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10 December 2018

Ms Doris LO
Clerk to the Public Works Subcommittee
Public Works Subcommittee
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong
(Fax: 2978 7569)

Dear Ms LO,

Paper No. PWSC(2018-19)30
45CG – District Cooling System at the Kai Tak Development

At the meeting of the Public Works Subcommittee on 7 November 2018, when Members were considering 45CG – District Cooling System (DCS) at the Kai Tak Development, they requested the Government to provide supplementary information. Our reply is set out below.

Charges and Fees for District Cooling Service

A Member asked the Government to provide the relevant financial analysis and estimates to explain how the capital and operating costs of the DCS would be recovered over the project life (estimated to be 30 years) by charging consumers for the district cooling service.

In accordance with section 10 of the District Cooling Service Ordinance (DCSO) (Cap. 624), the district cooling service charges are made up of two components,

i.e. the capacity charge and the consumption charge. The capacity charge aims to recover the capital cost of the DCS (including the plants, pipes and heat exchangers for individual buildings) as well as operation and maintenance costs, while the consumption charge aims to recover the costs that vary with the actual consumption of different consumers, most of which being the electricity cost for providing district cooling service.

The Government's objective in the construction of the DCS is to allocate resources to the project during the initial construction stage first and then recover all costs from the building owners or their authorised agents over the project life (estimated to be 30 years) after the DCS comes into operation. The year 2012-13 is chosen as the base year as the DCS commenced its operation in that year. The Electrical and Mechanical Services Department (EMSD) commissioned a consultancy study in 2014 to recommend a tariff level that can help achieve full cost recovery of the DCS over its project life of 30 years at a target internal rate of return. The DCSO passed in 2015 adopted this assumption in determining the tariff level. The current tariff level is at **Annex A**.

Under the DCSO, the capacity charge rate is adjusted annually according to the rate of change in the Composite Consumer Price Index, and the consumption charge rate is adjusted annually with reference to the rate of change in the electricity tariff. As the actual cost and revenue may deviate from the forecast, apart from the annual tariff adjustment made under the DCSO, we will conduct a tariff review at least once every five years. If the results of a review shows that there is a considerable deviation of the actual figures from the forecast, and such deviation will have a long-term impact on the cost and revenue, we will make reference to the results of the review and, by notice published in the Gazette, adjust the charge rates prescribed in Schedule 2 of the DCSO in accordance with Section 34 of the DCSO so as to achieve our objective of full cost recovery in 30 years.

Uncommitted Balance for Phases I, II, IIIA, IIIB and IIIC of the Project

A Member requested the Government to provide supplementary information on the details of the uncommitted balance for Phases I, II, IIIA, IIIB and IIIC of the project under 45CG, including the surplus contingencies and provision for price fluctuation for implementation of the remaining works under Phase III (Phase IIIR). The respective balances are set out in the table below:

	Uncommitted balance ($ million)	Percentage of completion (%)
Phases I & II	4.1[1]	100%
Phase IIIA	0.6[1]	100%
Phase IIIB	199.8[2]	96%
Phase IIIC	37.5	40%
Total	242	-

Contingency Plan for the DCS

The Government is requested by a Member to provide supplementary information to explain the notification mechanism between EMSD and the affected government departments and buildings when the district cooling service cannot be provided due to a breakdown of the DCS or other incidents, and the relevant emergency plans for the Hong Kong Children's Hospital and the New Acute Hospital to be built in Kai Tak.

Compared with conventional centralised air-conditioning systems, DCSs are built with standby cooling capacity to ensure that cooling is always available at the central plant to meet the needs. Their distribution systems are generally designed with multiple loops or other back-up facilities to increase the reliability in distribution. Overall, a properly designed and constructed DCS has a higher reliability than the individual cooling systems of most buildings. In comparison with traditional air-cooled air-conditioning systems and individual water-cooled air-conditioning systems using cooling towers, the DCS is more reliable as its electrical and mechanical equipment is placed underground or inside buildings. In case of system failure or other incidents, back-up facilities including back-up chiller plants, water pumps, water distribution pipes, etc. will come into operation to maintain the district cooling service.

Despite the reliable design of the DCS, EMSD has set up a customer liaison group to enhance communication with users. The group will hold regular meetings with users to understand their views on the daily operation of the DCS. EMSD will notify the users of the repair of the DCS and other situations through the liaison group so that the latter can make arrangements and take actions in response as early as possible. In case of emergency or other incidents regarding the DCS, we will notify the affected

[1] The relevant uncommitted balance is attributed to cost savings.
[2] This is mainly attributed to cost saving.

users according to the established emergency information and communication mechanism (including the use of instant messaging software) to facilitate their timely response. EMSD will also conduct regular drills in respect of the contingency arrangements for the DCS, and invite users to participate.

To meet its special operational needs, the Hong Kong Children's Hospital is equipped with back-up chiller plants that can provide the necessary air-conditioning under emergency or other situations to meet the hospital's basic operational needs (such as operating theatre service). As for the New Acute Hospital, the project is still in the design stage. Details of the emergency plans will be formulated in due course. EMSD will continue to keep in contact with the hospital in this regard.

Locations of the Electrical and Mechanical Equipment

The electrical and mechanical equipment involved in the remaining phase of the DCS will be installed at the existing DCS chiller plant building. Please refer to **Annex B** for details.

Buildings using District Cooling Service

The buildings that are using, that will start using between 2019-20 and 2021-22, and that are planned to use district cooling service are listed in the table below. Please refer to **Annex B** for their locations.

	Cooling capacity required	
	Megawatt	Percentage
Buildings that are using district cooling service	40	14%
Buildings that will start using district cooling service between 2019-20 and 2021-22*	189	67%
Buildings that are planned to use district cooling service **	55	19%
Total :	284	100%

* The Government has required all private non-domestic projects to be connected to the DCS by prescribing the relevant requirements in the conditions of land sale.

** Regarding the buildings that are planned to use district cooling service, the Government will require all private non-domestic projects in the district to be connected to the DCS by prescribing the relevant requirements in the conditions of land sale.

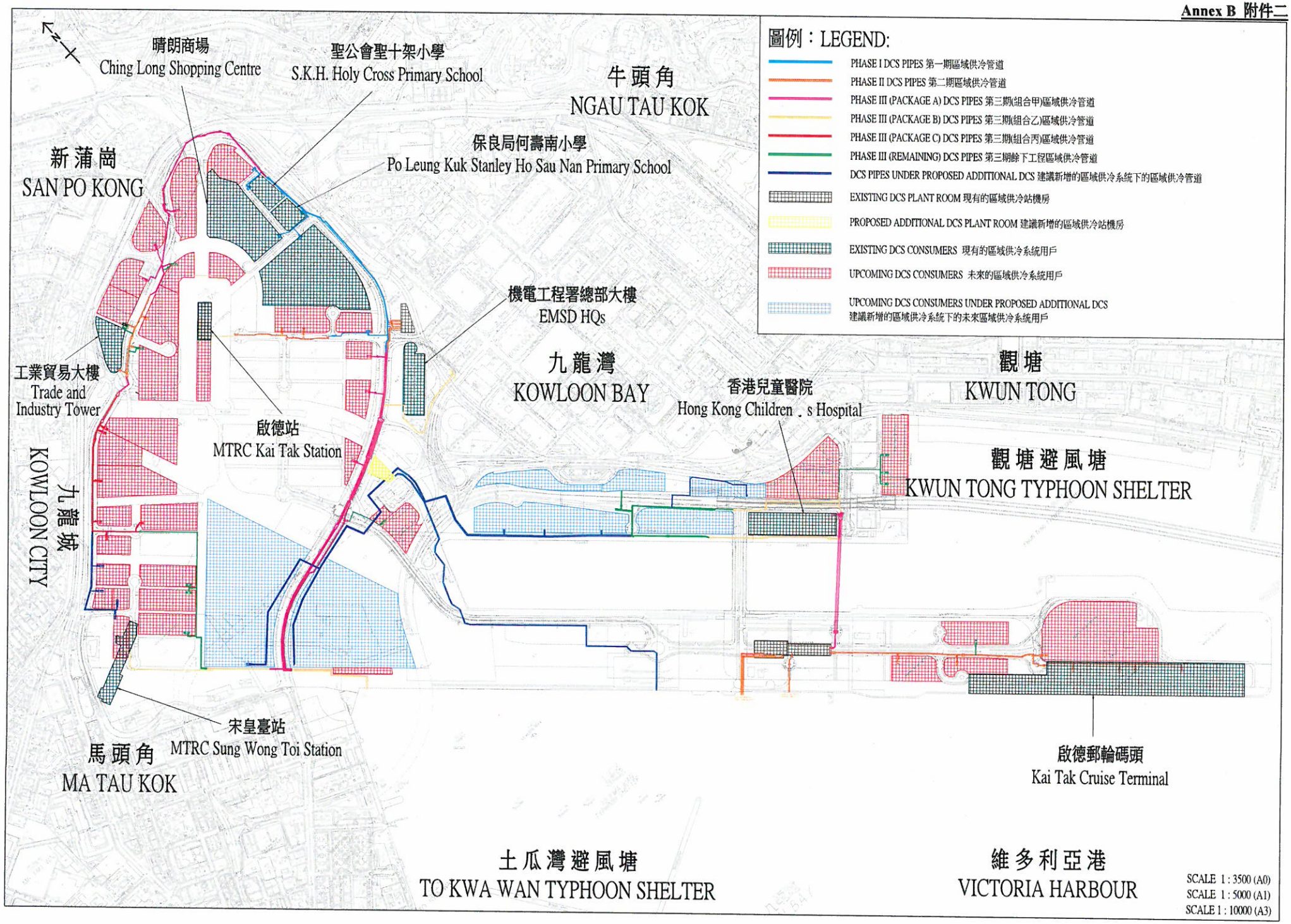
Yours sincerely,

(Desmond CHENG)
for Secretary for the Environment

c.c. Secretary for Financial Services and the Treasury
(Attn: Mr Denny HO)
Director of Electrical and Mechanical Services
(Attn: Mr Harry LAI
Mr CHAN Pak-cheung)

Annex A

	Charge Category	
	Capacity Charge Rate ($ per kilowatt refrigeration per month)	Consumption Charge Rate (per kilowatt-hour refrigeration)
2018-19 charge rates	123.74	0.1978


晴朗商場
Ching Long Shopping Centre
聖公會聖十架小學
S.K.H. Holy Cross Primary School
牛頭角
NGAU TAU KOK
新蒲崗
SAN PO KONG
保良局何壽南小學
Po Leung Kuk Stanley Ho Sau Nan Primary School
機電工程署總部大樓
EMSD HQs
工業貿易大樓
Trade and
Industry Tower
九龍灣
KOWLOON BAY
觀塘
KWUN TONG
香港兒童醫院
Hong Kong Children 。s Hospital
啟德站
MTRC Kai Tak Station
觀塘避風塘
KWUN TONG TYPHOON SHELTER
九龍城
KOWLOON CITY
宋皇臺站
MTRC Sung Wong Toi Station
馬頭角
MA TAU KOK
啟德郵輪碼頭
Kai Tak Cruise Terminal
土瓜灣避風塘
TO KWA WAN TYPHOON SHELTER
維多利亞港
VICTORIA HARBOUR
圖例：LEGEND:
PHASE I DCS PIPES 第一期區域供冷管道
PHASE II DCS PIPES 第二期區域供冷管道
PHASE III (PACKAGE A) DCS PIPES 第三期(組合甲)區域供冷管道
PHASE III (PACKAGE B) DCS PIPES 第三期(組合乙)區域供冷管道
PHASE III (PACKAGE C) DCS PIPES 第三期(組合丙)區域供冷管道
PHASE III (REMAINING) DCS PIPES 第三期餘下工程區域供冷管道
DCS PIPES UNDER PROPOSED ADDITIONAL DCS 建議新增的區域供冷系統下的區域供冷管道
EXISTING DCS PLANT ROOM 現有的區域供冷站機房
PROPOSED ADDITIONAL DCS PLANT ROOM 建議新增的區域供冷站機房
EXISTING DCS CONSUMERS 現有的區域供冷系統用戶
UPCOMING DCS CONSUMERS 未來的區域供冷系統用戶
UPCOMING DCS CONSUMERS UNDER PROPOSED ADDITIONAL DCS
建議新增的區域供冷系統下的未來區域供冷系統用戶
SCALE 1 : 3500 (A0)
SCALE 1 : 5000 (A1)
SCALE 1 : 10000 (A3)