INSPIRED BY NATURE, POWERED BY COLLABORATION

Leading industry transformation by example, the new base of the Singapore Green Building Council exemplifies a green and healthy workplace.
The Singapore Green Building Council (SGBC) began life in 2009 with only a handful of full-time Secretariat staff seconded from the Building and Construction Authority (BCA). As industry support for the Council grew, the Secretariat expanded along with larger office premises correspondingly required for the Council to effectively perform its duties. From a mandate to certify green building products during its inception to now covering the entire green building ecosystem including managing Singapore’s pool of Green Mark Accredited Professionals (GMAP) and the co-assessment of Green Mark building projects with BCA, SGBC has come full circle a decade on.

With the increased emphasis placed on climate change and global warming as extreme weather phenomena continue to make their presence felt across the globe, the built environment has been increasingly thrust into the limelight. Buildings are in a prime position to mitigate climate change and the Construction Industry Transformation Map released in 2017 specifically spells out green building as a key pillar of industry transformation. SGBC, now armed with a decade of actionable green building knowledge and expertise gleaned from both Singapore and the globe as well as the steadfast support of the construction industry, is primed to lead the way in sustainability for the next decade and beyond.
As the voice for green building in Singapore, SGBC’s new office premises must encapsulate green building design principles in both its design and fitout. It must also be designed for the health and wellbeing of the Secretariat, creating a cohesive and productive base to run the Council’s growing stable of activities, initiatives and programmes.

Intended to be SGBC’s permanent base of operations for the foreseeable future, a user experience exercise was conducted with the SGBC Secretariat. Facilitated by students from the Nanyang Polytechnic (a SGBC Founding Member) School of Design as part of an industry experience programme, the exercise gleaned interesting insights and achieved consensus that the office design should draw inspiration from nature.

SGBC Member CIAP Architects Pte Ltd, having worked on successful green healthcare and commercial developments, was entrusted to design and manage the fitout of this green, healthy and nature-inspired workplace for SGBC. Tapping on in-house technical expertise, SGBC Secretariat staff also provided input and support for the office’s environmentally sustainable design as well as mechanical and electrical engineering requirements.

While guided by the Building and Construction Authority (BCA) Green Mark for Healthier Workplaces certification, the SGBC Office also referenced the World Green Building Council’s (WorldGBC) Better Places For People project. Through in-depth research and technical studies, a green and healthy office is co-related with these seven features:

1. **Biophilia & Views**
2. **Good Lighting**
3. **Noise & Acoustics**
4. **Thermal Comfort**
5. **Interior Layout & Active Design**
6. **Indoor Air Quality**
7. **Location & Access to Amenities**

Through its design and fitout, the SGBC Office encapsulates all seven features of a green and healthy office that pushes the envelope of environmental sustainability.

**A NATURE-INSPIRED GREEN & HEALTHY WORKPLACE**

The SGBC office draws heavily from Mother Nature for design inspiration, to reflect SGBC’s key role as a champion of green building and sustainability in the built environment. The design strives to create the ambience of a park within the office space, to encourage occupant connectivity to the natural environment through direct and indirect association with nature.
Inspired By Nature, Powered By Collaboration

Biophilia & Views

Incorporating nature into the built environment has proven to reduce stress and enhance cognitive function, which can lead to increased productivity, reduced turnover and lowered absenteeism rates. Sited on the 2nd floor of the BCA Braddell Campus, the expansive window glazing along the perimeter of the office affords ample views out to tree canopies and exterior greenery. Nature also finds its way indoors in the form of tall potted plants and a green wall composed of preserved moss.

Biomimetic carpet tiles from Interface’s Human Nature and Human Connections collections with GlasBac backing system (SGBP ✔✔✔✔) extensively cover the floors of the office space, mimicking the look of cobblestones, pebbles, stepping stones and grass, while Interface’s Level Set Luxury Vinyl Tiles (SGBP ✔✔✔✔) simulate weathered outdoor decking. Furthering the office-in-a-park concept, timber-look high pressure laminates provided by Lam Chuan Import-Export (SGBP ✔✔✔✔) form ‘tree trunk’ wall panelling motifs throughout the office, to create the perception of being surrounded by trees in the workplace.

Interior furnishings that are suggestive of natural elements are used throughout the office. These include the white Axiom Cloud and Soundscapes Circle mineral fibreboard ceiling panels from Armstrong Singapore, the Pebble stools and replicas of iconic furniture classics such as the Tulip coffee tables and Swan lounge chairs.

The office’s meeting rooms are named after local trees, with their carpet tiles reflecting the floral colours of the Angsana, Flame and Tembusu trees respectively. The gazebo-like discussion pods further add to the office’s park-like ambience, with the pods named after tropical flowers (Jasmine and Orchid) and fitted with flower-inspired feature pendant lights.
Good Lighting

The SGBC Office embraces daylighting to enhance the health and wellbeing of its occupants, which has been proven to support the circadian rhythm (body clock) of office occupants and help improve concentration. The extensive high window glazing at the double volume main workspace was a challenge, turned into an opportunity. While it allowed for generous daylighting and views out to nature, glare from the intense evening sun rays could be overly harsh and adversely impact the occupants’ visual comfort, if left untreated.

A glare control design strategy was devised, comprising a combination of light shelves, translucent/patterned glass film and vertical fins to carefully filter and manage the sunlight penetrating the glazing envelope, while still permitting views to the exterior. This in turn results in a softer, more diffused, and overall more pleasant lighting quality in the workspace, while the sunshade elements themselves add further visual interest to the space. The use of light colours and matte finishes, especially above the desk plane, further ensures a visually soothing environment. Operable window roller shades (mostly reused from the previous office tenant) help facilitate individual user control over their immediate work environment.

The workstations with partitions lower than 1.2 metres in height also help create an open office layout to facilitate daylight propagation. Translucent workstation partitions further encourage daylight penetration, while affording some sense of privacy to each workstation occupant. These workstations are from Innoplan’s i3 Workstation (SGBP ✔✔) range. Additionally, AGC Lacobel (SGBP ✔✔) back-painted glazing, and AGC MNGE Mirox (SGBP ✔✔) grey tinted mirrors by AGC Asia Pacific Pte Ltd help reflect daylight deeper into the work spaces.

High performance Prestige PR60 solar film by 3M (SGBP ✔✔) with good visual light transmission properties, replaces the existing dark tinted glass film on the windows to help mitigate unwanted heat gain through the glazing, while producing a brighter and more cheerful workplace. Backend and ancillary facilities such as stores, server and printing rooms (enclosed in SGBP ✔✔✔✔ USG Boral Sheetrock® StandardCORE plasterboard) are located away from the office windows to keep the work spaces open to daylighting.

Artificial lighting supplement the generous daylighting to achieve comfortable illumination levels in compliance with Singapore standards. A minimum colour rendering index of 80 for all lamps ensures good colour perception throughout. A section of the office reuses circadian lighting from the previous office, with lighting temperature programmed to emulate the time of day. Artificial lighting along the office perimeter is linked to daylight sensors by Lutron to allow electrical energy savings when daylighting alone is sufficient. Further energy savings are achieved with Lutron occupancy/vacancy sensors that turn on or off lights as needed.
Workspace with ample daylighting with effective glare control strategy, comprising light shelves, vertical fins and patterned glass film; reducing the need for artificial lighting and improving occupants’ sense of wellbeing.
3 Noise & Acoustics

A noisy office environment is undoubtedly detrimental to productivity, with sounds from both internal and external sources leading to staff distraction and dissatisfaction. Research has shown that staff performance can fall as much as 66 percent as a result from an aurally distracting workplace environment.

The SGBC Office is zoned into several areas for different activities, with the server room and printing facilities located a distance away from the main workspace. Within the main workspace, Discussion Pods and Phone Pods help contain vocal noise, while sound absorbing dividers at workstations, acoustic wall panels at the Phone Pods, and Armstrong Optra/Ultima mineral fibre ceiling boards (SGBP ✔✔✔) help attenuate sound reverberation, to create an overall quieter and more conducive work environment. The glazed enclosures of these pods still allow access to daylight and maintain a visual connection to the rest of the office space as well as to the exterior greenery.

4 Thermal Comfort

It is not uncommon for staff members to feel differently about their thermal comfort: one occupant’s cold climate might be too warm for another. Research has shown a 6 percent dip in staff performance when the office is too warm and 4 percent if it is too cold. Care must therefore be taken to achieve the thermal sweet spot.

The SGBC Office’s air-conditioning (set at 24°C) is zoned according to usage and occupancy requirements. It is scheduled to turn on and off at specific times, with provisions for localised override controls to extend air conditioning beyond the set periods. Alternative cooling modes are also available for use after office hours (e.g. auxiliary air-conditioning for selected areas only, and localised cooling through TP-04 bladeless air purifying fans by Dyson). The meeting rooms, pantry and areas with specialty occupancies have controls capable of sensing space use and responding to space demand. Human comfort is ensured with energy savings in mind.
5 Interior Layout & Active Design

To enhance staff health and productivity, the SGBC Office is designed to provide staff members with a variety of working environments to work from, encouraging physical activity and movement. Staff members may work at their assigned workstations or in the pockets of break-out lounging and activity spaces around the office. Workstations can also be kitted out with standing desk converters, providing adjustable worktop surfaces to offer the option of working standing up. Bar-counter height tables within the Discussion Pods, Phone Pods and pantry also allow the users to convene standing meetings and casual discussions.

To provide for good office ergonomics, SGBC staff reviewed several office chair models and tried each one out before voting on their preferred choices. The eventual chair model selected features a high degree of personal control, being able to adjust almost every aspect of the seat (such as height, elevation and sway) to suit individual preference.

6 Indoor Air Quality

The Indoor Air Quality (IAQ) of a place or space directly impacts occupant health and wellbeing, with factors such as carbon dioxide levels, presence of volatile organic compounds (VOCs), mould and bacteria affecting the air we breathe in. Studies have shown that staff members tend to focus better in green, well-ventilated workplaces with low VOC and carbon dioxide levels.

Almost all of the materials selected for use in the SGBC office are highly-rated products certified by the Singapore Green Building Product (SGBP) certificate scheme, meaning that the materials have been verified to be green and eco-friendly through the necessary documentation, test reports and proven benchmarks. The SGBP criteria also necessitates a low carbon footprint (backed up by the relevant reports) for products seeking the highest possible rating, ensuring that the products that eventually found use in the office have the lowest possible carbon footprint, especially for high impact materials. Even the pantry chairs, although not SGBP-certified, have a green narrative in terms of being fabricated from recycled materials.
The architectural finishes used in the office are all certified for their low-VOC content, and the paints used in the office are not only low VOC, but VOC abatement types in the form of Akzo Nobel’s Dulux PureAir (SGBP ✔✔✔✔) interior paints. SGBC Member Big Red Pte Ltd also provided indoor air quality consultancy throughout the renovation process to ensure an atmospherically clean office premises.

**Location & Access to Amenities**

Green and healthy offices have good access to the public transport network, safe bike routes, ample parking and shower facilities, as well as a range of healthy food options. Ancillary services like childcare centres are also crucial considerations for employees.

Sited on the BCA Braddell Campus, the SGBC Office is well served by the public transportation network along Braddell Road leading to the Central Expressway (CTE) located 10 minutes away from Bishan MRT Station (NS17/CC15) and served by multiple public bus services. The Kallang Park Connector is also adjacent to the building, allowing for commutes by bicycle and even jogging as shower facilities are available on campus.

**BEYOND GREEN MARK**

For its new premises, SGBC is aiming for no less than the highest Green Mark Platinum rating under the BCA Green Mark for Healthier Workplaces certification, and beyond. The maximum lighting power density (LPD) for Platinum certification is 9W/m², while the SGBC Office is achieving about 6W/m². Air-conditioning indoor dry bulb temperature for Green Mark certification is not to be lower than 23°C, while the SGBC Office is set at 24°C. Additionally, just about everything that one sees, touches or steps on in the SGBC Office is a green product with a robust sustainability narrative. Coupled with green office policies such as a paper recycling programme and mandatory usage of environmentally-preferred stationery, SGBC is truly walking the talk and exemplifying sustainability in the built environment.

“SGBC’s role in the industry and built environment ecosystem has greatly expanded in the past 10 years, but we would never have come this far without the support of our Members, partners and the industry,” said Dr. Ho Nyok Yong, President of SGBC. “The new SGBC Office is a testament to SGBC’s collaborative nature, working with like-minded organisations to create a healthy and sustainable space that showcases exemplary green building design. I hope that this new office will inspire the industry to create their own green and healthy places and spaces.”

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**Project Details**

**Gross Floor Area:** 330 sqm  
**Design Architect:** CIAP Architects Pte Ltd  
**Contractor:** SkillPlan Designer & Builder Pte Ltd

**SGBC Office Contributors**
- 3M  
- AGC Asia Pacific Pte Ltd  
- Akzo Nobel Paints Singapore Pte Ltd  
- Armstrong Ceiling Solutions  
- Big Red Pte Ltd  
- Consis Engineering  
- Dyson Singapore  
- Innoplan Technology Pte Ltd  
- Interface  
- Lam Chuan Import-Export (Pte) Ltd  
- Lutron  
- Nanyang Polytechnic  
- USG Boral Pte Ltd
A GREEN & HEALTHY WORKPLACE

The SGBC Office is designed and fitted out with health, wellbeing as well as sustainability in mind. Addressing all 7 features of a green and healthy workplace according to the World Green Building Council’s Better Places for People project, SGBC is walking the talk for better workplaces.

**05 INTERIOR LAYOUT AND ACTIVE DESIGN**

Pockets of break-out lounging and activity spaces encourage physical activity and movement within the office, while bar-counter height tables at Pantry, Discussion and Phone Pods allow for standing discussions.

**WHY?**
Flexible workspaces help staff feel more in control of their workload and engenders loyalty.

**01 BIOPHILIA & VIEWS**

Biomimetic furnishings and materials in the office, resembling grass, moss, cobblestone, stepping stones, clouds, flowers and tree trunks, are used throughout the office. Expansive glazed windows allow for ample views to the outdoor tree canopies and greenery.

**WHY?**
Improvement in processing time at one office when staff had a view of nature.

**06 INDOOR AIR QUALITY (IAQ)**

The architectural finishes used in the office are all certified for their low-VOC content, with the paints used being of the VOC abatement variety. Indoor air quality checks throughout the renovation process also help ensure good air quality within the office.

**WHY?**
Increase in cognitive scores for workers in a green, well-ventilated office.

**101%**

**04 THERMAL COMFORT**

Air-conditioning dry bulb temperature is set at 24°C and is zoned according to usage and occupancy requirements. Meeting rooms, pantry and areas with specialty occupancies have controls capable of sensing space use and responding to space demand.

**WHY?**
Fall in staff performance when offices are too hot and 4% if too cold.

**6%**

**03 NOISE AND ACOUSTICS**

High window glazing with light shelves, coupled with glare control devices, allow for generous daylight penetration without unwanted glare. Artificial lighting linked to sensors supplement daylighting to achieve comfortable illumination levels throughout the office, while still achieving energy savings when not needed.

**WHY?**
Fall in staff performance as a result of distracting noise.

**7-12%**

**02 GOOD LIGHTING**

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WHY?
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WHY?
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66%
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46 minutes
More quality sleep at night for occupants with workspaces near windows and daylight.

02 GOOD LIGHTING
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03 NOISE AND ACOUSTICS
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05 INTERIOR LAYOUT AND ACTIVE DESIGN

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07 LOCATION & ACCESS TO AMENITIES
Well served by the public transportation network and major thoroughfares. An adjacent park connector also allows for commutes by bicycle and even jogging, with shower facilities available.

WHY?
Office occupants often place significant emphasis on how accessible and well-connected their workplaces will be, usually ranking in the top four of their key consideration priorities.

WHY?
Increase in cognitive scores for workers in a green, well-ventilated office.

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