

For discussion  
on 11 June 2013

PWSC(2013-14)22

## **ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 705 – CIVIL ENGINEERING**

#### **Air and Sea Communications – Port works**

#### **114AP – Providing sufficient water depth for Kwai Tsing Container Basin and its approach channel**

Members are invited to recommend to the Finance Committee the upgrading of **114AP** to Category A at an estimated cost of \$488.2 million in money-of-the-day prices for dredging the sea-bed of Kwai Tsing Container Basin and portions of the Northern Fairway and Western Fairway.

### **PROBLEM**

The depth of the sea-bed of Kwai Tsing Container Basin and its approach channel is not sufficient for the navigation of the new generation of ultra large container ships (ULCS) in and out of the Kwai Tsing Container Terminals at all tides.

### **PROPOSAL**

2. The Director of Civil Engineering and Development, with the support of the Secretary for Transport and Housing, proposes to upgrade **114AP** to Category A, at an estimated cost of \$488.2 million in money-of-the-day (MOD) prices, for dredging the sea-bed of Kwai Tsing Container Basin and portions of the Northern Fairway and Western Fairway.

**/PROJECT .....**

**PROJECT SCOPE AND NATURE**

3. The scope of **114AP** comprises –
- (a) dredging the sea-bed of Kwai Tsing Container Basin and portions of the Northern Fairway and Western Fairway from 15 metres (m) below Chart Datum to 17.5 m below Chart Datum;
  - (b) disposal of dredged sediments;
  - (c) modifying the existing Tsing Yi submarine outfall;
  - (d) demolishing the abandoned Kwai Chung submarine outfall; and
  - (e) implementing the environmental mitigation measures and the environmental monitoring and audit (EM&A) programme for the works mentioned in (a) to (d) above.

— A site plan showing the locations of the proposed dredging works and the submarine outfalls concerned is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed works in October 2013 for completion in the first quarter of 2016.

**JUSTIFICATION**

5. The sea-bed of Kwai Tsing Container Basin and its approach channel (covering an area of about 428 hectares) are currently maintained at a depth of 15.0 m below Chart Datum. This level is sufficient for the safe navigation of most container ships which are currently in service, but not for the new generation of ULCS having a maximum design draught of 15.5 m, which has come on stream since 2006. With the water depth of 15 m below Chart Datum, ULCS have to make use of tidal allowance to access the Kwai Tsing Container Terminals.

6. To enable ULCS to navigate in and out the Kwai Tsing Container Terminals at all tides, a design sea-bed level of 17.5 m below Chart Datum is required.

7. It is the trend in international shipping that ULCS are deployed in international voyages, especially long-haul routes, with a view to attaining economy of scale and reducing marine emissions. In 2012, there were a total of 216 trips of visiting container ship with draught of over 15 m. Among them, 107 trips needed to adjust for tidal allowance for the ship to berth or unberth from Kwai Tsing Container Terminals.

8. To meet the growing number of ULCS in international voyages, there is a need to take forward the project as soon as possible, otherwise more ULCS would be diverted to neighbouring ports, such as Singapore Port, Busan Port and Ningpo Port, which have the capacity to handle ULCS. In particular, the international transshipment cargo currently handled by the Hong Kong Port, amounting to 7.3 million Twenty-foot Equivalent Units in 2011 or about 30% of our total container throughput in the same year, might be lost to our competitors in the region if the Kwai Tsing Container Basin and its approach channel is not dredged. In the long run, this may have adverse impact on Hong Kong's status as a regional hub port as well as on the employment in the port and logistics sectors.

9. To suit the design sea-bed level, part of the existing Tsing Yi submarine outfall has to be modified and part of the abandoned Kwai Chung submarine outfall has to be demolished.

## FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the project to be \$488.2 million in MOD prices (please see paragraph 11 below), broken down as follows –

	<b>\$ million</b>
(a) Dredging and disposal of sediments	231.4
(b) Modification and demolition of the submarine outfalls concerned	1.9
(c) Environmental mitigation measures and EM&A programme	101.3

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		<b>\$ million</b>
(d)	Consultants' fees for	7.4
	(i) contract administration	3.3
	(ii) management of resident site staff	1.5
	(iii) Independent Environmental Checker (IEC) and Independent Expert (IE) services	2.6
(e)	Remuneration of resident site staff	32.4
(f)	Contingencies	36.5
	Sub-total	410.9 (in September 2012 prices)
(g)	Provision for price adjustment	77.3
	Total	488.2 (in MOD prices)

Due to insufficient in-house resources, we propose to engage consultants to undertake contract administration and site supervision of the proposed works. To meet the requirements of the environmental permit (EP), we propose to engage an IEC for monitoring and auditing the overall EM&A performance. We also propose to engage an IE as a member of the Community Liaison Group (please refer to paragraph 23 below) to provide independent advice on mariculture matters. A breakdown of the estimate for consultants' fees and resident site staff costs by man-months is at Enclosure 2.

11. Subject to funding approval, we will phase the expenditure as follows –

<b>Year</b>	<b>\$ million (Sept 2012)</b>	<b>Price Adjustment Factor</b>	<b>\$ million (MOD)</b>
2013 – 14	25.0	1.06225	26.6
			/2014 – 15 .....

Year	\$ million (Sept 2012)	Price Adjustment Factor	\$ million (MOD)
2014 – 15	139.5	1.12599	157.1
2015 – 16	143.8	1.19354	171.6
2016 – 17	61.6	1.26516	77.9
2017 – 18	41.0	1.34107	55.0
	410.9		488.2

12. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in prices of public sector building and construction output for the period 2013 to 2018. Subject to funding approval, we will deliver the construction works under a standard re-measurement contract to cater for the uncertainty of the quantities of dredged sediment for disposal at different designated sites, the sea-bed conditions and the variance of the EM&A requirements during the course of construction. The contract will provide for price adjustments. We will also engage consultants to perform the IEC and IE services described in paragraph 10(d)(iii) above on a lump sum basis with provision for price adjustments.

13. We estimate the annual recurrent expenditure arising from the proposed works to be about \$5.8 million.

## PUBLIC CONSULTATION

14. The Hong Kong Port Development Council<sup>1</sup> and Port Operations Committee<sup>2</sup> were consulted in 2008. They expressed support for the proposed

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<sup>1</sup> The Hong Kong Port Development Council is an advisory body chaired by the Secretary for Transport and Housing. The Council comprises stakeholders representing port operators and users such as shipping liners and shippers. It advises the Government on the port development strategy and port facilities planning to meet future demands.

<sup>2</sup> The Port Operations Committee is an advisory body chaired by the Director of Marine. The Committee comprises stakeholders representing port industries, local ferry and cargo vessel operators and users such as shipowners, shipping liners and shippers. It advises the Director of Marine on all matters affecting the efficient operations of the port of Hong Kong.

dredging works to take place at Kwai Tsing Container Basin and its approach channel to meet the operational needs of the ULCS in order to maintain the competitiveness of Hong Kong as a leading hub port in the region.

### **First round of public consultation in 2009**

15. We completed two rounds of public consultation in 2009 and 2012. In the first round of consultation in 2009, we consulted the Kwai Tsing District Council (K&TDC), the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee (TAFEHC) of the Islands District Council (IsDC) and, by circulation of information paper, the Southern District Council (SDC). Members of the aforesaid councils and committee did not raise any objection to the project but expressed concern on the potential impact on the environment during dredging and handling of the dredged sediment and requested us to minimise the impact on the fisheries industry.

16. We also consulted the Tsuen Wan District Council (TWDC) on 24 November 2009. Members raised concerns, among others, about the potential impact on the beaches in Tsuen Wan and the fish culture zone (FCZ) in Ma Wan. Members considered that we should not gazette the project under the Foreshore and Sea-bed (Reclamations) Ordinance (FS(R)O) (Cap 127) until the consultation process had been completed. Members also considered that the project would pose possible risk to the business of mariculturists and requested ex-gratia allowance (EGA) for the mariculturists.

17. We conducted an Environmental Impact Assessment (EIA) study in 2010 to address the concerns raised in the first round of public consultation. We also discussed with the affected fishermen and mariculturists issues regarding the EGA payment (please refer to paragraphs 34 to 35 below). The application for an EP for the proposed project had been temporarily suspended for a while pending the judicial review on the EIA report for the Hong Kong–Zhuhai–Macao Bridge project. Upon settlement of that judicial review, the EP was issued in October 2011. Separately, the FC approved a one-off special EGA to affected mariculturists in April 2012 (please refer to paragraph 35 below). The consultation exercise for the proposed project then resumed.

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**Second round of public consultation in 2012**

18. In the second round of consultation in 2012, we consulted TWDC, SDC and K&TDC (by circulation of information papers), as well as TAFEHC of IsDC. No objections were received except one suggestion that all vessels involved in the works and/or using the East Lamma Channel should use low sulphur fuel so that a low emission zone could be effectively created to safeguard the health of nearby residents. We will accordingly require our contractors to, as far as practicable, engage marine vessels powered by environmental green fuel available in the market for transporting the sediments generated by the project to disposal sites. We will also encourage the marine vessels working for the project to reduce vessel emissions by using cleaner fuels or adopting appropriate emission control measures.

19. We consulted relevant fisheries associations and mariculturists on the proposed project in 2012. They all supported the project.

20. At the detailed design stage, we consulted the container terminal operators, the Hong Kong Pilots Association Limited and the affected local ferry companies and cross-boundary ferry services operators on the potential marine traffic impact. They all supported the project. We have formed a marine traffic management liaison group with these parties and will continue to liaise with them on the temporary marine traffic management for the affected area during the construction period.

21. We gazetted the proposed dredging works under the FS(R)O (Cap 127) on 27 July and 3 August 2012. We did not receive any objection during the statutory two-month objection notification period. The authorisation of the proposed dredging works was gazetted on 9 November 2012.

**Consultation with the Economic Development Panel in 2013**

22. We consulted the Legislative Council Panel on Economic Development (ED Panel) on the proposed project at its meeting on 25 March 2013. At the meeting, there were questions on the arrangement for disposal of the dredged sediments and the impact on water quality. In response, we assured Members that the dredged sediments would be handled in strict compliance with

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the conditions set out in the dumping permit issued by the Environmental Protection Department (EPD) under the Dumping At Sea Ordinance (Cap 466). The disposal route would be closely monitored by the EPD through the Global Positioning System installed on the relevant barges. For dredged sediments higher than a specified level of contamination, they would be sewed and sealed to ensure no leakage during disposal. In addition, we will implement water quality impact mitigation measures, including the limitation of the number of dredgers, control of the dredging rate and the mode of work, installation of silt curtain and implementation of good site management practice as required under the EP.

23. One member asked for details of any new measure adopted to prevent the death of fish caused by the proposed project. We provided a supplementary note on 3 April 2013 advising that we would engage an environmental team<sup>3</sup> to implement the EM&A programme during construction to ensure the effectiveness of the mitigation measures. We would also engage an IEC to monitor and audit the work of the environmental team. The reports of the EM&A programme would be uploaded to the internet for inspection by the relevant parties. A community liaison group comprising relevant government departments, an IE, the environmental team, the IEC, project engineer, representative of the contractor, and representatives of the concerned fisheries associations or affected groups would be set up for the project. In case of fish-kill incidents, the environmental team would take immediate action to notify the contractor, other project stakeholders and the EPD. The project engineer and the contractor would review the working procedures and, if necessary strengthen the mitigation measures. The environmental team would monitor the effectiveness of the enhanced mitigation measures.

24. We also advised the ED Panel that container terminal operators have plans to deepen their respective berthing boxes to coordinate with the Government's dredging works, such as plans to dredge the water depth of Container Terminal (CT) 6, CT 7 and CT 9 North berths to 17 m below Chart Datum, and CT 9 South berths to 16.5 to 17 m below Chart Datum in 2016.

25. The ED Panel supported that the proposed project be submitted to the Public Works Subcommittee.

**/ENVIRONMENTAL .....**

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<sup>3</sup> The environmental team shall be employed by the contractor and independent of the contractor to implement the EM&A programme. They would collect samples and measure various environmental parameters at monitoring locations to ensure the non exceedance of the prescribed levels and the effectiveness of the mitigation measures.



## ENVIRONMENTAL IMPLICATIONS

26. The proposed project is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap 499) and an EP is required. An EIA was conducted for the project to address potential environmental impacts arising from both construction and operational phases of the project, including potential impacts on water quality, waste management, marine ecology, fisheries, hazard to life, landscape, visual and glare, cultural heritage, noise and air quality.

27. The EIA report concluded that, with the implementation of mitigation measures mentioned in paragraph 28 below, the environmental impacts of the project would be controlled to within the criteria under the EIAO and the Technical Memorandum on EIA Process. In particular, no adverse water quality impact is predicted for the identified water sensitive receivers including gazetted bathing beaches, coral communities and FCZs. With the provision of mitigation measures including silt curtain at the grab dredger and silt screens at sea water intakes, the Water Supplies Department's water quality criterion for flushing water at sea water intakes can also be achieved. In October 2010, the EIA report for the project was approved with conditions under the EIAO and an EP was issued in October 2011.

28. We shall adopt good site management practices, implement the mitigation measures and the EM&A programme as recommended in the approved EIA report and comply with the EP conditions. The key environmental mitigation and monitoring measures include the use of closed grab dredger, the deployment of silt curtains enclosing the grabs of the dredging plants and silt screens at sea water intakes, the limitation of the number of dredgers, the control of daily dredging rate of each dredger, the implementation of 24-hour water quality monitoring at chosen sensitive receivers and the setting up of community liaison group. The cost of implementing the environmental mitigation measures and the EM&A programme is estimated to be about \$101.3 million (in September 2012 prices), which has been included in the project estimate.

29. At the planning and design stages, we estimate that the project will generate in total about four million cubic metres of marine sediments. The marine sediments will be disposed of at designated sediment disposal facilities to be allocated by the Marine Fill Committee according to their chemical and biological contamination level.

30. The modification of part of the existing Tsing Yi submarine outfall and demolition of part of the abandoned Kwai Chung submarine outfall will remove part of the existing rock and rubble surround of the submarine outfalls, and the majority of these materials will be re-used on site for forming the new surround. Meanwhile, we estimate that the project will generate about 160 tonnes of rubble and concrete material which is classified as inert construction waste and will be delivered to public fill reception facilities for subsequent reuse. The demolished components of the submarine outfalls including steel pipes and rubber diffuser ports and other construction waste (e.g. worn-out silt curtain) of about 20 tonnes are classified as non-inert construction waste and will be disposed of at landfill sites. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$6,820 for this project (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne at landfill sites).

31. At the construction stage, we will require the contractor to submit a Waste Management Plan and an Environmental Management Plan for approval and implement the approved plans with an aim to minimise the generation of construction and demolition materials, and to avoid pollution during dredging and disposal of marine sediments. We will ensure that the day-to-day operations on site comply with the approved plans.

## **HERITAGE IMPLICATIONS**

32. 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**

33. The project does not require any land acquisition.

34. Under the existing criteria, EGA will be granted to the fishermen affected by marine works projects in Hong Kong waters who may suffer from a reduction of income and may incur extra expenses in relocating their activities to fishing grounds elsewhere. The project is expected to give rise to about 240 hectares of temporary loss of fishing ground. The estimated amount of EGA payable to eligible fishermen is about \$3.3 million. Funds will be made available under **Head 701 - Land Acquisition**.

35. Separately, FC approved on 27 April 2012 that a one-off special EGA be payable to the mariculturists of the Cheung Sha Wan, Ma Wan and Sok Kwu Wan FCZs in view of the almost unprecedented circumstances that there will be six large-scale marine works projects<sup>4</sup> (including this dredging project **114AP**) commencing within three years in the Western waters where the three FCZs are located. FC also approved the extension of applicability of the proximity criterion to cover large-scale mud dredging operation, under which mariculturists at Lo Tik Wan FCZ, which is 4.3 km away from the Kwai Tsing Container Basin dredging site, would also be eligible for the EGA. The estimated maximum amount of the one-off special EGA payable to mariculturists of the three FCZs is \$83 million, whereas the estimated maximum amount payable to affected mariculturists of Lo Tik Wan FCZ is about \$33.2 million<sup>5</sup>. Funds will be made available under **Head 701 - Land Acquisition**.

## BACKGROUND INFORMATION

36. We completed the preliminary study for the proposed dredging works in September 2008 using in-house resources. The study concluded that it was technically feasible to carry out the dredging works in Kwai Tsing Container Basin and its approach channel.

37. We included **114AP** in Category B in September 2008.

38. We engaged consultants in May 2009 to carry out detailed design and associated marine ground investigation works for the proposed works. The consultancy fee for the detailed design and the cost of the associated marine ground investigation works were charged to block allocation **Subhead 5101CX** "Civil engineering works, studies and investigations for items in Category D of the Public Works Programme" at an estimated cost of \$19.0 million in MOD prices. We have completed the detailed design of the proposed project.

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<sup>4</sup> The six large-scale marine works projects are –

- (a) Hong Kong-Zhuhai-Macao Bridge (HZMB) Hong Kong boundary crossing facilities;
- (b) HZMB Hong Kong Link Road;
- (c) Tuen Mun - Chek Lap Kok Link;
- (d) Dredging, management and capping of contaminated sediment disposal facility to the south of The Brothers;
- (e) Providing sufficient water depth for Kwai Tsing Container Basin and its approach channel; and
- (f) Development of integrated waste management facilities, phase 1.

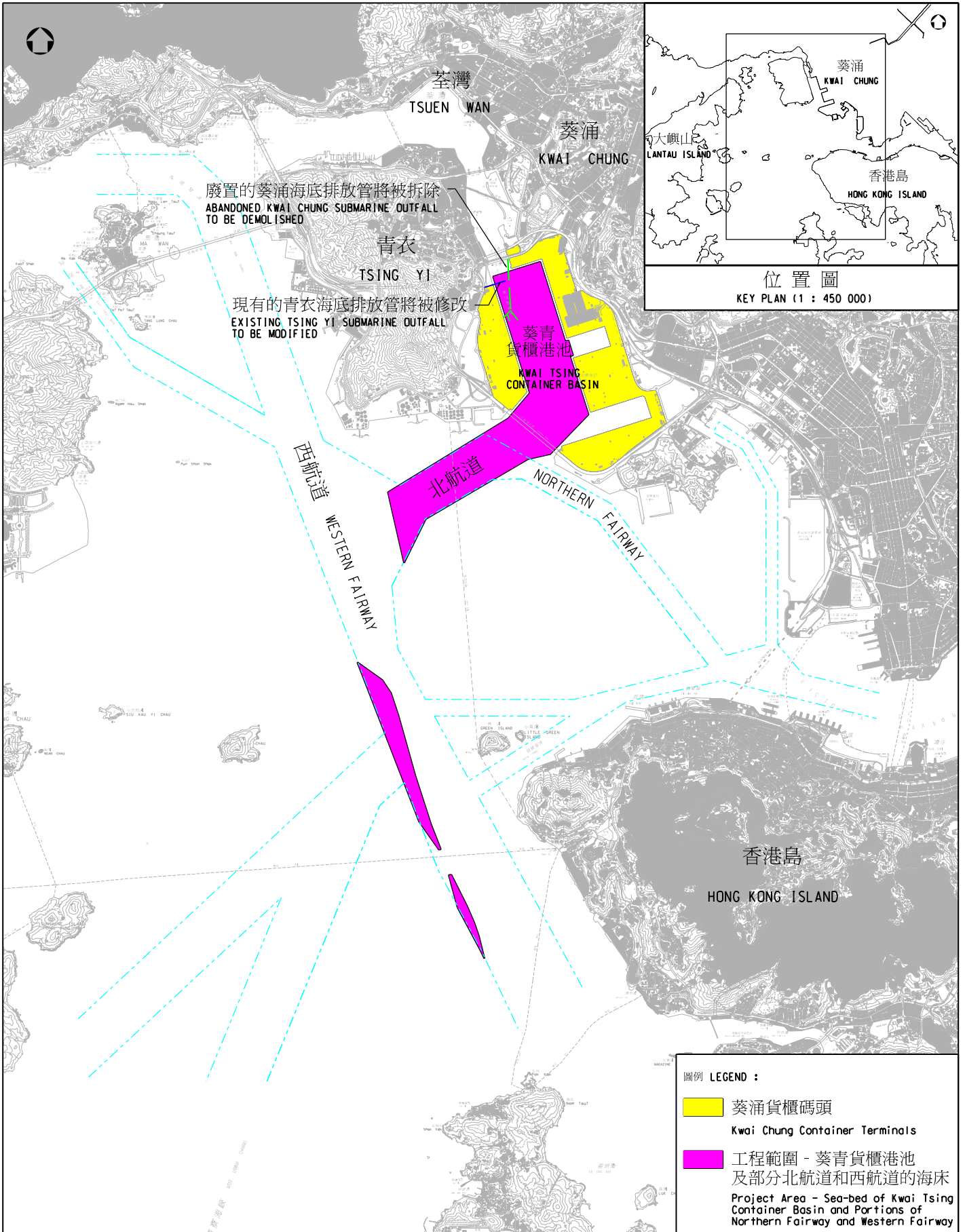
<sup>5</sup> The maximum amount of the EGA payable to mariculturists is estimated based on updated fish price.

39. The proposed project will not involve any tree removal or planting proposals.

40. We estimate that the proposed project will create about 64 jobs (20 for labourers and another 44 for professional/technical staff) providing a total employment of 1 700 man-months.

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Transport and Housing Bureau  
June 2013



圖例 LEGEND :

- 葵涌貨櫃碼頭  
Kwai Chung Container Terminals
- 工程範圍 - 葵青貨櫃港池及部分北航道和西航道的海床  
Project Area - Sea-bed of Kwai Tsing Container Basin and Portions of Northern Fairway and Western Fairway

<p>圖則名稱 drawing title</p> <p>工務計劃項目第 114AP 號 為葵青貨櫃港池及其進港航道提供足夠水深</p> <p>PUBLIC WORKS PROGRAMME ITEM NO. 114AP PROVIDING SUFFICIENT WATER DEPTH FOR KWAI TSING CONTAINER BASIN AND ITS APPROACH CHANNEL</p>	<p>設計 designed K. L. CHAN</p> <p>繪圖 drawn K. Y. CHAN</p> <p>核對 checked H. S. WONG</p> <p>核淮 approved K. S. CHAN</p> <p>版權所有 COPYRIGHT RESERVED</p>	<p>圖號 drawing no. SD2012-001</p> <p>比例 scale 1:75 000</p> <p>辦事處 office 土木工程處 專責事務(工程)部 SPECIAL DUTIES (WORKS) DIVISION CIVIL ENGINEERING OFFICE</p> <p>土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT</p>
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**Enclosure 2 to PWSC(2013-14)22**

**114AP – Providing sufficient water depth for Kwai Tsing Container Basin  
and its approach channel**

**Breakdown of the estimates for consultants’ fees and resident site staff costs  
(in September 2012 prices)**

		Estimated man- months	Average MPS* Salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a) Consultants’ fees for contract administration (Note2)	Professional	-	-	-	2.5
	Technical	-	-	-	0.8
				Sub-total	3.3
(b) Resident site staff costs (Note 3)	Professional	92	38	1.6	9.7
	Technical	676	14	1.6	24.2
				Sub-total	33.9
Comprising –					
(i) Consultants’ fees for management of resident site staff				1.5	
(ii) Remuneration of resident site staff				32.4	
(c) Independent Environmental Checker and Independent Expert services (Note 4)	Professional	16	38	2.0	2.1
	Technical	12	14	2.0	0.5
				Sub-total	2.6
				<b>Total</b>	<b>39.8</b>

\* MPS = Master Pay Scale

**Notes**

1. 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. A multiplier of 2.0 is applied to the average MPS salary point to arrive at the full staff cost including the consultants’ overheads and profit as the staff will be employed in the consultants’ offices. (As at now, MPS salary point 38 = \$65,695 per month and MPS salary point 14 = \$22,405 per month).

2. The consultant's staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the investigation, design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **114AP** to Category A.
3. The actual man-months and actual costs will only be known after completion of the construction works.
4. The actual man-months and actual costs will only be known after the consultants have been selected through the usual competitive lump sum bid system.