

# A REVOLUTIONARY STUDY COMMONS AND UNIVERSITY LIBRARY EXTENSION

THE CHINESE UNIVERSITY OF HONG KONG

World Sustainable Built Environment  
Conference 2017 Hong Kong



Organisers:



International Co-owners:



# INTRODUCTION



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



Global Alliance  
for Buildings and  
Construction



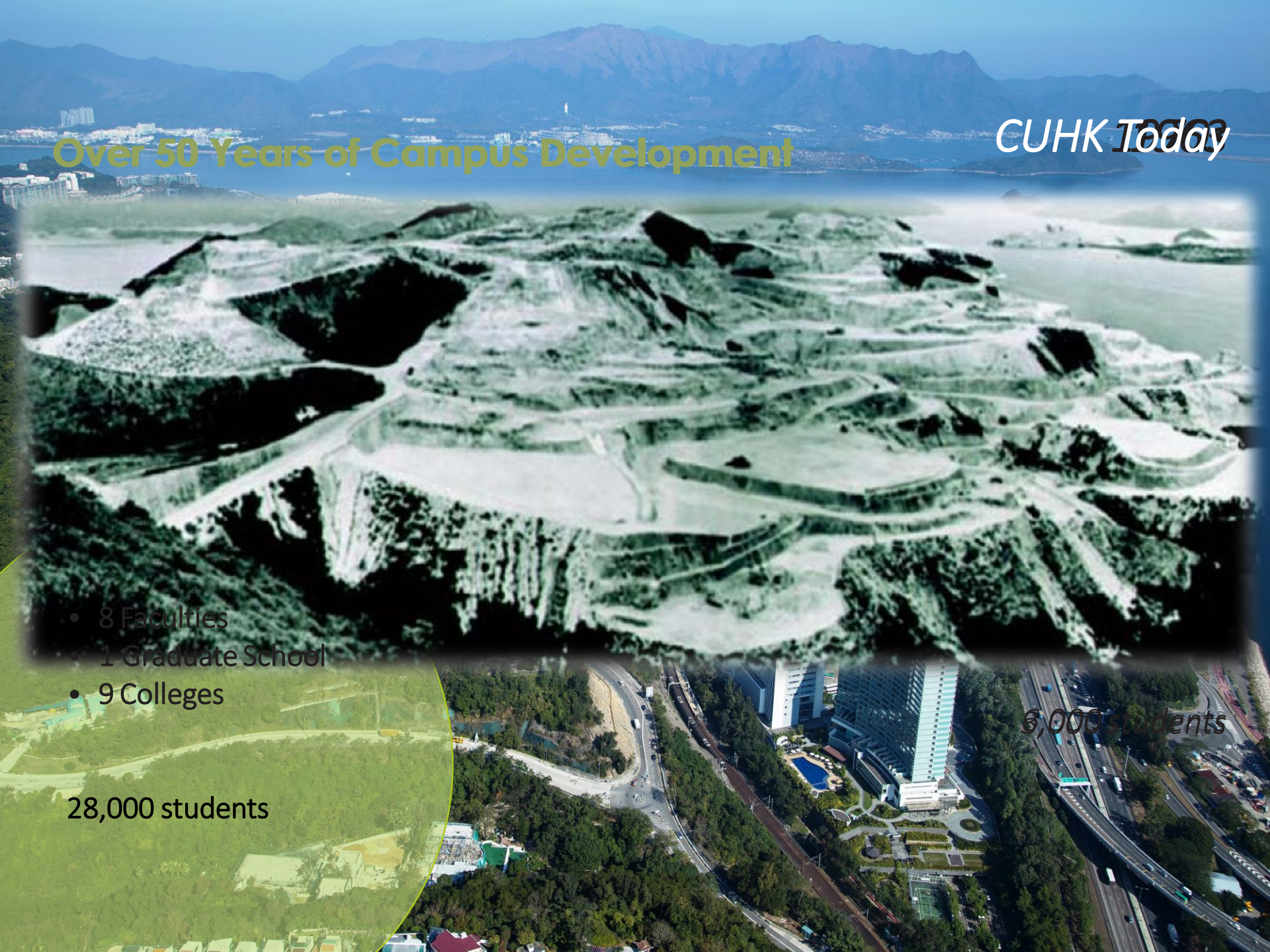
# Over 50 Years of Campus Development

CUHK Today

- 8 Faculties
- 1 Graduate School
- 9 Colleges

28,000 students

6,000 students





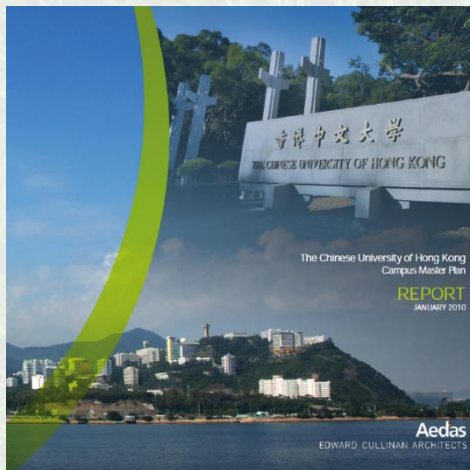
# OUR VISION



香港中文大學  
The Chinese University of Hong Kong



Campus Master Plan (2010)

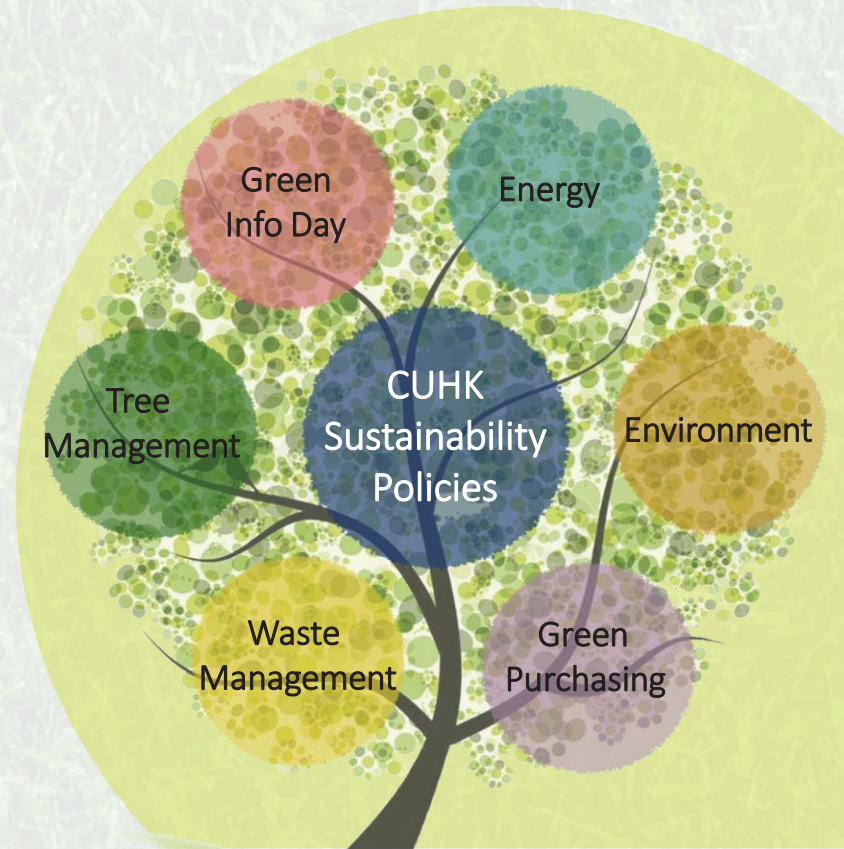


Sustainable  
 續  
 綠  
 中大  
 Campus

## Long Term Sustainability Targets (2005-25)

Energy (per capita) ↓ 25%

Greenhouse Gas (per capita) ↓ 20%



Organisers:



International Co-owners:



# OUR VISION & MISSION



香港中文大學  
The Chinese University of Hong Kong

## 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



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability





# 1. PRESERVING OUR HISTORY, VALUES & COLLECTIVE MEMORY



Organisers:



International Co-owners:



# 1. PRESERVING OUR HISTORY, VALUES & COLLECTIVE MEMORY

2083

結合傳統與現代  
融會中國與西方

*To Combine  
Tradition with Modernity  
To Bring Together  
China and the West*



International Co-owners:





# 1. PRESERVING OUR HISTORY, VALUES & COLLECTIVE MEMORY

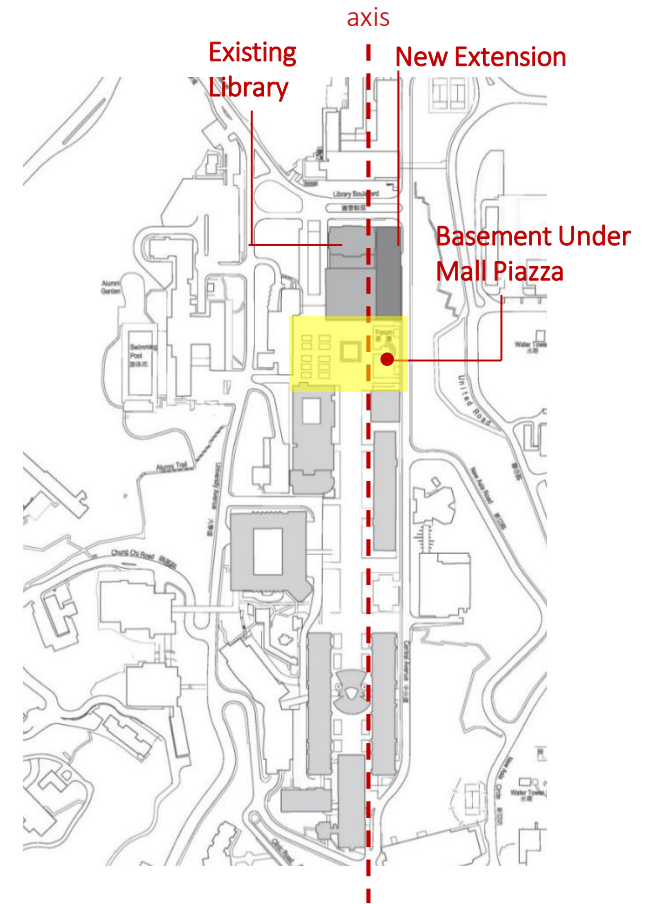
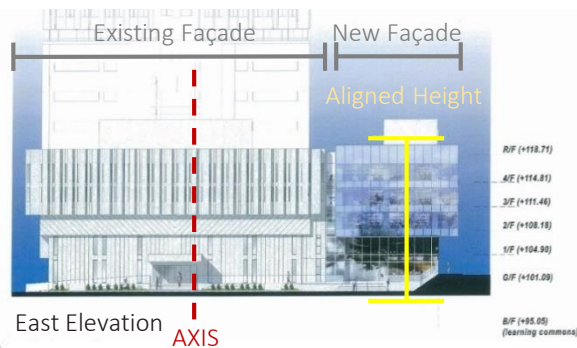
## Embedment into the Campus Environment

### 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

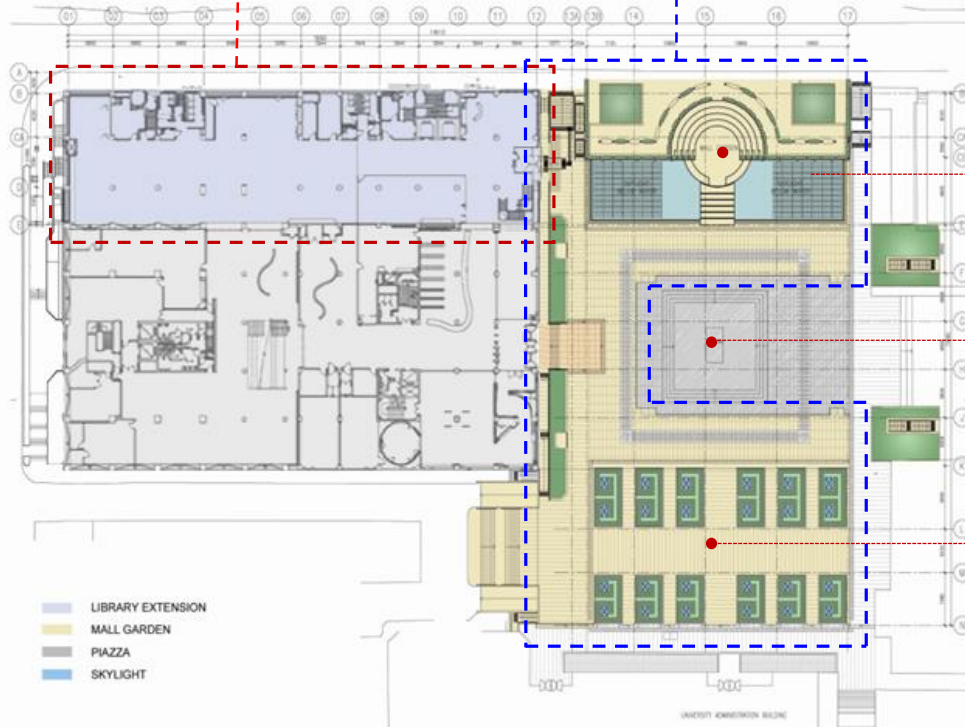


# Preserving Piazza, Mall Garden and Landscape Features

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

Carpark at basement

Learning Garden underneath



Restored  
Mall Garden



Mall Garden restored with Pools & Skylights

Beacon  
kept intact



Mall Piazza

Preserved Historical  
Shrub Patterns  
with new In-filled  
Skylights



# Preserving our History & Collective Memory

## University Mall & Garden preserved in Library Extension

1983



Before Renovation



During Construction



2012



Innovative Basement Design



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



Organisers:



International Co-owners:



# Preserving our Swift Habitats



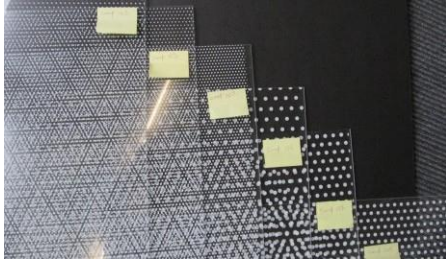
The eaves of the University Library house over 500 House Swifts, which is the largest swift colony in HK



New artificial nests at façades



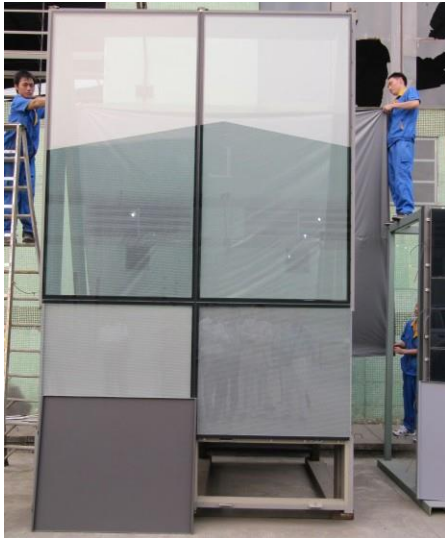
Building eaves



Pattern Study



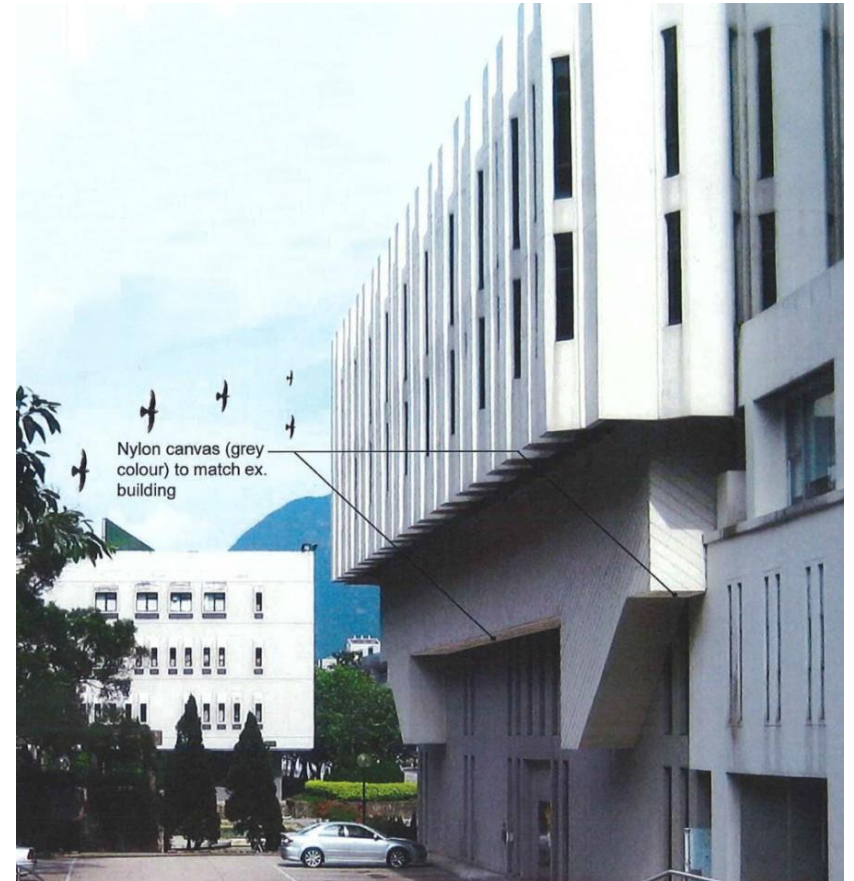
Bird fritted glass pattern



Curtain Wall mock up for bird test



Final Curtain Wall Design



Nylon canvas (grey colour) to match ex. building



## 2. DESIGN for QUALITY LEARNING ENVIRONMENT



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability

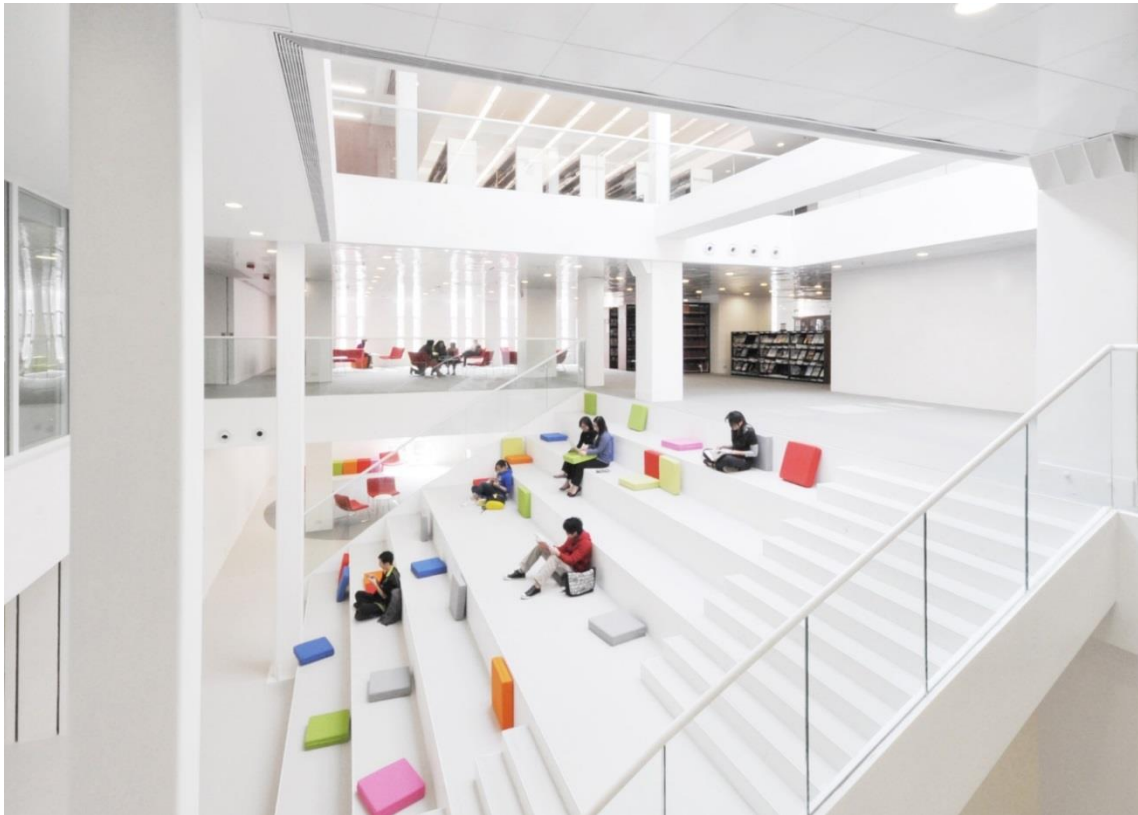


Global Alliance  
for Buildings and  
Construction

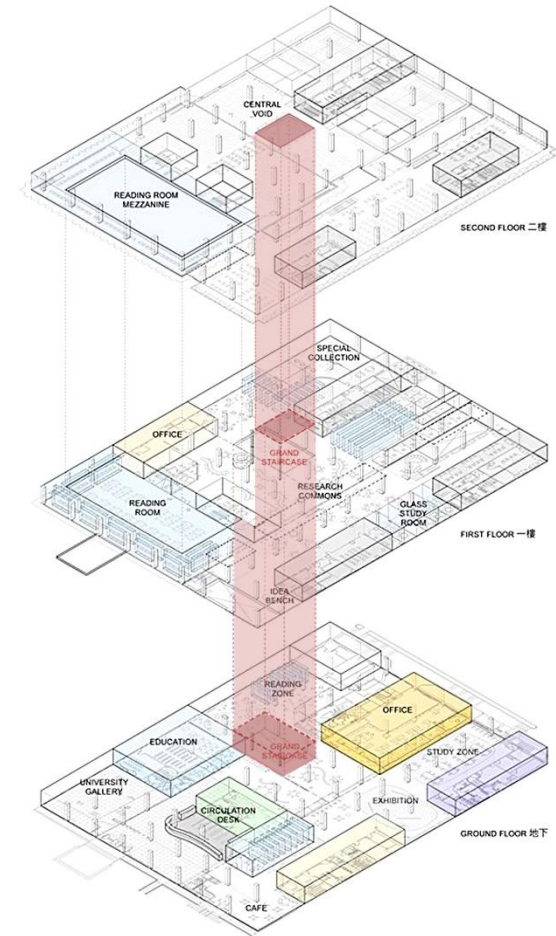
# 2. DESIGN for QUALITY LEARNING ENVIRONMENT

## Spatial Connectivity

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



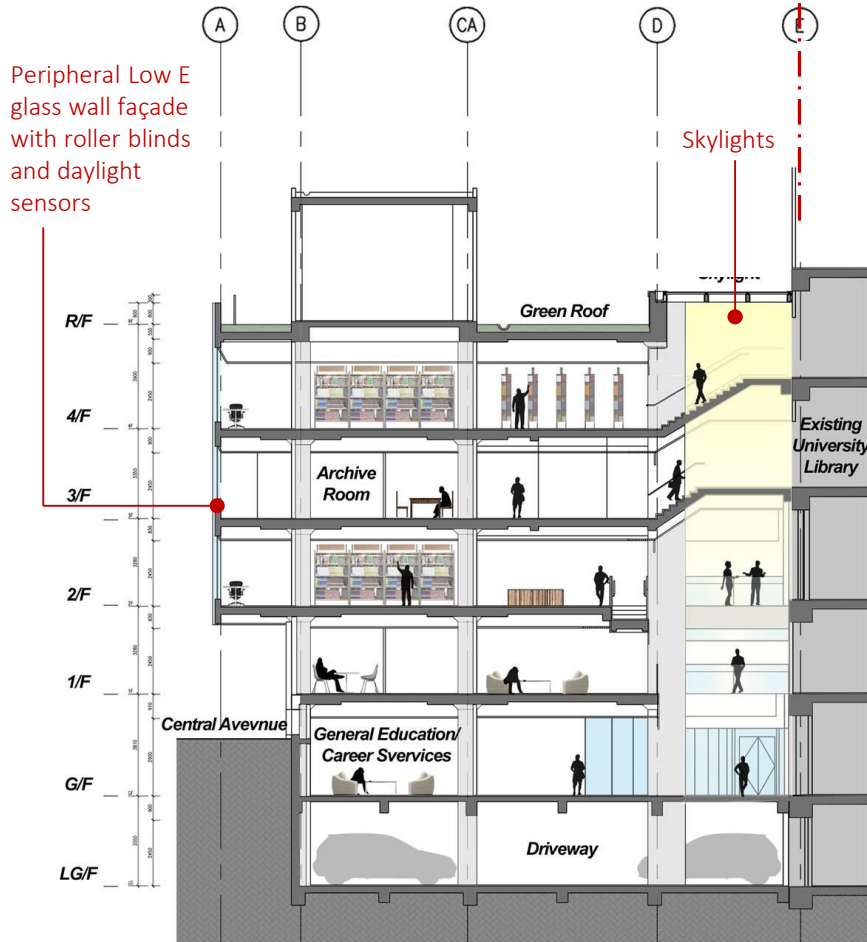
Reading Garden



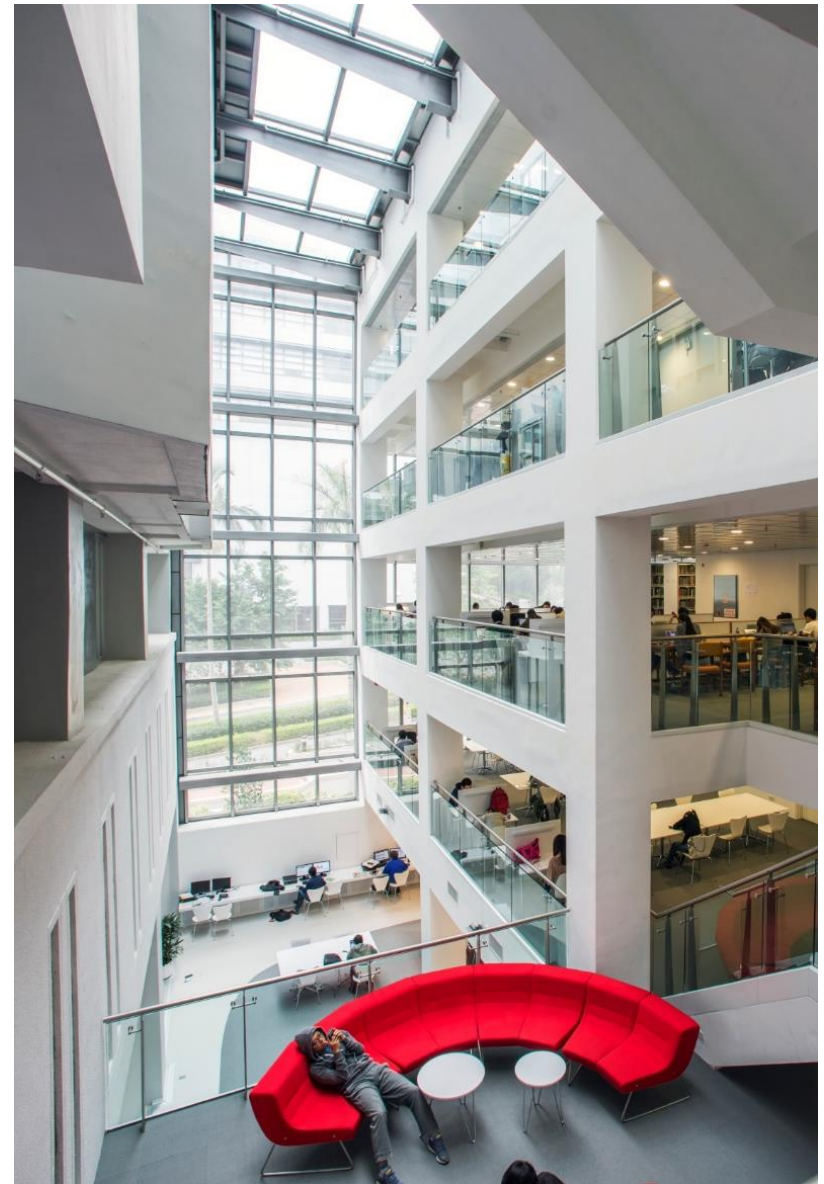


# Transparency and Daylight

Bringing natural daylight and natural environment into the interior.



Section - New Extension







### 3. DEVELOPMENT of UNDERGROUND SPACE



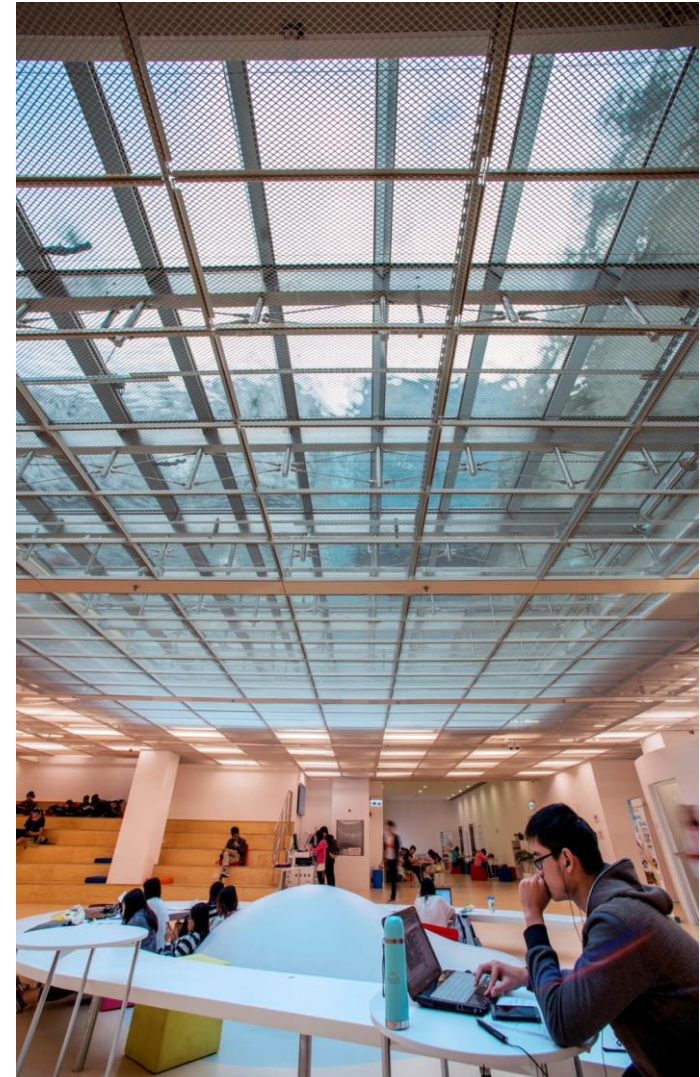
International Co-owners:



# 3. DEVELOPMENT of UNDERGROUND SPACE

## Innovative Learning Garden

- Daylight penetration through under-pool skylights
- Water feature to mitigate heat island effect
- Psychological and visual connection to outdoor nature



Organisers:



International Co-owners:





# Innovative Learning Garden underneath the University Mall Garden

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

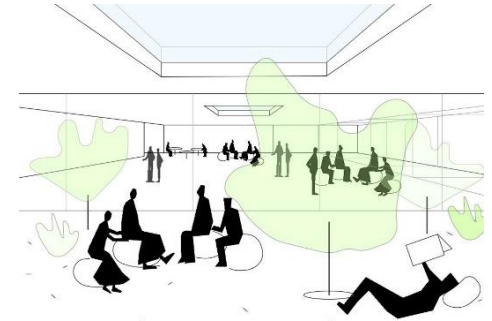


Learning Path



Learning Garden Plan

- **Learning Garden** to imitate outdoor atmosphere



Learning Garden



## 4. GREEN BUILDING DESIGN AND EFFICACY



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability

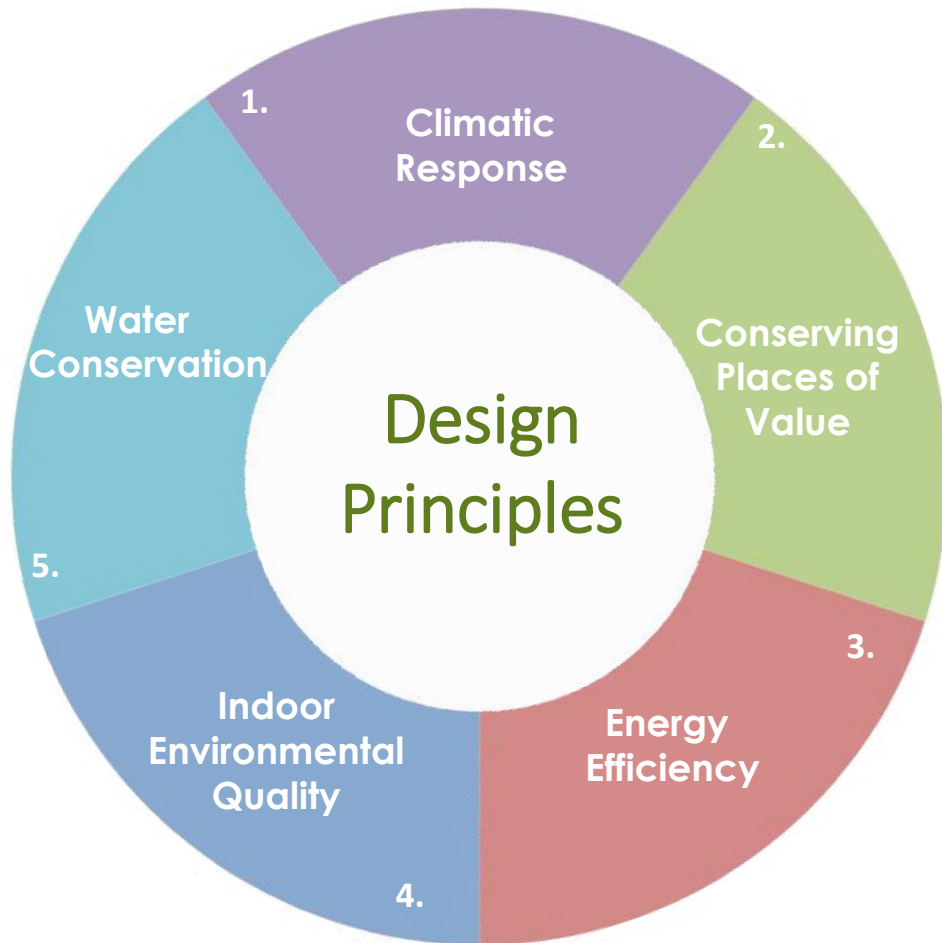


Global Alliance  
for Buildings and  
Construction



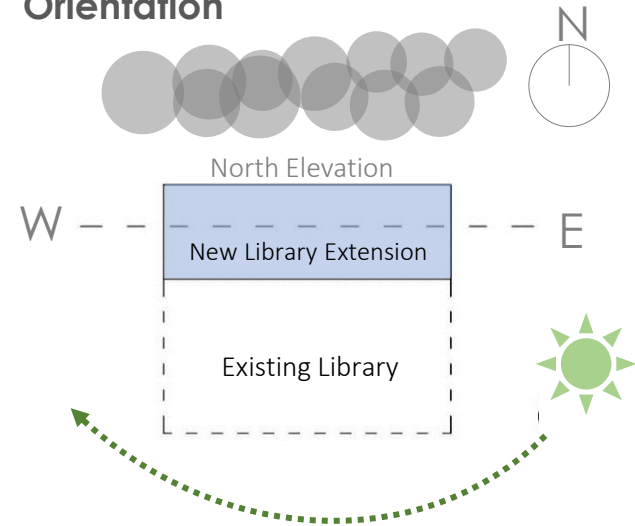
# 4. GREEN BUILDING DESIGN AND EFFICACY

## Green Building Design Principles

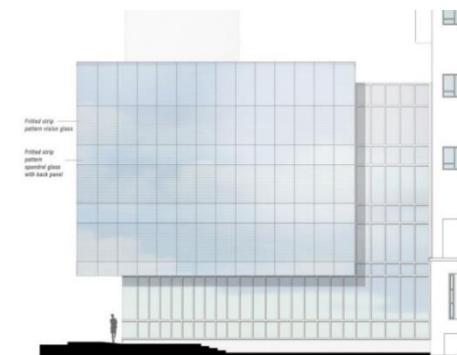


## Climatic Response

### Orientation



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



Shorter length at East & West Façades



International Co-owners:



# 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



Lake ad Excellentiam



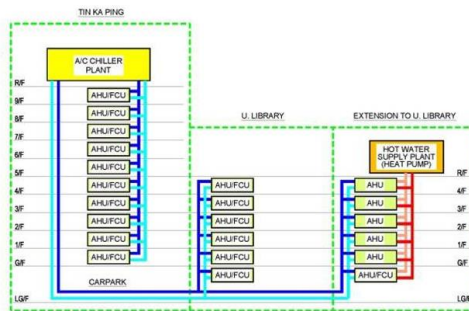
Filtration Plant



Sand Filters

# 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.



Schematic Diagram for District Cooling System

Centralised AC chiller plants

Centralised heat pump



District Cooling System



Organisers:



International Co-owners:



## 5. USER-ORIENTED DESIGN





# 5. USER-ORIENTED DESIGN



Learning Garden with S-shaped bench for interactive learning



Organisers:



International Co-owners:

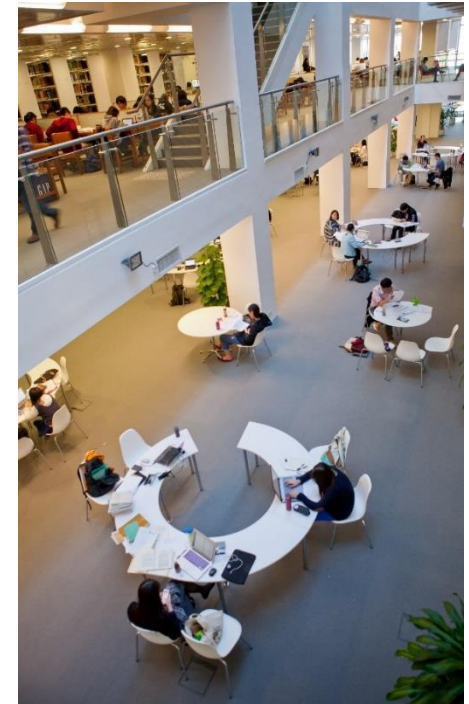


# Open Plans for Flexible Learning

## 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.



Organisers:



International Co-owners:

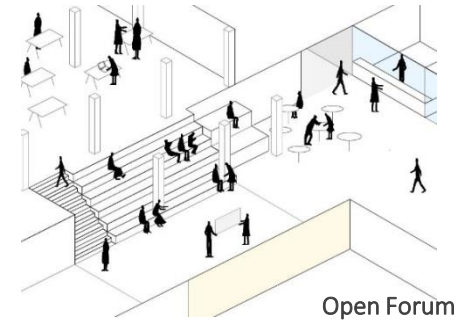




# Interactive Learning Environment



Idea exchange



Interactive White Walls



Forum & Workshop



Thank you



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative

