



Looking down into the magazine and newspaper reading room on the lower ground floor.

# Clear vision

Located in the heart of Sydney's inner-east is the Surry Hills Library and Community Centre. Right from briefing and consultations, one word came to not only describe the consultative process that led to its design, but also define the building's function and form: transparency. The project earned AIRAH's 2010 Excellence in Sustainability Award for Steensen Varming, **Sean McGowan** reports.

Photography by John Gollings courtesy of FJMT.

When you think of Australian suburban library buildings, you can't help but picture a squat, multi-purpose, brick veneer monument to the 70s and 80s. But as the Surry Hills Library and Community Centre attests, such buildings are a thing of the past.

Commissioned by the City of Sydney and completed in 2009, the Surry Hills Library and Community Centre was designed to be the most environmentally progressive building in Sydney, with a particular focus on occupant and user well-being.

Designed by architecture firm Francis-Jones Morehen Thorp (FJMT), the building is located on a constrained site measuring just 25m by 28m, flanked by two roads and a community park.

“It's not like we've thrown ideas on and then the architecture has to mould around these ideas. A lot of these opportunities were already there; it's just a matter of identifying a better use for these sorts of spaces and systems in the building.”

Working closely with FJMT on the library's design, consulting firm Steensen Varming developed the mechanical, ESD, electrical and lighting designs for the building, winning the

2010 AIRAH Award for Excellence in Sustainability for their efforts.

## OUTSIDE THE BOX

The location presented formidable challenges to the design team. Yet the possibility of “outside-the-box” design contributed significantly to the final form and function of the building, and in the process solved some of the location-related issues.

According to FJMT, a key objective for the centre was to establish a new Australian standard of excellence for environmentally sustainable design in civic buildings.



The reading room and café are on the east side of the award-winning building.

“The design philosophy evolved from principles established in a detailed community consultation process, which informed an understanding of the community needs and reinforced the environmentally sustainable program,” FJMT associate, Simon Barr, recalls.

This extensive consultation took place with what is a very active and diverse local community. The key message to emerge was that the community wanted a facility in which everyone could share, combining all three facilities – library, community centre and childcare centre – to become a “hybrid” facility.

Important also was that the building both represent and reflect the community’s values, including that it be designed with the environment and user well-being at the forefront. Importantly, it needed to be in stark contrast to the previous building, which was both dark and unwelcoming.

According to FJMT, after establishing a continuing stakeholder consultation process that opened a dialogue between the designers and users, a number of ideas and concepts were tested against the design brief and principal project objectives. Several opportunities were identified.

These would become the cornerstones of the project, and included accessibility; access to clean, fresh air; low-glare daylight access; shaded reading and work space; good visual egress; and effective environmental control systems.

“The success of the facility with its users and occupants lies in the innovative integration of leading-edge technologies and passive systems,” Barr says.

## REDEFINING THE PUBLIC BUILDING

Not only is the local community characterised by a diversity of age, income, cultural and professional backgrounds, so too is the context in which the site sits, surrounded by residential apartments, terrace housing, retail and commercial premises, all varying in scale but predominantly of Victorian style.

From the briefing and consultations, one word came to not only describe the consultative process, but also define the building’s function and form: transparency.

And so it was that the building’s glass southern façade was conceived, providing transparency and a visual link from

the interior of the building to the park opposite, and thereby welcoming users to the space.

Meanwhile, the constrained site led the design team to develop innovative approaches to space utilisation that also answered the complex and extensive functional and stakeholder brief requirements.

Given the specifics of the client brief and legislative requirements for the design of community facilities, the FJMT team focused on developing a design approach to minimise the planned impact of services.

This included the redesign of fire stairs, such that a “scissor” stair configuration was used to achieve the required number of egress paths from level two.

The constrained site also presented opportunities to utilise passive, hybrid and multifunctional systems, with the design team drawing inspiration from natural organisms that have evolved in response to resource-constrained environments.

FJMT says the project integrates a number of elements that not only draw upon these natural systems but directly uses them to improve the internal and



The eastern elevation is shielded by operable timber-faced panels.

external environment and thereby occupant physiology.

This philosophy is perhaps no better illustrated than in the building envelope, where environmental initiatives have become sewn into the fabric of the building. Examples include the environmental atrium and series of triangular, tapering glass air shafts that draw in outside air and passively clean and cool it.

## MULTIPLE STAGES OF AIR “CONDITIONING”

The collaboration between FJMT and Steensen Varming was fundamental to the project’s ultimate success as a public building, with the mechanical and ESD aspects of the design integrated into the architecture.

Steensen Varming director Chris Arkins, M.AIRAH, likens the process of developing the library’s ultimate design to that of a DNA string of ideas, where one leads to another, and another, while all remaining intrinsically linked. Nowhere is this better illustrated than in the elaborate, yet largely passive treatment of outside air for the building.

“Even though the overall system works collectively in its use of passive, active and organic elements to provide an improved condition and quality of air to the interior, the component parts are all interesting in their own way,” Arkins says.

“It’s a small project, but it really punches above its weight in terms of what it has achieved. It is a success on so many levels. So while it looks great from an architectural perspective, it’s also delivering what a lot of other buildings can’t do.”

The journey of the building’s indoor air begins far above street level, where pollutants from Crown Street, Surry Hill’s main thoroughfare, are avoided. Along with the air intake at roof level, a green roof has been planted to provide a level of insulation to the building.

“The intake is protected from ingress of rain, integrates the first stage of particulate filtration and naturally

tempers the air as it flows across a water-to-air heat exchanger coupled to five geothermal bores, which draw energy from the earth to heat cold air or cool hot air as required,” Arkins says.

From the top of the building, this tempered air is then drawn down the southern double façade, made up of seven glass-enclosed shafts, which help “cocoon” the building from the outside while maintaining transparency – an important element of the building’s aesthetic.

This transparency and connection to the building’s surrounds is further enhanced by the southerly orientation not requiring shading, and the planting forms the secondary stage of air filtration.

“It was quite a good idea to use the façade to move air as opposed to taking up floor space with ductwork risers, because it’s such a tight site,” Arkins says. “To take up space with risers would have further eaten into the floor plate.”

The third stage of air “conditioning” is more conventional, with a further fine grade of air filtration added, as well as in-line fans used to drive the air. Energy used here is off-set by a 4.725kW photovoltaic array mounted on the roof,



The childcare centre includes an open-air play area.

## COVER FEATURE

which also acts to shade the external air conditioning heat exchangers, thereby increasing their efficiency.

The photovoltaic array, comprising some 27 175W panels, is expected to generate in excess of 8MWh per annum of renewable energy.

Upon reaching the basement of the building, the air is directed through a thermal labyrinth, which is a naturally occurring chasm resulting from the cavity created between the dry wall of the building and the face of the adjoining bedrock.

“This inherent void was used to circulate air through the thermally massive labyrinth arrangement and provide further passive tempering of the air while also reducing the need for any extra space and costs associated with distributing ductwork,” Arkins says.

The labyrinth is “recharged” nightly as required by a night-purge cycle, which also helps disperse the CO<sub>2</sub> released naturally by the plants at these times, while also removing any humidity created by the out-of-hours irrigation system.

From the labyrinth, air is distributed into the building, either as 100 per cent outside air where areas can benefit from hybrid or mixed-mode ventilation, or otherwise reticulated through reverse-cycle fan coil units when air conditioning is required on occasions of higher-than-normal internal heat gains or extremes of outside conditions.



The internal spaces boast a robust rather than lavish finish.

Air then enters the occupied zones through floor grilles, which aid cross-flow and buoyancy-driven ventilation, satisfying the majority of requirements throughout the year. Where heat gains are higher or external conditions demand it, the building's low-energy, zoned VRF air conditioning units are called upon.

Inside air is largely relieved from the building naturally via high points within transitory zones, with the assistance of buoyancy and wind forces.

According to Arkins, the HVAC design here is a result of a collaboration of all these design ideas integrated in a manner that complements the architectural form and the manner in which the staff and public use the building.

**“If your design team is made up of like-minded people with a common goal, quite quickly ideas like those we’ve developed for this building can come out. The key is not to get lost on the tick-a-box approach to rating sustainability because you can start to get blinkered in terms of what the building can actually achieve and do.”**

“Our concepts are founded on the principles of bio-mimicry, where buildings and systems emulate nature to provide suitable environments or structures in a sustainable way,” Arkins says.

“It’s not like we’ve thrown ideas on and then the architecture has to mould around these ideas. A lot of these opportunities were already there; it’s just a matter of identifying a better use for these sorts of spaces and systems in the building.”

Other environmental design initiatives include a timber louvre façade system, which features automated solar tracking to shade the façade; automated fabric shading; a green roof to provide insulation; rainwater recycling; and sustainable material selection.

The various energy systems have been designed to achieve significant savings in mains power. Up to 680,000 litres of potable water is also expected to be saved annually.

A building management system (BMS) has also been installed to monitor and control the internal environmental conditions, as well as adjusting the ventilation and timber louvres as required to control heat load. It also monitors and records the building's electrical and hydraulic systems to ensure efficiency and to identify system faults.

A building users' guide was prepared to provide guidance to the building occupants and ensure the building's environmental performance was maintained as per the design team's vision.

## THE NEXT LEVEL OF MATURITY

Following completion in 2009, the building has been embraced by locals, having 88,000 visitors and 2,800 new library memberships recorded in the first four months.

Preliminary results have shown the building to be performing well in terms of energy, water and gas use, with results either matching or bettering the predicted outcomes established from detailed modelling.

As well as with being popular within its local community, the project has also been recognised by the industry, winning the 2010 NSW Architecture Award – Milo Dunphy Award for Sustainable Architecture, in addition to earning the prestigious AIRAH gong.

According to Arkins, there is no reason why other building designers can't embrace the same approach used on the Surry Hills Library and Community Centre to achieve the same sort of outcome.

“It’s a small project, but it really punches above its weight in terms of what it has achieved,” Arkins says. “It is a success on so many levels. So while it looks great from an architectural perspective, it’s also delivering what a lot of other buildings can’t do.

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The benefit of collaboration is not lost on the FJMT design team, either. Proud of its collaborative design philosophy, FJMT

says a likeminded approach from all of the consultancies involved in the project was important to achieving the stated outcomes.

“We enjoy the process of idea development,” Barr says. “This building relied upon an innovative team of designers to deliver.”

The Surry Hills Library and Community Centre has been described as reflecting the next level of maturity in environmentally responsible design. FJMT believes many of the systems used in the project will soon be considered baseline initiatives in environmental design, such that this building will become a benchmark for future developments.

“These systems and elements couldn't be removed from the building without changing its form and capacity, and this cannot be said for many green buildings,” Barr says. “The building demonstrates that it is possible to build a sustainable low-energy-use building without losing functionality or comfort, while maintaining state-of-the-art design.”

Regardless of whether or not the Surry Hills Library and Community Centre becomes a benchmark for public building design, one thing can be said: it has lived up to its promise in the eyes of its council and community. That alone is a quality to which few others can lay claim. ■

## PROJECT AT A GLANCE

Architect: **Francis-Jones Morehen Thorp**

Acoustic consultant: **Acoustic studio**

AV consultant: **Noisebox**

BCA and PCA consultant: **Davis Langton**

Builder: **WBHO Pro Build**

ESD: **Steensen Varming**

Fire engineer: **Arup Fire**

Developer: **City Projects**

Mechanical engineer: **Steensen Varming**

Project manager: **Altus Page Kirkland**

Structural and facade engineer: **Taylor Thomson Whitting**