UNIVERSITY OF SYDNEY

BAULDERSTONE

CAMPERDOWN

Project Dimensions
Interior Building Area: 41,000m²
Library Area: First Floor = 2,000m²
Second Floor = 700 m²

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TOP OF THE CLASS

Built by Baulderstone, The University of Sydney's Faculty of Law is an engineering feat; from the post tensioned reinforced concrete structure to the innovative façade and light tower. Baulderstone took the concept and design from the architect FJMT and has created a unique building which is a landmark project for the university. It is part of the Campus 2010 project, which is the largest infrastructure project ever undertaken by the University.

A collaborative approach was taken between Baulderstone and the engineers & designers which has resulted in a building that was not only being constructed to high safety and quality standards required by the University, but was also completed in a tight 90 week programme ready for the start of the 2009 semester.

The Project

The new Faculty of Law Building consists of seven levels of academic and administrative offices, together with a range of research centres. It incorporates collaborative spaces, meeting and conference rooms. There are a total of 23 teaching spaces within the building ranging from 300 and 100 seat lecture theatres, through to 60, 56, and 24 seat seminar facilities to suit a wide range of teaching requirements. It also has a Moot Court and a large Law Library. A 13m tall stainless steel and glass Light Tower directs light into the library.

Extensive paving and landscaping works, including a staircase leading from Victoria Park integrate this new project into the existing campus and the surrounding environment. The teaching spaces in this facility are state of the art, including the audio visual systems that are integrated with the lighting, motorised blinds, the façade louvers and the heating/cooling system.

The Faculty of Law building includes several industry leading green features such as chilled beams, low VOC materials, timber sourced from sustainable forests, an on-site rainwater reuse system, and Building Management Controls System fully integrated with all building services. Unique green features include the Light Tower and the Faculty Building composite cavity façade system.

The Camperdown Public Domain (CPD) area was upgraded to form a pedestrian walkway and a landscaped environment with seating and lighting. 45,000 students cross the CPD daily, and a clear pedestrian path needed to be maintained at all times so safety and environmental management were Baulderstone's main concerns.

Interesting project features

The Light Tower

The light tower stands over 13 metres above the podium. Its complex shape, with varying angles for each steel column, required Baulderstone to implement careful coordination and quality control between the steel, concrete and glass subcontractors. A spiral staircase wraps around the light tower between levels 1, 2 and a glass stair case located on level3.

The façade

The unique main Faculty Building façade required Baulderstone to use sophisticated construction techniques and safety procedures. The facade consists of an internal aluminium window wall, an exterior frameless glass wall, and timber louvers in the cavity between. The louvers are opened and closed depending on daylight, with a user controlled override, allowing building occupants to take advantage of natural lighting and reduce glare depending on the positioning of the sun. Within the cavity and between the panes of glass, there is constant airflow, as the top and bottom of the cavity are open. The internal windows are operable, which allows staff to cool the room utilising natural ventilation, derived from the constant air flow in the cavity. This is the first time this innovative system has been utilised in Australia.

Baulderstone

The Law faculty is the latest NSW addition to Baulderstone's extensive project portfolio which includes commercial office buildings, cultural, health and educational facilities, roads, bridges, rail projects and other infrastructure and engineering works throughout Australia.

Landmark Baulderstone projects include the Anzac Bridge in Sydney, the Storey Bridge in Brisbane and the Etihad Stadium in Melbourne. Baulderstone's greatest asset is its people and their collaborative knowledge, skills and experience. As a national organisation they have a pool of more than 1000 construction professionals which means they can assemble the best team for any project.

Backed by the considerable resources of Bilfinger Berger, Baulderstone has the financial resources to carry out major projects.

Over many years, Baulderstone has promoted better ways of delivering outstanding results. Their determination to work collaboratively, coupled with the talent and dedication of their people, is what sets them apart from their competitors.

KICKING OFF THE PROJECT

Sage Allan is an Australian facilitation consultancy operating across Australia, the Middle East and Asia. Project managers and construction companies bring them in as high performance team building specialists, to design and create workshops specific to the needs of each project team.

Baulderstone, with Capital Insight, invited Sage Allan to the beginning of the University of Sydney project to smooth out problems before they arose. The team kickoff day was a great success with 45 representatives from each of the companies involved in the project attending the day.

The objectives of the day were to: create a high performance team, understand how to solve and resolve problems, how to improve team communication, and how to motivate the team throughout the project. It was a performance based team building strategy.

'The Project Kick Off Day marked an important starting point for the team' says Isabella, Lead Facilitator from Sage Allan. Isabella has a background in conflict resolution, change management, dialogue, deliberation and public engagement.

Baulderstone and Capital Insight found the input of Sage Allan very worthwhile. 'I've worked with most of the guys over many years, on all sorts of projects', commented a senior executive on site, 'but this is the first time I've really understood how the team would discuss issues and make decisions - the day made real sense to me'.

On the day, the team explored the project vision, participated in leadership and team behaviour simulations and agreed on values and behaviours they would use on site. They also explored how decisions and problems would be handled and resolved.

The outcomes were extremely positive, with people still remarking how extremely practical and very different the day was. Small groups coming together created a special opportunity to form the high performance team that would deliver an iconic project.

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A TALL ORDER

Nestled between the Carslaw Building and the Fisher Library and overlooking Victoria Park is Sydney University's newest building for the Faculty of Law.

Much of the building is situated below the large, open courtyard with direct, level access from Eastern Avenue. Steps at the eastern end of the courtyard lead down to Barff Road and the boundary of the University grounds. Amongst the walkways and grassed areas that form the open courtyard are several skylights that are flush with their surroundings so that they are trafficable. Access from external to internal areas are flush as are the internal floors and adjacent external paving. Within the building below the courtyard are study rooms, seminar rooms, bathrooms, a lecture theatre and library.

A critical element of the building's functionality was the waterproofing. With such large areas to be waterproofed over critical areas and knowing that access to the waterproofing medium would be extremely difficult to access once the landscaping works were completed, the Wolfin bonded membrane system was chosen due to its proven track record in similar projects such as the Sydney Conservatorium of Music extensions (2001) and more recently the National Library forecourt, Canberra.

Omega Building Services Pty Ltd carried out the Wolfin membrane installation.

The membrane works also included the external stairs from the courtyard to Barff Road, open plant areas and flat roofs and joining onto the existing adjacent buildings. The lift over run pits in the basement of the building were also waterproofed with the Wolfin system.

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LOOKING FOR A STEEL

This project has consumed over 5000 hours of shop fabrication and welding time and as is the case with a good deal of our work it is all covered up and never seen. You have to know where to look.

For over 30 years Edcon Steel has been setting and meeting the challenges of Structural Steel Supply, Fabrication, welding and erection.

When the drawings for the steel on this project first got opened, the whole office came down to look at them. Edcon Steel has produced some unusual structures before but nothing quite like this.Our decision to proceed with this project showed the confidence we have to complete structures which will test our abilities. The result demonstrates emphatically what can be done with structural steel using our professional team.

We have worked with Australia's leading names in construction and contracting. Our aim is to be the name which brings confidence with the delivery of structural steel to your next project.

The job was broken into three major sections. The roof steel for the two buildings and the "Light Tower" (pictured). The light tower had to have some of the most complex geometry we have ever seen. The intersection of a plane at an angle with a cylinder at the front and a development of a line to a cone at the back.

It is not often a job covers such a great diversity of work including 90mm VSL Bars supporting the link bridge (pictured inset). Stainless steel structures, pipe work, cast – in structural steel elements and welded composite beams. All of which had to be completed to very high standards as the Architects on this project were looking for nothing short of excellence.

Edcon Steel extends our gratitude to all those on this project who have assisted us in what was truly a challenging job, and we are looking forward to our next challenge.

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AIR SUPPORT

Hastie Australia has been one of the leading mechanical services contractors and engineers in Australia for thirty years. They pride themselves on friendly service and true value to clients. In-house engineering, drafting, latest IT applications and complete ductwork manufacturing facilities together with the highest standards in project management and customer service are the core business elements and values that enable Hastie to deliver on the most challenging and complex projects.

For the University Of Sydney's Faculty of Law project, Hastie provided detailed design, co-ordination supply and installation of the mechanical services and Building Management and Control System.

The challenge of this project was in its intricate architectural and structural design. This demanded a extensive mechanical design rationalization and a strong involvement in the co-ordination process from the outset.

The building is served by a multitude of mechanical system types; Lecture theatres are served by under-floor displacement systems with conditioned air distributed through common pressurised floor plenums and displacement diffusers located under seats, the library common areas are served via a combination of Displacement, Active and Multiservice Chilled Beam systems while Seminar rooms utilise dedicated Constant Air Volume Systems. Parts of levels 1 and 2 are also served via variable air volume systems.

The integration of sprinklers, EWIS and Smoke detectors within the multiservice chilled beams represented a great challenge. Exact setout of these services in particular sprinkler heads had to be predetermined at a very early stage so that adequate provisions can be provided during manufacturing of the beam face plates. Each row of beams had to be very carefully designed to house air ducts, chilled water pipework and sprinkler pipes in very limited spaces and without adversely affecting the performance of the system.

Across the Library, Teaching and Faculty buildings there are 5 main and some 10 to 15 smaller air handing plants all served with chilled and heating hot water reticulation systems from a central energy plant located in the roof top plant room.

In addition, the Faculty offices are served by local Fan Coil Units located under desk joinery. This system enables occupants to individually control their own environment and to use natural ventilation when appropriate by simply opening their windows and switching off their Air Conditioning. These systems are also served with chilled and hot water from a the roof top central energy plant.

The BMCS provides integrated control of air conditioning, lighting, AV system, EWIS, Internal Blinds, External Double Skin Facade Louvers and Faculty Bridge and Light Tower Ventilation Dampers through high level user interface.

Credit of this success goes to the Hastie Project Team namely Paul Millard in the capacity of Site Manager, Paul Portelli – Drawing Office Manager, Shane Durkin - Engineering Office Manger, Liza Lynn and Emilios Papantoniou in the capacity of Site Engineers.

Commented by Khaled Elsawi – Project Manager.

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NEW HOME TURF

Turf Design Studio collaborated with renowned Danish landscape architect Jeppe Aagaard Andersen working with Tinka Sack in the multi-million dollar upgrade of the main campus at Camperdown. The team also designed the new Faculty of Law public domain, a concurrent project.

Their challenge was the conversion of Eastern Avenue into a new pedestrian thoroughfare linking the north and south campuses, first articulated in their winning entry of the Campus 2010 International Design Competition.

The site stretches from City Road embracing the University's most famous building, the Quadrangle. The project required resolution of complex design requirements: services rationalisation; WSUD measures; retention and relocation of heritage items; a new lighting system; incorporation of CPTED findings and provision of universal access to adjacent Faculty buildings, Fisher Library and the Carslaw teaching complex.

The design unites the Camperdown precinct with a new suite of contemporary, yet timeless urban elements and materials. The central thoroughfare is a procession of banded granite under an avenue of Sydney Red Gums, a 'ramblas' responding to the energetic rhythm of the campus.

In keeping with the Campus 2010 vision to upgrade the university and embrace a sense of openness, the thoroughfare is open to all. All in all a new University 'common' has been created, uniting an eclectic and complex setting, particularly so that Law has finally returned to 'home turf'.

Turf Design Studio responsibilities for USyd included design, documentation, site advice and consultant team management.

TDS specialise in landscape architecture and urban design focussing on public domain, community development, environmental and infrastructure projects. Turf also has a strong track record in major events having designed the 2004 Athens Olympic Games Village and currently designing the Delhi 2010 Commonwealth Games Village.

In Sydney, Turf Design Studio are landscape architects for the vast Frasers Broadway project, the North Eveleigh Railyards Masterplan for Redfern Waterloo Authority, the Cronulla Rail Line Duplication and the new Southern Sydney Freight Line.

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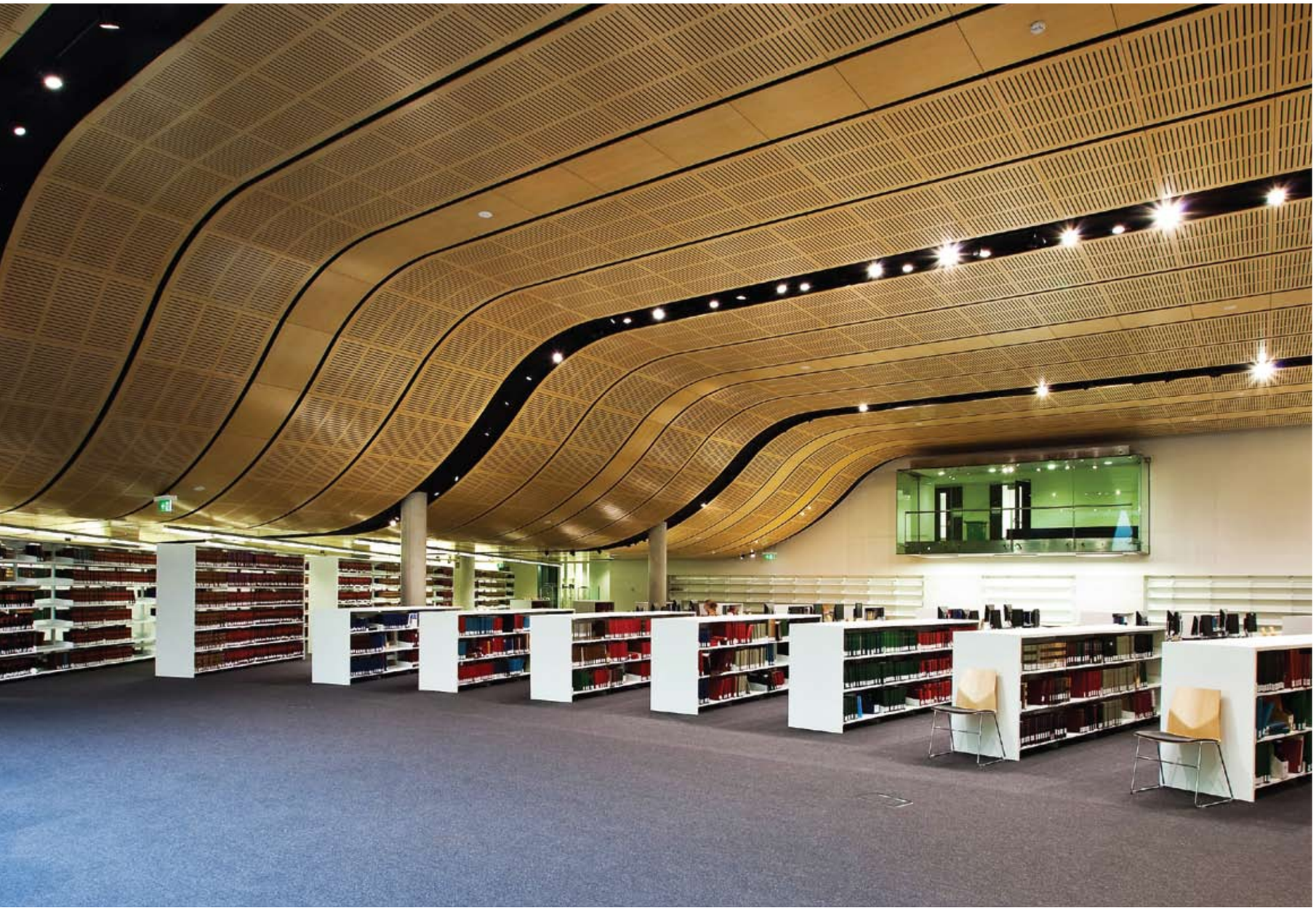

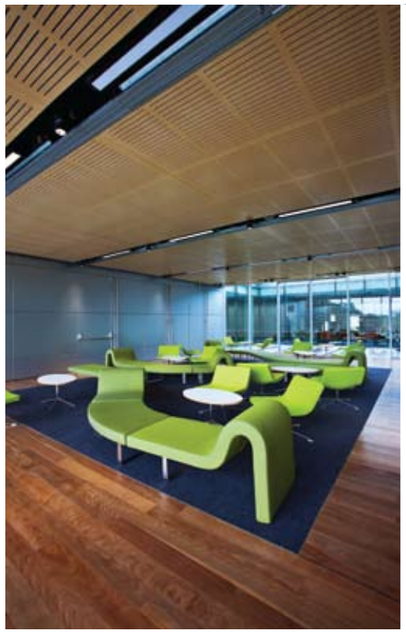

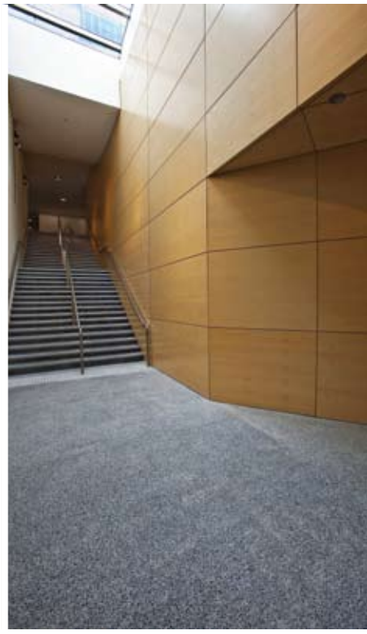

AESTHETICALLY ACOUSTIC

The Supawood panelling system is utilised to its fullest extent in prestigious university faculty buildings. Features which enhance these buildings include aesthetics and acoustics for the Supawood look.

In a recently completed Faculty of Law building in Sydney, Supawood provided over 3000m^2 of a range of panelling types; inside and outside the main auditorium, inside the lecture rooms and on feature walls and ceilings.

Supaline (solid) and Supacoustic panels are used together on both walls and ceilings including curved and wave effects in the impressive library (see main picture).

The Supacoustic ceiling panels in combination with Supaline (solid) deflector wall panels are installed in multiple planes and angles. Both ensure reduction of reverberation time in the auditorium (see lower left picture), lecture rooms and the moot court.

Supafabric panels are used to good effect in smaller lecture rooms.

The Supawood panel system is complete including returns, backing strips, insulation and fixing systems, plus it is quality assured with detailed shop drawings and site support to ensure a successful outcome.

Quality is in the detail. Supawood helped to ensure that the joints in the panels lined up with the expansion joint lines in the concrete and the edges of slabs and doors. Colour consistency was maintained through careful selection of the Hoop Pine Crown Cut natural timber veneer used on 2500m2 of wall and ceiling panels supplied.

All Supawood panels supplied for this landmark project are environmentally sustainable using E0 and FSC certified substrates in the manufacture of the panels. Supawood's non-VOC, non-yellowing clear Supafinish was used to polish all the veneered panels to maintain the natural blond look of Hoop Pine.

From start to finish, specification to installation, Supawood is involved in every aspect of each project to achieve the best possible solution.

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FIT FOR PURPOSE

Established for more than 18 years, Brighton Australia specialises in lightweight internal construction and commercial fit-outs. With a territory expanding through NSW, Queensland, Victoria, and the ACT, the company has been involved in a large number of commercial, retail and residential projects during this time.

Some significant projects in Brighton's portfolio include signature developments such as Westpac Place, the Macquarie Bank headquarters, Foster & Partners Regent Place and Harry Seidler's Cove Apartments; Centre Court North Ryde – the largest single tenant campus style construction in the country and the national headquarters for Optus; and Westfield Bondi Junction, which won Brighton Australia a NSW Wall & Ceiling Industry Award for Excellence in 2005.

The University of Sydney, Faculty of Law adds to Brighton's portfolio of work at the University which includes the new Central Building. This represents a continuation of work for Australia's major builders including Multiplex, Bovis Lend Lease, Leighton Contractors, Westfield, Abigroup, Mirvac, Thiess, Watpac and Grocon.

As the management subcontractor for the internal fit-out, this project presented Brighton with a large number of challenges. The site management team of Michael Marjanac, Bobby Boroja, Adnan Halilovic and Anthony Banicevic had the complex task of managing not only its own workforce, but the coordination of 14 subcontractors in trades including doors and door hardware, glazing, rendering, joinery, painting, carpentry and toilet partitions.

The company has had to call on all of its experience and know how to cater for the demands of an exceptionally detailed design. With an architect pushing the boundaries of construction, together with a tight building programme, this has been one of the most demanding projects ever undertaken by the company, according to Brighton representative, Adnan Halilovic. Once completed, the Faculty of Law will represent another jewel in the crown of Brighton's ever growing portfolio.

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A CLASSY EXTERIOR

Sharvain Group, established 1998, provides comprehensive Design and Construct solutions for specialized glazing and façade projects across the wide range of market segments. Sharvain Facades P/L also manufactures and distributes a comprehensive range of façade components and architectural hardware.

For the Sydney University project, Sharvain was responsible for detail design, fabrication and installation of the façade window wall, frameless specialized glazing and cladding (composite metal and composite timber) packages, including auto doors, SS structures and structural steel supports where required. The demands of the project were its complexity. Consideration had to be given to site access restrictions where glazing was placed over the composite timber cladding at return corners and special fixing methods for the large glass spans. Specific materials, finishes, systems, and equipment were installed.

Boris Kostura, the Project Manager says the highlights of Sharvain's part in the project are: the double skin external façade supported by purpose designed SS cast arms and patch fittings, semi-frameless glazing supported by horizontal transoms, incorporating specially designed concealed fixing method, moulded electrically operable timber louvres for shading where motors have been incorporated into aluminium trapezoidal transoms, frameless external glazing to the double skin façade, clamped with SS clamps fitted to SS cast arms of a very large size (1200mm), and an internal window curtain wall allowing the utilisation of natural ventilation. Most of external glass has special performance coating as well as the Low E coating improving the energy efficiency of the premises. The louvre colour matches the color of composite timber cladding giving the building an exceptionally smooth look.

The success of this exciting venture is due to diligent and creative design work by the design department in particular the Design Director, Ms. Shangyun Zhao, Chief Designer Mr. Jeff Anderson and the Manager of Sharvain Hong Kong office, Mr. Stanley Po.

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