For discussion
on 15 January 2019

TFKT/01/2019

Additional District Cooling System at the Kai Tak Development

PURPOSE

This paper seeks Members' views on the proposed additional District Cooling System (DCS) at the Kai Tak Development (KTD).

BACKGROUND

2. The DCS is a major infrastructure in support of the sustainable and environmentally-friendly development at KTD. It is an energy-efficient air-conditioning system, consuming 35% and 20% less electricity as compared with traditional air-cooled air-conditioning systems and individual water-cooled air-conditioning systems (WACS) using cooling towers respectively.

3. To promote energy efficiency and conservation, and with the support of the Legislative Council, the Government is constructing a first-of-its-kind DCS at KTD. Owing to better energy efficiency, the maximum annual saving in electricity consumption upon completion of the entire DCS project is estimated to be 85 million kilowatt-hour, with a corresponding reduction of 59 500 tonnes of carbon dioxide emission per annum. DCS is expected to help mitigate climate change.

4. Apart from energy saving, the DCS will bring about the other benefits for individual users and the community, such as more flexible building designs for user buildings as they do not need to install their own chillers and the associated electrical and mechanical equipment; and reduced heat island effects at KTD and help adaptation for climate change.

5. In view of the substantial increase in the non-domestic air-conditioned areas arising from the increase in the development intensity of Kai Tak area, latest design of Kai Tak Sports Park (KTSP) and expanded scope of New Acute Hospital (NAH), the cooling load demand has far exceeded the planned cooling capacity of the existing DCS. Hence, an additional DCS is proposed. A

location plan of the additional DCS plant is at **Annex A**.

6. The project is to construct a large-scale centralised air-conditioning system which produces chilled water at the central chiller plant and distributes it to user buildings at KTD through a network of underground water pipes.

SCOPE OF WORKS

7. The scope of the project includes –

(a) construction of an additional DCS plant building with electrical and mechanical ("E&M") equipment;

(b) laying of underground seawater pipe networks and underground chilled water pipe networks; and

(c) installation of connection facilities at user buildings.

PROPOSED DESIGN

8. The actual design of the DCS plant will be carried out by a Design-Build-Operate (DBO) contractor to be engaged through the established capital works tendering procedures. In drawing up the design scheme for reference by the DBO contractor, we have taken into account the following Harbour Planning Principles to ensure its compatibility with the surrounding environment with rich soft landscaping -

(a) **Preserving Victoria Harbour**

The additional DCS plant has no physical impact and minimal visual impact on the Victoria Harbour. The effect of the submerged seawater discharge has been reviewed to be without adverse impact on the water quality of the Victoria Harbour.

(b) **Stakeholder Engagement**

We have consulted the Wong Tai Sin District Council, Housing and Infrastructure Committee of the Kowloon City

District Council and Environment and Hygiene Committee of the Kwun Tong District Council in November 2018. They have agreed in principle with or do not have objection to the proposed project. The design of the additional DCS plant has taken into account their concerns such as maximising the site utilisation for DCS plant and incorporating facility to promote the sustainable DCS infrastructure to the public.

(c) **Sustainable Development**

The proposed additional DCS at KTD will achieve significant energy saving and the corresponding reduction of carbon dioxide emissions. It will also help obviate the need for roof-top air-conditioning plants at individual user buildings for better city landscape.

Aiming at achieving the second highest rating under the BEAM Plus, the additional DCS plant building will be installed with renewable energy system such as photovoltaic panels. It can serve as demonstration and education purpose to raise the public awareness of energy conservation design for infrastructure development.

(d) **Integrated Planning**

The additional DCS plant building is designed to support the efficient functioning of the DCS. Provision of sufficient space for maintenance within the building with good connectivity between plantrooms, and good road access to the building for emergency vehicular access ("EVA") and operational access will be required. A block plan showing the footprint of the DCS plant building and the site boundary is at **Annex B**.

The footprint of the additional DCS plant is optimized so as to allow for a section of proposed cycle track, which would form part of the proposed 13 km long cycle network in KTD, and pedestrian footpath for connection with the waterfront promenade.

The landscape design will be complementary to and in harmony with the soft landscaping design adopted by the adjacent DSD Desilting Compound. This integrated site planning strategy will enhance a harmonious long-term

landscape development around the KTD.

The operation of the additional DCS plant will be in close coordination with the adjacent DSD Desilting Compound on shared use of the EVA and seawater intake from the Desilting Compound for heat rejection.

(e) **Proactive Harbour Enhancement**

The design of the additional DCS plant will minimise its visual impact to the existing harbour with sustainability as an important consideration. We intend to employ a minimalist design approach. The design of façade will not only blend in with the adjacent DSD Desilting Compound and EMSD Headquarters building, but also reduce heat gain and limit the heat island effect of the building, on the surrounding. The rhythmic configuration would soften the façade massing and reduce its visual scale.

(f) **Vibrant and Accessible Harbour**

Although the proposed additional DCS plant building is not immediately fronting the promenade, it will serve as one of the landmarks alongside the proposed 13 km long cycle network in KTD for connection with the waterfront promenade. The design of the additional DCS plant building will blend into the surrounding environment and facilities.

(g) **Public Enjoyment**

As there has been a significant number of requests for visits to the existing North DCS Plant and that the Government is exploring the feasibility of providing more DCSs in new development areas in Hong Kong, we consider it appropriate to explore the opportunity for public enjoyment in the design and planning stage of the DCS project in KTD. A visitor/education centre including educational facilities such as a video viewing area, an interactive displays area and a discussion area is proposed to be included in the DCS to enhance public understanding on the initiatives and development of DCS in Hong Kong.

The greenery and soft landscape design proposed within the additional DCS plant site will provide an aesthetic view to

the environment.

9. Layout plan of the project is at **Annex C**.

WAY FORWARD

10. After consultation with the Task Force and the District Councils, EMSD will consider and incorporate comments received into the detailed design of the proposed additional DCS. We plan to consult the Panel on Development of the Legislative Council afterwards before seeking funding for the project in the second quarter of 2019.

VIEWS SOUGHT

11. Members are invited to give comments on the design of the project.

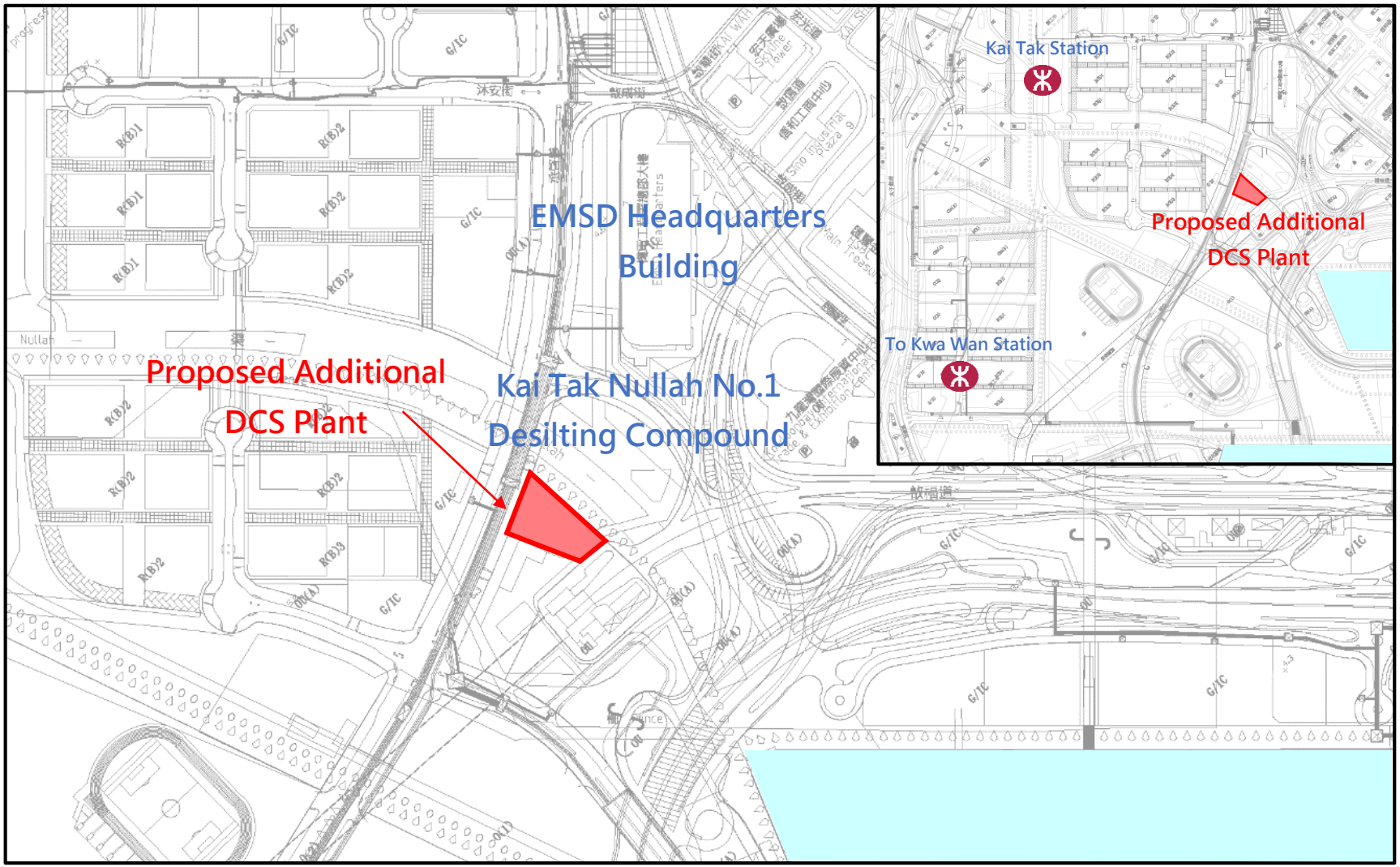
Electrical and Mechanical Service Department

January 2019

Annex A	Location Plan
Annex B	Block Plan on Building Footprint and Site Boundary
Annex C	Layout Plan

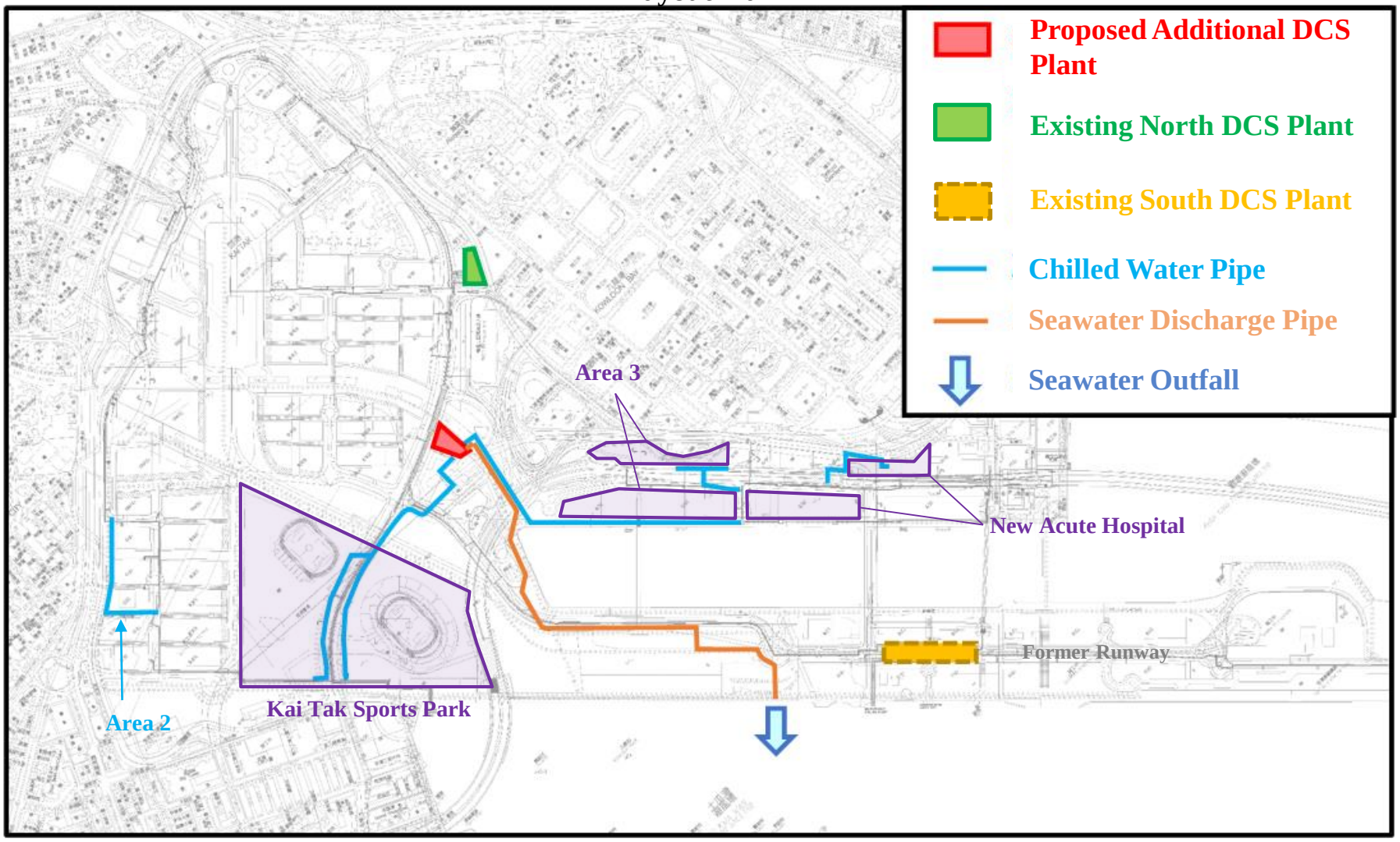
Annex A

Location Plan



BLOCK PLAN ON BUILDING FOOTPRINT AND SITE BOUNDARY

Layout Plan


Proposed Additional DCS Plant
Existing North DCS Plant
Existing South DCS Plant
Chilled Water Pipe
Seawater Discharge Pipe
Seawater Outfall
Area 3
New Acute Hospital
Former Runway
Kai Tak Sports Park
Area 2