



ComfortDelGro Corporation Limited

Green Building User Guide for ComfortDelGro's Head Office

This Green Building User Guide forms part of ComfortDelGro's effort to ensure a healthy and sustainable working environment for all occupants in office buildings. The Guide shall ensure a cohesive green culture is adopted by occupants as everyone shall contribute a part towards a greener and healthier environment.

The efficient and safe operations of a building depend on the interactions of tenants and occupants within the building. This Guide shall provide a direction to building occupants and facilities managers on how to operate the building in accordance with design intent and in an efficient manner. The Guide shall also include details of the sustainability features incorporated in the design of the building, which when operated correctly, shall fully optimize the building's environmental performance. Further fine tuning or improvement plans may be necessary to improve building performance continuously.

This Guide has been developed as a user friendly and easily managed manual to encourage occupants to adopt the green culture. The Green Building User Guide shall encompass the following:

- Energy efficient features of building;
- Water efficient features of building;
- Energy management;
- Water management;
- Waste management;
- Indoor air quality management

Introduction

The ComfortDelGro Corporation Limited Head Office is located at 205 Braddell Road Singapore 579701. The Head Office is made up of both East and West Wing buildings and the location is easily accessible by public transport such as buses.

The Property Services Office manages the building maintenance of both East and West Wing buildings. The East Wing office has a total of 7 levels including a reception area at the first level Lobby whereas the West Wing office has a total of 5 levels.

Energy Efficient Features

Energy Efficient Air Conditioning & Mechanical Ventilation System (ACMV)

The air conditioning systems is vital in office buildings especially in Singapore due to its hot and humid conditions. The energy consumed by a ACMV system can comprise up to 50% of total energy consumption in a building. Given that the ACMV accounts for such high energy consumption, ComfortDelGro is constantly monitoring the energy consumption of the ACMV and the efficiency of the system in Head Office.

The air conditioning systems at both East and West Wing buildings are replaced gradually in phases since end 2018 and will be fully replaced by end 2019. The air conditioning systems at both East and West Wing buildings are now retrofitted to multi split air conditioning systems.

The new air conditioning systems efficiencies are as follow:

Table 1: Air Conditioning System Efficiency

Building Wing	System Type	Building Cooling Load (RT)	Part Load Efficiency (kW/RT)
East Wing	Unitary / Multi Split	<500	0.85
West Wing	Unitary / Multi Split	<500	0.73

The air conditioning systems also undergoes regular maintenance to ensure they are kept in optimal

condition for better energy efficiency.

LED Lighting

The Group Property Services Office started to retrofit the offices in phases since June 2018, starting from East Wing and finally completed the replacement of LED lighting for both East and West Wing in the beginning of 2019.

The entire building is 100% fitted with LED fluorescent lamps with the exception of downlights which remains to be Programmable Logic Control (PLC) light fittings.

Energy Efficient Lighting Features

Occupancy Sensors

To improve the energy efficiency for the building, occupancy sensors are installed at the common areas such as toilets, pantry and staircases at each level. Occupancy sensors are used to turn off the lights if the area is vacant for a certain amount of time (usually fifteen minutes) and will switch on the lights automatically upon detecting movements. This lighting feature can contribute a significant amount of energy savings. Light energy savings of up to 30% can be achieved through the use of occupancy sensors.

Zoning

Zoning is also introduced in the building to improve the energy usage. The light zoning are controlled manually by switches and sectioned by different areas in each level.

Naturally Ventilated Carparks

The carparks at ComfortDelGro's Head Office are also located in open areas and naturally ventilated, thus reducing the need for mechanical ventilation which are often required in basement carparks.

Water Efficient Features

Water Efficient Fittings

In the resource constrained Singapore, water has always been a strategic priority to the country. It is crucial to encourage both domestic and non-domestic consumers to use water efficiently. The Public Utilities Board (PUB) has launched the Water Efficient Labelling Scheme (WELS) since end Oct 2006 and has implemented the scheme across the island.

By installing water efficient fittings and adopting the Water Efficient Building (WEB) recommended flow rates/flush volumes, premises can save about five percent of their monthly water consumption.

ComfortDelGro is conscious of the limited water resource in Singapore and has ensured that all water fittings installed are of minimum 2 ticks WELS "Very Good Rating" taps.

Table 2: Water Efficient Labelled Fittings¹

Products/Fittings	Flow Rate/Flush Capacity Requirements	
	2-tick ✓✓	3-tick ✓✓✓
Shower Taps & Mixers (L/min)	> 5 to 7	5 or less
Basin Taps & Mixers (L/min)	> 2 to 4	2 or less
Sink/Bib Taps & Mixers (L/min)	> 4 to 6	4 or less
Dual-flush flushing Cisterns (litres per flush)	> 3.5 to 4.0 (full flush) > 2.5 to 3.0 (reduced flush)	3.5 or less (full flush) 2.5 or less (reduced flush)
Urinal Flush Valve & Waterless Urinals (litres per flush)	> 0.5 to 1	0.5 or less or waterless urinals
Water closet (WC) flush valves (litres per flush) -from 1 Jan 2022	>3.5 to 4.0	3.5 or less

Energy Management

Energy Management for Air Conditioning Systems

Maintain Set Point Temperature

To ensure a comfortable working environment, the air conditioning temperature must be maintained at an optimal level which would also contribute to higher work productivity.

To manage the energy savings within East and West Wing buildings, the air conditioning set point is maintained at a minimum of 24°C across all levels including the individual office rooms. The set point of 24°C is also acceptable to most office staff as an ideal temperature for a comfortable working environment.

Every 1°C increase in temperature is able to save the organization 3% to 4% in energy savings. By maintaining the set point temperature at a minimum of 24°C as compared to 18°C generally set in large number of commercial establishments, ComfortDelGro is able to save up to 24% in electricity consumption every year.

Scheduled Switch-Off Time

The fan coil units (FCUs) for common areas are scheduled to switch off by 1800HR on weekdays and certain areas are scheduled to switch off by 2000HR latest.

By having a central control system and a scheduled switch off time allows for better energy management of the air conditioning systems. This would reduce energy wastage after office hours.

Naturally Ventilated Lift Lobby & Common Corridors

To ensure greater energy savings for the air conditioning systems, the air conditioning systems are switched off for areas with low human traffic such as lift lobbies and common corridors.

For East Wing, air conditioning is switched off from Level 2 to 6 at lift lobbies and common corridors. The air conditioning system is switched off at all levels at lift lobbies and common corridors for West Wing.

Lighting Controls

Lighting controls are also practiced in ComfortDelGro as one of our energy conservation strategies. The lighting is segregated by various zones at each level and controlled by staff access cards. The first person to scan their staff access card for attendance will activate the lighting switches on each floor. Each level has an assigned Administrator to monitor and feedback to Group Property Services on any issues

¹ https://www.pub.gov.sg/Documents/WELS_Requirement.pdf
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encountered.

To ensure that all lighting will be switched off by end of the day, the Security Office has a master switch for each level and will switch off all lightings by 2300HR daily after their routine survey of the office grounds.

Monitoring of Energy Consumption

In line with the Energy Policy and Management Plans, ComfortDelGro Head Office shall monitor the energy usage on a monthly basis. Private power meters are installed in individual buildings on the Braddell premises to allow the Group Property Services team to track the energy consumption.

The electricity consumption readings are taken on the beginning of every month for tracking and monitoring of energy usage.

Water Management

Monitoring of Water Consumption

In the water scarce Singapore, it is important to conserve water. Therefore, ComfortDelGro adopts water monitoring practices, such as the monitoring of our monthly water consumption for the office buildings. The water consumption readings are taken in the beginning of every month for the monitoring and tracking of water usage as well as to detect water leakages.

Additionally, water consumption readings are also taken during major water related system testing such as hydrant test and during draining of the sprinkler system to record any abnormalities.

Indoor Air Quality Management

Indoor Air Quality Audit

The indoor air quality (IAQ) of air-conditioned offices has always been a subject of public health importance as most people spend a substantial amount of time in these premises. Good IAQ can lead to improved productivity at the workplace whereas poor IAQ will lead to sick building syndrome that reduces productivity.

ComfortDelGro acknowledges the importance of IAQ in the enclosed air-conditioned office premises and therefore, engages a third party every three years to conduct an external IAQ audit. The results are then reviewed by Group Property Services before proposing improvement plans.