Saraceni L and N Design Group.

Recently completed, the development has already become a landmark address, with a broad frontage to Hay Street, the major traffic artery heading west from the Perth CBD. Behind its eye-catching façade are four levels of large floor plate office space above ground floor retail tenancies. Basement and ground level parking provides spaces for 170 vehicles. The central service core provides all the wanted facilities including three passenger lifts, which connect all levels. The wide but relatively shallow floor plates mean that office space receives abundant natural light. Finishes are to the highest standards.

Fire engineer Lou Saraceni designed the fire sprinkler systems and came up with several alternative fire safety solutions which were fully supported by local Council authorities. The shape and size of the floor plates and potential total number of occupants required solutions above and beyond the conventional code.

"We didn't just want to satisfy the code," said Lou, "We wanted to make sure that the building's fire safety would go several steps further."



The solutions adopted ensure that 502 Hay Street meets and generally exceeds the fire safety performance requirements of the Building Code of Australia and all of the relevant Australian standards. For example, in the basement car park, extra fire hose reels were installed to insure full coverage. The number of hydrants was also increased. Within the office tower, additional egress capacity was designed in and additional hydrants and hose reels installed.

Saraceni L and N Design Group provide the full range of fire safety engineering services, including design and documentation, fire safety audits and compliance reports, as well as building surveying compliance reports.

SARACENI L & N DESIGN GROUP
PO Box 900
Inglewood WA 6932
t. 08 9271 1366
f. 08 9271 1316
e. reception@saradesigns.com



REINFORCING 502 HAY STREET

Steel Reinforcement Company Malaga were contracted to supply and fabricate reinforcement steel for all areas of the 502 Hay Street, Subiaco project.

When their work at Hay Street commenced in September 2007, SRC Malaga was a young company, having been established only in March of that year. However the company's owner, Russell Williams, has a long and distinguished background in the Western Australian construction industry and, under Russell's guidance the SCR Malaga fabricating facility at 27 Harris Road had been set up specifically to handle projects of the type and scale of the Hay Street office and retail development. The company's state of the art factory is able to operate 24hrs a day with shift work for all your reinforcing needs.

"It was no trouble for us to ramp up our production rate in the factory whenever it was needed throughout the two years we spent on the Hay Street job," said Jane Tilley of SRC Malaga. "Our factory set up, and our experienced teams in the factory meant that we had the flexibility and capacity to adjust as the project demanded."

Russell Williams is also the owner and director of well-known Western Australian formwork company, Ausform/Wesform. His knowledge and expertise in the building industry comes from over 40 years of hands on experience. Russell has completed many major formwork projects throughout Perth and Western Australia.

SCR Malaga has already formed a strong customer base, thanks to its emphasis on customer service, competitive prices and its ability to meet orders promptly and to exact specification. The company has a network of overseas raw material suppliers who are able to meet the Australian Standards Grade 500N and consistently meet the steel delivery schedules.

SRM PTY LTD
27 Harris Road
Malaga WA 6090
t. 08 9248 1105
f. 08 9248 1109
m. 0409 201169
e. enquiries@srcm.com.au
www.srcm.com.au

502 Hay Street, Perth, WA



PLUMBING CONTRACTOR OF CHOICE

For Paul Troaini, proprietor of Austech Plumbing (WA), the 502 Hay Street project was the largest undertaken in the Subiaco district. A third generation plumber, Paul has been driving Austech's development since its establishment in 1989.

The scope of Austech's sub-contract comprised all plumbing, stormwater and fire services, including booster, conventional and mains. Because the building aimed for – and earned – a four and a half star AGBR rating, Austech's expertise proved valuable in helping with selection of materials, fittings and equipment that minimised water and energy consumption.

"We started work on the 502 Hay Street site more than two years ago," said Paul. "As usual, the plumbing contractor is one of the first in and almost the last out on a major commercial construction site. We had a team of seven dedicated to the site, including a site manager."

Austech handle all types of plumbing, fire service and gas work. Their specialties are larger commercial projects and the detailed work demanded by architects on larger private homes. "Our whole-of-home self-regenerating water filtration systems are becoming very popular on that sort of project," said Paul.

Austech is a Perth-owned-and-grown company, which has earned a "plumbing contractor of choice" reputation, based on a dedication to customer service. "We depend on word-of-mouth and customer referrals to keep our business growing," said Paul. "Since 1995, we have also been doing a lot of insurance work. That's the sort of repeat client business that lives or dies on how promptly and efficiently you get the jobs done. We will always give our customers value for money as we value long term relationships."

Other current and recent Austech projects include a major, new apartment complex in Malcolm Street, Perth, and refurbishment of the Sunday Times building.

Austech Plumbing (WA) are fully licensed and members of the Master Plumbers association.

AUSTECH PLUMBING
Unit 3, 52 Erindale Road
Balcatta WA 6021
t. 1300 559 118
f. 08 9240 8227
e. admin@austechplumbing.com.au
www.austechplumbing.com.au