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14 February 2011

Clerk to Public Works Subcommittee  
Legislative Council  
Legislative Council Building  
8 Jackson Road,  
Central, Hong Kong  
(Attn.: Mr Frankie Woo)

Dear Mr Woo,

**Public Works Subcommittee  
Meeting on 19 January 2011**

**45CG – District Cooling System at the Kai Tak Development**

I refer to your letter of 24 January 2011, seeking the following information of the project 45CG – “District Cooling System at the Kai Tak Development” –

- (a) how to increase the subscription rate through a competitive tariff level;
- (b) the scope of the legislation to be introduced for the Government to charge tariff for the District Cooling System (DCS) services;
- (c) measures to be adopted to cope with DCS system failure; and
- (d) the flexibility in undertaking construction works for Phase III subject to the progress and development of Kai Tak Development (KTD).

The relevant information is set out in the following paragraphs.

2. Implementation of a DCS in KTD will bring about significant environmental benefits. Given its high energy efficiency (35% more energy-efficient than traditional air-cooled air-conditioning system), the maximum annual saving in electricity consumption will be 85 million kilowatt-hour (kWh), with a corresponding reduction of 59 500 tonnes of carbon dioxide emission per annum for the planned total public and private non-domestic air-conditioned floor area of about 1.73 million square meters. As such, DCS can contribute to air quality improvement and the vision of achieving low carbon economy.

#### Increasing the Subscription Rate

3. The non-domestic parts of all public projects in the KTD will connect to DCS service. With a view to increasing the subscription rate and maximizing environmental benefit of the DCS project, it is the Administration's policy intention to require all private non-domestic projects in the KTD to connect to the DCS service. We are now discussing with relevant Government departments to prescribe the requirement to connect to the DCS in appropriate provisions in the land lease conditions. This approach has been confirmed with the Department of Justice as legally in order.

4. We have consulted the Lands Sub-Committee of the Land and Development Advisory Committee, comprising representatives from the Real Estate Developers Association of Hong Kong, the Hong Kong Institution of Engineers, the Hong Kong Institute of Surveyors, the Hong Kong Institute of Planners, the Hong Kong Institute of Architects, etc. They did not object to the proposed requirement in land lease. With such a requirement being put in place, all private non-domestic projects are expected to subscribe to the DCS having regard to the following benefits:

- (a) the DCS tariff would be set at a competitive level comparable to the cost of individual water-cooled air-conditioning systems (WACS) using cooling towers;
- (b) reduction in upfront capital cost for installing chiller plants at their buildings, estimated at about 5 – 10% of the total building cost;
- (c) user buildings do not need to install their own chillers and the

associated electrical equipment thus allowing more flexible building designs;

- (d) the DCS is more adaptable than individual air-conditioning system to the varying demand for air-conditioning; and
- (e) the service quality and reliability will be overseen by the Electrical and Mechanical Services Department (EMSD).

5. The future DCS is a government facility and its charging tariff will have to be set out in legislation. We will submit a Bill on the DCS charging tariff to the Legislative Council for scrutiny. In proposing the charging tariff, our policy intention is that –

- (a) it will be set at a competitive level comparable to the cost of individual WACS; and
- (b) both the capital and operating costs should be recovered from users over the project life which is estimated to be 30 years, as taxpayers should not subsidise such air-conditioning charges.

6. On the latest information available including the tender returns for Phase I and II works and on the basis that all air-conditioned floor area of public and private non-domestic projects in the KTD will use the DCS service, the DCS at KTD is estimated to breakeven within 25 years, which satisfies the principle in paragraph 5(b), while the estimated tariff is at a level fulfilling the principle in paragraph 5(a).

#### Scope of Legislation concerning DCS

7. The legislation concerning DCS is proposed to provide for the following, among other things –

- (a) the statutory authority in respect of the determination and the collection of charges for the DCS services and related implementation matters;
- (b) the structure and level of tariff; and
- (c) the necessary powers for the Government to oversee and regulate the operation of DCS services, including the

supervision, inspection and maintenance of the equipment and related matters.

### Measures to Cope with DCS System Failure

8. To achieve a high level of reliability, the design of DCS has incorporated a number of features to cope with emergency situations.

#### *Electricity Supply*

(i) The electricity supply for the chiller plant rooms and seawater pumphouse will be provided by nearby power substations under a “dual-feed circuit” arrangement. This is to ensure that even with failure of any one of the electrical power cables, the other electrical power cable would continue to provide reliable electricity supply to relevant facilities.

#### *Chilled Water Distribution Network*

(ii) The chilled water distribution network in KTD is designed in two ring circuits, i.e. one from southern DCS chiller plant to provide chilled water around runway areas and another from northern DCS chiller plant to provide chilled water for north apron areas. If one of the chilled water pipes fails, chilled water can be supplied through another direction of the ring circuit. In addition, leakage detection sensor cables will be installed in the chilled water distribution network. The cables can give early warnings when there is leakage in the pipework, so that timely repair can be carried out. The location of leakage can also be identified quickly for isolating the concerned pipes by stop valves to contain the impact on the operation of DCS as far as practicable.

#### *Electrical and Mechanical Equipment*

(iii) As with other essential utilities, the DCS is designed with adequate reserve capacity in its electrical and mechanical (E&M) equipment, including the provision of multiple chillers and pumps that are capable of serving the peak demands of all the users. This is to ensure service quality and reliability. For instance, if a chiller or pump breaks down, the system can switch to another chiller or pump in the system within a short period of time without adversely affecting normal service operation.

### *Emergency Response Plan*

(iv) In addition, a systematic operation and maintenance programme supported by computerized supervisory control and monitoring system will be put in place, and detailed emergency response plan will be developed. Regular drills will also be conducted to ensure that DCS staffs are well prepared for handling emergency situations. The service quality and reliability of the DCS services will be overseen by EMSD.

### Flexibility for Phase III works under the Currently Proposed Procurement Strategy

9. Under the currently proposed procurement strategy, the DCS will be implemented in three phases (i.e. Phases I, II and III) so that Phase I and II can proceed urgently to provide the core facilities, to proceed with the pipe laying works and to install E&M equipment to tie in with the development schedules of committed public works projects (e.g. the cruise terminal and shopping arcade of the public housing estate in KTD) while the laying of pipes and installation of E&M equipment to support future new developments in KTD will be implemented at a later stage in Phase III of the project.

10. The scope of works under Paper PWSC(2010-11)31 includes part of the pipe laying works for certain KTD Package 1<sup>1</sup> users (Phase I) and the design for the whole DCS, the building and engineering works for the northern and southern underground chiller plant rooms and the seawater pumphouse, which are the core facilities to support the whole operation of the DCS at the KTD, and the laying of the outstanding chilled water distribution pipes and E&M equipment for KTD Package 1 users (Phase II). Phase III of the project covers the works contracts for the installation of additional E&M equipment and laying of chilled water distribution pipes to serve KTD Packages 2 and 3 users.

11. Given the scale of KTD, there may be adjustments to the design and implementation schedule of various projects. As Packages 2 and 3 users are scheduled for completion in 2016 and thereafter, there may still be uncertainties in the cooling demand and location of developments, the

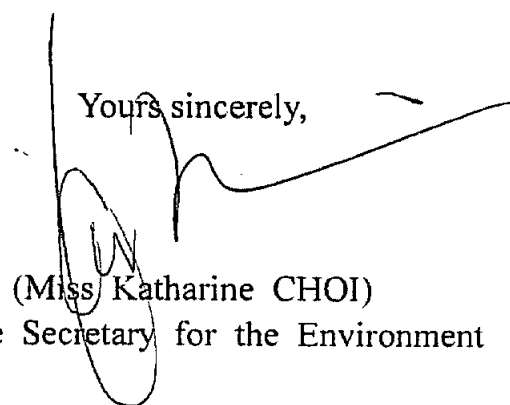
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<sup>1</sup> The latest development programme of KTD is broadly grouped into three packages with reference to their scheduled completion dates, as follows –

- (a) Package 1 – scheduled for completion in 2013, including mainly the Cruise Terminal and non-domestic areas of a public housing estate;
- (b) Packages 2 and 3 – scheduled for completion in 2016 and thereafter, including Tourism Node, hotels, Kai Tak Government Offices, private commercial and residential developments etc.

size and routing of DCS pipes, and the number of E&M equipment to be procured for Packages 2 and 3 users. Any such developments may affect the cost of works under Phase III. The currently proposed procurement strategy, under which construction works for Phase III are expected to commence in 2013-14, can better cater for latest changes and development, and also minimize unnecessary idling of early investment in pipe layings and E&M equipment installations as they could be timed for provision according to the actual schedule of KTD. Tenders would be invited at a later stage for Phase III works which may be further broken up to better suit the development schedule of KTD, and funding approval would be sought from the Finance Committee in due course.

Yours sincerely,



(Miss) Katharine CHOI

for the Secretary for the Environment