A REVOLUTIONARY STUDY COMMONS
AND UNIVERSITY LIBRARY EXTENSION
THE CHINESE UNIVERSITY OF HONG KONG

World Sustainable Built Environment
Conference 2017 Hong Kong
INTRODUCTION
Over 50 Years of Campus Development

CUHK Today

- 8 Faculties
- 1 Graduate School
- 9 Colleges

28,000 students
OUR VISION

Campus Master Plan (2010)

Long Term Sustainability Targets (2005-25)

<table>
<thead>
<tr>
<th>Target</th>
<th>Goal</th>
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<tbody>
<tr>
<td>Energy (per capita)</td>
<td>25%</td>
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<tr>
<td>Greenhouse Gas (per capita)</td>
<td>20%</td>
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OUR VISION & MISSION

CUHK Green Campus

1. Preserving History, Values and Collective Memory

2. Design for Quality Learning Environment

3. Exploring opportunities for developing Underground Space

4. Green Building Design and Efficacy

5. User-oriented Design and Knowledge Sharing

CUHK Green Campus
1. PRESERVING OUR HISTORY, VALUES & COLLECTIVE MEMORY
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To Combine Tradition with Modernity
To Bring Together China and the West
1. PRESERVING OUR HISTORY, VALUES & COLLECTIVE MEMORY

Embedment into the Campus Environment

Master Planning

- Complimentary building massing, high and disposition
- Basement under the Mall Piazza

Respect the Surrounding Building Heights

Respect the Historical Axis of the University Mall
Preserving Piazza, Mall Garden and Landscape Features

With about 3,000sq.m. CFA new Basement underneath

Carpark at basement
Learning Garden underneath
Restored Mall Garden
Preserved Historical Shrub Patterns with new In-filled Skylights
Beacon kept intact
Mall Garden restored with Pools & Skylights

Mall Piazza
Preserving our History & Collective Memory

University Mall & Garden preserved in Library Extension

Before Renovation

Preserving...... Forum Pool Beacon Shrub Pattern

Innovative Basement Design

WORLD Sustainable Built Environment Conference

Organisers:

International Co-owners:
Preserving the Existing Historical Façade

Meeting of Old and New

Existing University Library Façade becomes Internal Feature of the New Extension
Preserving our Swift Habitats

The eaves of the University Library house over 500 House Swifts, which is the largest swift colony in HK.
2. DESIGN for QUALITY LEARNING ENVIRONMENT
Spatial Connectivity

- A void is created to bring daylight from the existing skylight to lower floors
- Provide visual and physical links between floors
Transparency and Daylight

Bringing natural daylight and natural environment into the interior.

Peripheral Low E glass wall façade with roller blinds and daylight sensors

Section - New Extension
Transparency and Daylight

Long elevation along the North to capture greening and diffuse day light North – facing the main façade to minimize glare and heat penetration

Acoustics

- **Double glazing**, an effective acoustic insulation, provides a quiet learning ambience
- Noise generated from adjacent busy road traffic has reduced from level 80dBA to 35dBA measured inside the Library
- Adopted low flow low noise variable air volume (VAV) A/C system
3. DEVELOPMENT of UNDERGROUND SPACE
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Innovative Learning Garden

- Daylight penetration through under-pool skylights
- Water feature to mitigate heat island effect
- Psychological and visual connection to outdoor nature
Innovative Learning Garden underneath the University Mall Garden

- **S-shaped Bench** weaves students together and defines a series of study zones

- **Learning Garden** to imitate outdoor atmosphere
4. GREEN BUILDING DESIGN AND EFFICACY
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Green Building Design Principles

1. Climatic Response
2. Conserving Places of Value
3. Energy Efficiency
4. Indoor Environmental Quality
5. Water Conservation

Climatic Response

Orientation

North Elevation
New Library Extension
Existing Library

Building elongated along the East-West axis so as to minimize heat gain

Shorter length at East & West Façades
Energy Efficiency

Green Features

1. Building Technology
   Daylight/ Motion Sensors to control lighting & AC

2. Solar Landscape Lighting
   Renewable energy

3. Roof Garden
   Green roof as insulation layer

4. Thermal Comfort
   Fresh Air Control by means of CO2 sensors

5. Heat Pump
   High efficient heat pump unit for dehumidification and space heating

6. Building Technology
   Energy Efficient LED task light filling

7. Energy Management
   Web-based energy meter to monitor power consumption

8. District Cooling
   To maximize efficiency of chillers in building clusters
Rainwater and Condensate Water Collection System

- Central collection of rain water and condensate water to Lake ad Excellentiam for irrigation/cooling tower/flushing

District Cooling System to save energy

- Shared use of the cooling capacity of chiller plant;
- Diversification of loading profile and peak electricity demand via different operation schedules of buildings.
5. USER-ORIENTED DESIGN
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Learning Garden with S-shaped bench for interactive learning
Open Plans for Flexible Learning

Flexible Lighting Zoning

Flexible Furniture Layout

Flexible A/C Zoning
Carbon Dioxide Sensors to regular A/C flow rates in relation to user population

Flexible IT Backbone
Raised floor with IT outlets and sockets.
Interactive Learning Environment

Interactive White Walls

Idea exchange

Forum & Workshop

Open Forum
Thank you