Palm Tree Residential Area, Ecopark, Hung Yen

Building investor: Viet Hung Company (VIHAJICO)

Architecture designer: Kume Sekkei

Total land area: 40,100m²

Ecopark blocks were designed in accordance with the functional city model with full utilities. The buildings are covered by trees surrounding and water ponds, which are combined harmonizing between citizens and nature.

The investor also create new bus lines for citizens and visitors. So that the distance between ecopark and city center may be not a trouble for citizens to come.

CLIMATE ANALYSIS

Hanoi has a warm humid subtropical climate with plentiful precipitation. The city experiences the typical climate of Northern Vietnam with 4 different seasons. Summer, from May until August, is characterized by hot and humid weather with abundant rainfall. September to October is fall, characterized by a decrease in temperature and precipitation. Winter, from November to January, is dry and cool. The city is usually cloudy and foggy in winter.

The averages rainfall is 1,680 millimetres (66.1 in) per year and the most precipitation is from May to September.

The average temperature is 23.6°C (74°F) with a mean relative humidity of 79%. The highest recorded temperature was 42.8°C (109°F) on SMay 1926 while the lowest recorded temperature was 2.7 °C (37 °F) on January 1955.
The blocks are located as zigzag shapes; therefore, the apartments have daylighting, good and diverse views.

Orientation of buildings is considered clearly, which does not face to East or west and may utilize the prevailing wind from the South and the South-East.

Ventilation gaps/clefts are installed surrounding the buildings are to get more daylighting and ventilation into auxiliary space (restroom, kitchen...). Therefore most of their spaces have natural ventilation and daylighting. Garden is in the middle of blocks with ponds for evaporative cooling.

Guidelines for wind flows:
+ Tower only, no podium to allow more channels for air to move at ground level
+ Staggered tower arrangement across park.
+ Taller tower along edge of park to accelerate air movement through wind tunnel effect.

1 - Technical roof and insulated roof
2- Non-baked brick from recycled material with low U-value for better insulation, (mova motar)
3 - Balcony as solar shading in some spaces
4 - Vegetalisation of the surroundings
5 - Water Efficient equipment
6 - Evaporated cooling
7 - Natural ventilation for all main function spaces/auxiliary spaces
8 - Daylighting for all main function spaces/auxiliary spaces
To avoid the use of air-conditioning, several passive strategies are used: insulation roof, cross ventilation by ventilation clefts/gaps, reduce heat, orientation according to prevailing winds. The large and dense garden and vegetalisation of building access permit to limit heat accumulation. Artificial lights are reduced to accurate requirement. And water ponds for evaporate cooling.

The buildings with ventilation gaps/clefts surrounding can get more daylighting and ventilation into auxiliary space (restroom, kitchen...). Therefore most of spaces have natural ventilation and daylighting.
ENERGY SYSTEMS

Installed by the occupants

Type: solar energy lighting
Controls: timer switch according to the sun

Type: Inverter air-conditioning

ENERGY FEATURES

Domestic solar water systems are installed in only private houses but not in the highrise buildings.

Street lights use solar energy and timer switches according to the level of daylight. Energy efficiency appliances are used including air-conditioners, fridges, washing machines (inverter system), televisions, LEDs and fluorescents. Heating/cooling systems are installed by tenants.
SITE INTEGRATION

Trees are grown for shading and water ponds are installed for evaporative cooling. Reducing the concrete surface by weed area is to increase permeable surface. More weed and trees surface helps to reduce heat island effect. Water ponds also reduce the heat by 2-3°C surrounding the buildings.

OTHER STRUCTURAL ISSUES

Balcony is built next to the kitchen to increase natural ventilation, reduce the bad smell and keep it clean and dry to ensure the indoor air quality. The buildings with ventilation gaps/clefts surrounding can get more daylighting and ventilation into auxiliary space (restroom, kitchen...). Therefore most of the spaces have natural ventilation and daylighting.

LESSONS LEARNED / FEEDBACK
Design team (Architect, energy consultancy):
Palm Tree Residential Building is a modern residential area with smart design, open spaces and effective utility service. The project is surely an optimized choice for families.

Users:
The building with great infrastructure and landscape surrounding. The outdoor activities are often performed here to attract people to live. However, it is quite far from city center.

Maintenance
Service maintenance is quite good until now.

Others:
The blocks are in a new eco-residential area with full infrastructure. It is far from city center; however, the bus is convenience to go. The citizens can also use their private vehicles for travelling.