CASE STUDY – CAPITALAND TOWER

General Information

- Site area : 8,847 sq.m
- GFA : 113,557.75 sq.m
- Project type : Office Building
- Floors : 4 basements + 55 floors
- Location : 2 Ton Duc Thang Street, Ben Nghe Ward, Ho Chi Minh City, Viet Nam.
- Owner : CAPITALAND TOWER COMPANY LIMITED

CONTENTS

I. INTRODUCTION

The idea of this project is to construct a sustainable and eco-friendly building in the Vietnam Industrial Manufacturing, in accordance with standards of LEED (Leadership in Energy and Environmental Design) Green Building Rating System. There have been many conscious efforts toward "going green" Industrial Manufacturing, and Capitaland Tower project sets the target of being a part of sustainability through achieving the LEED certification.

Figure 1. Capitaland Tower is located 2 Ton Duc Thang, Ben Nghe Ward, District 1, Ho Chi Minh City, Vietnam.

Being recognized by U.S. Green Building Council (USGBC) that the project has met all requirements of international environmental design standards, Office Building will not only have positive impacts on the environment but also result in a significant reduction of operation costs. Lighting and air quality, vegetation, relaxation areas, cleanliness, functionality, and thermal comfort together will contribute to the effective operation of Industrial Manufacturing.

Key highlights:

- Water-efficient systems reduce potable water demand
- High-quality facility components reduce chemicals and contaminants in office area
- High efficiency (high COP) water-cooled chiller system reduces energy cost
- Efficient light with LED lamps having high lighting efficiency.

In this case study, other highlighted features which make the hotel become a LEED-certified building are also introduced in details.

II. TRANSPORTATION

1. Bike parking

The purpose is to promote bicycling and transportation efficiency, as well as provide an ideal storage area for bicycle users. The project provides bicycle storages in Basement 1 with a total of 100 bicycle spaces, including long-term storages for staff and short-term storages for visitors.

Figure. Illustrating pictures of bicycle racks used in **Capitaland Tower**

2. Car parking

To minimize the environmental harms associated with parking facilities and reduce pollution by promoting alternatives to conventionally fueled automobiles, the project encourages everyone to use green vehicles and carpool vehicles. In details, the project provides 19 parking space for carpool vehicles, 19 parking space for electric vehicles and 08 space reserved for the electric vehicle supply equipment (EVSE).

Figure 3. Carpool, Green vehicle and Electric car parking spaces signage

III. SUSTAINABLE FEATURES

1. Building envelope

Roof assemblies include concrete deck, Vegetated, two layers of plaster, minimize the U-value of the Roof to decrease the demand for cooling. Indoor comfort conditions are ensured for all areas within the building, including common spaces, working areas.

The system of external double-glazed windows with low-e coating, low U-value, and good light transmittance (LT) value works effectively to limit solar radiation, energy loss but increase daylighting harvesting. In other words, the glazing system limits the amount of heat and UV-rays transmitted through glass, but still allows light to easily pass through the window. This contributes to the reduction of interior artificial lighting and cooling demand.

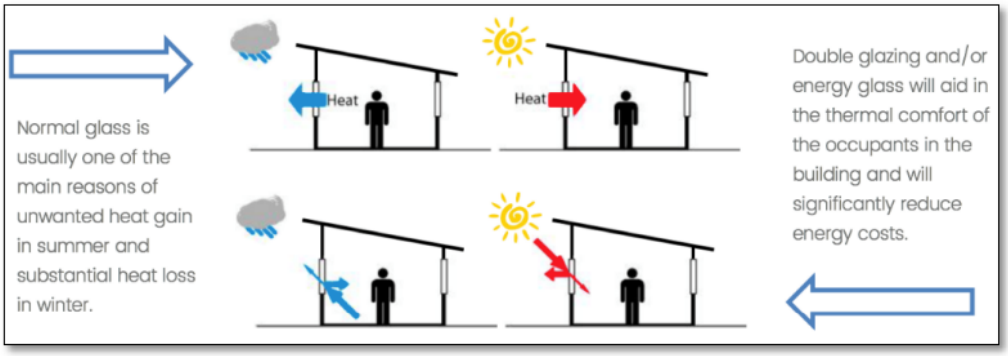

Figure 4. Difference between single-glazed windows and double-glazed windows

2. Waste management

To reduce the amount of waste generated by either building occupants or guests, as well as encourage everyone to classify waste, the project reserves an area of 80 m^2 at Ground floor for the central waste storage. This central waste storage includes separate areas for different types of waste such as recyclable waste, domestic waste, and hazardous waste.

- Recyclable waste: 660-liter waste bins with labels are provided for five types of recyclable waste: paper, cardboard, glass, metals, and plastics.
- Domestic waste: a 660-liter waste bin with label is provided.
- Hazardous waste: 240-liter waste bins with labels are provided for batteries and e-waste.

Waste storage capacity is completely sufficient for the amount of waste generated within the building. In specific, the amounts of recyclable, domestic, and hazardous waste are estimated to be 1.638 m^3, 0.48 m^3, and 0.11 m^3. The actual capacity of recyclable, domestic, and hazardous waste storages are 80 m^2, respectively.

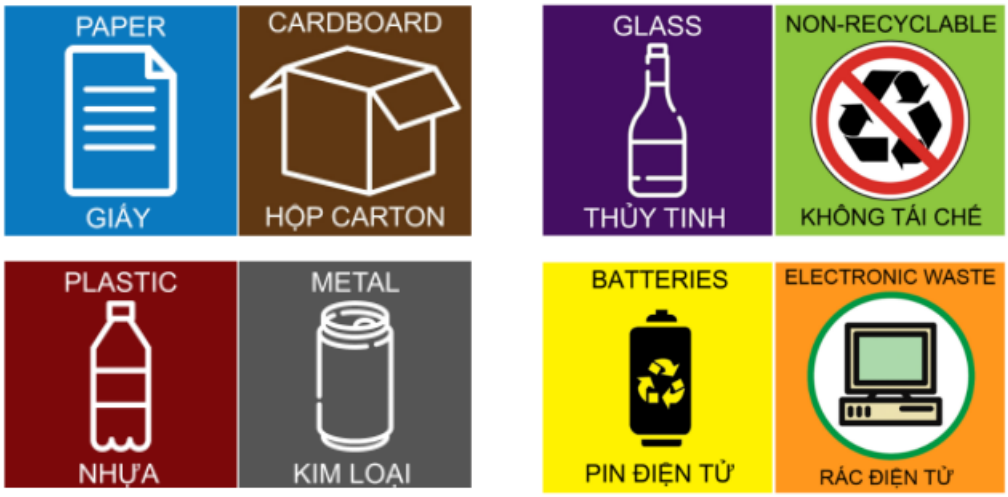

Figure 5. Waste bin labels

IV. WATER EFFICIENCY

1. Indoor water use

The project aims to reduce indoor water consumption through using water-efficient fixtures such as low flowrate water closets, urinals, and lavatory faucets. Besides, lavatory faucets are equipped with LEED-compliant pressure compensating aerators to reduce water flowrate.

Fixtutes	Water Closet	Lavatory Faucet	Showerhead	Urinal
Brand	MOEN	MOEN	MOEN	MOEN
Model	SW0313PO + 030570099	140NN4412	10136BL+9026ECBL	SW6151HPG
Flowrate	3-4.8lpf	1.5lpm	5lpm	0.5lpf
Sample picture				

2. Outdoor water use

Selecting native and climate-adapted plants whose water demand is not high helps saving irrigation water although the project does not have to use potable water for irrigation. In details, 100% of irrigation demand is covered by Condensate water.
Multifunctional fixed spray equipment is a solution that helps reduce outdoor water consumption for irrigation. The equipment is movable and convenient for irrigation work.

Figure 6. Irrigation equipment used for the project

3. Water metering

The project aims to manage water use and track water consumption by installing permanent water meters for all water subsystems. A system of 1 water meters and 58 water sub-meters have been installed to measure these water consumptions:

- total potable water use for the building
- total Recycled water use for irrigation (1 sub-meters)
- total potable water use for indoor plumbing fixtures and fittings (56 sub-meters)
- total potable water use for Process water – Cooling tower (1 sub-meters)

Sub-meters will be manually read and periodically checked for monitoring purposes concerning water consumptions and potential damages.

V. INDOOR ENVIRONMENTAL QUALITY

1. Lighting

The lighting system of the building uses only LED lights for energy efficiency and savings. Time switches are installed in the factory, warehouse, and office to automatically control lighting according to operating hours. Occupancy sensors are installed in the lobbies, corridors, meeting rooms, toilets, storage, etc. to automatically turn off lighting fixtures when nobody is in the space.

Figure 7. Illustrating picture of lighting system

2. Air-conditioning & Ventilation

To optimize energy performance of the building as well as reduce environmental and economic harms associated with excessive energy use, the project uses water-cooled chiller to maximum the COP, reducing the energy consumption and minimize the ham of the refrigerant to the Ozone.

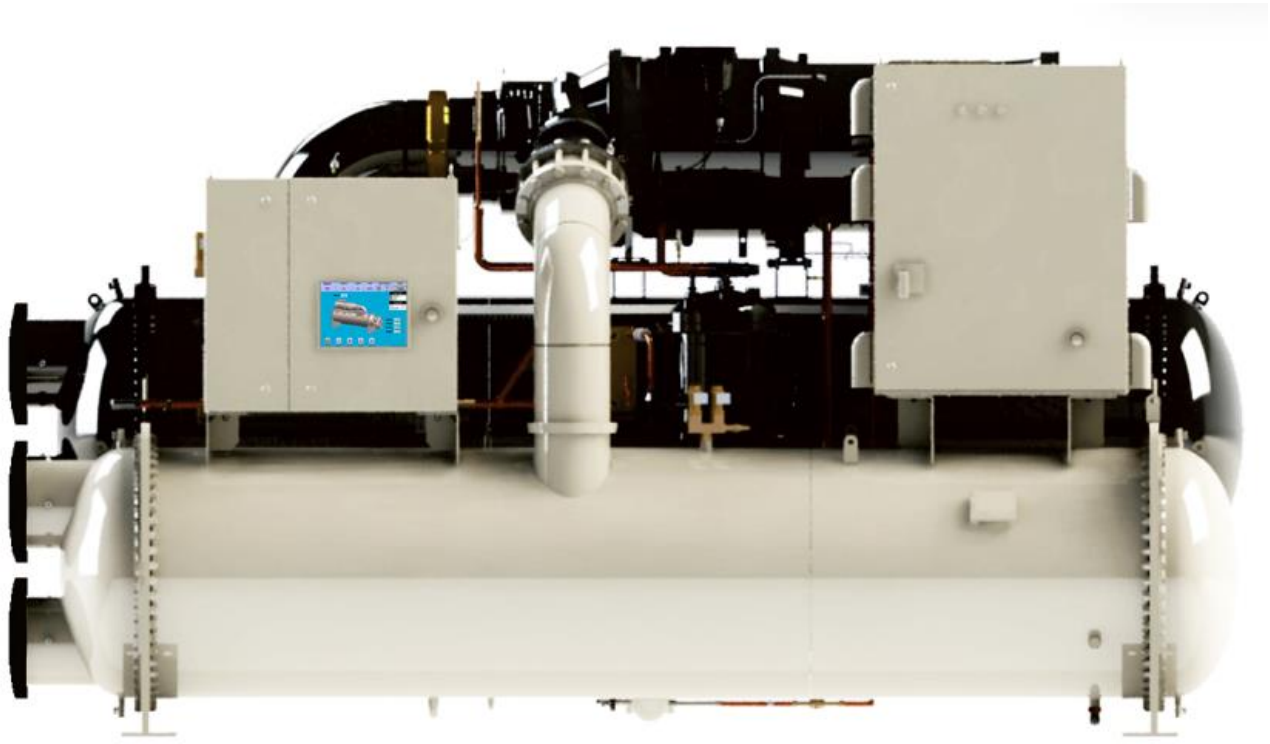

Figure 8. Illustrating pictures of air-conditioning system (chiller unit)

Indoor air quality performance of the building is ensured to contribute to the comfort and well-being of occupants. Indoor air quality of working areas is controlled by PAU (Primary Air Handling Unit) with air filtration media (class F7) and AHU (Air Handling Unit) system with air filtration media (class F7) and monitored by flow meter connected to BMS system. All toilets at all floor are ventilated by exhaust fans.