The Additional District Cooling System (DCS) at the Kai Tak Development (KTD)

Harbourfront Commission
Task Force on Kai Tak Harbourfront Development

15 Jan 2019

ARUP

機電工程署
EMSD

Agenda

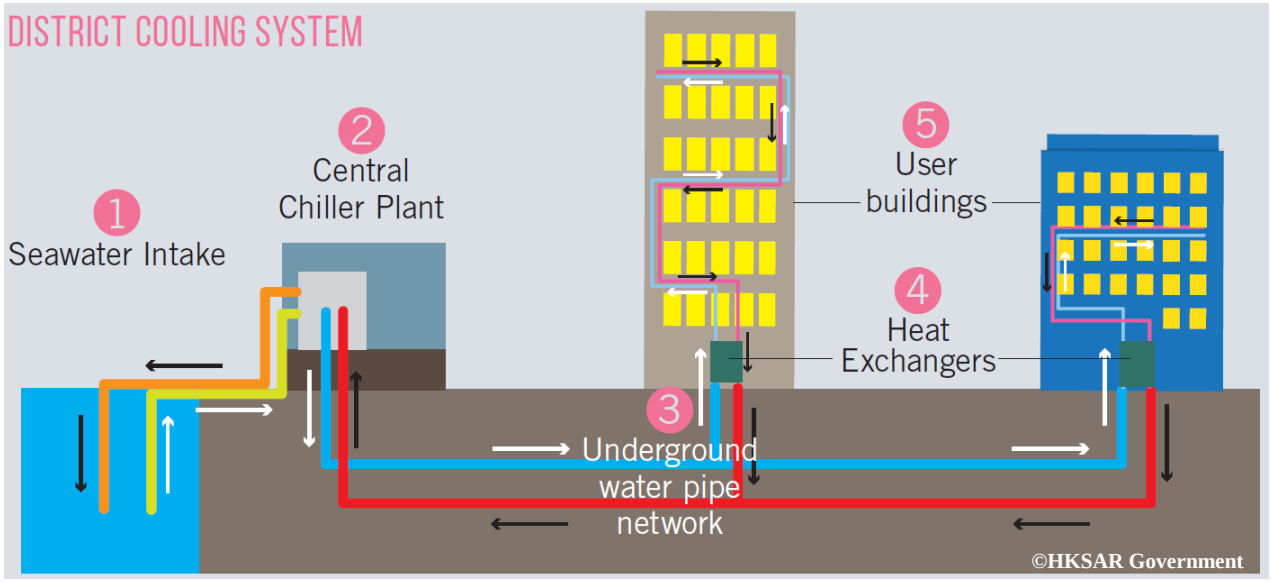
- Background of DCS
  - What is DCS?
  - DCS at KTD

- Brief Introduction of Additional Plant for KTD DCS
  - Why Additional Plant for KTD DCS
  - Location of Additional Plant for KTD DCS
  - Block Plan of Additional Plant for KTD DCS
  - Works Area Outside the DCS Site

- Design Concept
  - Sustainable Development
  - Integrated Planning
  - Proactive Harbour Enhancement
  - Visual Impact Assessment
  - Vibrant and Accessible Harbour
  - Public Enjoyment
  - Greenery and Landscape Design

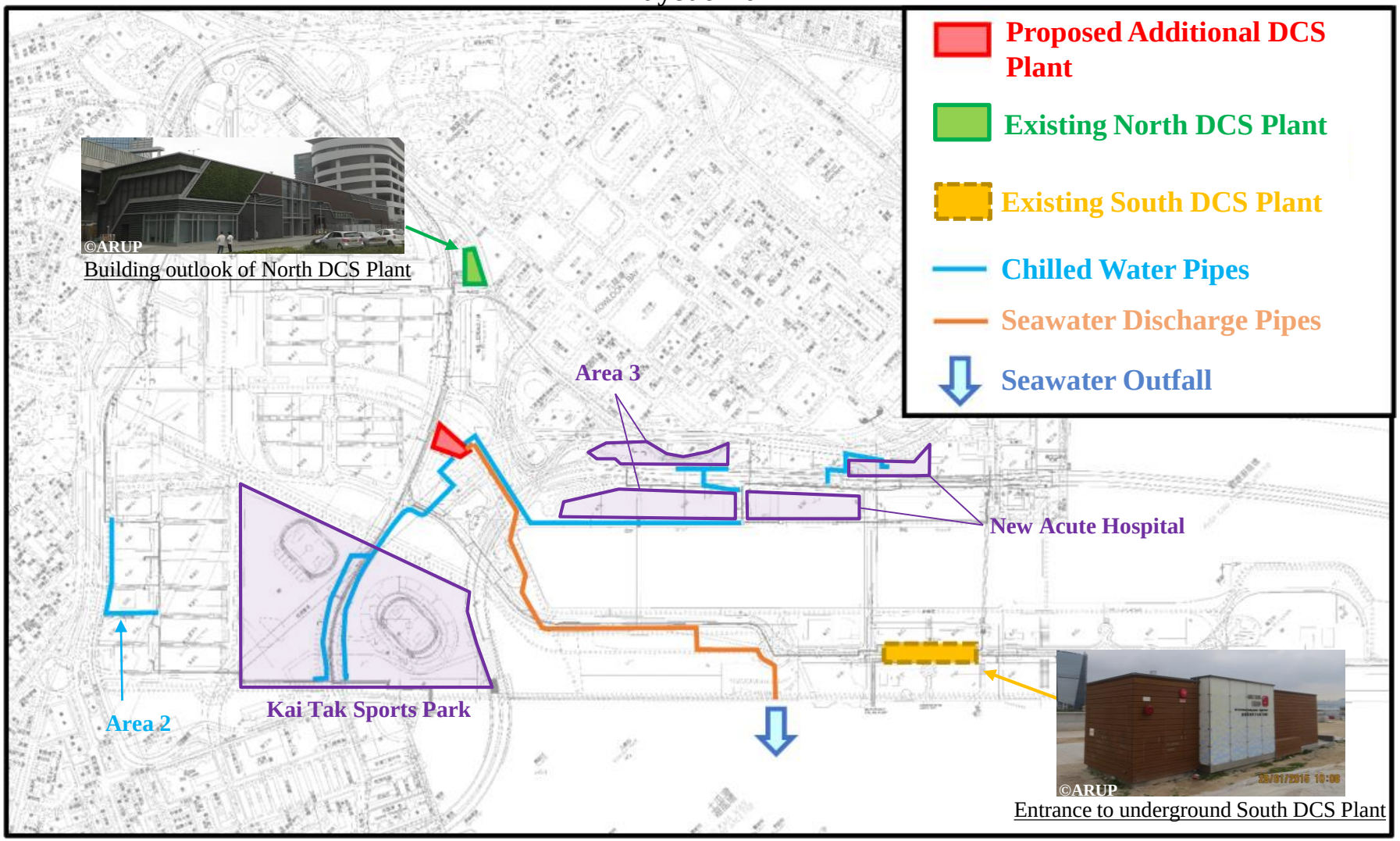
What is DCS?

- District cooling system (DCS) distributes chilled water through network of underground pipes from central chiller plant to multiple buildings for air-conditioning
- Suitable for developments with operational diversity and clusters of buildings



DCS at KTD

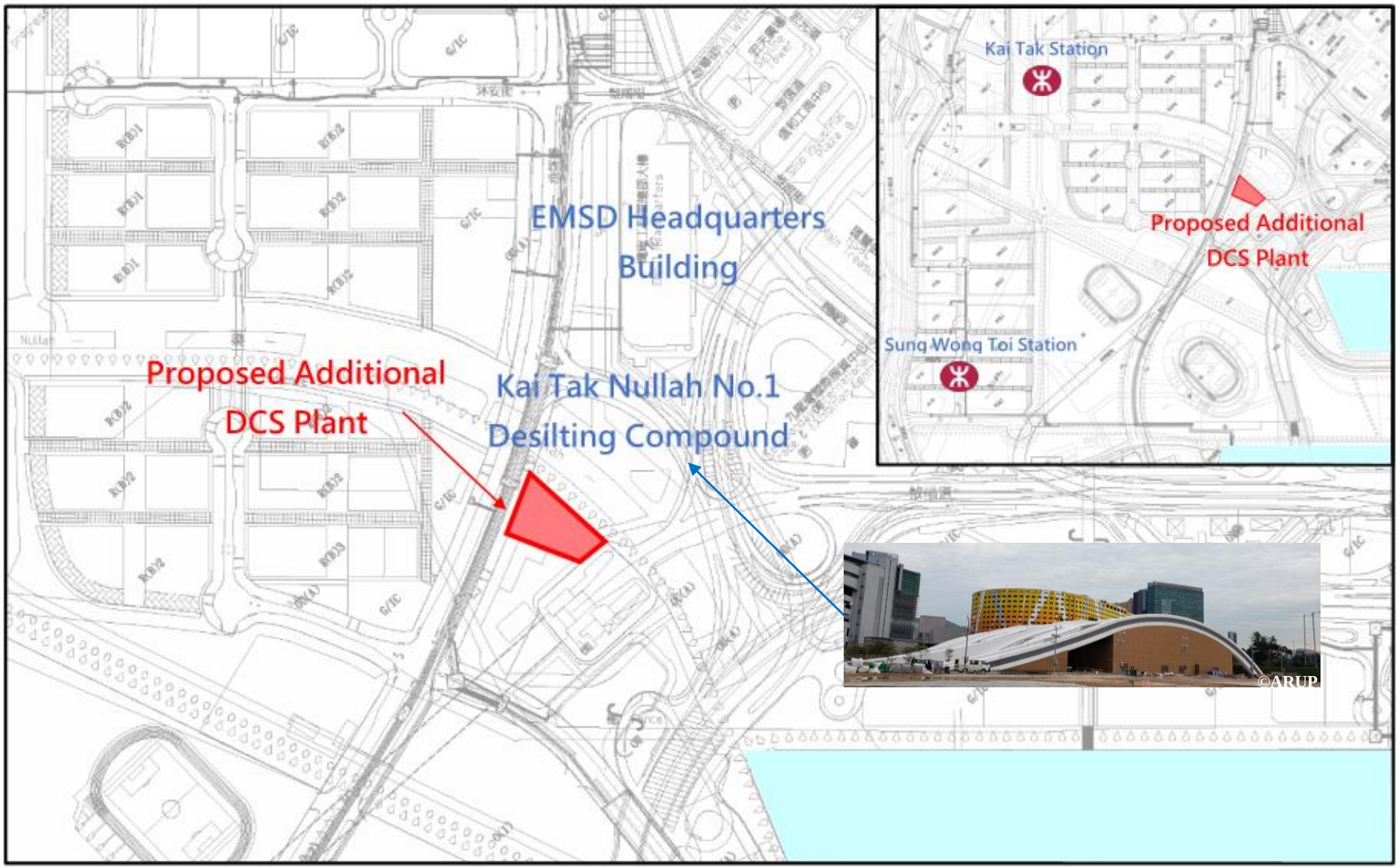
Layout Plan



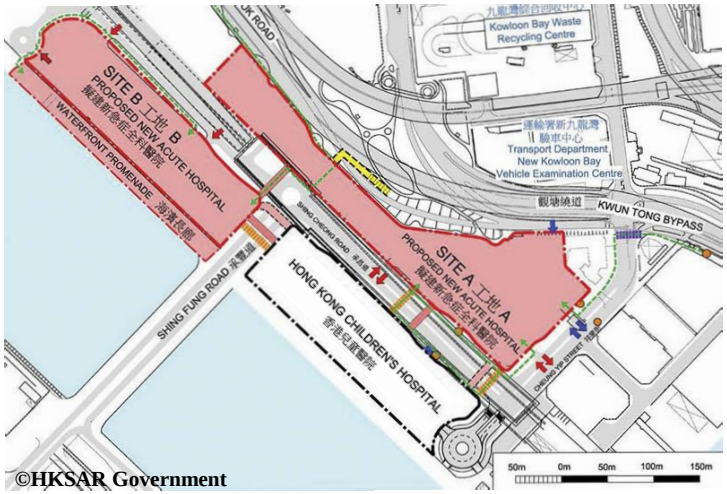
Building outlook of North DCS Plant

Entrance to underground South DCS Plant

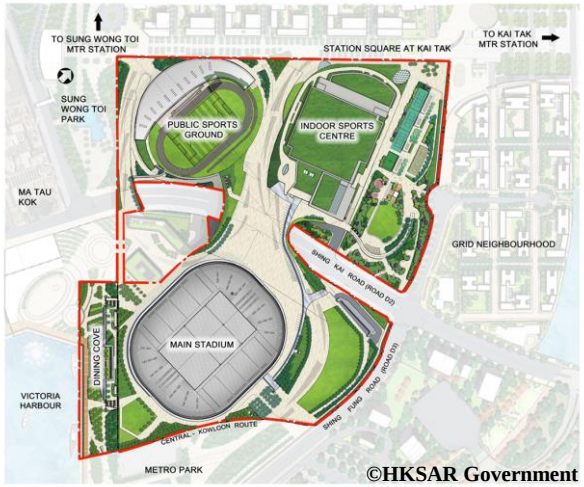
Location Plan of Additional Plant for KTD DCS



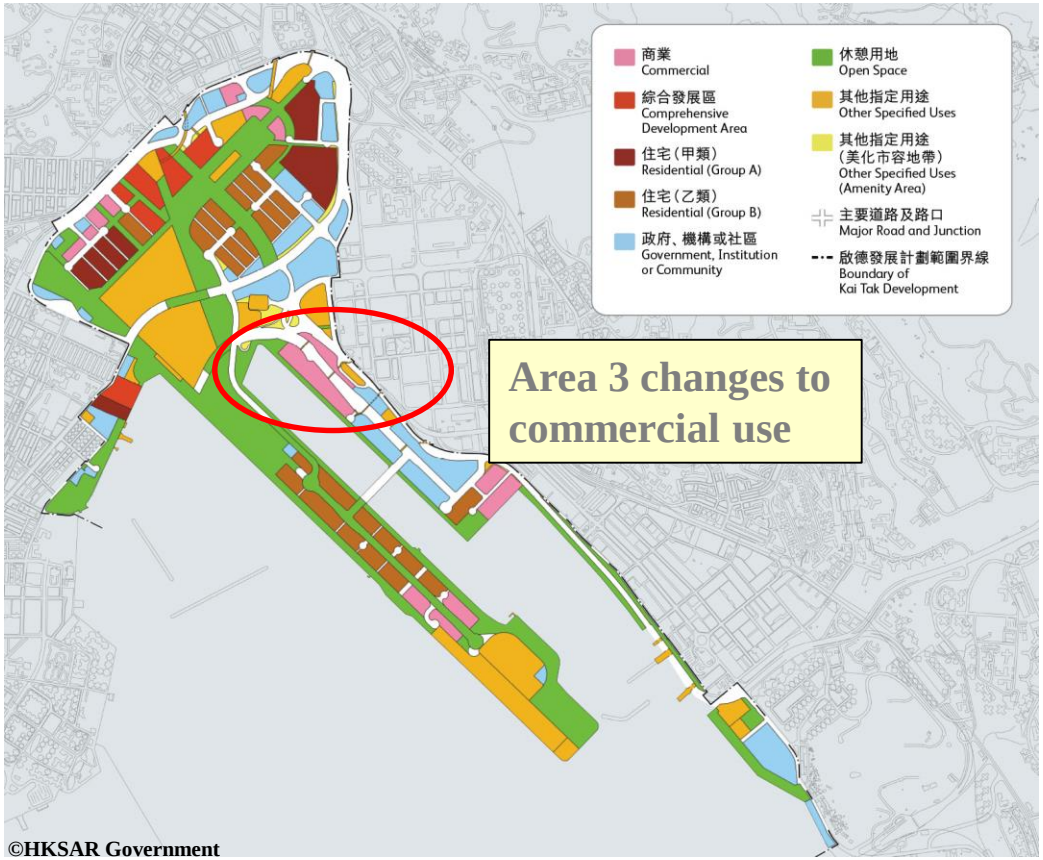
Why Additional Plant for KTD DCS



New Acute Hospital (NAH)

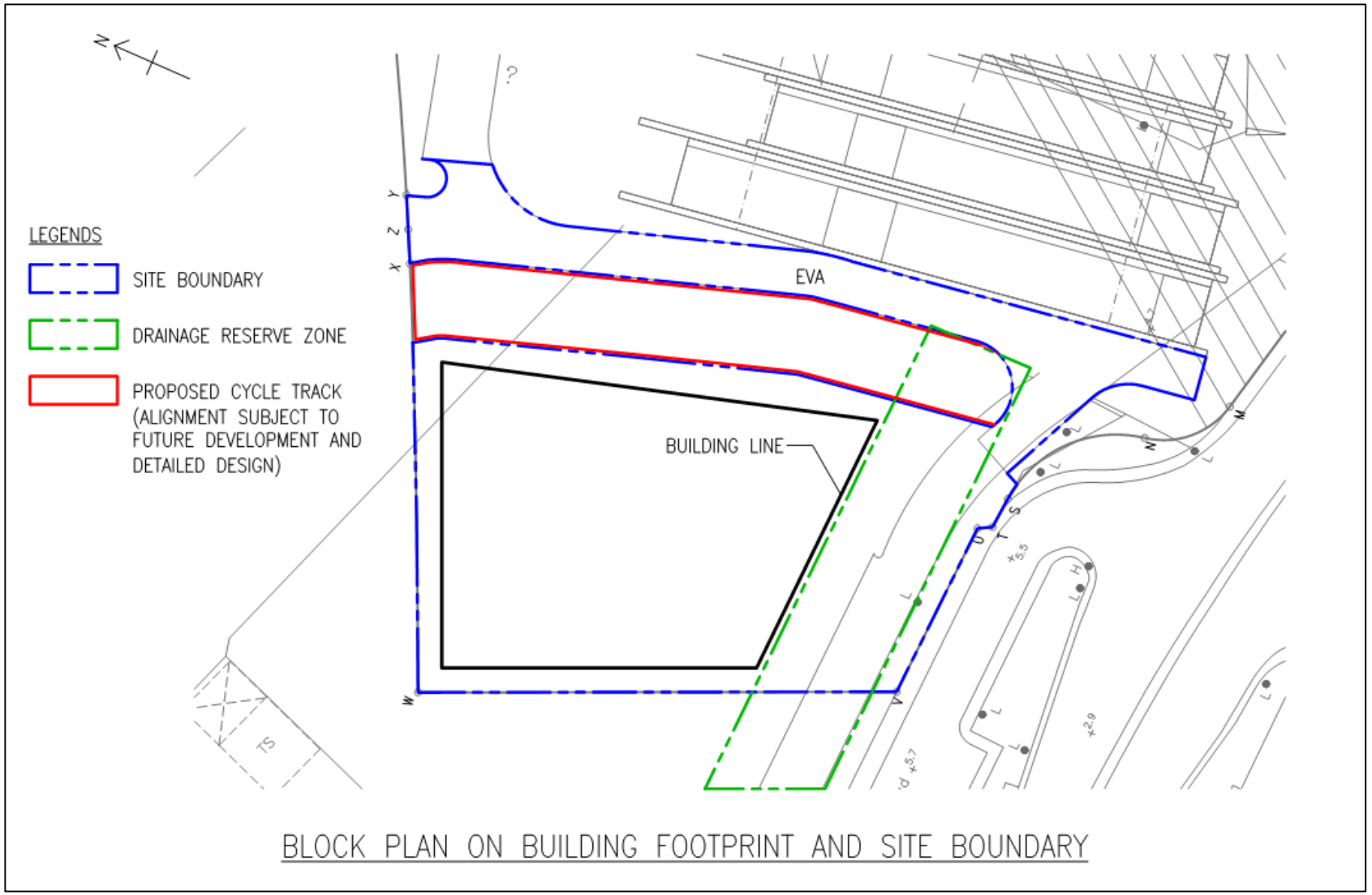


Kai Tak Sports Park (KTSP)

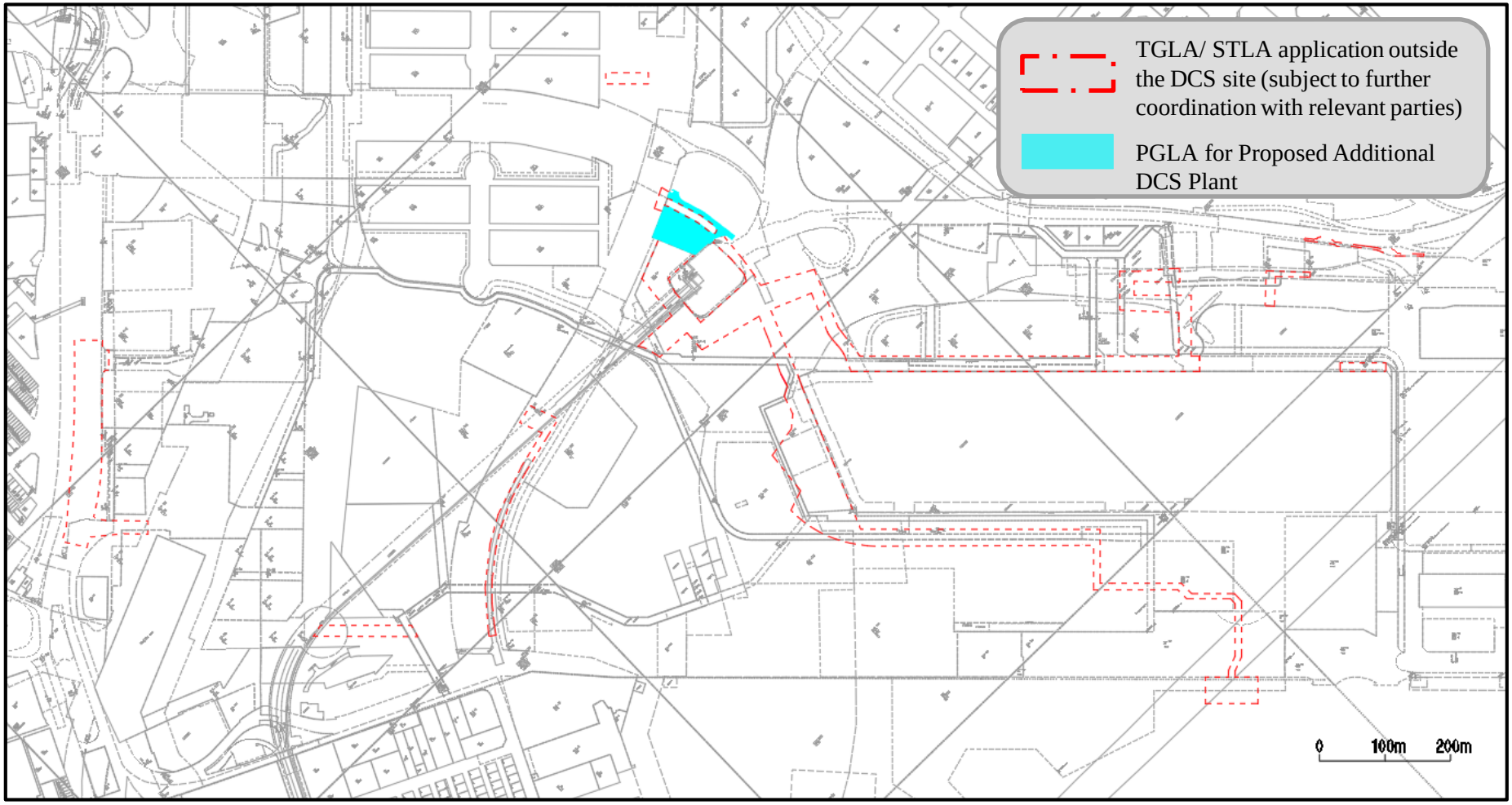


Commercial Developments in Area 3

Block Plan of Additional Plant for KTD DCS



Works Area Outside the DCS Site

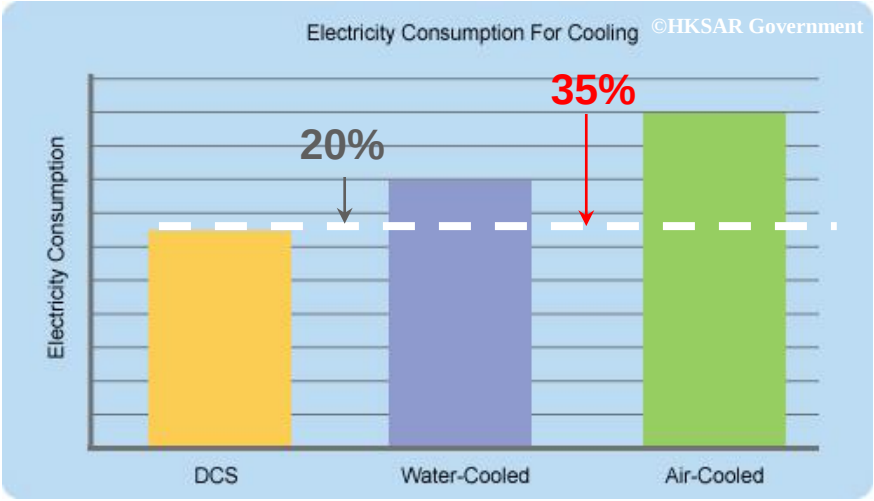


Sustainable Development

Major Benefits to the Environment

- **Energy Saving, Reduction of carbon footprint**

35% saving to traditional air-cooled system, 20% saving to individual water-cooled system.



- **Elimination of heat island effect**

Cooling System on rooftop is not required. The roof of the building can be designed with more sustainable features, such as green roof and roof garden to reduce the heat island effect.

- **BEAM Plus**

The second highest BEAM Plus Rating is targeted to be achieved.

Sustainable Development

Major Benefits to the Environment

- **Reduction of greenhouse gases emission**

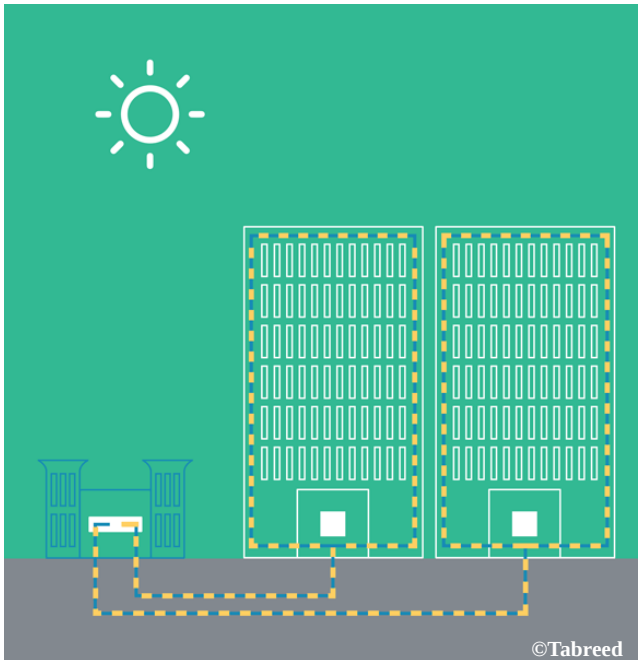
Improve energy efficiency, reduce energy consumption and carbon emissions.

- **Reduction of noise pollution**

Greatly reduce pollution of noise, vibration and waste heat pollution from building chillers and condensers.

- **Reduction of use of refrigerant**

The overall number of chillers in the DCS is smaller, thus reducing the amount of refrigerant required.

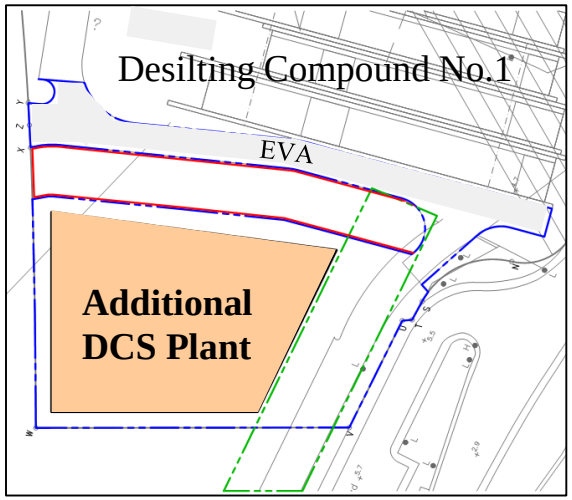


Integrated Planning

- **Functional Planning**
  The functional and efficient planning for the DCS locates the building to the north-western edge of the site with shared access facilities located between the DSD Desilting Compound and EMSD DCS facilities.

- **Public Access**
  Public access to the Visitor / Education Centre facilities is provided for educational purposes by appointed guided tours. Public access is segregated from operational areas for safety and operational efficiency.

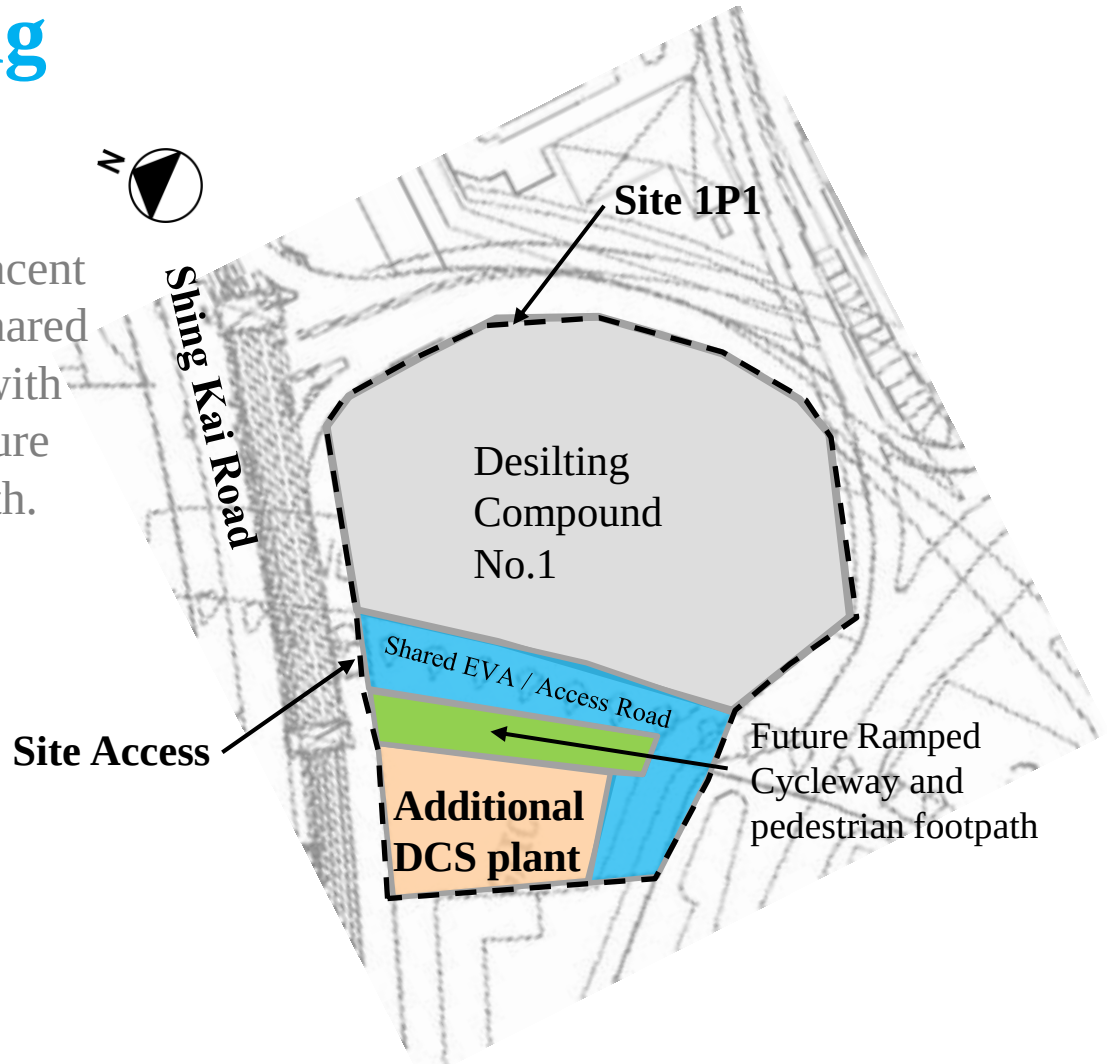
- **Integrated Soft Landscape**
  The proposed soft landscape design employs compatible landscape strategy as its adjacent DSD & EMSD sites, allowing for a harmonious, integrated landscape development to the DCS / KTD site.



Block Plan of Additional DCS Plant

Integrated Planning

- **Close Coordination**
  Close coordination with the adjacent DSD Desilting Compound on shared use of EVA / Access Road and with CEDD on reserving area for future cycleway and pedestrian footpath.



Indicative layout of Site 1P1

Proactive Harbour Enhancement

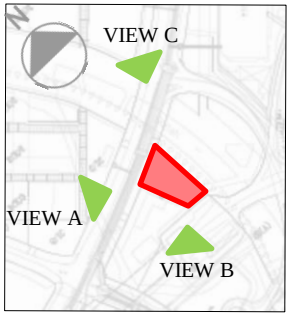
- **Façade Concept**

  Form follows function

  - Visual impact of building massing addressed by precast facade emulating a series of ripples that reflect sunshine

  Facade

  - Sustainable precast modular facade composed of fluted elements that create visual ripples
  - Integrated, articulated diagonal landscaping feature of vertical greening



Key Plan

Combine Notes:

- Photomontage shows reference design of Additional DCS Plant Building, subject to future DBO contractor's design
- Buildings and environment surrounding the DCS Plant Building are hypothetical and shown for information

View B

View A

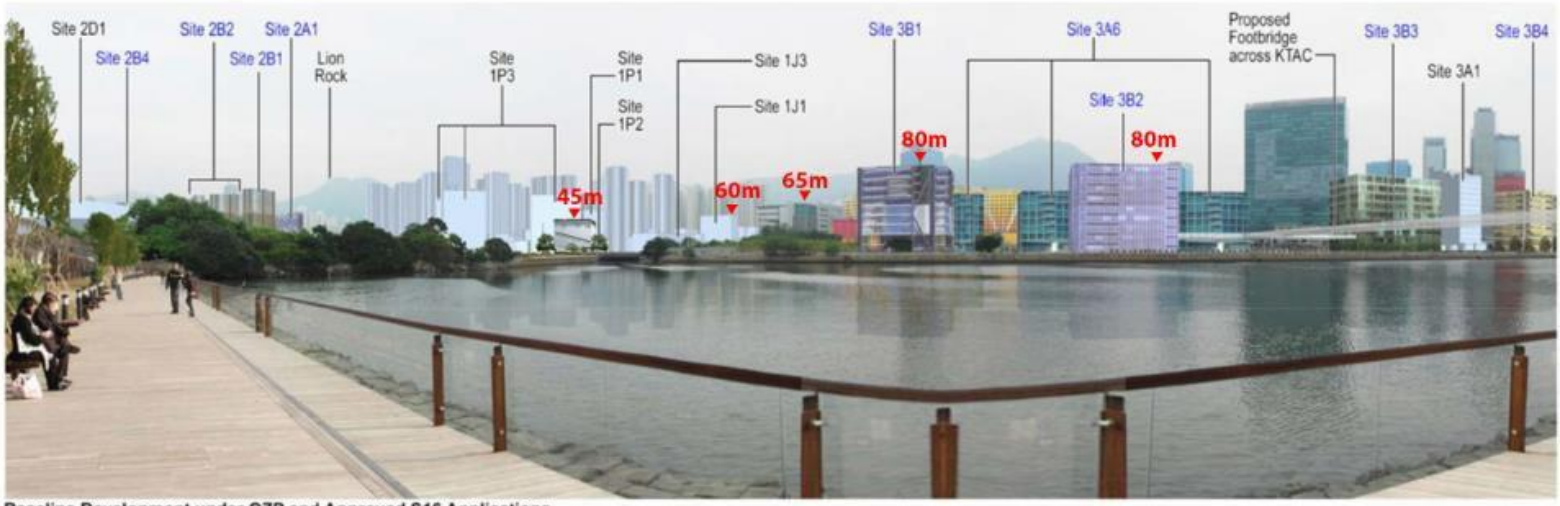
View C

Visual Impact Assessment

KEY PLAN

Note:
Sites labelled in blue indicate intensification sites and are rendered with simulated facade treatments.
Sites labelled in black indicate baseline development sites permitted under the OZP not subject to intensification and are rendered a plain pale blue colour.
Key visual elements are labelled in green.

Note:
a. Photomontage taken from PlanD document.
b. Above Maximum Heights Information are base on OZP

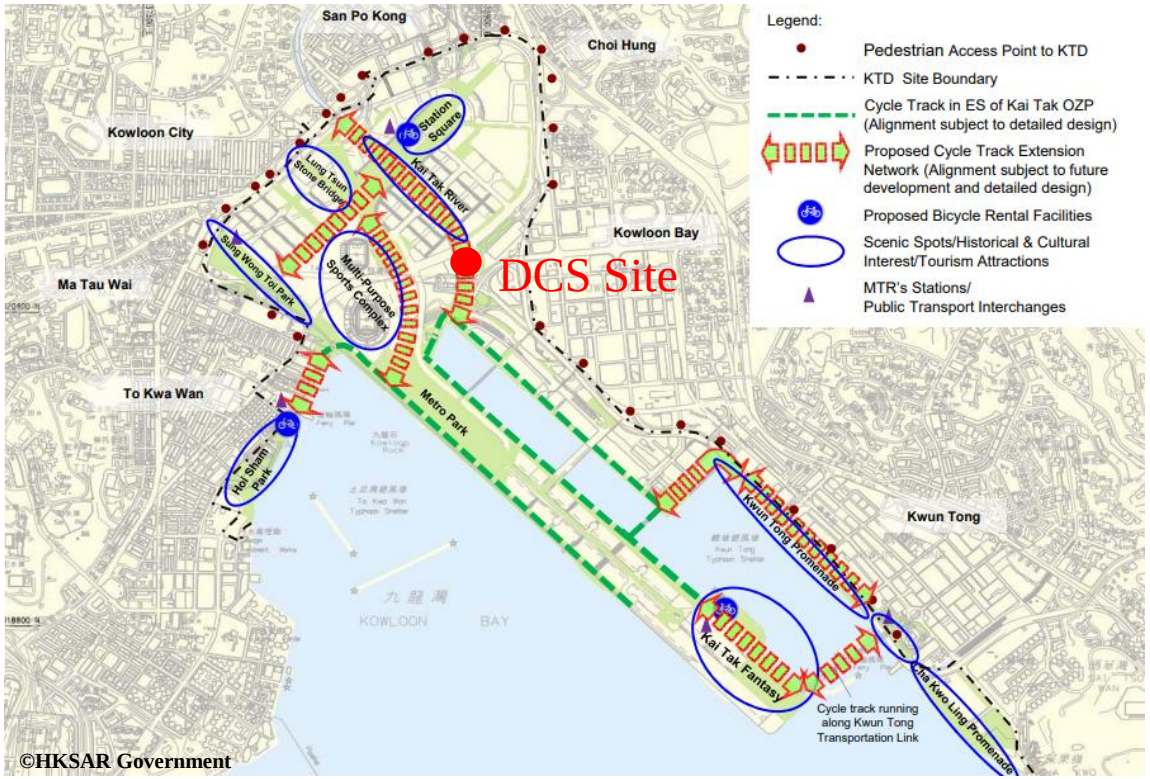


Baseline Development under OZP and Approved S16 Applications

Vibrant and Accessible Harbour

- **Site Connectivity**
  The site is designed to allow for the integration of the public cycleway and harbourfront access footpath.

- **Site Integration**
  The design and the visual impact of the DCS blend into the surrounding environment and facilities.



Public Enjoyment

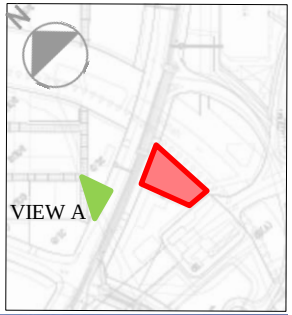
- **ECO friendly**
  The building is constructed with green, eco friendly materials that will also address the biophilic nature of the DCS and allow the building to be appreciated in a holistic way.

- **Public Access**
  A Visitor / Education Center will be provided for an appointed educational experience on the benefits of the District Cooling Facility.

Public Enjoyment

- **Harmonious Design**
  The DCS provides a harmonious design that is integrated with and enhances the harbourfront experience whilst providing this facility for this district.

- **Enhanced Aesthetic**
  The design and its articulation provides for an enhanced urban fabric for the district.



View A ~ (Photomontage shows reference design of Additional DCS Plant Building, subject to future DBO contractor's design)

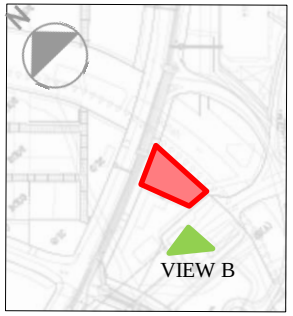
Greenery and Landscape Design

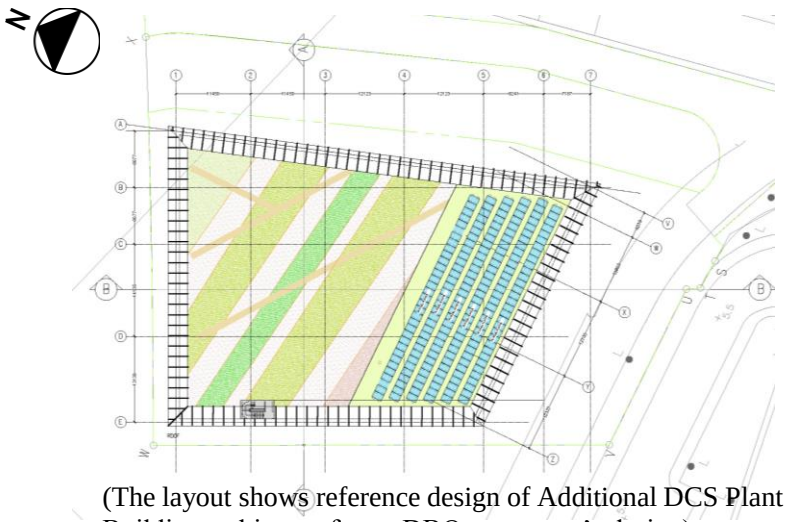
- **Design Philosophy**

  The landscape design will be complementary, and in harmony with the soft landscaping design adopted by the adjacent DSD Desilting Compound.

This will allow for a holistic landscape design for this area of the harbourfront.

Species will be selected for their durability, low maintenance. Exotic species are avoided.



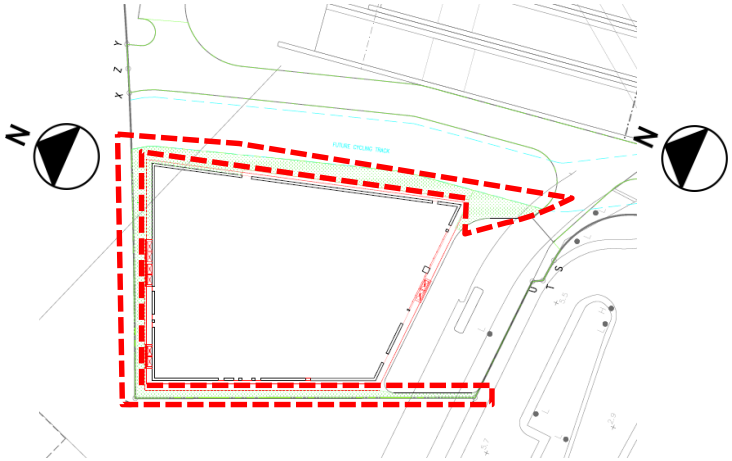


(The layout shows reference design of Additional DCS Plant Building, subject to future DBO contractor's design)

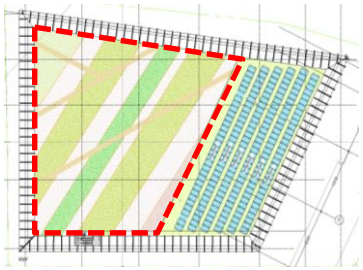
View B ~ (Photomontage shows reference design of Additional DCS Plant Building, subject to future DBO contractor's design)

Greenery and Landscape Design

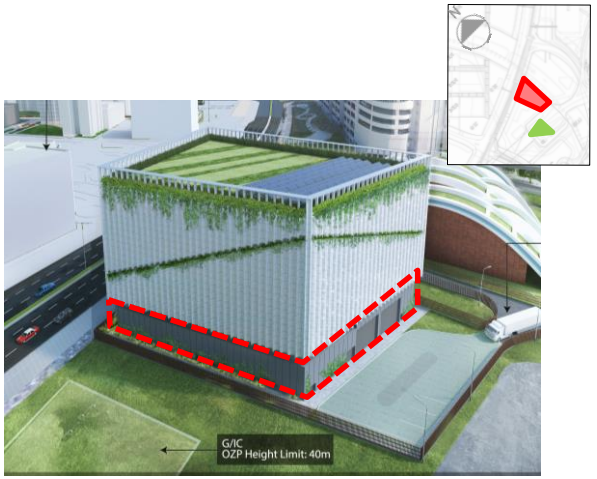
KTD Requirements	Proposed landscape area
Ground level to 15m above ground level: 20% of Site Area	> 20%
Roof Level: 20% of Roof Area	> 20%
Overall: 30% of Site Area	> 30%



At-grade greenery



Roof greenery



Vertical greening (below 15m)

(The layouts and photomontage show reference design of Additional DCS Plant Building, subject to future DBO contractor's design)

END ~

Q & A