## 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 Finance Committee to increase the approved project estimate of **45CG** by \$1,284.1 million from \$1,861.8 million to \$3,145.9 million in money-of-the-day prices for implementing Phase III (Package A) of the District Cooling System at the Kai Tak Development.

#### PROBLEM

We need to implement Phase III (Package A) (Phase IIIA) of the District Cooling System (DCS) to meet the development schedule of the projects at the Kai Tak Development (KTD). The approved project estimate (APE) of **45CG** is not sufficient to cover the costs of works under the project.

#### 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 \$1,284.1 million from \$1,861.8 million to \$3,145.9 million in money-of-the-day (MOD) prices for implementing Phase IIIA of the project.

3. Subject to the progress and development programme of KTD, we will consider the need and the programme for the remaining works under Phase III<sup>1</sup> in due course, and seek approval from the Public Works Subcommittee (PWSC) and Finance Committee (FC) for further increasing the APE to cover those works.

#### PROJECT SCOPE AND NATURE

4. Phase IIIA of the DCS project aims to provide chilled water supply from DCS to the public developments in KTD, i.e. the Trade and Industry Tower (TI Tower) and the Centre of Excellence in Paediatrics (CEP). The pipe laying works under Phase IIIA will also facilitate the connection of DCS to future developments located close to the pipes laid in Phase IIIA.

- 5. The proposed scope of works under Phase IIIA comprises
  - (a) laying of chilled water distribution pipe networks at sections of Cheung Yip Street, sections of Road D1, sections of Road L2 and sections of Road D2 (as indicated in Enclosure 2);
  - (b) laying of seawater pipe networks under a section of Road D2;
  - (c) supply and installation of electrical and mechanical (E&M) equipment at northern and southern chiller plant buildings and the seawater pumphouse; and
  - (d) provision of connection facilities (including heat exchangers) at user buildings of the TI Tower and the CEP.

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

/6. .....

<sup>&</sup>lt;sup>1</sup> The scope of the remaining works under Phase III includes the installation of electrical and mechanical equipment and pipe laying for remaining KTD Packages II and III. Details are set out in Enclosure 1.

6. Subject to FC's funding approval, we plan to commence the construction works for Phase IIIA in the third quarter of 2013 for completion in phases by the fourth quarter of 2017 to tie in with the programme of the relevant road construction works and scheduled completion of the TI Tower by the end of 2014 and the CEP in mid-2017.

#### JUSTIFICATION

7. DCS is one of the major infrastructure facilities in support of the sustainable and environmentally-friendly development at Kai Tak. 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 with a planned total of about 1.73 million square metres (m<sup>2</sup>) of non-domestic air-conditioned gross floor areas, requiring about 284 megawatt of refrigeration (MWr) cooling capacity. The DCS is an energy-efficient air-conditioning system as it consumes 35% and 20% less electricity as compared with traditional air-cooled air-conditioning systems and individual water-cooled air-conditioning systems using cooling towers respectively. The technology has been widely adopted in other parts of the world, such as Singapore and the United States. Implementation of a DCS in the KTD will bring about significant environmental benefits. Due 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 (kWh), with a corresponding reduction of 59 500 tonnes of carbon dioxide emission per annum.

8. Apart from energy saving, the DCS would bring about the following benefits for individual users –

- (a) reduction in upfront capital cost for installing chiller plants at their buildings estimated at 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 equipment;
- (c) a more adaptable air-conditioning system to the varying demand as compared to individual air-conditioning systems; and
- (d) service quality and reliability to be overseen by the Electrical and Mechanical Services Department (EMSD).

9. For the environment of the whole KTD, noise and vibration arising from the operation of heat rejection equipment and chillers of air-conditioning plants in buildings can be reduced as such equipment will no longer be necessary for buildings subscribing to DCS.

#### Urgency of Phase IIIA

10. As mentioned in paragraph 6 above, we need to urgently proceed with the proposed works in order to meet the development schedules of the TI Tower and the CEP in KTD.

11. Moreover, the laying of underground DCS pipes and seawater pipes under Phase IIIA will have to match with the programmes of ongoing and upcoming road construction, as well as other underground utilities, including sections of Cheung Yip Street, sections of Road D1, sections of Road L2 and sections of Road D2. This can minimize the need for diversion of completed or existing utilities services, and/or subsequent re-opening of newly completed road for installing DCS pipes at a later stage. To achieve better co-ordination and interface, part of the DCS pipe laying works at sections of Road D2 to be funded under Phase IIIA will be entrusted to the Civil Engineering and Development Department (CEDD) for implementation together with the Stage 4 infrastructure works<sup>2</sup> at the north apron area of Kai Tak Airport.

#### Returned Tenders for Phase IIIA under the Project

12. We invited tenders for the Phase IIIA works<sup>3</sup> in December 2012, which were returned in February 2013. Based on the returned tenders, we estimate the capital cost of Phase IIIA to be \$1,284.1 million in MOD prices.

/<u>Project</u> .....

<sup>&</sup>lt;sup>2</sup> CEDD plans to seek funding approval from PWSC and FC in May and June 2013 respectively for upgrading part of **469CL**, entitled "Kai Tak development - Stages 3A and 4 infrastructure at north apron area of Kai Tak Airport", to Category A.

<sup>&</sup>lt;sup>3</sup> Except for the works to be entrusted to CEDD (paragraph 11 refers). The entrusted works were included under the contract for the Stage 4 infrastructure works at the north apron area of Kai Tak Airport.

#### Project Estimate up to Current Development

13. The estimated cost of Phases I and II of **45CG** is \$1,861.8 million in MOD prices. Together with the estimated cost of \$1,284.1 million in MOD prices for Phase IIIA under the project, the estimated project cost of **45CG** up to current development is \$3,145.9 million in MOD prices. For the remaining works under Phase III, the latest estimated cost is \$1,799.6 million in MOD prices. The estimated project cost up to current development for all phases of **45CG** would be \$4,945.5 million in MOD prices, as compared to \$3,646.3 million in MOD prices estimated in January 2011 (please refer to Table 2 of Enclosure 4). The increase in the estimated project cost is due to the following –

- (a) the latest market price trend for major material, equipment and labour cost for E&M and construction works which are specifically and extensively adopted for DCS, such as large diameter thermal insulated underground chilled water pipes and accessories, high voltage high capacity air-conditioning chillers, pipe jacking and excavation, etc.;
- (b) cost of additional works made necessary by project design development and changes in construction requirements due to unexpected site constraints such as additional interfacing between the underground DCS pipes and other existing underground facilities at KTD requiring deeper excavation for DCS pipes laying and additional pipe jacking below utilities;
- (c) additional consultancy fee, resident site staff (RSS) cost and contingency due to additional site supervision required for more complicated site works, salary increase in RSS and increase in project estimate; and
- (d) higher provision of price adjustment as a result of the increase in the overall project estimate and latest price adjustment factors.

/FINANCIAL .....

### FINANCIAL IMPLICATIONS

14. We estimate the capital cost of the proposed works of Phase IIIA under the project to be \$1,284.1 million in MOD prices, broken down as follows –

		\$ million	
(a)	DCS electrical and mechanical installations and associated builders' works	196.4	
(b)	Mains laying	686.5	
(c)	Connection facilities at user buildings	18.6	
(d)	Environmental mitigation measures	5.5	
(e)	Consultants' fees for contract administration for Phase IIIA	8.0	
(f)	RSS costs	87.8	
(g)	Contingencies	91.5	
	Sub-total	1,094.3	(in September 2012 prices)
(h)	Provision for price adjustment	189.8	
	Total	1,284.1	(in MOD prices)

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

/15. .....

Year	\$ million (Sept 2012)	Price adjustment factor	\$ million (MOD)
2013-14	210.0	1.06225	223.1
2014-15	393.9	1.12599	443.5
2015-16	243.6	1.19354	290.7
2016-17	119.6	1.26516	151.3
2017-18	81.2	1.34107	108.9
2018-19	27.4	1.41147	38.7
2019-20	13.5	1.48205	20.0
2020-21	5.1	1.55615	7.9
	1,094.3		1,284.1

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

The cash flow and provision for price adjustments under the project are set out in Enclosure 4. Comparison of the cost breakdown of the APE and the latest project estimate (PE) is at Enclosure 5.

16. 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 2013 to 2021. The contracts will provide adjustments for price fluctuation.

17. The latest estimates on the annual recurrent costs arising from this project are at Enclosure 6. We plan to introduce new legislation such that the recurrent costs arising from this project, including the service fee payment to the contractor and other operating costs, will be offset by the DCS tariff charges to users.

/18. .....

18. When we sought PWSC/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 maximizing environmental benefit of the project, Members of the LegCo Panel on Environmental Affairs suggested in July 2010 that all private non-domestic projects in the KTD be obliged to subscribe to the DCS services.

19. The Government has actively 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, 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.

#### Tariff Rate

20. The DCS tariff will be set at a competitive level comparable to the cost of individual water-cooled air-conditioning systems (WACS) using cooling towers, which is one of the most cost-effective air-conditioning systems available in the market. We also intend to recover both the capital and operating costs from DCS users over the project life, which is estimated to be 30 years, as taxpayers should not subsidise such air-conditioning charges.

#### PUBLIC CONSULTATION

21. We consulted the LegCo Panel on Development on the proposed works under Phase IIIA on 22 January 2013. Members in general supported the submission of the proposal to PWSC for consideration.

22. We have consulted the following parties which supported the implementation of DCS at the 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.

#### PWSC(2013-14)12

23. In addition, we consulted the following parties which had no objection to the implementation of DCS at the KTD –

- (a) 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 Habour-front Enhancement Committee on 15 December 2008.

24. On 13 February 2009, the Town Planning Board (TPB) approved the planning application for the proposed public utility installation (DCS including chiller plant, 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 the then approved Kai Tak Outline Zoning Plan No. S/K22/2. On 31 August 2012, the Director of Planning, under the delegated authority of the TPB, approved the application for minor amendment to the approved application regarding the change in gross floor area and disposition of the DCS chiller plant and the seawater pump room, and suit the design of the road situated above the related facilities.

#### **ENVIRONMENTAL IMPLICATIONS**

25. **45CG** is not a Schedule 2 designated project requiring environmental permit under the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). However, the DCS forms part of the overall KTD which is a Schedule 3 designated project under the EIA Ordinance. The KTD EIA report approved by the Director of Environmental Protection on 4 March 2009 concluded that the DCS would not cause adverse long term environmental impact.

26. 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 recommended in the KTD EIA report, such as the use of quiet construction plant, water-spraying and proper pre-treatment of site run-off. We will also carry out site inspections to ensure that these recommended mitigation measures and good site practices are properly followed and implemented.

27. At the planning and design stages, we have considered the alignment, design level and construction method of the proposed works to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste at public fill reception facilities<sup>4</sup>. We will encourage the contractor to maximize the use of recycled / recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

28. 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.

29. We estimate that the project will generate in total about 318 609 tonnes of construction waste. Of these, we will reuse about 84 039 tonnes (26.4%) of inert construction waste on site and deliver 194 047 tonnes (60.9%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose the remaining 40 523 tonnes (12.7%) 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 \$10.3 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne<sup>5</sup> at landfills).

/HERITAGE .....

<sup>&</sup>lt;sup>4</sup> 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.

<sup>&</sup>lt;sup>5</sup> This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m<sup>3</sup>), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

#### HERITAGE IMPLICATIONS

30. The project will not affect any heritages sites, 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

31. The proposed works do not require any land acquisition.

#### **BACKGROUND INFORMATION**

32. 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<sup>6</sup>. The construction works for Phase I were completed in the first quarter of 2013, and the construction works for Phase II are now underway for target completion in the third quarter of 2014. We also informed PWSC/FC that subject to the progress and development programme of KTD, we would invite tenders for Phase III works in due course. Based on the outcome of such tender exercise, we would then seek approval from PWSC and FC for further increasing the APE to cover Phase III works.

33. 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), 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 PWSC submissions. For details, please refer to the Development Bureau's PWSC submission PWSC(2013-14)11 on **469CL** "Kai Tak development – infrastructure at north apron area of Kai Tak Airport", which has been submitted to be considered at the same PWSC meeting.

/34. .....

<sup>&</sup>lt;sup>6</sup> The FC of the LegCo 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 with the development plan of KTD.

34. Of the 78 trees within the works boundary of Phase IIIA of the project, 71 trees will be preserved. The proposed works will involve the removal of seven trees and all these trees are to be felled. All trees to be removed are not important trees<sup>7</sup>. We will incorporate planting proposals as part of the project, including estimated quantities of nine trees.

35. We estimate that the proposed works for Phase IIIA under the project will create about 250 jobs (200 for labourers and another 50 for professional/technical staff) providing a total employment of 12 080 man-months.

\_\_\_\_\_

Environment Bureau May 2013

<sup>&</sup>lt;sup>7</sup> "Important trees" refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

<sup>(</sup>a) trees of 100 years old or above;

<sup>(</sup>b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, trees as landmark of monastery or heritage monument, and trees in memory of an important person or event;

<sup>(</sup>c) trees of precious or rare species;

<sup>(</sup>d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or

<sup>(</sup>e) trees with trunk diameter equal or exceeding 1.0 metres (measured at 1.3 metre above ground level), or with height/ canopy spread equal or exceeding 25 metres.

Phases	Construction Period	Scope of Works
Phase I – Works contract for the pipe laying work for part of the Kai Tak Development (KTD) Package I	2010/11 – 2012/13	Pipe laying from northern chiller plant room for provision of chilled water to public rental housing site project to meet the roadwork programme in the North Apron
Phase II – DCS core services under Design, Build and Operate (DBO) arrangement	2010/11 – 2019/20 (include 6.5 years operation) (with an option for extending the operation period for eight years)	<ul> <li>Design for the whole DCS</li> <li>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</li> <li>Laying of chilled water distribution pipes not covered in Phase I for Package I users (Kai Tak Cruise Terminal (KTCT) building)</li> <li>Electrical and Mechanical (E&amp;M) equipment for KTD Package I users</li> <li>Operation of DCS up to 2019/20, and possibly for eight more years (for users of all packages) assuming extension of operation contract</li> </ul>
<b>Phase IIIA</b> – E&M installation and pipe laying for part of KTD Packages II & III <sup>8</sup>	2013/14 – 2017/18	<ul> <li>Pipe laying works to match with the programme of road construction and upcoming building developments including TI Tower and CEP</li> <li>Provision of E&amp;M equipment for the above building developments</li> </ul>

#### **Scope of Works under Various Phases**

<sup>&</sup>lt;sup>8</sup> The cost of the connection facilities for the two primary schools in the North Apron was included in Phase IIIA works when we consulted the LegCo Panel on Development in January 2013. As the cost of pipe laying works for the schools has already been included in Phase I works, and having reviewed the overall financial position of **45CG**, we consider it appropriate to absorb the cost of the connection facilities for the schools within the APE for Phases I and II, instead of including it under Phase IIIA.

Remaining	2014/15 -	•	Pipe laying works for remaining works
works under	2021/22		in KTD to match with the overall
Phase III–			development programme
E&M installation		•	Provision of E&M equipment for the
and pipe laying			above developments
for remaining			
KTD Packages II			
& III			





#### Enclosure 3 to PWSC(2013-14)12

#### 45CG - District Cooling System at the Kai Tak Development

# Breakdown of the estimates for consultants' fees and resident site staff costs for Phase IIIA (in September 2012 prices)

			Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$million)
(i)	Consultants' fees for contract administration for Phase IIIA	Professional Technical	44 50	38 14	2.0 2.0	5.8 2.2
(ii)	Resident site staff cost (Note 2)	Professional Technical	294 1585	38 14	1.6 1.6	31.0 56.8
				Total		95.8

#### \* 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 resident site staff supplied by the consultants. (As at now, MPS pt.38 = 65,695 per month, and MPS pt.14 = 22,405 per month.)
- 2. The actual man-months and actual costs will only be known after the completion of the construction works.

#### 45CG - District Cooling System at the Kai Tak Development

Tabla 1	_ I atost	cosh flow	and nr	ovision	for price	adjustment	for	Phases	Т	П	8- TT	TA
I able I	- Latest	cash now	anu pi	0121011	ior price	aujusimeni	101	r nases	1,	11 (	XII	IA

Year	Phases I &		Phases I, II		
	II				& IIIA
	Latest PE	Latest	Latest price	Latest	Latest PE (\$
	(\$ million	<b>PE (\$</b>	adjustment	<b>PE (\$</b>	million in
	MOD	million	factors	million	MOD
	prices)	in Sept	(Sept 2012)*	in	prices)
		2012		MOD	
		prices)		prices)	
	(a)	<b>(b)</b>	(c)	( <b>d</b> )	<b>(e)</b>
2010 - 2011	14.3	_	_	_	14.3
2011 - 2012	435.8				435.8
2012 - 2013	876.0	_	_	_	876.0
2013 - 2014	336.5	210.0	1.06225	223.1	559.6
2014 - 2015	90.0	393.9	1.12599	443.5	533.5
2015 - 2016	50.0	243.6	1.19354	290.7	340.7
2016 - 2017	35.0	119.6	1.26516	151.3	186.3
2017 - 2018	24.2	81.2	1.34107	108.9	133.1
2018 - 2019	_	27.4	1.41147	38.7	38.7
2019 - 2020	_	13.5	1.48205	20.0	20.0
2020 - 2021	_	5.1	1.55615	7.9	7.9
Total	1,861.8	1,094.3		1,284.1	3,145.9

\* Price adjustment factors adopted in March 2013 are based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 6% per annum over the period from 2013 to 2017 and 5% per annum over the period from 2018 to 2023.

Year	PE in PWSC (2010-11) 31#	Price adjust- ment factors in	PE in PWSC (2010-11) 31#	Latest PE (\$ million in Sept	Latest price adjust- ment	Latest PE (\$ million in MOD	Net change (\$ million in MOD)
	(\$ million in Sent	PWSC (2010-11)	(\$ million in MOD	2012 prices)	factors (Sent	prices)	
	2010	31#	prices)	prices)	(Sept 2012)*		
	prices)						
	(a)	(b)	(c)	( <b>d</b> )	(e)	( <b>f</b> )	(g)
2010 - 2011	14.0	1	14.0	14.3	1	14.3	
2011 - 2012	404.6	1.04250	421.8	435.8	1	435.8	
2012 - 2013	831.1	1.09463	909.7	876.0	1	876.0	
2013 - 2014	774.0	1.14936	889.6	526.8	1.06225	559.6	
2014 - 2015	421.5	1.20682	508.7	473.8	1.12599	533.5	
2015 - 2016	89.6	1.27169	113.9	523.5	1.19354	624.8	(g)=
2016 - 2017	100.6	1.34163	135.0	477.3	1.26516	603.9	
2017 - 2018	108.6	1.41542	153.7	394.3	1.34107	528.8	(f) - (c)
2018 - 2019	111.1	1.49327	165.9	287.4	1.41147	405.7	
2019 - 2020	73.4	1.57540	115.6	118.5	1.48205	175.6	
2020 - 2021	68.5	1.66205	113.9	81.1	1.55615	126.2	
2021 - 2022	59.6	1.75346	104.5	27.0	1.63396	44.1	
2022 - 2023		_		10.0	1.71565	17.2	
Total	3,056.6		3,646.3	4,245.8		4,945.5	1,299.2

Table 2 - Latest cash flow and provision for price adjustment for all Phases

- # As per Enclosure 4 to PWSC(2010-11)31 when we sought PWSC's endorsement of APE increase for Phases I and II of 45CG on 19 January 2011. We estimated at the time that the cost for Phase III would be \$1,784.5 million in MOD prices and that the estimated project cost for all phases would be about \$3,646.3 million in MOD prices.
- \* Price adjustment factors adopted in March 2013 are based on the latest movement of prices for public sector building and construction output, which are assumed to increase by 6% per annum over the period from 2013 to 2017 and 5% per annum over the period from 2018 to 2023.

^ FC approved the implementation of Phases I and II on 18 February 2011 at an APE of \$1,861.8 million in MOD prices. Taking into account the proposed APE increase for Phase IIIA by \$1,284.1 million in MOD prices and the estimated cost of \$1,799.6 million in MOD prices for the remaining works of Phase III, the latest estimated project cost for all phases is \$4,945.5 million in MOD prices.

#### 45CG - District Cooling System at the Kai Tak Development

#### Comparison between existing APE for Phases I & II and the latest project estimate for Phases I, II & IIIA

A comparison of the existing APE for Phases I & II and the latest project estimate for Phases I, II & Phase IIIA is as follows –

		(A) Existing APE for Phases I & II	(B) Latest Project Estimate for Phases I, II & IIIA	(B) – (A) Difference
		(\$ million)	(\$ million)	(\$ million)
(a)	DCS plants			
	(i) civil works	897.0	897.0	0
	(ii) E&M works	278.8	475.2	196.4
(b)	Mains laying	410.4	1,096.9	686.5
(c)	Connection facilities at user buildings	8.7	27.3	18.6
(d)	Environmental mitigation measures	3.3	8.8	5.5
(e)	Consultants' fee for contract administration	9.0	17.0	8.0
(f)	Resident site staff costs	16.0	103.8	87.8
(g)	Contingencies	71.4	162.9	91.5
(h)	Provision for price adjustment	167.2	357.0	189.8
	Total	1,861.8	3,145.9	1,284.1

2. **As regards item (a)(ii) (DCS plants – E&M equipment)**, the increase of \$196.4 million is for supply and installation of electrical and mechanical equipment at northern and southern chiller plant buildings and the seawater pumphouse for TI Tower and the CEP.

3. **As regards item (b) (mains laying)**, the increase of \$686.5 million is for laying of chilled water distribution pipe networks at sections of Cheung Yip Street, sections of Road D1, sections of Road L2 and sections of Road D2 and laying of seawater pipe networks under a section of Road D2.

4. **As regards item (c) (connection facilities at user buildings)**, the increase of \$18.6 million is for supply and installation of connection facilities such as heat exchangers, lead-in pipes and valves and sensors at user buildings of TI Tower and the CEP.

5. **As regards item (d) (environmental mitigation measures)**, the increase of \$5.5 million is for environmental mitigation measures such as water, noise and air pollution controls for DCS Phase IIIA works.

6. **As regards item (e) (consultants' fee for contract administration)**, the increase of \$8.0 million is for consultants' fee for contract administration for DCS Phase IIIA works.

7. As regards item (f) (resident site staff costs), the increase of \$87.8 million is for resident site staff for DCS Phase IIIA works.

8. **As regards item (g) (contingencies)**, the increase of \$91.5 million is the cost estimation for contingency for DCS Phase IIIA works.

9. **As regards item (h) (provision for price adjustment)**, the increase of \$189.8 million is the provision for price adjustment for DCS Phase IIIA works.

#### 45CG - District Cooling System at the Kai Tak Development

#### **Estimated recurrent costs (in MOD prices)**

Year	Estimated recurrent costs* \$ million (in MOD prices)
2014-2015	56.7
2015-2016	70.4
2016-2017	102.0
2017-2018	192.9
2018-2019	174.4
2019-2020	185.0
2020-2021	194.8
2021-2022	297.9
2022-2023	326.3
2023-2024	342.3
2024-2025	358.0
2025-2026	375.3
2026-2027	393.3

\* The estimated recurrent costs cover the service fee for the repairs, maintenance and management of the DCS plants operated by the DCS operator, and the operating costs for the electricity charge for the operation of the DCS plants, etc. Price adjustment factors adopted for converting recurrent costs in September 2012 prices to MOD prices are based on the assumption of 4.5% increase per annum, from 2014 to 2027.