



Energizing Kowloon East

Energizing Kowloon East Office (EKEO) Building Green Temporary Office Building

COMMUNITY
BRANDING
DESIGN
DIVERSITY

ENERGIZING
KOWLOON
EAST

10 July 2012



起 energizing 動 Kowloon East 九龍東

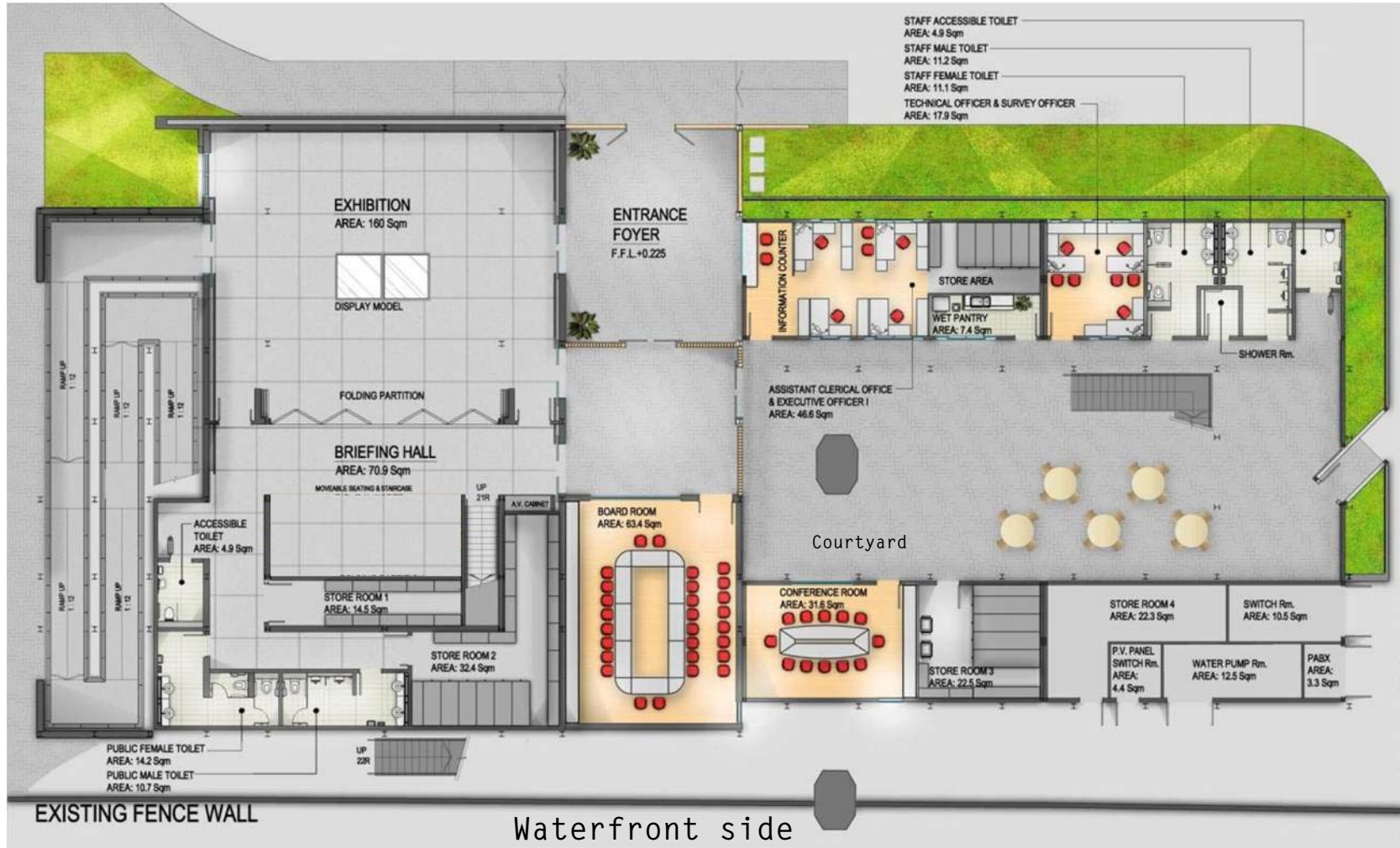


EKEO is located near the junction of Hoi Bun Road and How Ming Street in close proximity to both Kai Tak Development and the business areas within Kowloon East.

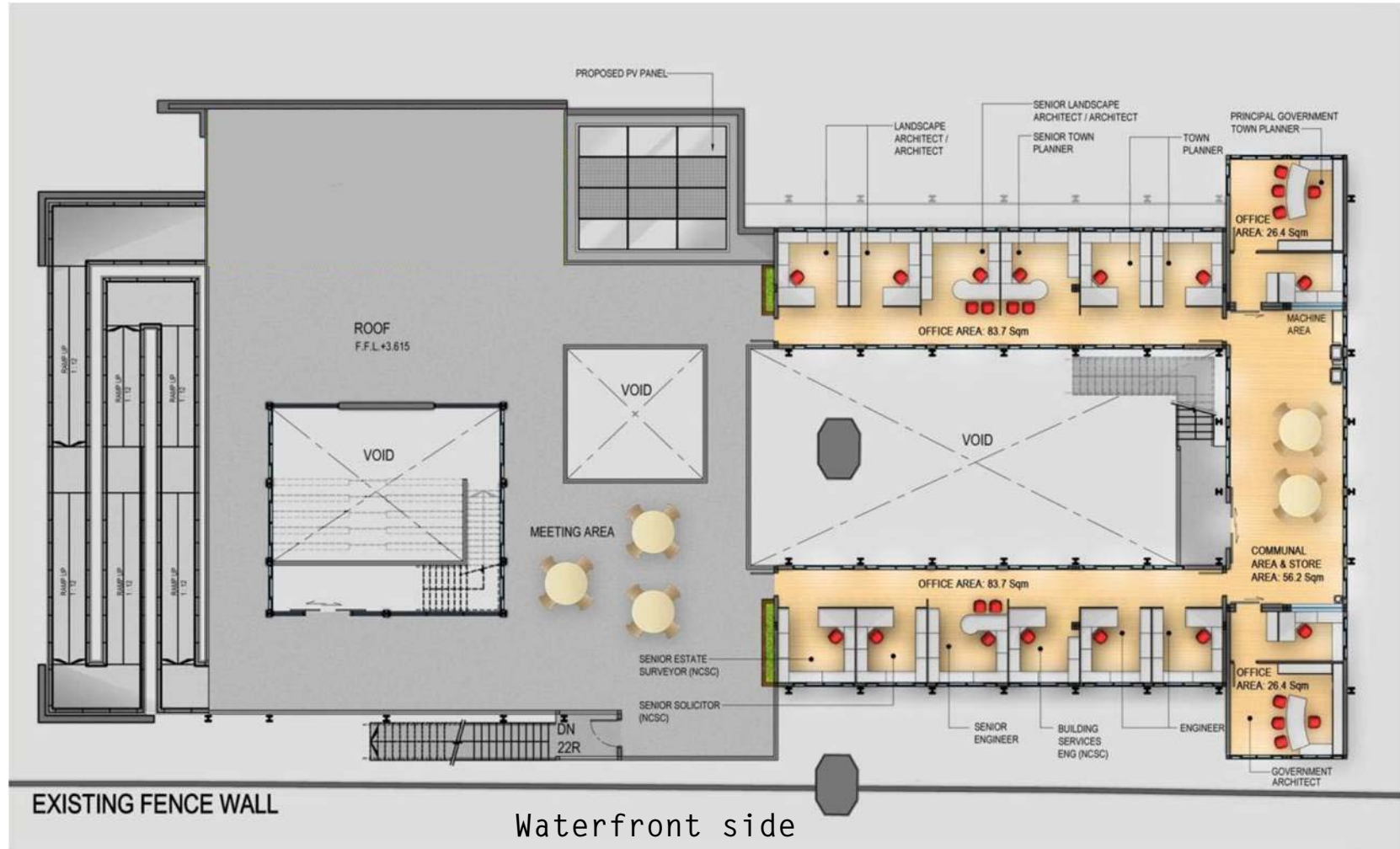
EKEO is a two-storey 1,200m² floor area building which can accommodate 20 staff and 50 visitors out of an area of 3,600m² underneath the Kwun Tong Bypass.



G/F Plan



1/F Plan



Key Sustainable Features

- **Ultra Low Embodied Carbon** with modular design using used freight containers and reusable structural steel members, which could be easily disassembled and reused at other site
- **Low Energy Consumption – 33% reduction** compared to EMSD Building Energy Code through Passive and Active Design
- **Low Water Footprint – 57% saving** through the rainwater recycling and use of water efficient devices
- **Quality Site Office Environment** – Use of **Natural Ventilation** and **Daylighting** to create a healthy and comfortable working environment
- **Waste Minimization – 69% construction waste** to be recycled and reduce operation waste through 3-bins recycling system
- **Green Operation** – Energy saving, smart control and intelligent operation of the Kiosk
- **Sustainable Development Showcase / Green Education**
 - BEAM Plus Platinum (Provisional)
 - Exhibition Area and Briefing Hall with well-managed guided tour
 - Enhanced access for persons with disability
 - Air purifying paving blocks

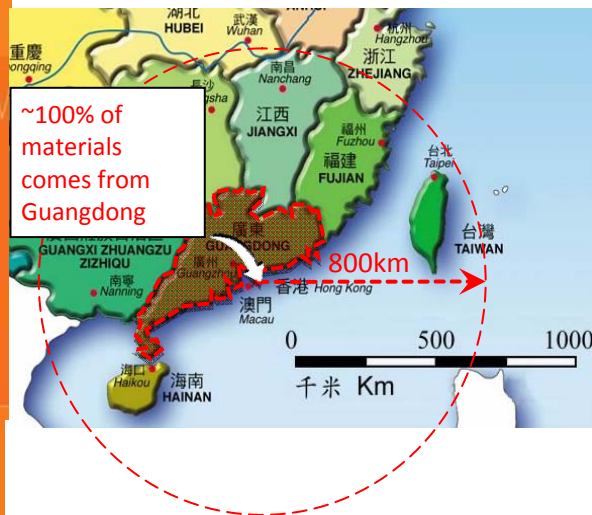
Saving Materials throughout Whole Building Life Cycle (1)

- **Lean Construction** with **Standardized Used Freight Containers** (22) and **Modular Structural Steel Members** as major building components
 - Maximize Use of **Prefabrication**, i.e. **Reduce Construction Waste and Environmental Impacts**
 - Can be **Easily Disassembled** and **Reused (Almost 100%)**



Saving Materials throughout Whole Building Life Cycle (2)

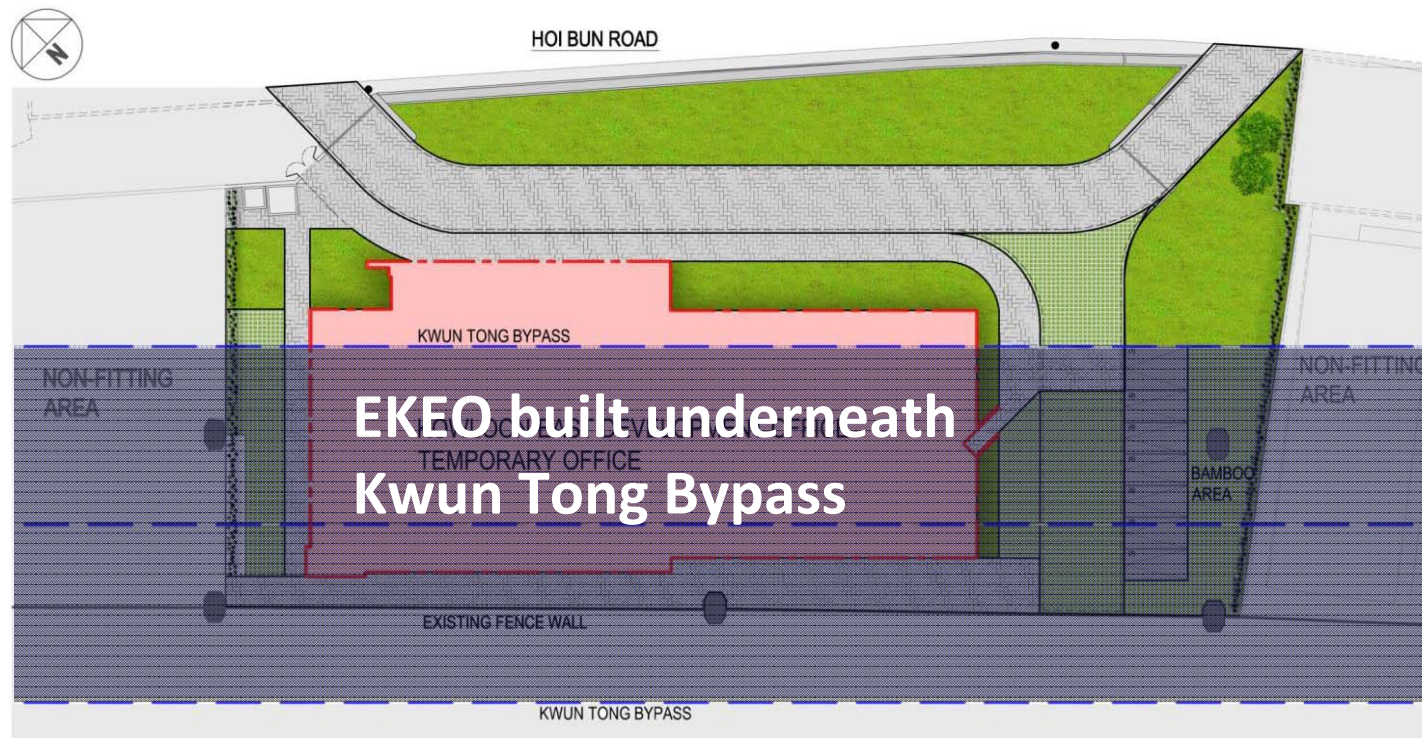
- **Almost 100% of Materials from Regional Sources** (manufactured within 800km of the project site)
- **Maximize Use of Recycled / Reused Materials**
Used containers, paving blocks made from recycled aggregates, recycled glass sand and fly ash, etc.



Low Energy Consumption (1)

Passive Design

1. Optimum use of site features to minimize solar heat gain with 80% roof area under covered by Kwun Tong Bypass



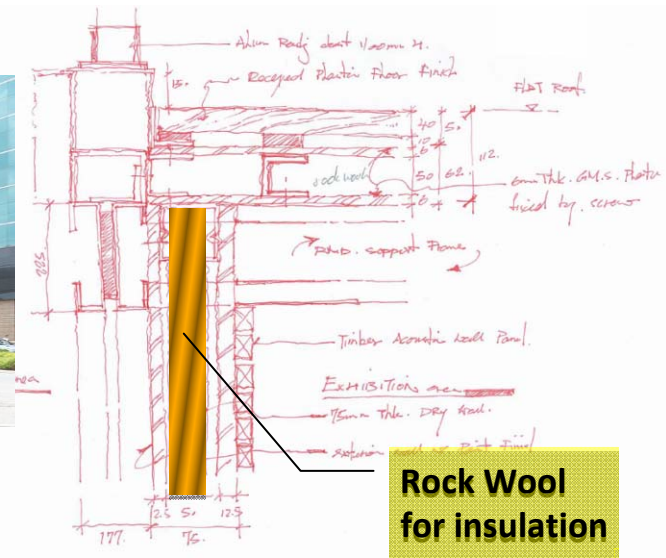
Low Energy Consumption (2)

Passive Design

2. Reduce cooling demand via:
 - Optimize window to wall ratio (~20%) to reduce solar heat gain
 - Insulated envelope using rock wool (U-value of wall: 0.83 vs BEAM Plus Baseline 3.7, i.e. **78% reduction in thermal transmission**)



Optimize window to wall ratio

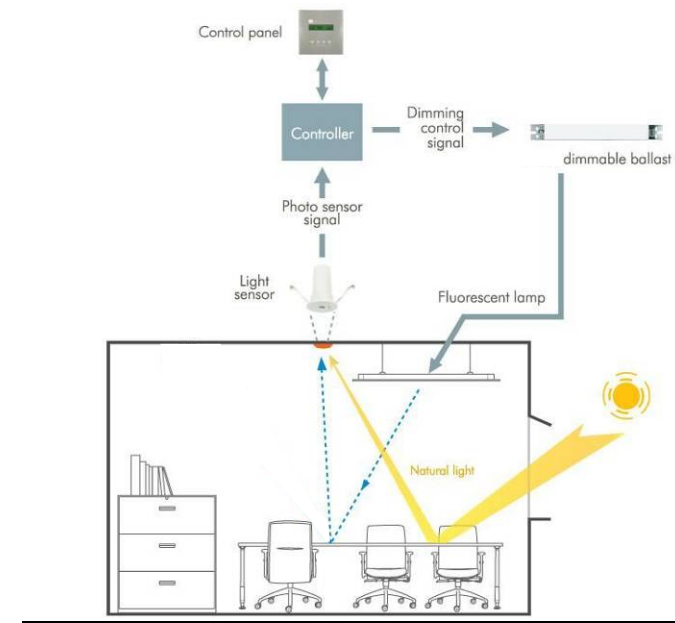
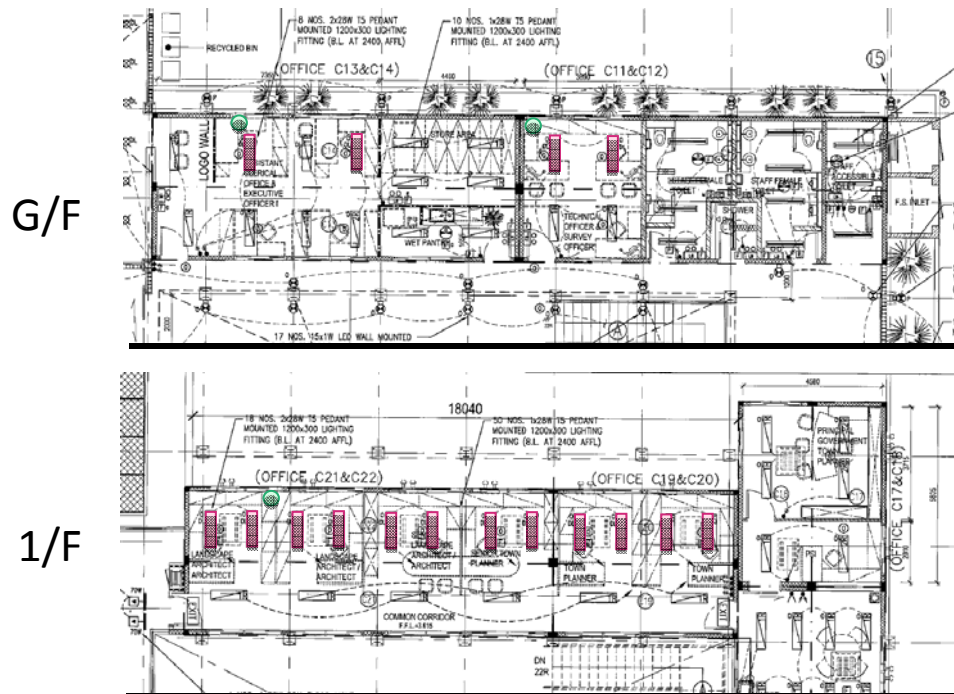


Rock Wool for insulation

Low Energy Consumption (3)

Passive Design

3. Daylighting to reduce lighting energy consumption



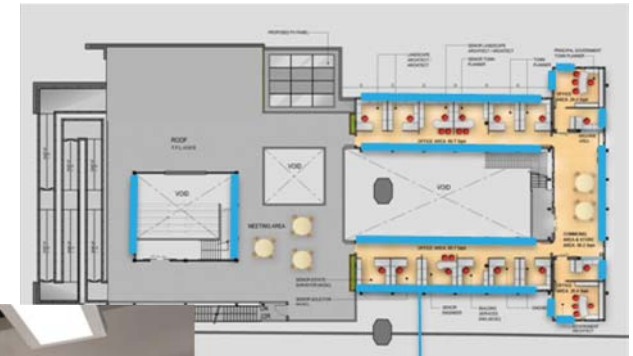
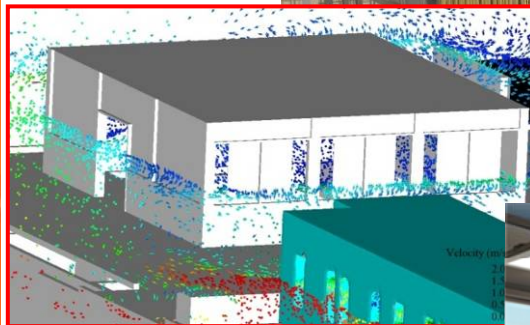
● Photo sensors ■ Lighting fittings along windows controlled by photo sensors

Low Energy Consumption (4)

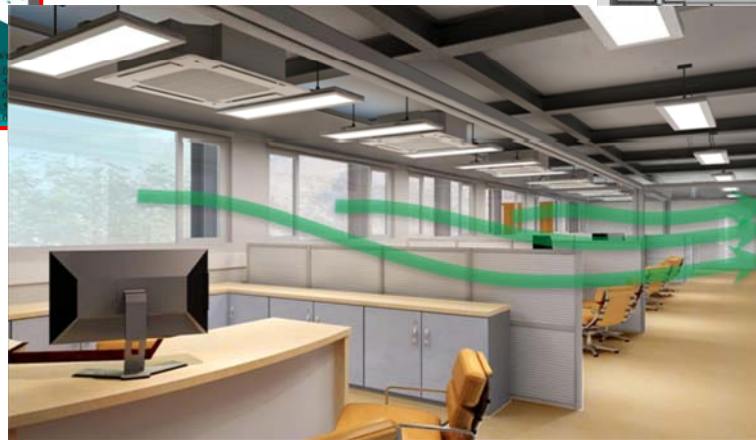
Passive Design

4. Provision of cross-ventilated openings to utilize natural ventilation during desirable seasons

Exhibition Area



Windows



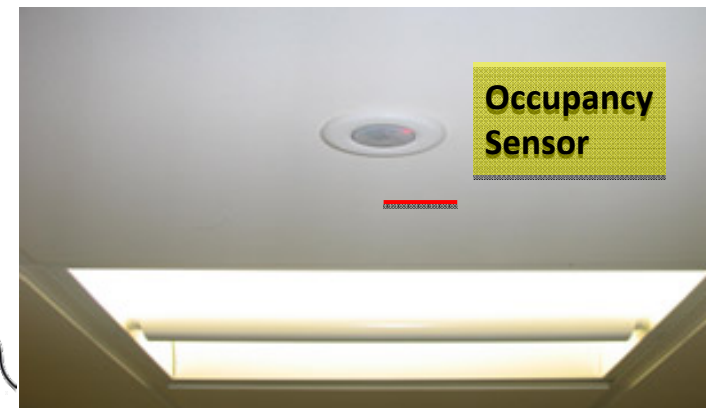
Office Area

Low Energy Consumption (5)

Active Design

1. Efficient Lighting System

- T-5 Lamps + Task Lights w/ adjustable illuminance (30%-100%)
- Avg. lighting power density (LPD) for office = 8.2 W/sq.m
i.e. 45% less than the requirement of BEC 2012 (15 W/sq.m)
- Daylight and occupancy sensors

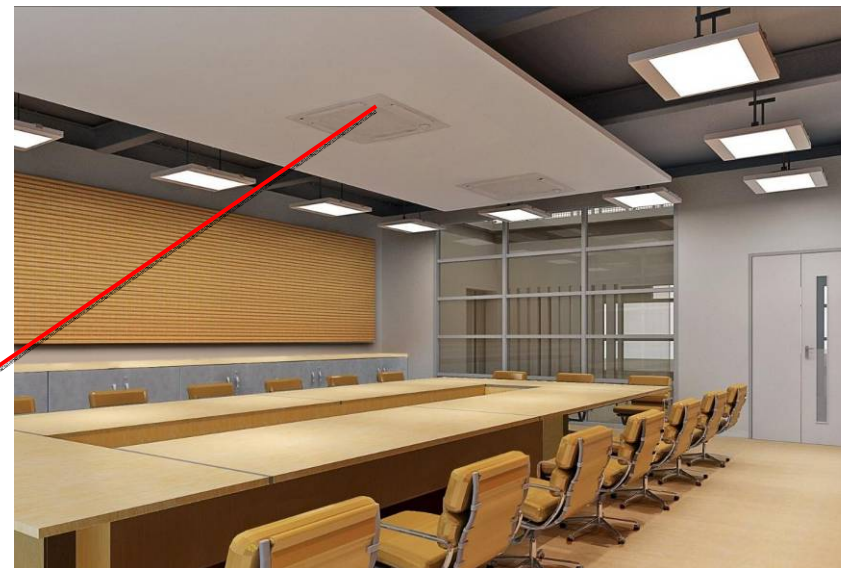


Low Energy Consumption (6)

Active Design

2. High Efficiency HVAC System

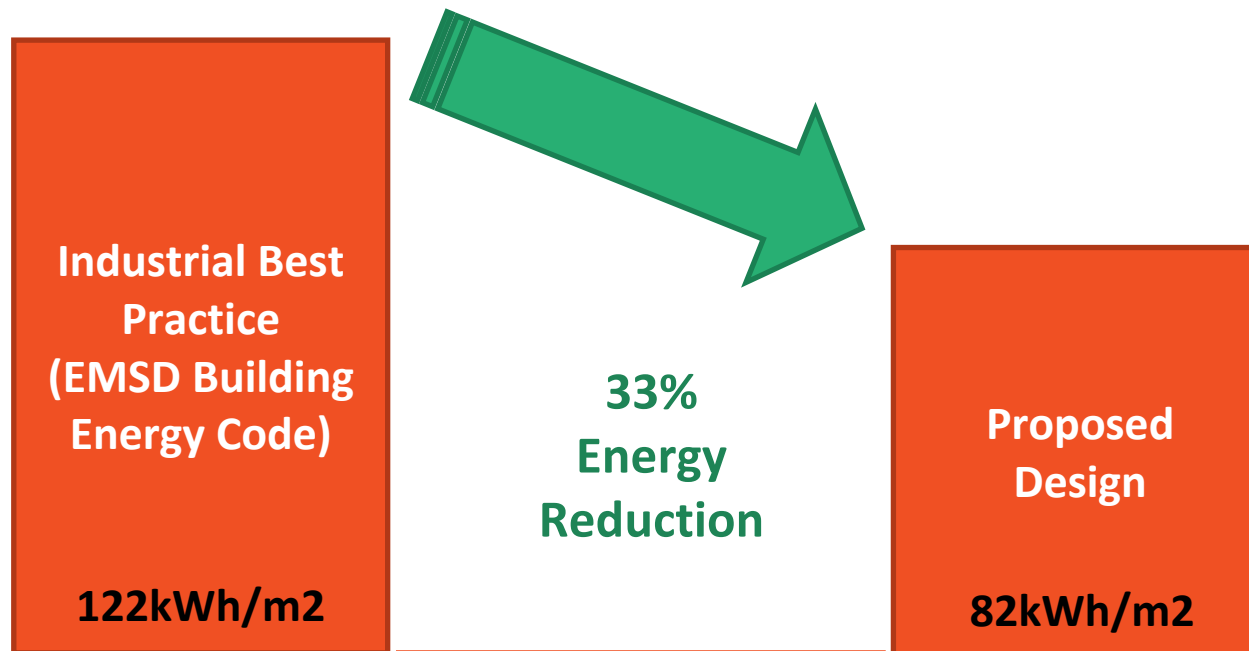
- Variable Refrigerant Volume (VRV) units with higher COP (> 4.0) instead of window / split type air-conditioners (≤ 3.0)
i.e. $>33\%$ increase in energy efficiency



Low Energy Consumption (7)

Energy Simulation Results

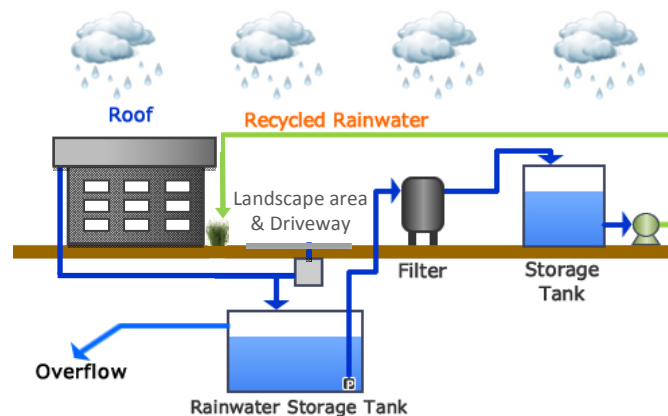
- **33% energy reduction**
= 48,500kWh/year or 642 nos. 28W T5 lighting for 1 year
- **37% reduction in peak electricity demand**



Low Water Footprint

Water Conservation

- **57% reduction in fresh water consumption** or 805,000L/year
 - Use of low flow and/or sensor-controlled faucets
 - Rainwater recycling
- **22% reduction in flushing water demand** or 51,600L/year by using low flow urinal & dual flush toilets

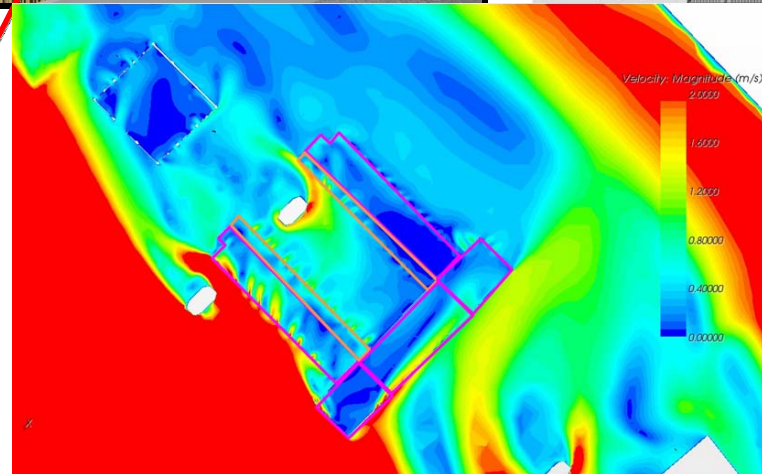
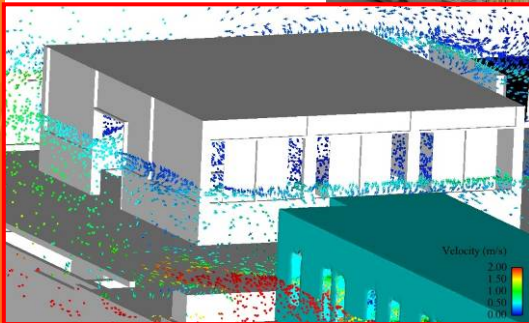


Quality Site Office Environment (1)

Enhance Natural Ventilation

- Openings are provided to facilitate cross ventilation in transitional seasons

Exhibition Area



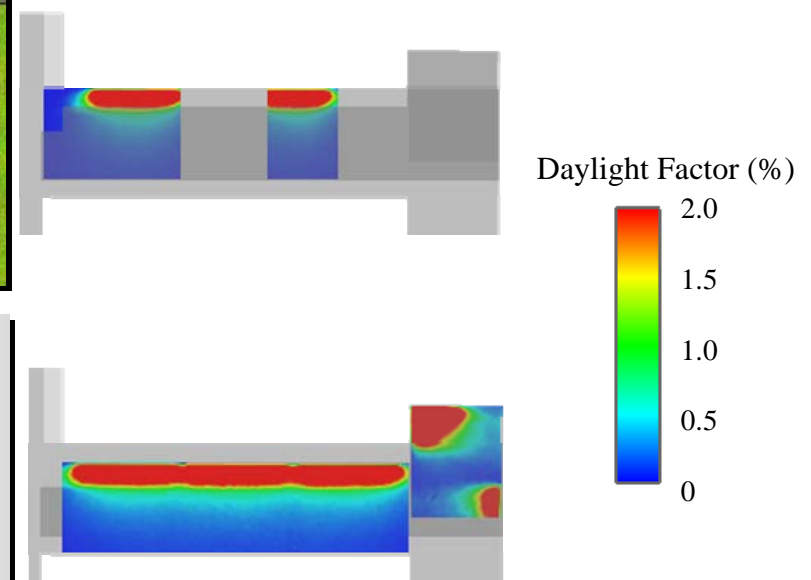
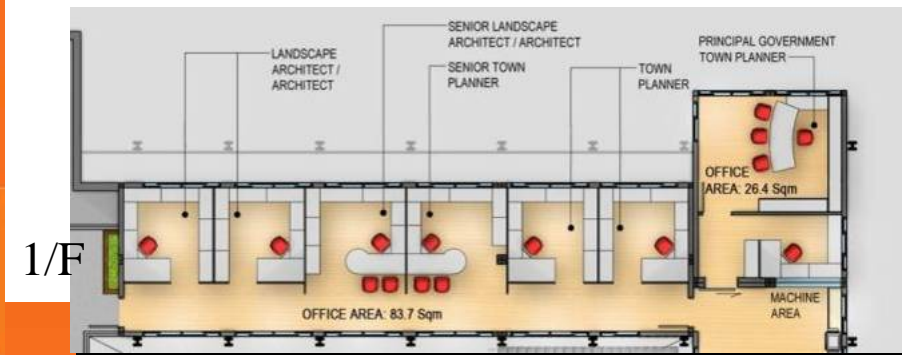
Windows

Office Area

Quality Site Office Environment (2)

Enhance Daylighting

- Optimum window area
- balance daylighting
and solar heat gain



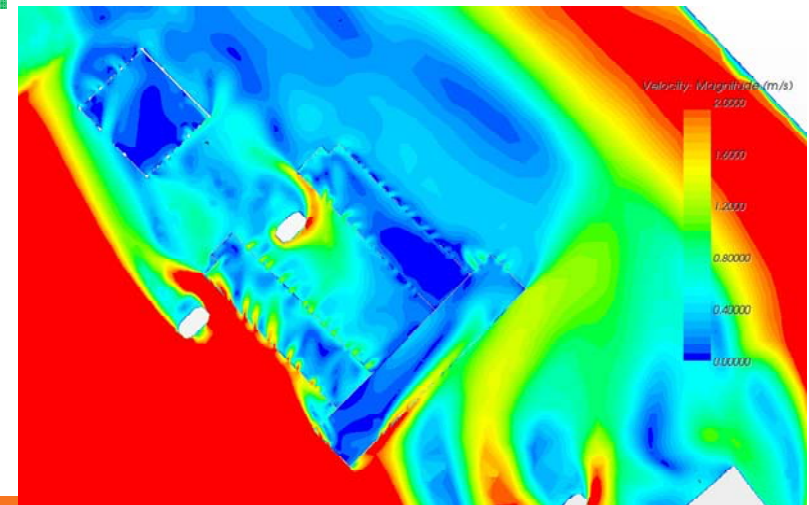
Quality Site Office Environment (3)

Enhance Ventilation at Courtyard

- Building design to facilitate natural ventilation at courtyard and office.



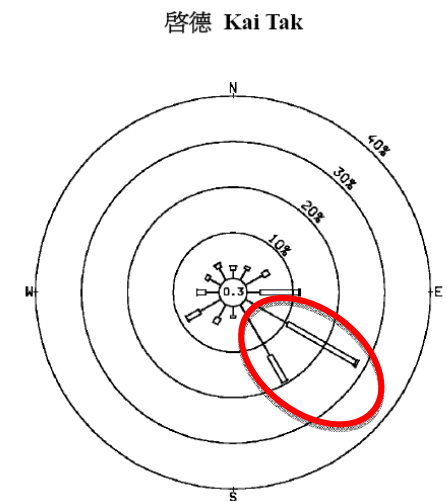
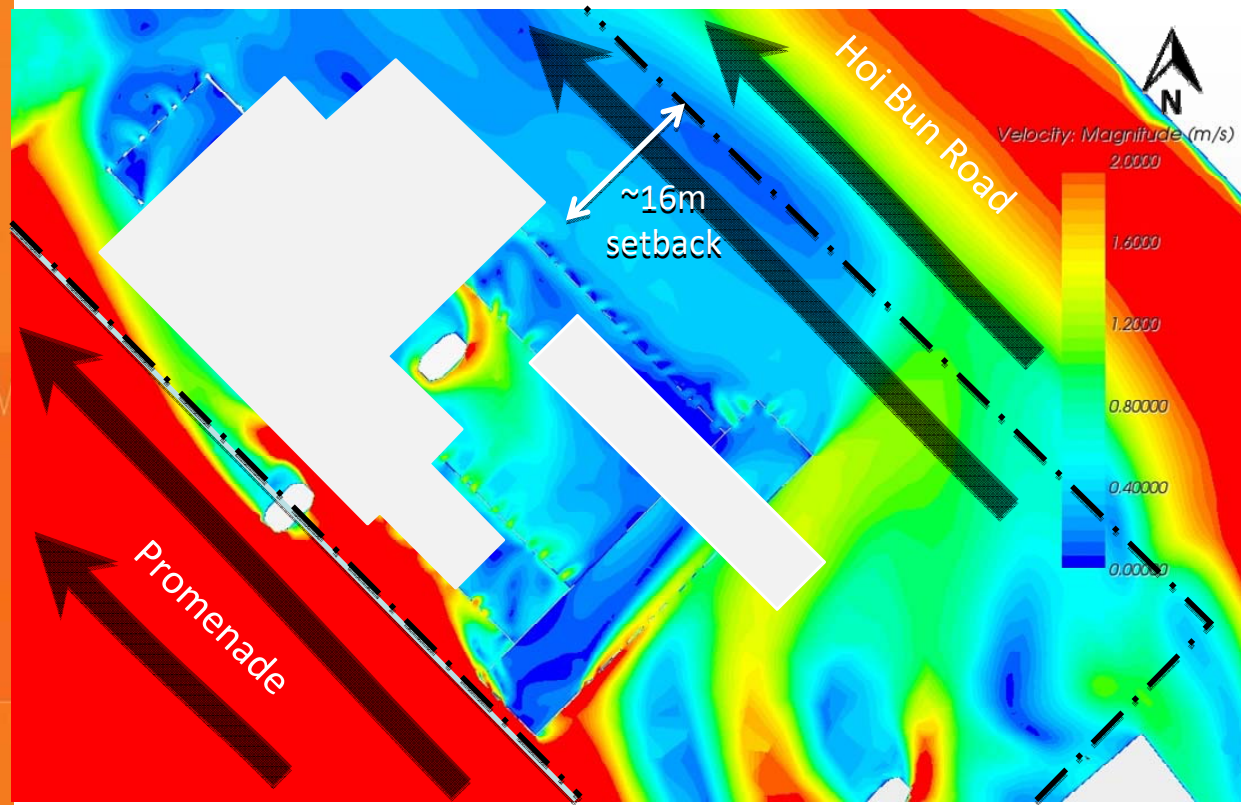
Perforated Fence Wall & Operable Windows to capture prevailing wind



Quality Site Office Environment (4)

Optimized Urban Air Ventilation

- Building shape aligns with the annual prevailing wind direction (SE) to facilitate air ventilation

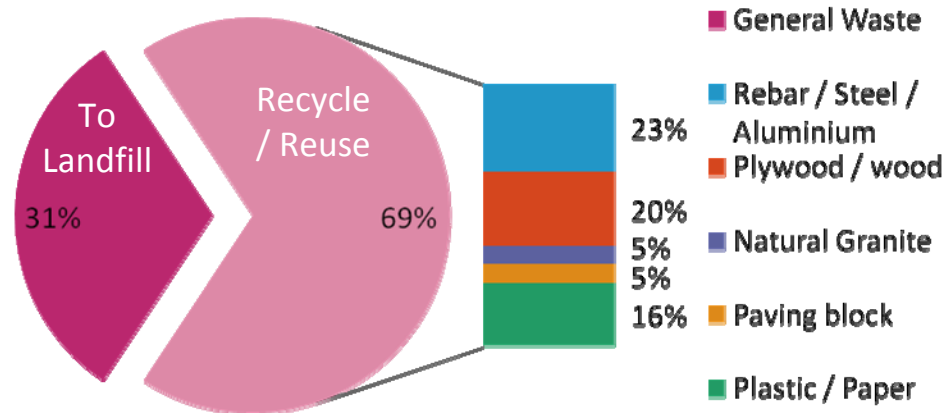


Waste Minimization

Waste Management

- **Construction: Reduce ~69% or 10,500 kg of Construction Waste by Recycling / Reuse**
- **Operation: 3-bins recycling system to encourage waste recycling**

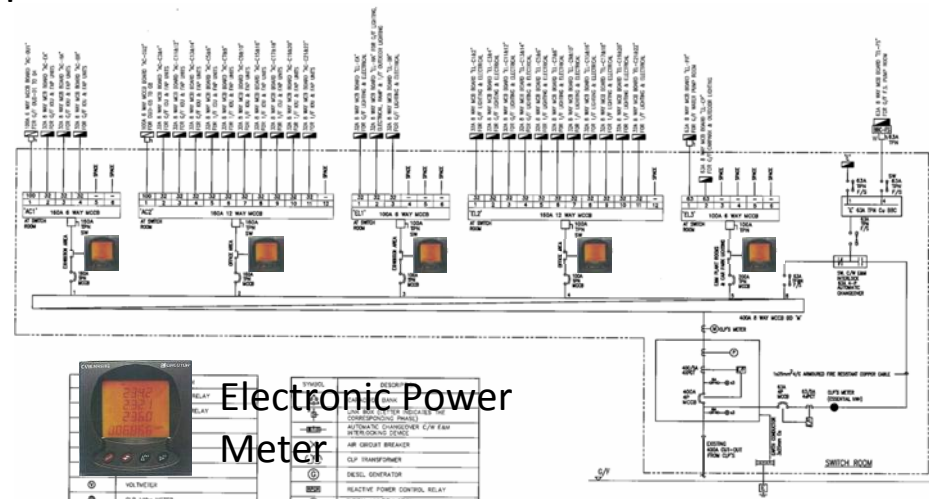
Construction Waste Estimation



Green Operation

Sustainability Policy & Feedback Loops

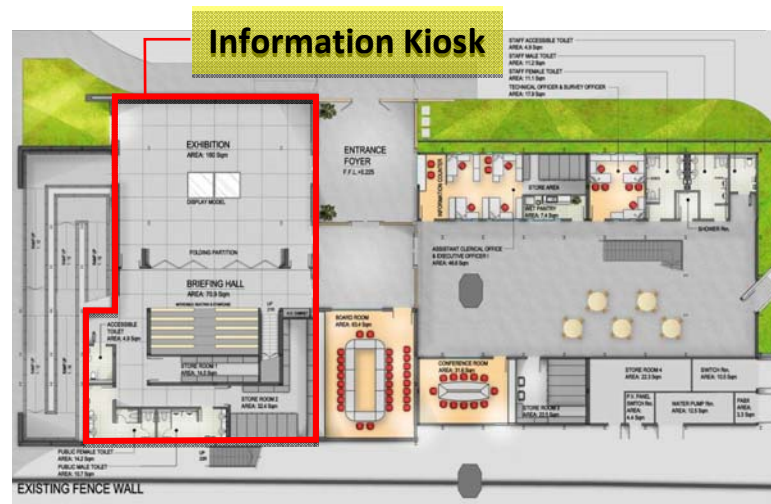
- **Sub-metering** are installed to monitor separately electricity consumption by HVAC and Electrical systems
- **Green Operation**
 - operation guideline distributed to staff
 - advance appointment of visits to Information Kiosk for smart control and intelligent operation



Sustainable Development Showcase/Green Education (1)

Raise Public Awareness of Sustainability

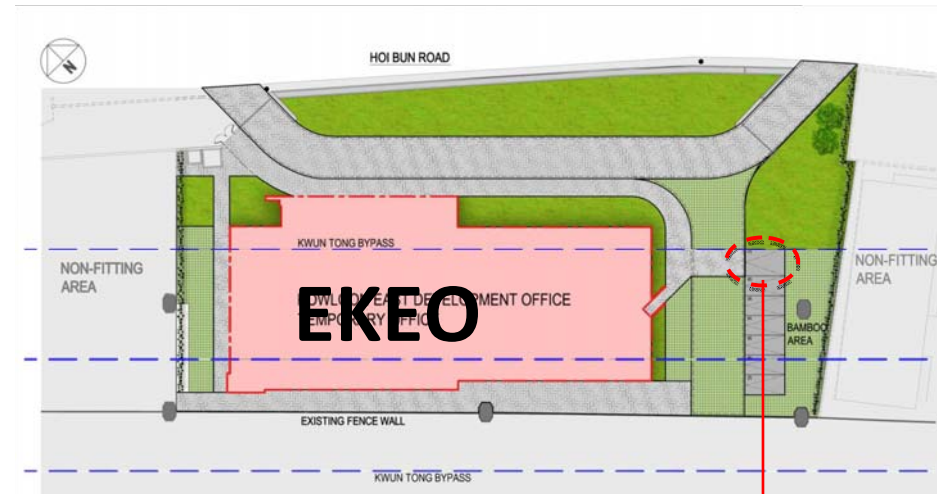
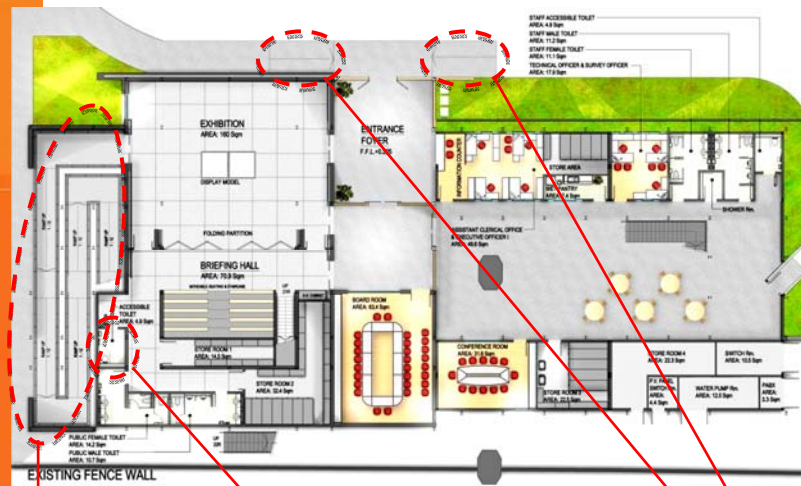
- Promote public awareness on sustainable development at Kai Tak Development and demonstrate government's great effort on promoting low carbon environment
 - **Information Kiosk** and a Briefing Area with well-managed guided tour



Sustainable Development Showcase/Green Education (2)

Building Amenities

- Enhance Accessibility for Persons with Disability (EXCEPTIONAL for temporary building)
 - Ramp for access
 - Parking space



Ramp to 1/F

Accessible Toilet for persons with disability

Ramp to Entrance Foyer

Accessible car parking for persons with disability

Sustainable Development Showcase/Green Education (3)

Environmentally Friendly Pavement

■ Tiostone

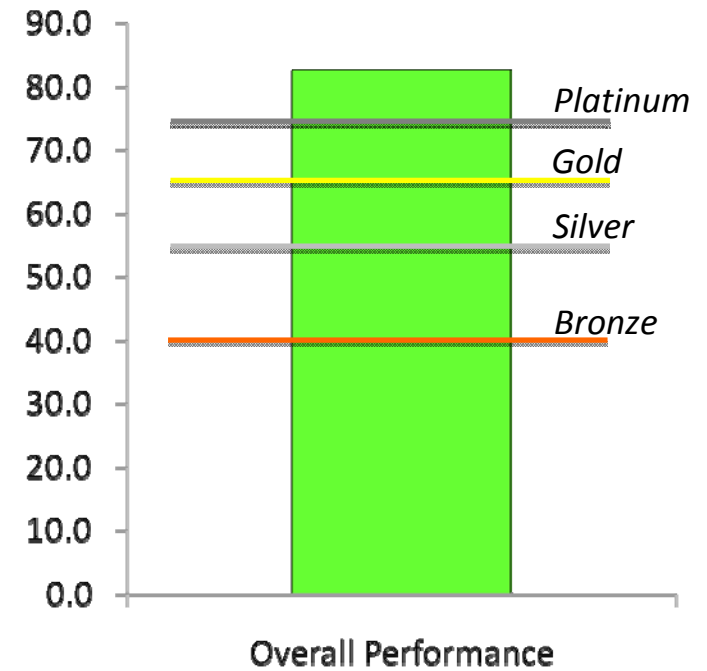
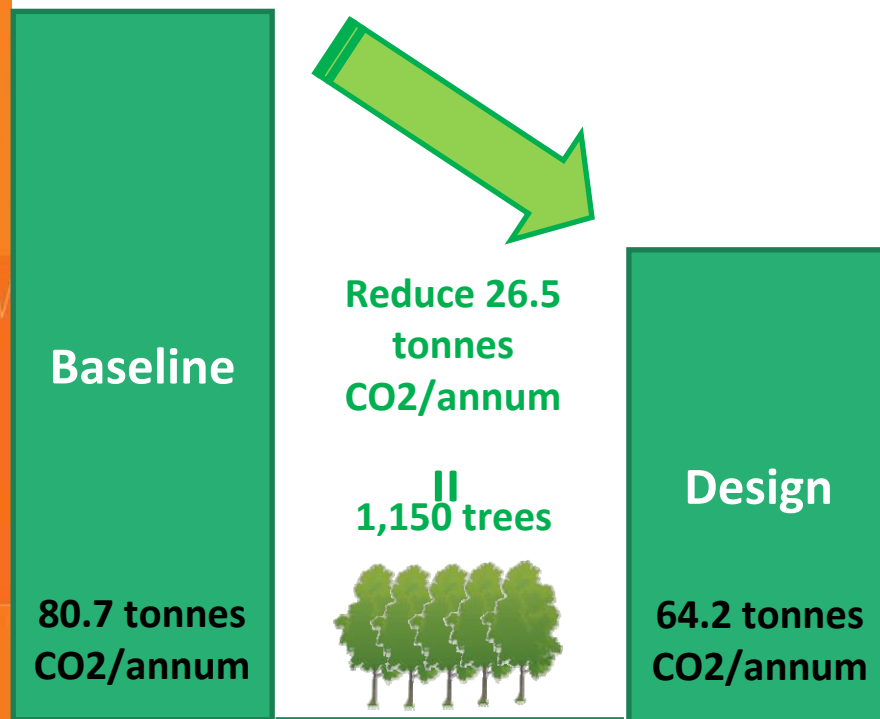
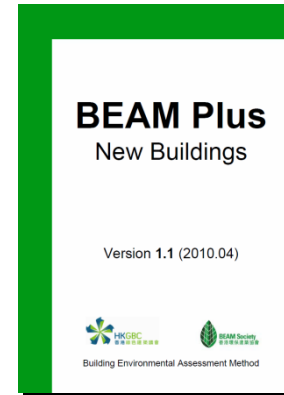
- Made from recycled materials (recycled aggregates, recycled glass sand and fly ash)
- Contain Titanium Dioxide (TiO_2) which help abate nitrogen oxide (NO_x) from road vehicles
- Purify ambient air, i.e. **Improve Health of Building Users and Pedestrian**

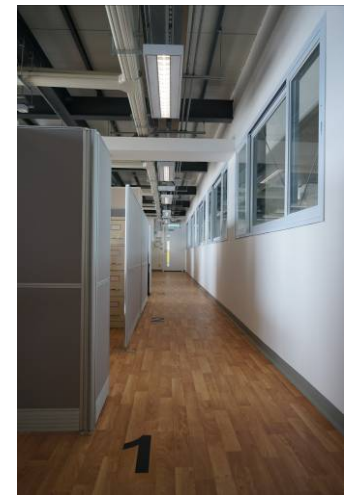


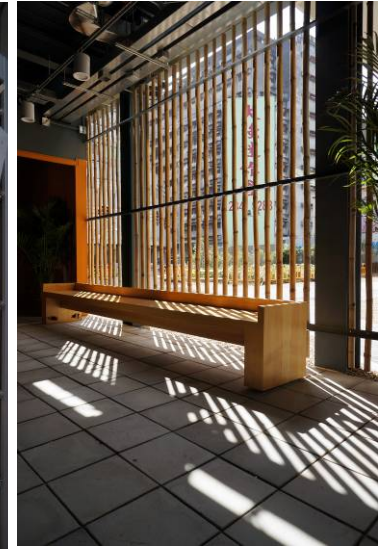
Overall Performance Highlight

- Ultra Low Embodied Carbon
- Operational Carbon Emissions reduced by 33%

- Achieved BEAM Plus Platinum (Provisional)







Summary

Energy Saving

1. About 33% or 48,500 kWh/year reduction of annual energy consumption
2. About 37% reduction in peak electricity demands

Water Conservation

1. About 57% or 805,000L/year reduction in fresh water consumption by harvesting rainwater for irrigation
2. About 22% or 51,600L/year reduction in flushing water demand by using low flow urinal and dual flush toilets

Waste Reduction

1. About 69% or 10,500kg of construction waste will be recycled or reused
2. About 50% of building materials are prefabricated



Double rainbow connection

多謝!

Thank You!

Connectivity

Design

Diversity

Branding