

GREEN DECK PROJECT INTRODUCTION AND DESIGN DEVELOPMENT PROCESS IN BUILDING INDUSTRY



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

Green Deck
A Catalyst for Vibrant Community
綠化平台工作室

ARUP
ROCCO 嚴

A Dream of Turning Grey to Green



Existing Condition



Green Deck











4 Objectives of the Green Deck

1



**Improve air
quality &
community
health**

2



**Restore
community
connectivity**

3



**Satisfy social
needs**

4



**Revitalise urban
centers and
upgrading local
economy**

Aerial View of the GD



HIGH LINE

Visit Photos Donate Events









Green Deck Project Introduction

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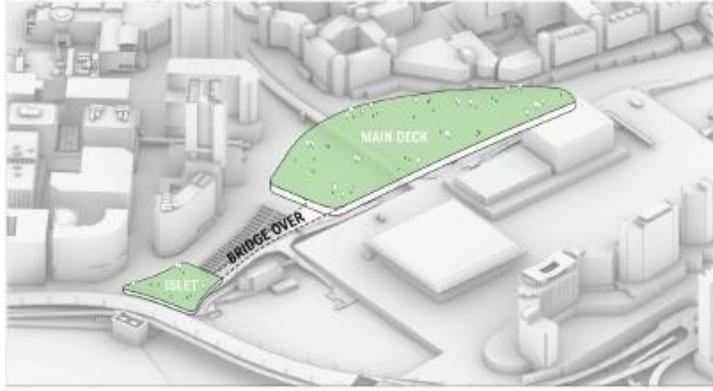
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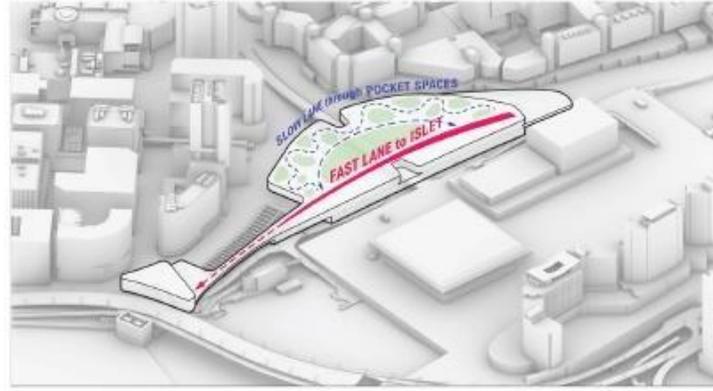
Proposed Site



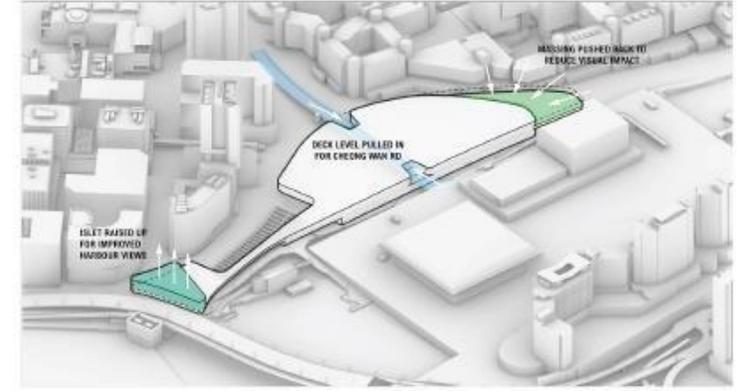
Architectural Concept



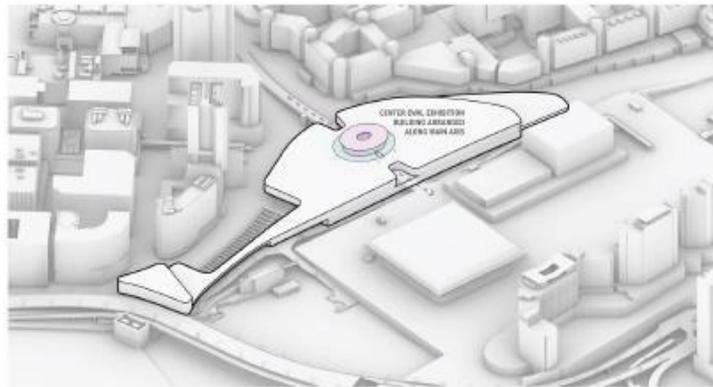
Green Deck Concept:
main deck, which covers the CHT toll plaza and the southern observation deck, the islet



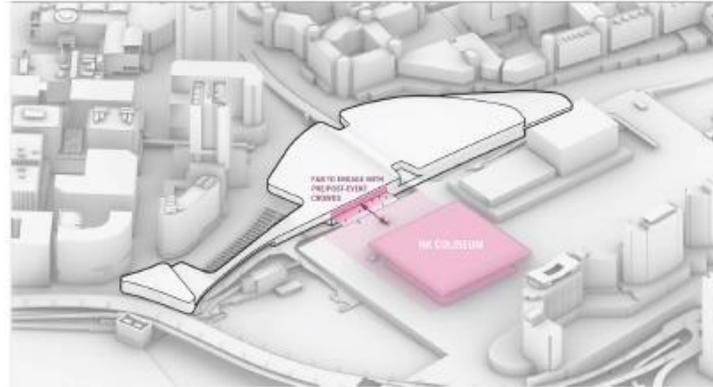
Deck Level Concept:
fast lane leads visitors straight to islet while slow lane takes people through pocket spaces



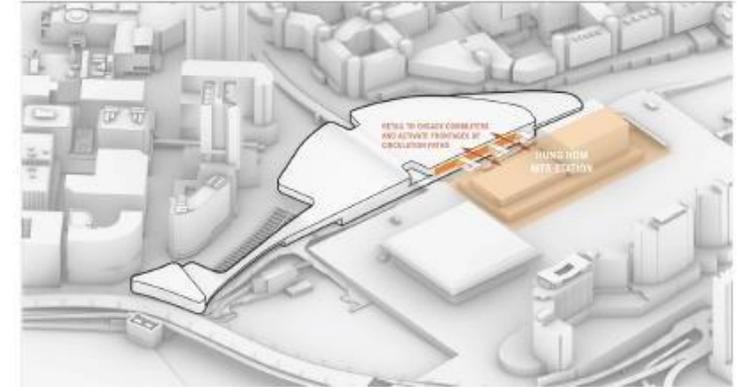
Massing Diagram:
massing at northern end pushed back to reduce visual impact of Green Deck



Oval Building:
arranged along the main axis to serve as a focal point



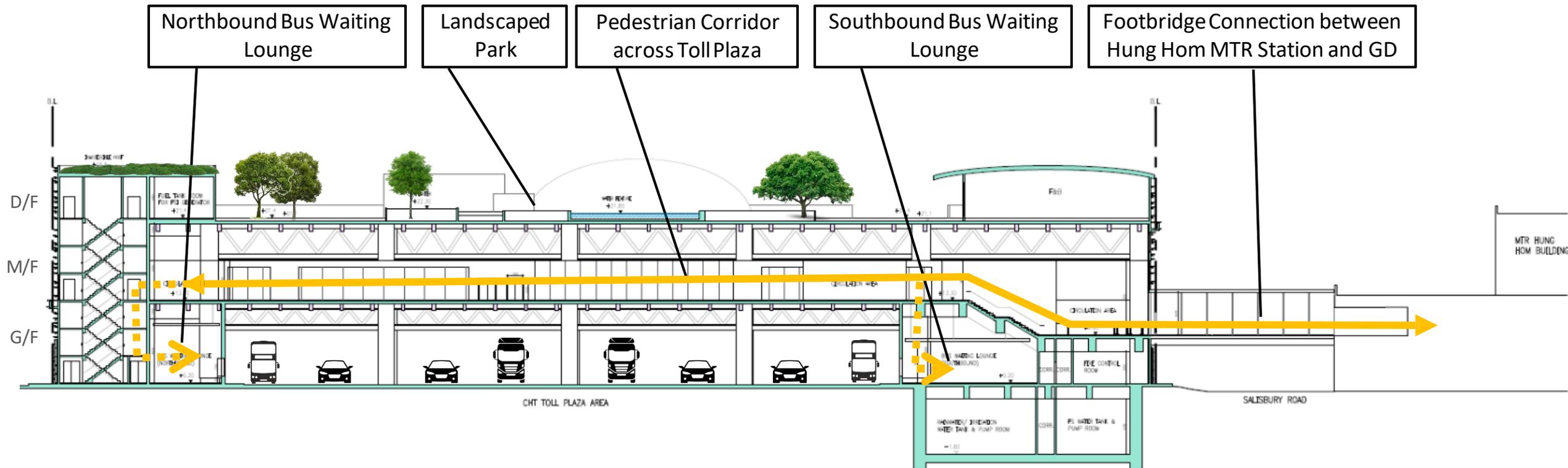
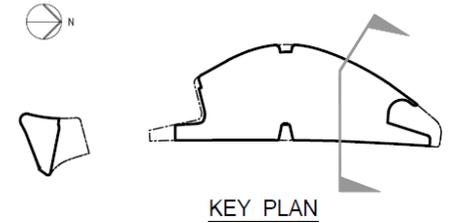
Engage with HK Coliseum:
F&B to engage with pre/post-event crowds at the Hong Kong Coliseum



Key Circulation Strategy:
retail to engage commuters and activate frontages of circulation paths

Section of the Green Deck

- The proposed Green Deck has 3 Principal Levels:
 - Ground Level (G/F)
 - Mezzanine Level (M/F)
 - Deck Level (D/F)

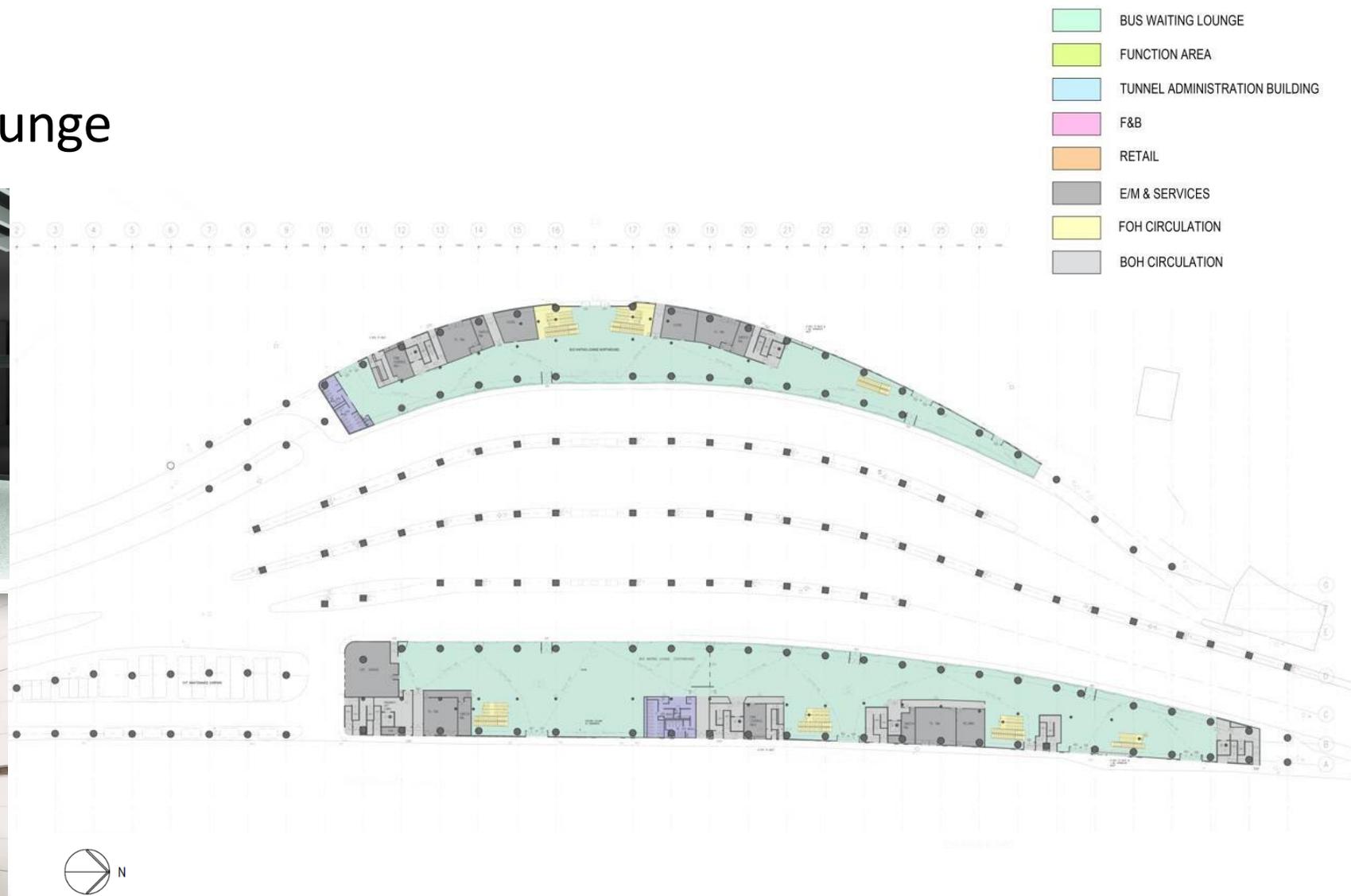


Ground Level

• Indoor Bus Waiting Lounge

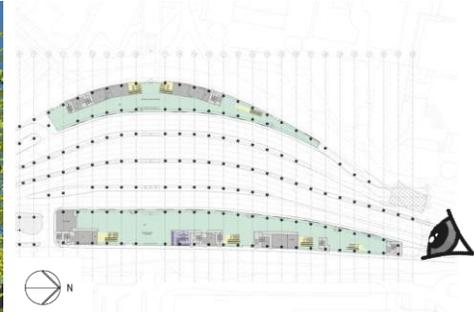


Indoor bus waiting lounge example from Kwun Tong Yue Man Square PTI



- BUS WAITING LOUNGE
- FUNCTION AREA
- TUNNEL ADMINISTRATION BUILDING
- F&B
- RETAIL
- E/M & SERVICES
- FOH CIRCULATION
- BOH CIRCULATION

Ground Level - View of GD from Southbound Traffic

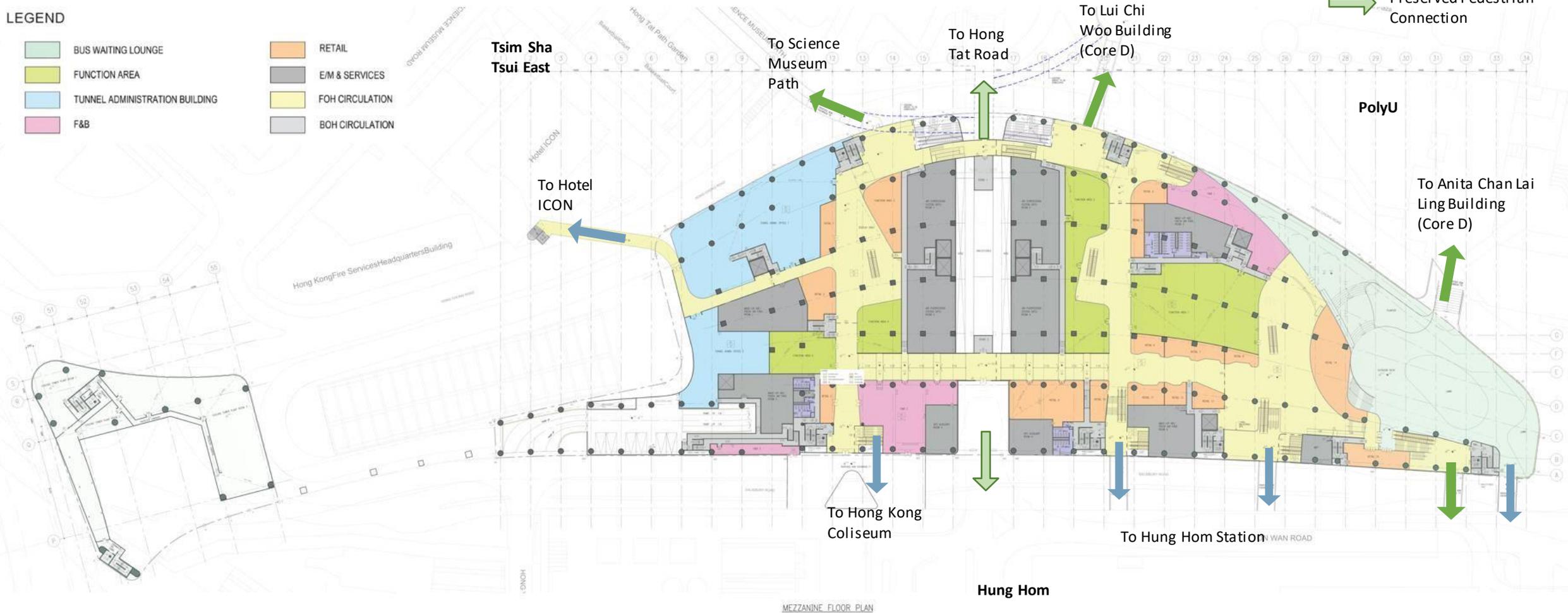


Mezzanine Level

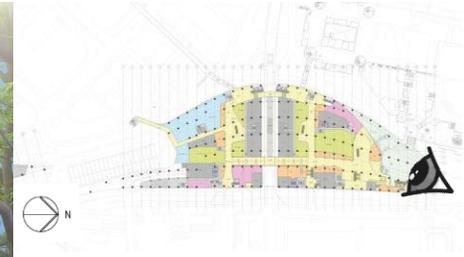
LEGEND

- | | |
|---|---|
|  BUS WAITING LOUNGE |  RETAIL |
|  FUNCTION AREA |  E/M & SERVICES |
|  TUNNEL ADMINISTRATION BUILDING |  FOH CIRCULATION |
|  F&B |  BOH CIRCULATION |

-  Proposed Pedestrian Connection
-  Revised Pedestrian Connection
-  Preserved Pedestrian Connection

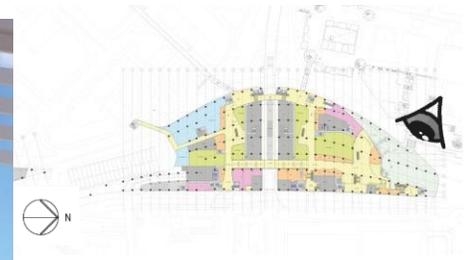


Mezzanine Level - Mezzanine Outdoor Deck

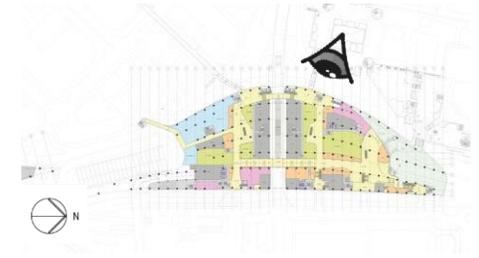


Proposed Connection with PolyU

With Anita Chan Lai Ching Building



Proposed Connection Bridge with PolyU



Mezzanine Level – Interior Design



▲ Mezzanine Level Interior Circulation Area

Landing between Deck Level and Mezzanine Level ►



Deck Level



LEGEND

- | | | | |
|---|--------------------------------|---|-----------------|
|  | BUS WAITING LOUNGE |  | RETAIL |
|  | FUNCTION AREA |  | E/M & SERVICES |
|  | TUNNEL ADMINISTRATION BUILDING |  | FOH CIRCULATION |
|  | F&B |  | BOH CIRCULATION |

The Islet

The Oval

Pedestrian connection
to the Islet and
harbourfront on D/F

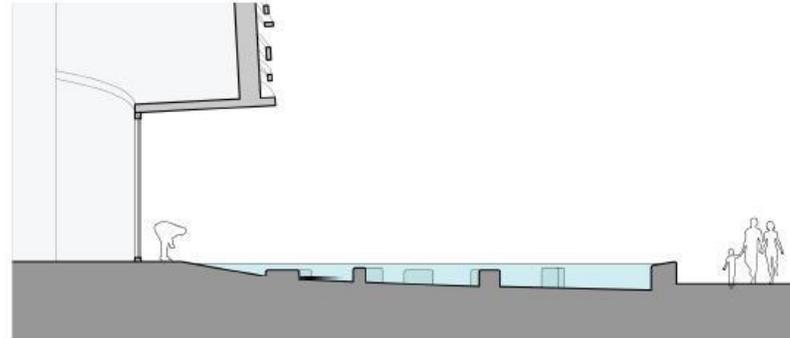
To TST
Promenade



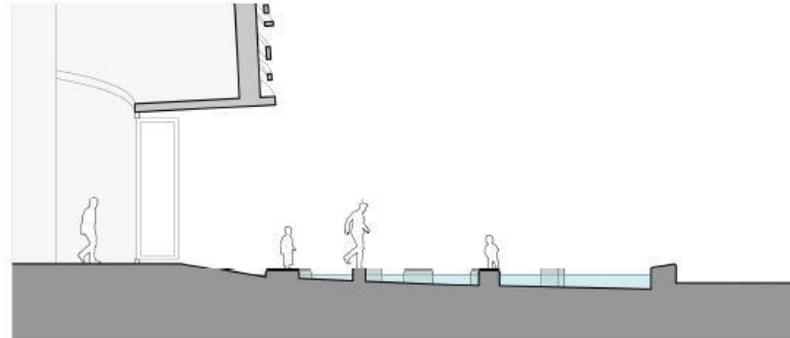
Deck Level - The Oval



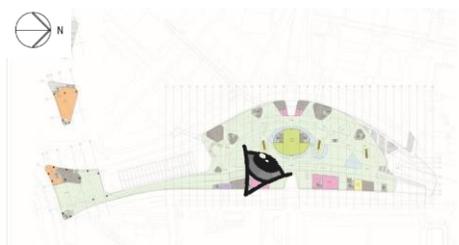
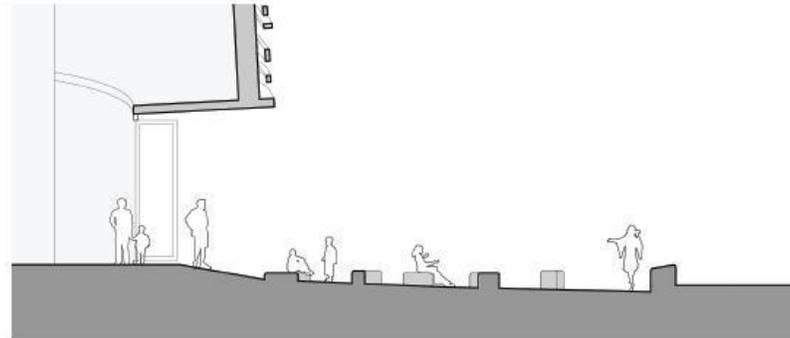
1. FULL
Reflective Pool



2. HALF
Playspace



3. DRY
Gather & Perform



He Art Museum, Foshan, China

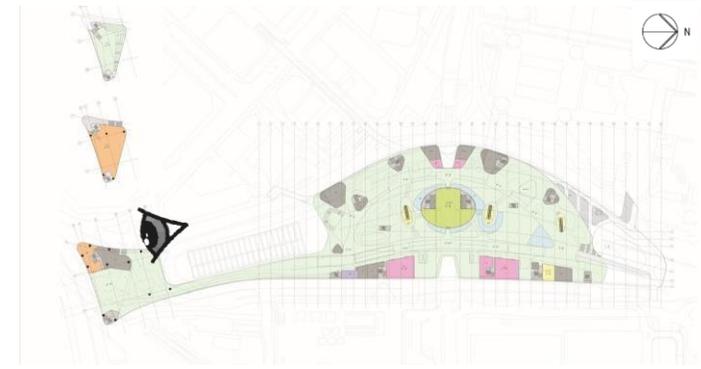


First Avenue Water Plaza, New York



Hong Kong Cultural Centre, Tsim Sha Tsui, Hong Kong

The Islet – Public Observation Deck



Roof Level
Open-air Observation Deck

Upper Deck Level
Retail / F&B Space

Deck Level
Covered Observation Deck

Meeting the 4 Green Deck Project Objectives

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**Improve air
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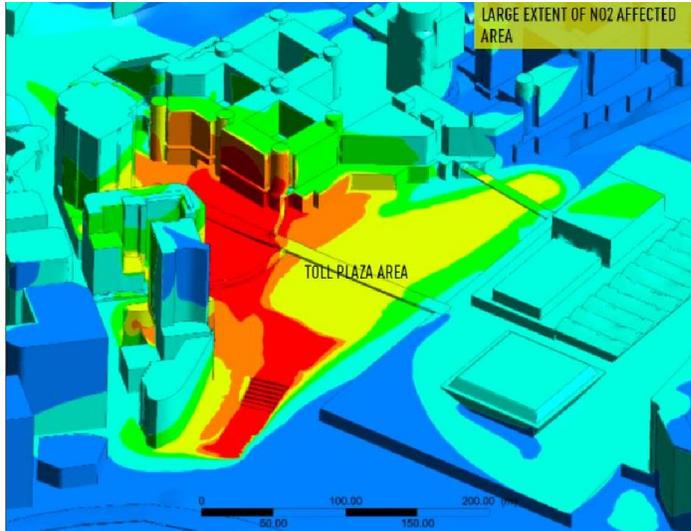
**Revitalise urban
centers and
upgrading local
economy**

Benefits of the Green Deck to the Community

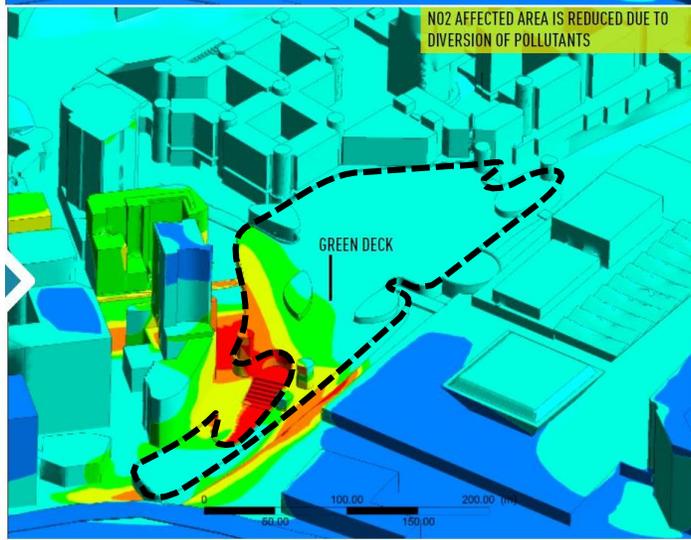
1. Improve air quality & community health



Base Scenario
(No Green Deck)

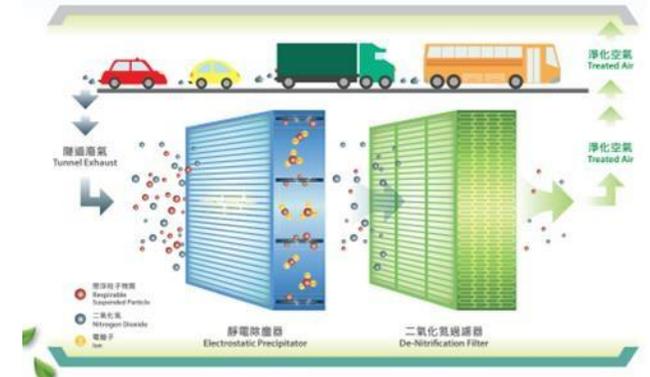


Proposed Scenario
(with Green Deck)



Proposed measures to improve air quality in Green Deck:

- Installation of **Air Purification System (APS)** within **Green Deck** to treat polluted air from the toll plaza



Other air quality improvement measures to be developed by PolyU:

- Application of photocatalytic coating
- Small-scale air purification device
- Implementation of post-construction monitoring



Benefits of the Green Deck to the Community

1. Improve air quality & community health



Sustainable Design Strategy

Green Deck's Benefits to the Environment and Health in an Urban Setting
綠化平台在都市中對環境和健康的益處

Use of Sustainable Building Materials
使用可持續建築材料

Use of Sustainable Building Material such as Eco-block
使用環保磚等可持續建築材料

Air Purification 空氣淨化

Air Purification System - Process air pollutants from tunnel traffic underneath the Green Deck
空氣淨化系統 - 處理來自綠化平台下方隧道交通的空氣污染物

Introduction of Native Tree Species
種植本地原生樹木

Carbon Sequestration, Tree Planting and Biodiversity
碳封存、種植樹木和生物多樣性

Carbon sequestration through planting on GD
碳封存 - 在綠化平台種植樹木

Maintain Biodiversity
維持生物多樣性

Water Consumption Reduction
減少用水量

Applying efficient water fixtures
使用高效的水裝置

Rainwater Recycling
雨水回收

Annual water consumption reduction by both strategies are equivalent to around 4 standard main swimming pools in HK
兩種策略每年減少的最少用水量相當於 4 香港標準主游泳池

Renewable Energy Integration
整合可再生能源

Electricity generation from the renewable energy is equivalent to ~220 typical household's annual electricity consumption
可再生能源發電量相當於 ~220 典型家庭的年用電量

Energy Efficiency Measures
提升能源效率措施

Potentially save ~580 typical household's annual electricity consumption
整體能效措施可潛在節省 ~580 典型家庭的年用電量

Use of building equipment with higher efficiency
使用效率更高的建築設備

Natural Ventilation
自然通風

Daylighting
採光



Carbon Reduction
減少碳排放



Reduce Heat Island Effect
降低熱島效應



Encourage Active Lifestyle
鼓勵動態生活模式



Improve Walkability
提升可步行性

Green Coverage
綠化比率

~41%

Estimated Local Temperature Reduction
估計局部降溫

~-2.2°C

Carbon Neutrality Principle incorporated in the design

Benefits of the Green Deck to the Community

2. Restore community connectivity



A Convenient Access to Tsim Sha Tsui Promenade via the Islet
經維港眺望台到尖沙咀海濱花園的便利連接



B New Connection to Hung Hom MTR Station
與紅磡港鐵站的新連接



C Revitalised Connection to Hung Hom MTR Station
改善與紅磡港鐵站的現有連接

Connection to Surroundings 與相鄰建築的連接



D Preserving Connection with Tsim Sha Tsui East
保留與尖東之間的行人連接



E Improving Environment of Existing Connection with PolyU near Core D
改善與理大D棟連接的環境



F Improving Environment of Existing Connection with PolyU near Core P
改善與理大P棟連接的環境

Benefits of the Green Deck to the Community

2. Restore community connectivity



Potential Extension of the Pedestrian Connections and Cycling Network in the Surrounding Area of Green Deck

-  Residential Precinct
-  Commercial Precinct
-  Hotels
-  Education Facilities
-  Museum Cluster
-  MTR Stations
-  Proposed Green Deck Project Boundary
-  Pedestrian Connections
-  Potential Cycling Network Extension *(subjected to further policy and infrastructural support)*

Benefits of the Green Deck to the Community

3. Satisfy social needs



Landscaped park (About 24,300m²) on the D/F and M/F

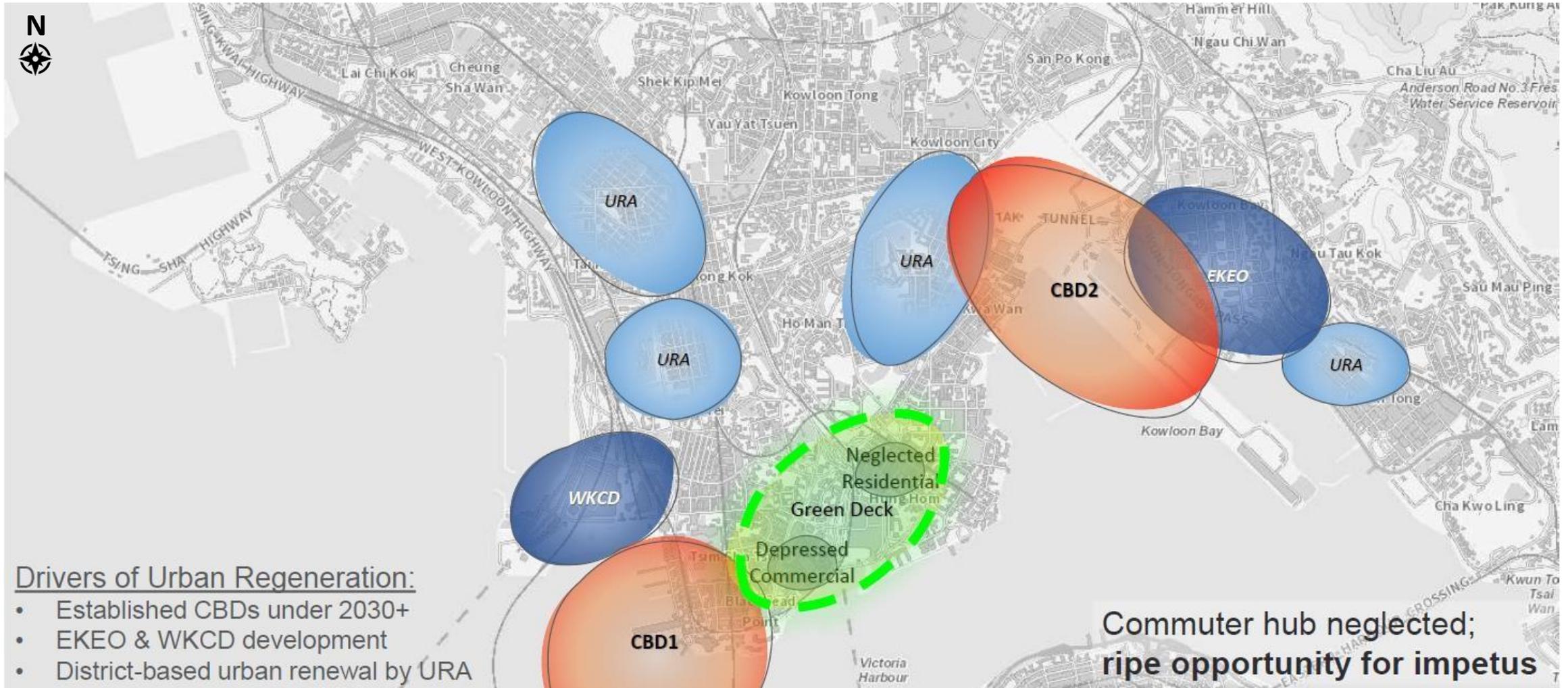
Functional areas on M/F to drive community development across different social groups

Air-conditioned Bus Waiting Lounges on the G/F

Benefits of the Green Deck to the Community

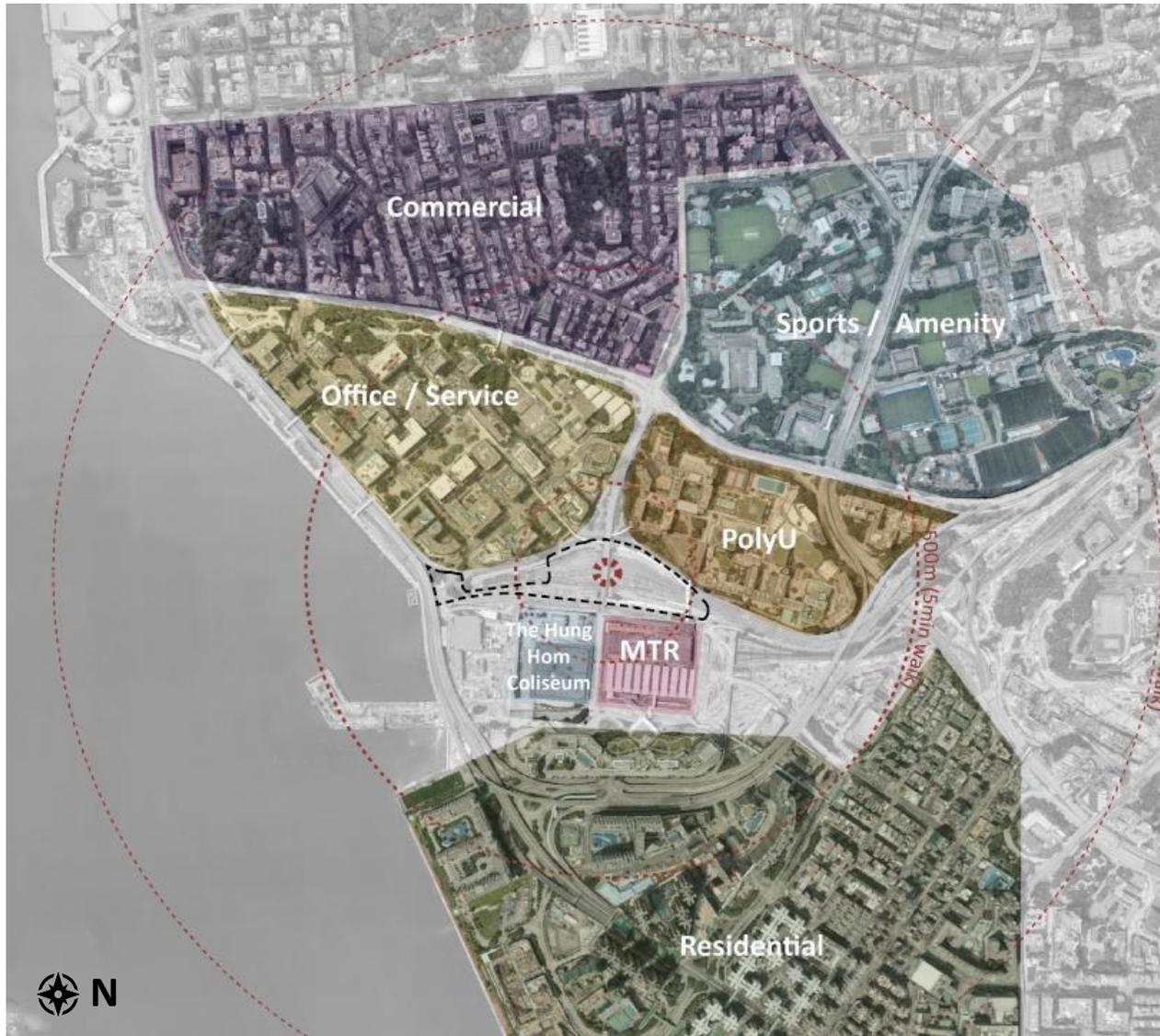
4. Revitalise urban centers and upgrading local economy

- Green Deck as catalyst for revitalising the neighbourhood



Benefits of the Green Deck to the Community

4. Revitalise urban centers and upgrading local economy



- **Green Deck** could act as catalyst to the neighbourhood and community development
- Physical environment improvement brought by **Green Deck** will lead to appreciation of surrounding property value and creation of opportunities for new jobs

Benefits of the Green Deck to the Community

4. Revitalise urban centers and upgrading local economy



- TST East and Hung Hom Station Area are currently depressed areas
- Green Deck can attract footfall to the adjacent area
- Opportunity to revitalize the TST East and Hung Hom Station Area with GD's visitors

Benefits of the Green Deck to the Community

4. Culture & Arts – World Class Waterfront



Design Development Process in Building Industry

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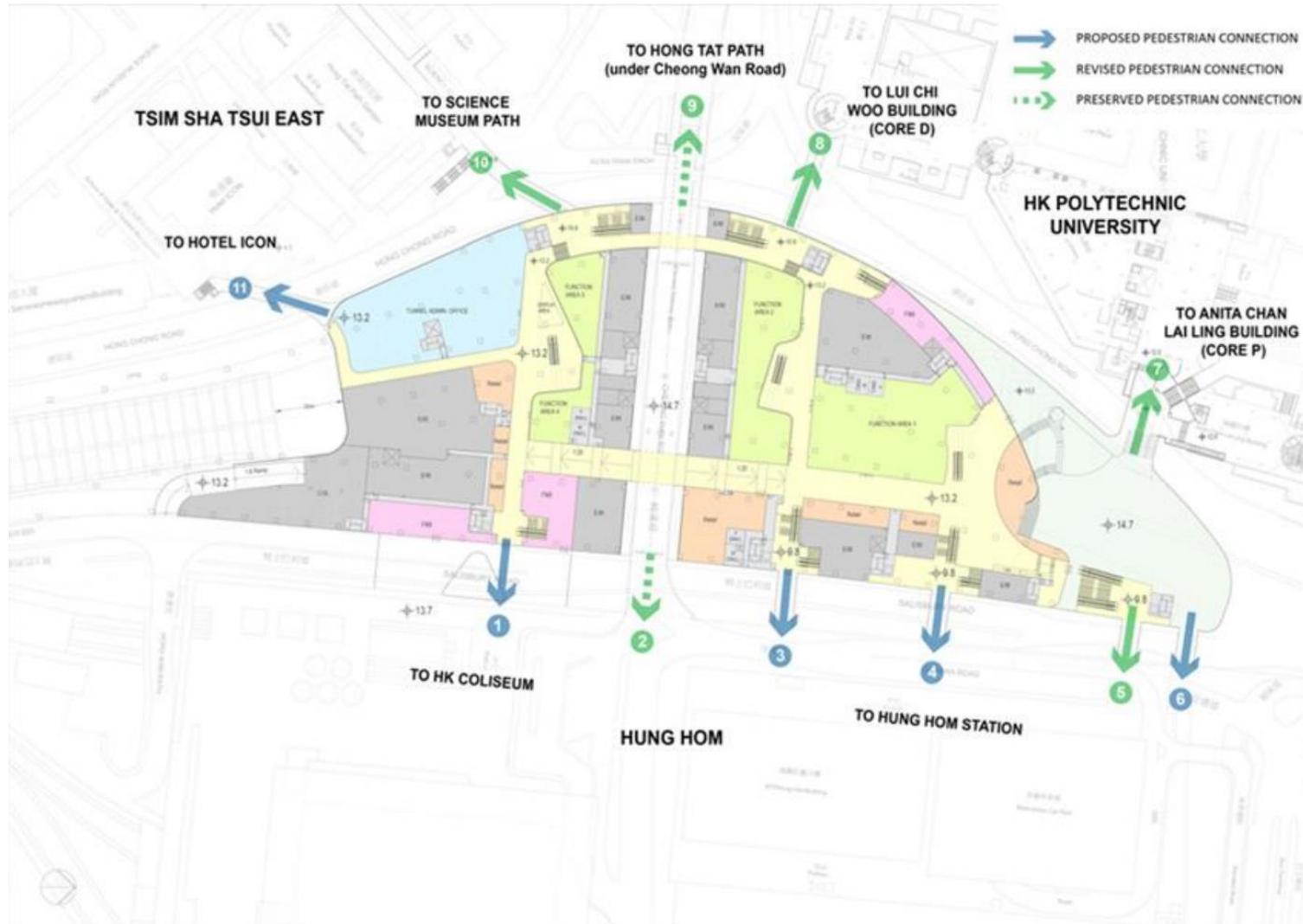
Consultants' Professional Responsibilities

Indicative list of disciplines



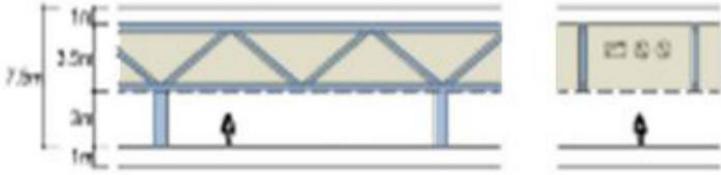
- (i) Architect and Authorized Person
- (ii) Building Service Engineers
- (iii) Civil Engineers
- (iv) Geotechnical Engineers
- (v) Structural Engineers and Registered Structural Engineers
- (vi) Quantity Surveying Consultants
- (vii) Environmental Engineers and Specialists
- (viii) Fire Engineering and Safety Consultants
- (ix) Traffic and Transportation Engineers
- (x) Land and Estate Consultants
- (xi) Landscape Consultants
- (xii) Planning Consultants
- (xiii) Sustainability Design Consultants
- (xiv) Public Consultation Consultants; and
- (xv) Any other Sub-consultants and Specialist deemed necessary the Objectives of the Consultancy

Example of a building space plan – Mezzanine Level Green Deck

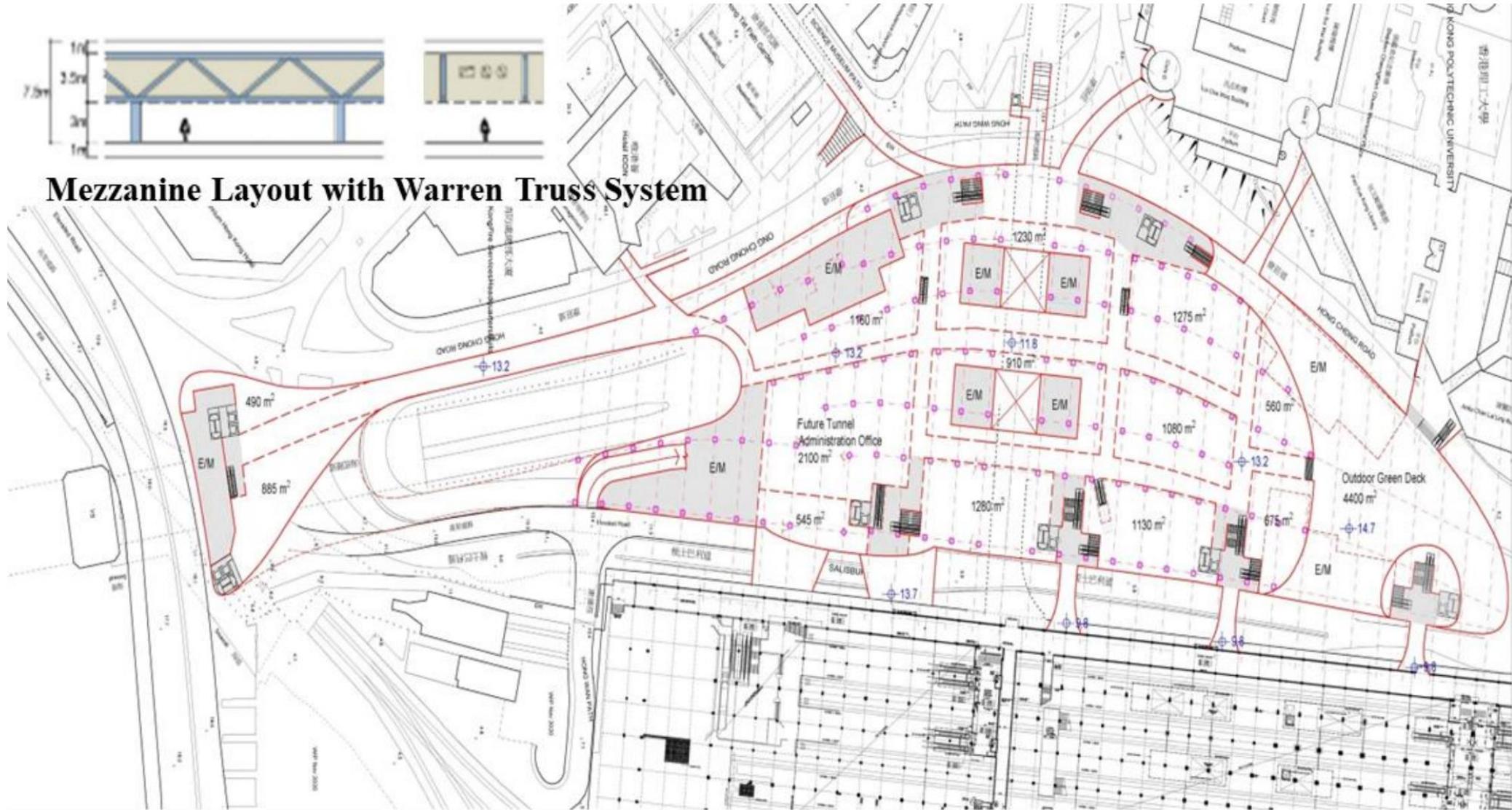


Structural System Options

Mezzanine Layout with Warren Truss System

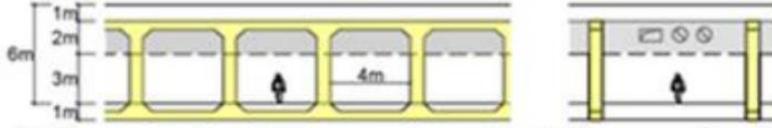


Mezzanine Layout with Warren Truss System

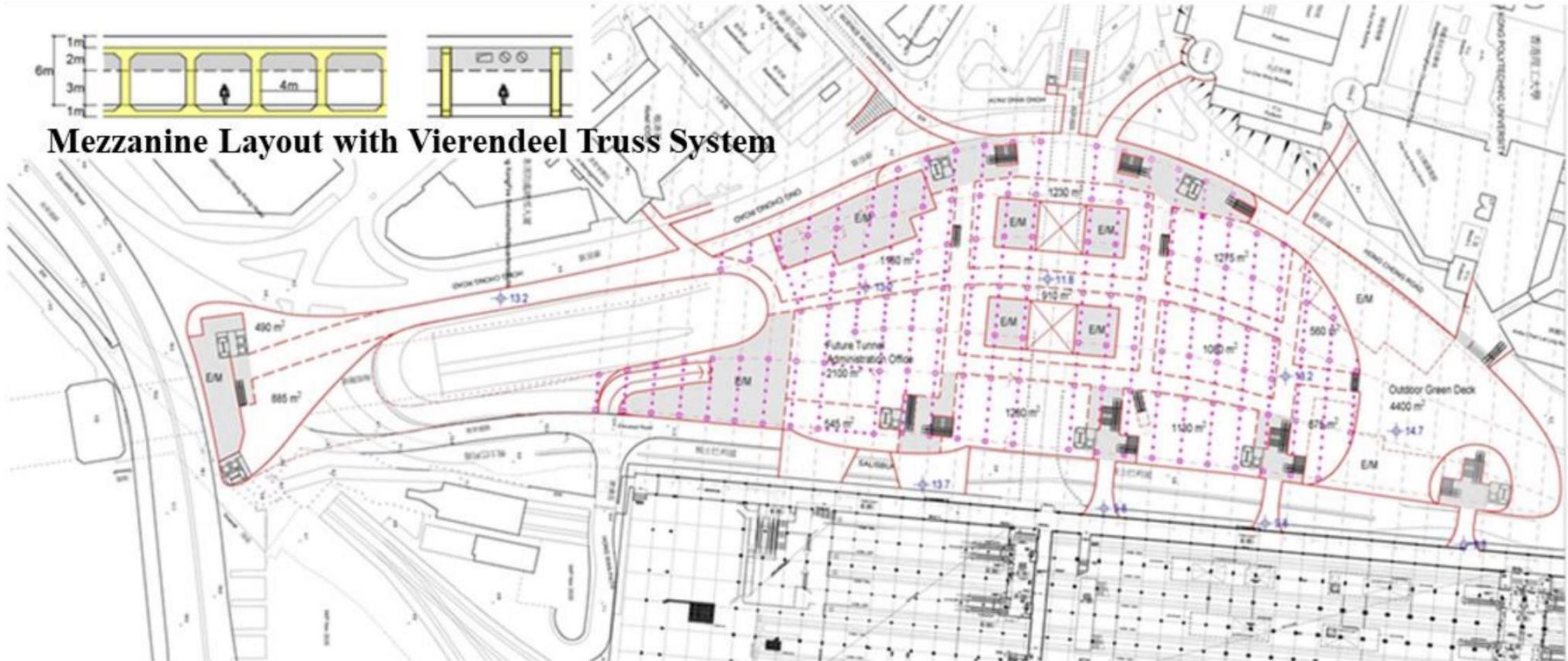


Structural System Options

Mezzanine Layout with Vierendeel Truss System



Mezzanine Layout with Vierendeel Truss System

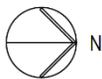
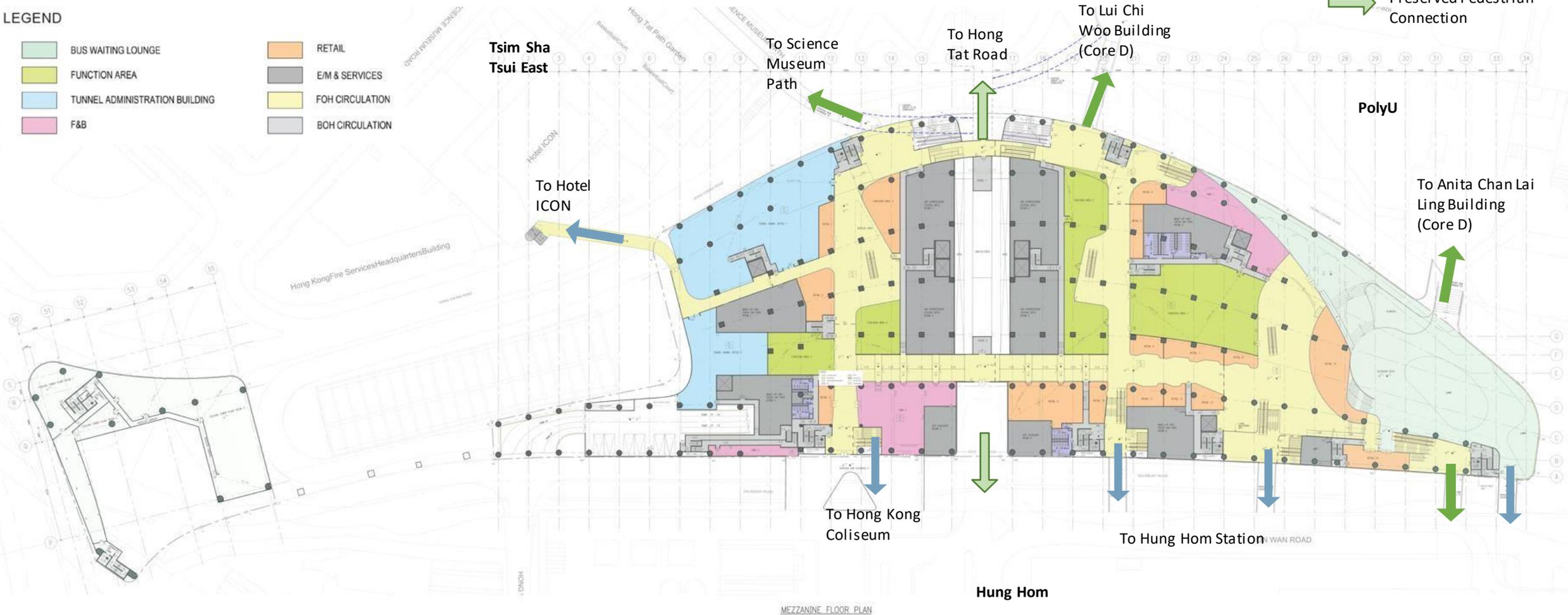


Mezzanine Level – Collaborated Space and Structural Design Plan

-  Proposed Pedestrian Connection
-  Revised Pedestrian Connection
-  Preserved Pedestrian Connection

LEGEND

- | | | | |
|--|--------------------------------|---|-----------------|
|  | BUS WAITING LOUNGE |  | RETAIL |
|  | FUNCTION AREA |  | E/M & SERVICES |
|  | TUNNEL ADMINISTRATION BUILDING |  | FOH CIRCULATION |
|  | F&B |  | BOH CIRCULATION |



The End

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