For discussion **PWSC(2018-19)30**
on 24 October 2018

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 705 – CIVIL ENGINEERING
Civil Engineering – Multi-purpose
45CG – District Cooling System at the Kai Tak Development

Members are invited to recommend to the Finance Committee to increase the approved project estimate of **45CG** by $1,039.8 million from $3,905.7 million to $4,945.5 million in money-of-the-day prices for implementing the remaining works under Phase III of the District Cooling System at the Kai Tak development.

PROBLEM

We need to implement the remaining works under Phase III (Phase IIIR) of the District Cooling System (DCS) to meet the latest progress of building developments at the Kai Tak development (KTD). The approved project estimate (APE) of **45CG** is not sufficient to cover the costs of Phase IIIR of the project. As reported to the Legislative Council (LegCo) in May 2013, June 2015 and March 2016 (vide PWSC(2013-14)12, PWSC(2015-16)29 and PWSC(2015-16)62 respectively), on the basis of the latest development schedule of KTD, the project cost for all phases (including Phase IIIR) of the DCS is estimated to be $4,945.5 million in money-of-the-day (MOD) prices, which is in line with our previous estimates as reported to LegCo.

/PROPOSAL …..

PROPOSAL

2. The Director of Electrical and Mechanical Services, with the support of the Secretary for the Environment, proposes to increase the APE of **45CG** by $1,039.8 million from $3,905.7 million to $4,945.5 million in MOD prices for implementing Phase IIIR of the project.

PROJECT SCOPE AND NATURE

3. Phase IIIR of the DCS aims to provide chilled water supply from DCS to the remaining user buildings at the KTD under Phase III. The water pipe laying works will dovetail with the programme of ongoing and upcoming road construction.

4. The proposed scope of works under Phase IIIR comprises –

(a) laying of chilled water distribution pipe networks at a total length of about 5 900 metres (m) at sections of Roads L10 & L18, Lam Chak Street, the waterfront promenade adjacent to the New Acute Hospital and the Station Square;

(b) supply and installation of electrical and mechanical equipment at the northern chiller plant building;

(c) supply and installation of electrical and mechanical equipment at the southern chiller plant building; and

(d) provision of connection facilities (including heat exchangers) at the remaining user buildings at KTD under Phase III.

5. An outline of the proposed scope of works and a layout of DCS pipe networks under various phases are set out at Enclosures 1 and 2 respectively.

6. Subject to the funding approval of the Finance Committee (FC), we plan to commence the construction works for Phase IIIR in the first quarter of 2019 for completion by end of 2025.

/**JUSTIFICATION** …..

JUSTIFICATION

7. The DCS is a major infrastructure in support of the sustainable and environmentally-friendly development at KTD. To promote energy efficiency and conservation, and with the support of the LegCo, the Government is constructing a first-of-its-kind DCS at KTD supporting a planned total of about 1.73 million square metres of non-domestic air-conditioned gross floor areas, requiring about 284 megawatt of refrigeration cooling capacity.

8. The DCS 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. The technology has been widely adopted in other parts of the world, such as Europe, the United States, Singapore and Mainland China.

9. Implementation of the DCS at KTD will bring about significant environmental benefits. 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 (or about 35% reduction as compared with the original electricity consumption of 243 million kilowatt-hour without the DCS), with a corresponding reduction of 59 500 tonnes of carbon dioxide emission per annum. DCS is expected to help mitigate climate change.

10. Apart from energy saving, the DCS will bring about the following benefits for individual users and the community –

(a) reduction in upfront capital cost for installing chiller plants at their buildings. The reduction is about 5% to 10% of the total building cost;

(b) more flexible building designs for user buildings as they do not need to install their own chillers and the associated electrical and mechanical equipment;

(c) reduced heat island effects at KTD and help adaptation for climate change. There will be no noise and vibration arising from the operation of heat rejection equipment and chillers of air-conditioning plants in user buildings, as such equipment will not be necessary for buildings subscribing to district cooling services. Also, DCS can contribute to air quality improvement; and

/(d) …..

(d) a more adaptable air-conditioning system to meet the varying demand as compared to individual air-conditioning systems. For each of the individual buildings, its cooling capacity can be adjusted by putting up a written application to the Electrical and Mechanical Services Department (EMSD) [1] without carrying out extensive modification or retrofitting works for the buildings concerned.

Urgency of Phase IIIR

11. We need to urgently proceed with Phase IIIR to meet the latest progress of building developments at KTD. Moreover, the laying of underground pipes under Phase IIIR will have to tie in with the programme of ongoing and upcoming road construction as well as other underground utilities, including sections of Road L10 & Road L18. This can minimise the need for utility diversions, and/or subsequent re-opening of newly completed road for laying DCS pipes at a later stage. To achieve better co-ordination and interface, the DCS pipe laying works at sections of Road L10 & Road L18 to be funded under Phase IIIR will be entrusted to the Civil Engineering and Development Department (CEDD) for implementation together with the infrastructure works at the former south apron area of KTD, the funding of which will be sought under Public Works Programme Item No. **702CL** "Kai Tak development – remaining works for development at the former runway and south apron".

Project estimate up to current development

12. As mentioned in paragraphs 1 and 2 above, on the basis of the latest development schedule of KTD, the project cost for all phases (including Phase IIIR) of the DCS is estimated to be $4,945.5 million in MOD prices. Funding approval from LegCo has been secured for Phases I, II, IIIA, IIIB and IIIC of the project at an APE of $3,905.7 million in MOD prices under **45CG**. Together with the proposed increase in APE of $1,039.8 million in MOD prices for Phase IIIR, the latest project cost for all phases of the DCS is estimated to be $4,945.5 million in MOD prices, which is in line with our previous estimates as reported to LegCo in May 2013, June 2015 and March 2016 as mentioned above.

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[1] The user building should put up a written application to EMSD one year before the proposed date for the adjusted cooling capacity to take effect. While it may take some time for EMSD to confirm the cooling demand of the building and revise the contract cooling capacity accordingly, EMSD will make its best efforts to provide the user building with the required cooling capacity under normal operating conditions of the DCS.

13. The estimated capital cost of the proposed works for Phase IIIR is $1,281.8 million in MOD prices. Taking into account the uncommitted balance of $242[2] million released from the existing APE of $3,905.7 million, the proposed amount of increase in APE for implementation of Phase IIIR is $1,039.8 million.

FINANCIAL IMPLICATIONS

14. We estimate the capital cost of the proposed works of Phase IIIR to be $1,281.8 million in MOD prices, broken down as follows –

			$ million (in MOD prices)
(a)	DCS electrical and mechanical installation and associated builders' works		540.1
(b)	Mains laying		317.7
(c)	Connection facilities at user buildings		183.3
(d)	Environmental mitigation measures		9.9
(e)	Consultants' fees for		14.0
	(i) contract administration	9.0	
	(ii) management of resident site staff (RSS)	5.0	
(f)	Remuneration of RSS		100.1
(g)	Contingencies		116.7
	Sub-total		1,281.8

/**Partly** …..

[2] The uncommitted balance of $242 million is attributed to two items: (i) surplus contingencies of $74.4 million – under the existing APE, $248.1 million has been allowed for provision on contingencies. With the substantial completion of the majority of works of previous phases (Phases I, II, IIIA, IIIB & IIIC), the provision on contingencies for these phases can be reduced by $74.4 million (from $248.1 million to $173.7 million); and (ii) surplus provision for price fluctuation – as mentioned in paragraph 12 above, since the majority of works of previous phases (Phases I, II, IIIA, IIIB & IIIC) has been substantially completed, $167.6 million can be released.

			$ million (in MOD prices)
Partly offset by –			
(h)	Uncommitted balance released		242.0
		Total	1,039.8

A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-month is at Enclosure 3.

15. Subject to approval, we plan to phase the expenditure of Phase IIIR works as follows –

Year	**$ million (MOD)**
2018 – 2019	10.0
2019 – 2020	268.7
2020 – 2021	661.2
2021 – 2022	326.8
2022 – 2023	1.5
2023 – 2024	0.6
2024 – 2025	12.3
2025 – 2026	0.7
	1,281.8

16. The latest cash flow for Phases I, II, IIIA, IIIB, IIIC & IIIR is set out in Enclosure 4.

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17. We have derived the MOD estimates on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2018 to 2026. The contract will provide adjustments for price fluctuations.

18. The latest estimates on the annual recurrent costs arising from this project are at Enclosure 5. The District Cooling Services Ordinance (Cap. 624), which was passed by LegCo in March 2015, provides that the recurrent costs arising from this project, including the operation and maintenance fees for engaging a contractor and utility charges for operating the DCS plants, are offset by the district cooling services charges collected.

19. When we sought FC's approval for upgrading **45CG** to Category A in June 2009 (PWSC(2009-10)24 refers), we proposed that private non-domestic developments would be connected to DCS on a voluntary basis. For the purpose of increasing the subscription rate and maximising environmental benefit of the project, Members of the LegCo Panel on Environmental Affairs suggested in July 2010 that all private non-domestic projects at KTD be obliged to subscribe to the district cooling services.

20. The Government explored the feasibility of the above suggestion and considered it feasible to stipulate the requirement to connect to the DCS in the conditions of sale for the sale sites for non-domestic development. In general, the Lands Department (LandsD) will check compliance with the positive obligations in the conditions of sale on completion of the new development on the sale site before the issuance of Certificate of Compliance, which would only be issued to the purchaser of the site by LandsD upon satisfactory compliance with the positive obligations. Insofar as the DCS requirement is concerned, LandsD will consult EMSD to ensure that the requirement for connection to DCS has been complied with to the satisfaction of EMSD.

Charge Rate

21. The district cooling services charges have been set at a competitive level comparable to the cost of individual WACS using cooling towers, which is one of the most cost-effective air-conditioning systems available in the market. We also plan to recover both the capital and operating costs from DCS consumers over the project life, which is estimated to be 30 years, as taxpayers should not subsidise such air-conditioning charges.

PUBLIC CONSULTATION

22. We consulted the LegCo Panel on Development on the proposed works under Phase IIIR on 26 June 2018. Members generally supported the funding proposal. The Government provided supplementary information on the DCS charging mechanism as requested by the said Panel on 28 August 2018.

23. We consulted the following committees which supported the implementation of DCS at KTD –

(a) the Energy Efficiency and Conservation Sub-committee of the Energy Advisory Committee on 24 October 2008; and

(b) the Environment and Hygiene Committee of the Kwun Tong District Council on 2 December 2008.

24. In addition, we consulted the following District Council and committees which had no objection to the implementation of DCS at KTD –

(a) the Wong Tai Sin District Council on 18 November 2008;

(b) the Housing and Infrastructure Committee of the Kowloon City District Council on 11 December 2008; and

(c) the Habourfront Enhancement Committee on 15 December 2008.

25. The Metro Planning Committee of the Town Planning Board (TPB) approved on 13 February 2009 the planning application for the underground DCS, including chiller plant cum seawater pump house, and above-ground operational facilities within the "Open Space", "Commercial (4)" and "Residential (Group C)" zones at the middle section of the ex-Kai Tak Airport runway. On 31 August 2012, Director of Planning, under the delegated authority of TPB, approved the minor amendments to the approved scheme regarding the change of gross floor area and disposition of the above-ground facilities of chiller plant, which were proposed to suit the design of the road situated above the related facilities.

/ENVIRONMENTAL …..

ENVIRONMENTAL IMPLICATIONS

26. **45CG**, which forms part of KTD, is not a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). The engineering feasibility study of KTD is a designated project under Schedule 3 of the EIA Ordinance, requiring an EIA report to be approved under the EIA Ordinance. The environmental acceptability of the DCS development was addressed in the EIA report of KTD, which was approved by the Director of Environmental Protection on 4 March 2009 that concluded the DCS would not cause adverse long-term environmental impacts.

27. For short-term construction impacts, we will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures. These include the use of quiet construction plant, silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleansing and watering of the site, and provisions of wheel-washing facilities. We will also carry out site inspections to ensure that these mitigation measures and good site practices are properly followed and implemented. We have included in the project estimates the cost for the implementation of these mitigation measures.

28. At the planning and design stages, we have considered the piping alignment, design level and construction method of the proposed works to reduce the generation of construction waste where possible. In addition, the contractors will be required to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities[3]. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

29. At the construction stage, we will require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

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[3] Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

30. We estimate that the project as a whole will generate in total 118 560 tonnes of construction waste. Of these, we will reuse 69 120 tonnes (58.3%) of inert construction waste on site and deliver 47 800 tonnes (40.3%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of 1 640 tonnes (1.4%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be $3.7 million for this project (based on a unit charge rate of $71 per tonne for disposal at public fill reception facilities and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

31. The project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites / buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

32. The proposed works do not require any resumption of private land.

BACKGROUND INFORMATION

33. With the support of the LegCo Panel on Environmental Affairs, the Government sought FC's funding approval for implementing DCS Phases I and II on 18 February 2011 at an APE of $1,861.8 million in MOD prices[4]. The construction works for Phase I and those for Phase II of DCS were completed in the first quarter of 2013 and the third quarter of 2014 respectively.

34. To tie in with the developments and infrastructure works at KTD, the Government sought FC's funding approval for implementing Phase III (Package A) (Phase IIIA), Phase III (Package B) (Phase IIIB) and Phase III (Package C) (Phase IIIC) at an APE of $1,284.1 million, $606.1 million and $153.7 million on 21 June 2013, 14 July 2015 and 29 April 2016 respectively. The total APE for Phase I, II, IIIA, IIIB and IIIC works is $3,905.7 million in MOD prices.

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[4] FC approved the DCS at KTD at an APE of $1,671 million in MOD prices in June 2009. Given that the returned tender price far exceeded the original estimates, and having reviewed the latest development plan of KTD, we adjusted the procurement strategy by implementing the DCS in three phases, i.e. Phases I, II and III, which produced more reasonable cost estimates and could better tie in with the development plan of KTD.

35. At the PWSC meeting on 31 October 2001, to enable Members to consider projects relating to the entire KTD (formerly known as South East Kowloon development) more easily, some Members suggested and the Administration agreed to include information on the progress, scope and approved project estimates of all the KTD Public Works Programme items in future KTD-related PWSC submissions. In this connection, the Development Bureau has separately submitted PWSC(2018-19)29 on **702CL** "Kai Tak development – remaining infrastructure works for developments at the former runway and south apron" for consideration together with this application.

36. The proposed works will not involve any tree removal or planting proposals.

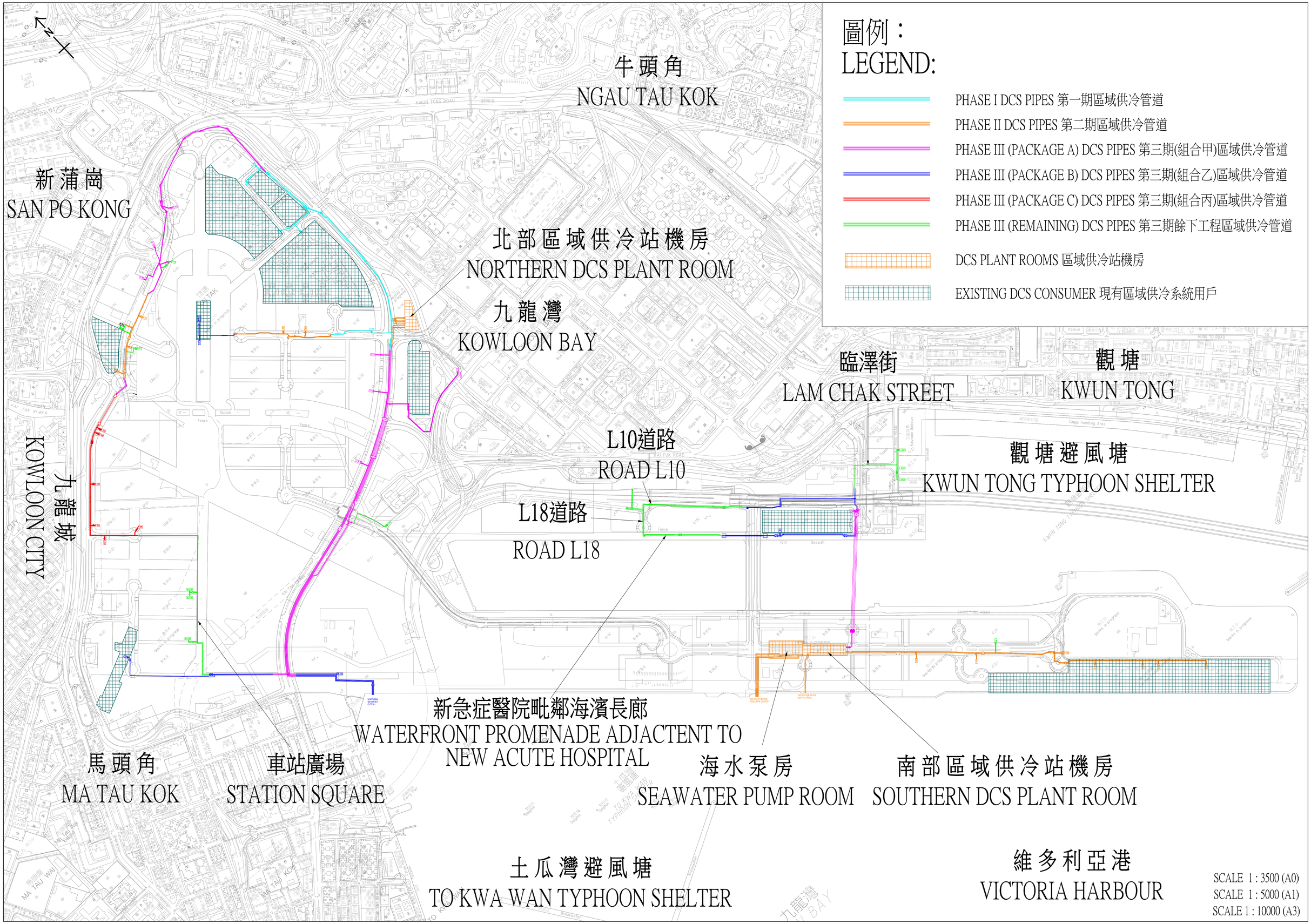
37. We estimate that the proposed project as a whole will create about 300 jobs (240 for labourers and another 60 for professional or technical staff) providing a total employment of 7 900 man-months.

Environment Bureau
October 2018

District Cooling System (DCS) at the Kai Tak development (KTD)
Scope of Works under Various Phases

Phases	Period	Scope of Works
Phase I – Works contract for the pipe laying work for part of KTD Package I	2010-11 – 2012-13	◆ pipe laying from northern chiller plant room for provision of chilled water to Ching Long Shopping Centre under the Hong Kong Housing Authority to meet the roadwork programme in the North Apron.
Phase II – DCS core services under Design, Build and Operate arrangement	2010-11 – 2014-15	◆ design for the whole DCS; ◆ building and engineering works, the northern chiller plant room, southern underground chiller plant room and the seawater pumphouse to support the operation of the entire DCS; ◆ laying of chilled water distribution pipes not covered in Phase I for Package I users (Kai Tak Cruise Terminal building); ◆ electrical and mechanical (E&M) equipment for KTD Package I users; and ◆ operation of DCS up to 2027-28.
Phase III (Package A) – E&M installations and pipe laying for part of KTD Packages II and III	2013-14 – 2017-18	◆ pipe laying works to match with the programme of road construction and upcoming building developments including Trade and Industry Tower and Hong Kong Children's Hospital; and ◆ provision of E&M equipment for the above building developments and two schools.

Phases	Period	Scope of Works
Phase III (Package B) – E&M installations and pipe laying for part of KTD Packages II and III	2015-16 – 2018-19	◆ pipe laying works to match with the programme of road construction and upcoming building developments including the Electrical and Mechanical Services Department Headquarters, Sung Wong Toi Station (previously named as To Kwa Wan Station) and Kai Tak Station of the Shatin to Central Link, and the Kowloon East Regional Headquarters and Operational Base cum Ngau Tau Kok Divisional Police Station; ◆ provision of E&M equipment for the above building developments; and ◆ consultancy services for pre-construction stage (design) of the remaining Phase III works to tie in with the ongoing and upcoming programmes on the developments and infrastructure works carried out by CEDD.
Phase III (Package C) – Pipe laying for part of KTD Packages II and III	2016-17 – 2019-20	◆ pipe laying works to match with the programme of road construction of Road D1 (Part) and Road L7.
Remaining Works under Phase III – E&M installations and pipe laying for remaining KTD Packages III	2018-19 – 2025-26	◆ pipe laying works to match with the programme of Roads L10 & L18. ◆ Pipe laying works at Station Square, Lam Chak Street and waterfront promenade; and ◆ provision of E&M equipment for remaining building developments in KTD under Phase III.


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 PLANT ROOMS 區域供冷站機房
EXISTING DCS CONSUMER 現有區域供冷系統用戶
牛頭角
NGAU TAU KOK
新蒲崗
SAN PO KONG
北部區域供冷站機房
NORTHERN DCS PLANT ROOM
九龍灣
KOWLOON BAY
臨澤街
LAM CHAK STREET
觀塘
KWUN TONG
L10道路
ROAD L10
觀塘避風塘
KWUN TONG TYPHOON SHELTER
L18道路
ROAD L18
九龍城
KOWLOON CITY
新急症醫院毗鄰海濱長廊
WATERFRONT PROMENADE ADJACENT TO NEW ACUTE HOSPITAL
馬頭角
MA TAU KOK
車站廣場
STATION SQUARE
海水泵房
SEAWATER PUMP ROOM
南部區域供冷站機房
SOUTHERN DCS PLANT ROOM
土瓜灣避風塘
TO KWA WAN TYPHOON SHELTER
維多利亞港
VICTORIA HARBOUR
SCALE 1 : 3500 (A0)
SCALE 1 : 5000 (A1)
SCALE 1 : 10000 (A3)

45CG – District Cooling System at the Kai Tak development

Breakdown of the estimates for consultants' fees and resident site staff costs for Phase IIIR (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($million)
(a)	Consultants' fees for contract administration	Professional	35	38	2.0	5.7
		Technical	43	14	2.0	2.5
					Sub-total	8.2#
(b)	Resident site staff (RSS) costs(Note 2)	Professional	250	38	1.6	32.8
		Technical	1 360	14	1.6	62.5
					Sub-total	95.3
	Comprising –					
	(i) Consultant's fees for management of RSS				4.5#	
	(ii) Remuneration of RSS				90.8#	
					Total	**103.5**

* MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 is applied to the average MPS salary point to estimate the cost of staff to be employed in the consultants' offices. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $81,975 per month, and MPS salary point 14 = $28,725 per month).

2. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The cost figures in this Enclosure are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 14 of the main paper.

45CG – District Cooling System at the Kai Tak development

Latest cash flow for Phases I, II, IIIA, IIIB, IIIC & IIIR

Year	Phases I, II, IIIA, IIIB & IIIC	Phase IIIR	Phases I, II, IIIA, IIIB, IIIC & IIIR
	Latest project estimate (PE) ($ million MOD prices) **(a)**	**Latest PE ($ million MOD prices)** **(b)**	**Latest PE ($ million MOD prices)** **(c)=(a) + (b)**
2010 – 2011	14.3	–	14.3+
2011 – 2012	435.8	–	435.8+
2012 – 2013	876.0	–	876.0+
2013 – 2014	566.8	–	566.8+
2014 – 2015	488.8	–	488.8+
2015 – 2016	446.0	–	446.0+
2016 – 2017	235.1	–	235.1+
2017 – 2018	211.3	–	211.3+
2018 – 2019	96.4	10.0	106.4
2019 – 2020	121.2	268.7	389.9
2020 – 2021	147.1	661.2	808.3
2021 – 2022	24.9	326.8	351.7
2022 – 2023	0.0	1.5	1.5
2023 – 2024	0.0	0.6	0.6
2024 – 2025	0.0	12.3	12.3
2025 – 2026	0.0	0.7	0.7
Total	**3,663.7***	**1,281.8**	**4,945.5^**

* Since there is a uncommitted balance of $242.0 million (i.e. 6.2%) from the APE of $3,905.7 million for Phases I, II, IIIA, IIIB & IIIC, the latest PE of these phases is therefore revised from $3,905.7 million to $3,663.7 million.

^ The Finance Committee approved the implementation of Phases I, II, IIIA, IIIB & IIIC on 29 April 2016 at an APE of $3,905.7 million in MOD prices. Taking into account the proposed increase in APE for Phase IIIR by $1,039.8 million in MOD prices, the estimated project cost for all phases of 45CG would be $4,945.5 million in MOD prices.

+ Actual expenditure up to March 2018.

45CG – District Cooling System at the Kai Tak development

Estimated recurrent costs (in MOD prices)

Year	Estimated recurrent costs* $ million
2018-19	61.2
2019-20	58.6
2020-21	33.65

* As provided in the District Cooling Services Ordinance (Cap. 624), charges and fees received for the provision of district cooling services are used to settle the operation and maintenance fees for a DCS operator as well as utility costs for operating the DCS plants. Therefore, the estimated recurrent cost shown in the table above is the shortfall of operating expenses incurred after deducting the charges and fees received for the provision of district cooling services of that particular year. The price adjustment factor adopted for converting charges/fees received and operating expenses incurred in September 2017 prices to MOD price is based on the assumption of 2% increase per annum, from 2018 to 2021. It is estimated that starting from 2021-22, the charges and fees received would be sufficient to settle all the operation and maintenance fees for the DCS operator as well as utility costs for operating the DCS plants.