

>> BLUEPRINT

Green machine

The Ridge, a highly innovative building for Deloitte at the V&A Waterfront, with architecture by StudioMAS and interiors by Paragon Interface, has received a 6-Star Design rating by the GBCSA.

PHOTOGRAPHY SARAH DE PINA



PROJECT #1 THE RIDGE

The Ridge, a new commercial building in the Portwood District of the V&A Waterfront for professional services firm Deloitte, is a groundbreaking project in sustainable design in South Africa. Many of the concepts, technologies and materials used in its design and construction are pioneering

instances of their use, particularly at the scale of this project and in a high-end commercial space.

The design of The Ridge involved a close collaborative process, particularly between architects StudioMAS and consulting engineers Arup. In fact, they had begun working together on a proposal for another unrealised

project on a nearby site with the V&A Waterfront some years before with ambitions to be similarly sustainable, after which they began holding informal but regular sessions "with no scheme in mind ... just brainstorming what would make a good building", says lead architect Sean Mahoney.

When a request for proposal (RFP) was issued for The Ridge's site, however, StudioMAS and Arup had already, as Mahoney says, been "chewing the fat on it for quite a while in different ways".

"We were fortunate in that we'd already started the thinking," says Tessa Brunette, associate at Arup and lead engineering and façade consultant. They were able to apply some of the ideas they had been incubating into their proposal for The Ridge.

The result is a design in which engineering and architecture are thoroughly integrated, having developed side by side from the earliest conceptual stages. Mahoney calls it "an incredibly rational design" while Brunette calls it "architecturally something truly wonderful".

The site, previously a parking lot, is rectangular and orientated on a 'slight diagonal' from the ideal north-south orientation. The site development plan was fixed, with the building having to fill the site. "We had to make decisions early on about how to improve the orientation of the building," says Brunette.

The solution was what has been variously called the faceted, zig-zag, serrated, saw-toothed or pleated façade, which, in effect, corrects the orientation of the building, ingeniously controlling the direct sunlight and regulating the temperature as the north-south orientation would, while also opening up views that would otherwise have been obstructed.

The design of the façade features extended 'fins' or contemporary crenulations along its top and bottom in a way that fragments the monolithic façade, breaking it up visually so that the bulk of the building is less imposing than it might otherwise have been, and creating interest within the rational engineered form.



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The façade, executed using cross-laminated timber (more of which later), gives the building its distinctive identity.

The V&A Waterfront's sustainable imperative informed every aspect of the design, and StudioMAS and Arup emphasise the importance of first principles. Apart from orientation, cooling is achieved with natural ventilation. On one level, this means something simple - when it's too hot, you can open a window. The principle, however, extrapolated to a building this size, becomes highly complex.

After calculating the depth of the floorplates necessary to maximise natural light and allow for cross-ventilation, StudioMAS and Arup arrived at a design defined by two wings separated by an internal atrium. Functionally, the atrium facilitates natural cross-ventilation, drawing air up and out of the building like a chimney. Large, drum-shaped light scoops above the atrium let natural light into the core of the building. Conceptually, the architects imagined the atrium as a central street running the length of the building.

In terms of the interior design, by Paragon Interface, this arrangement allows for a central thoroughfare and central meeting area on the ground floor, which is accessible to the

public and is activated along its edges. As Brunette puts it, the atrium becomes "the heart of the building". It allows relaxation areas, gathering points, and dining, and enables the flexible collaborative atmosphere characteristic of Deloitte's corporate culture.

"The whole idea is that it becomes like a street and a pavement where you circulate before you move into the more private spaces to work," says Mahoney.

Mahoney adds that the concept of the street also speaks to a larger urban plan that will unfold as the precinct develops, which opens connections between the V&A Waterfront and the Greenpoint, and which will ultimately contribute to creating a more integrated, connected city. Most immediately, as Paragon Interface director Claire D'Adorante points out, this is evident in the way that the coffee shop, which is accessible to passers-by via an external hatch, is already bringing life and activity to the building's immediate surrounds.

Those 'first principles' - the dimensions of the floor plates, the central atrium and the façade design - make it possible to control the temperature of the building, using only natural ventilation, for around 60 percent of the year, says Brunette, which is pioneering territory for a building of this scale



- and with The Ridge's blue-chip status - in South Africa.

"South Africa has an amazing benign climate," says Brunette. "We should be using natural ventilation as our default mode of operation."

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The central atrium, which helps create the cross-ventilation necessary for the building's cooling system, is conceptualised as a 'street' running through the building, activated along its edges. Cylindrical light scoops flood the atrium with natural light.

To extend that to 82 percent, she points out another remarkable feature of the building - its thermally activated building system (TABS). TABS involves waterpipes cast into the building's concrete floor slabs. "Those waterpipes circulate water kept at 19 degrees, which effectively provides radiant cooling," Brunette explains.

The remaining 18% of the year, when air-conditioning is required to regulate the temperature, a system that circulates via a raised access floor, rather than overhead ducting, has been used. "It was important for us that we also made the air-conditioning design as passive or as low-energy as possible," says Brunette. "The best way to do that is to use displacement."

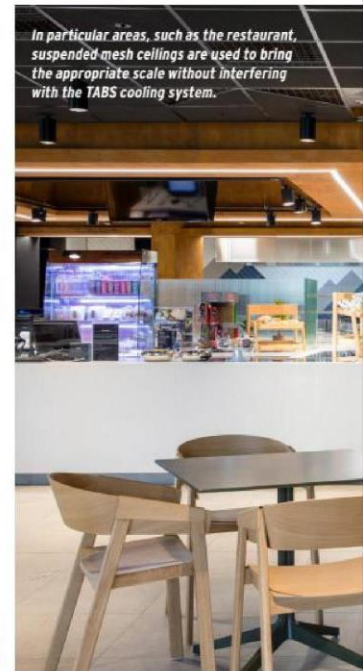
Cool air fills the space from the bottom up (where the people in the building will experience its benefits most immediately). It also allows for improved flexibility in the internal fit-out, with fewer limitations affecting the office layout. A boosting system for localised areas, operated simply with easily accessible buttons, allows the building to activate a local portion of the system, further limiting energy usage.

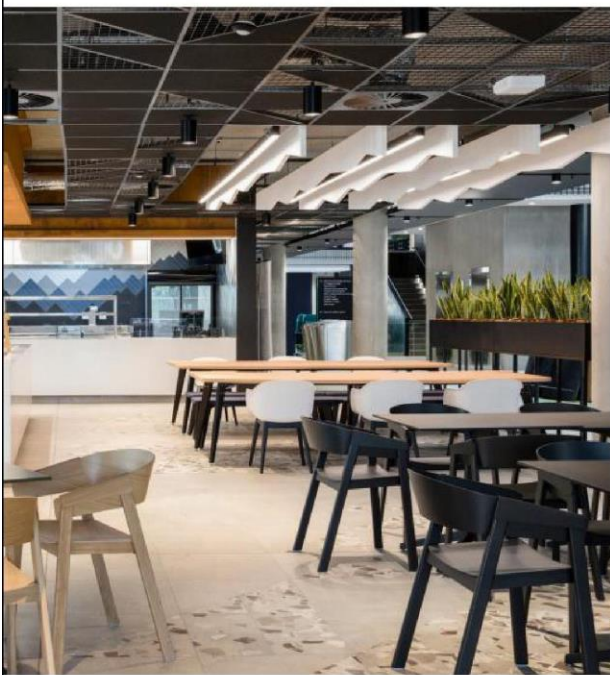
Another of The Ridge's pioneering features is its use of cross-laminated timber on its façade. The aesthetic benefits are immediately apparent in the warmth, texture and attractive appearance it imparts to the building. It will weather and change, Mahoney says, which is extremely important to him from

a design perspective - ultimately allowing the appearance of the building to improve with time. This natural alteration is also important in the way it communicates the building's biophilic character in tune with its natural surrounds, climate and time itself.

The simple carbon savings involved in the use of CLT are hugely significant. It is local, renewable and highly durable. (The thermally treated external cladding, albeit imported, comes with a 50-year guarantee.) Brunette also speaks of "dematerialisation" - the fact that CLT doesn't require any cladding or additional finishes (or even insulation in this climate) reduces the demand for materials overall.

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Above: Casual seating areas in the central atrium are centered on circular rugs which mirror the light scoops above them, but slightly offset.

INTERIOR DESIGN

The interior design of The Ridge was carried out by Paragon Interface, who also designed the interiors of Deloitte's building in Waterfall, Johannesburg, which was featured in the April May 2020 edition of *Leading Architecture & Design*. Careful consideration has been given to the company's brand colours, corporate identity and culture in the interiors of The Ridge, adapted to find unique expression in the very particular 'architectural base', engineered as it is for sustainability and energy efficiency.

Deloitte's agile approach is characterised by open floor plans (no cellular offices) and shared workspaces, which enables interaction, collaboration and social engagement. Paragon director Claire D'Adorante points out that this flexibility suits the way in which the building operates, which also prioritises flexibility and free movement, particularly in relation to the building's users being able to exercise agency and seek out spaces suited to their subjective sense of comfort.

This open arrangement is complemented with a variety of cellular and open-plan collaborative spaces, such as pods and other focus areas. D'Adorante particularly draws attention to the concept of the central atrium as a street, the edges of which are activated with a variety of workspaces, including client-facing meeting and training rooms, as well as social spaces, a restaurant, coffee shop and the like so that the concept functions optimally. The positioning of walkways and collaborative spaces around the atrium edge on the upper floors also activates the peripheries of the floor plates on the upper levels, and strategically placed transparent balustrades enhance lines of sight and communication.

D'Adorante notes the degree to which The Ridge's technical requirements drove elements of the interior aesthetic. The thermally activated building system (TABS), for example, required that the soffits remain uncovered to function effectively. Paragon's response was to embrace the industrial aesthetic, and in many respects touch the base architecture lightly. The acoustic panels and lighting are suspended or 'float' within the larger volumes. Where ceilings are necessary to provide an appropriate sense of scale, mesh ceilings, which remain permeable, have been used. Much of this was planned in close consultation with architects and engineers.

Beyond the functional elements, the aesthetics embrace expressive materials such as exposed brick to complement the timber panels and raw concrete. The facets, pyramids and triangulations created by the pleated façade design have been reprised as a motif throughout the interiors, such as the patterning used for the floor tiling and the zigzags and wedges of the acoustic baffles.

Similarly, the circular shape of the light wells is reprised in design elements throughout the interior, including the dramatically offset circular mats below them in the atrium, but also including acoustic panels, graphics, and even circular furnishings such as tables and stools. Biophilic aspects of the building are enhanced with abundant interior planting.

Ultimately, the interiors enhance the experience of the building, enabling its inhabitants to occupy it comfortably, and helping them to understand it. This approach simultaneously allows a rich corporate brand experience and enhanced corporate culture, while prompting the behaviours upon which the effective functioning of the building relies.

*Below: Circular motifs in the interior reference the circular light scoops in the central atrium.
Right: The use of angular patterned timber in the interior is inspired by the faceted façade of the building.*



An essential benefit of the use of CLT for a corporate project of this scale is market transformation - pioneering the possibilities of CLT in the local market and paving the way for the industry so that it becomes increasingly easy and efficient to use CLT in future.

An unusual aspect of the building's green credentials arose from the use of plastic waste as eco-bricks inside the non-load-bearing concrete floor slabs in certain areas, to displace the use of conventional concrete or polystyrene 'void formers'. This appears to have been a first for a global commercial building and achieves various sustainability goals.

Perhaps one of the most interesting and challenging aspects of the building's design, however, is the degree to which its ultimate success relies on its inhabitants' behaviour: the extent to which

they interact with the building and understand it. While the building management system (BMS) might be responsible for controlling the windows in the light scoops and the blinds over the windows on the façade, a significant part of the cost and energy savings depends on whether the building's inhabitants do indeed open them. (Lights linked to the BMS will prompt them to open and close the windows under certain conditions.)

Brunette points out that the building is designed according to a metric of comfort, not specific predetermined temperatures. And comfort, she adds, is highly subjective. Simply put, different people find different conditions comfortable. To further complicate matters, Arup has data to show that people's tolerance of temperature variations is much greater when they can

independently open and close the windows, which is not the case in a sealed, air-conditioned building. As such, the system is designed, too, to be adaptive - to respond to individuals and allow them to find their comfort zones.

"It's about adaptive comfort, which really means that the people in the building have agency," says Brunette. "And they make choices that influence their own environment, which allow them to be comfortable."

People's willingness to open the windows, and be willing and

enabled to work in different areas at different times of day, according to the light or temperature, for example, or their individual sense of comfort - will affect the degree to which the building's potential benefits are realised.

Mahoney also points out that he gauges its success on something important but also intangible - the extent to which the building connects you to nature, creates awareness of the environment, climate and natural surroundings (albeit in a more comfortable environment).

PROFESSIONAL TEAM

LANDLORD: V&A Waterfront **TENANT:** Deloitte **ARCHITECTS:** StudioMAS **ENGINEERING TEAM:** Arup **PROJECT MANAGERS:** Mace **QUANTITY SURVEYORS:** Smith & Co **INTERIOR ARCHITECTS:** Paragon Interface **MAIN CONTRACTOR:** GVK Siya Zama **GEO-TECH ENGINEERS:** Core Geotech **LANDSCAPE ARCHITECTS:** Planning Partners **ACOUSTICS:** SRL **ECO-BRICKS:** V&A Waterfront 