

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment

125DS – Tolo Harbour sewerage of unsewered areas, stage 2

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **125DS**, entitled “Tolo Harbour sewerage of unsewered areas, stage 2 phase 1”, to Category A at an estimated cost of \$364.7 million in money-of-the-day prices; and
- (b) the retention of the remainder of **125DS** in Category B.

PROBLEM

Sewage from the unsewered areas in Sha Tin and Tai Po is a source of water pollution to nearby watercourses as well as the receiving waters of Tolo Harbour.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade part of **125DS** to Category A at an estimated cost of \$364.7 million in money-of-the-day (MOD) prices for implementing sewerage works in the nine unsewered areas in Sha Tin and two unsewered areas in Tai Po.

/PROJECT

PROJECT SCOPE AND NATURE

3. The part of **125DS** that we propose to upgrade to Category A comprises the construction of –

- (a) about 11.7 kilometres (km) of sewers ranging from 150 millimetres (mm) to 300 mm for nine unsewered areas in Sha Tin, namely Siu Lek Yuen, Ngau Pei Sha, Tsok Pok Hang, Sha Tin Heights, Fui Yiu Ha, Kwai Tei New Village, Sha Tin Fishermen's New Village (also known as Ah Kung Kok Fishermen Village), Kau To and Tin Liu, as well as two unsewered areas in Tai Po, namely, Ha Wun Yiu and Shan Tong;
- (b) one sewage pumping station (SPS) at Kau To in Sha Tin;
- (c) about 130 metres (m) of twin rising mains of 100 mm in association with construction of the SPS in (b) above; and
- (d) ancillary works.

———— A site plan showing the proposed works is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee, we plan to commence construction of the proposed works in July 2013 for completion by September 2017.

5. We will retain the remainder of **125DS** in Category B, which involves laying of about 60 km of sewers in 30 other unsewered areas in Sha Tin and Tai Po. Planning and design of the relevant works are in progress. Funding for the remainder of **125DS** will be sought at a later stage after completion of the design and preparatory works.

/JUSTIFICATION

JUSTIFICATION

6. At present, sewage from the unsewered areas in Sha Tin and Tai Po is often treated and disposed of by means of private on-site treatment facilities (such as septic tanks and soakaway (STS) systems). Such facilities might however be ineffective due to their proximity to watercourses¹ and inadequate maintenance². Sewage from such unsewered areas has therefore been identified as a source of water pollution to nearby watercourses and the receiving waters of Tolo Harbour.

7. The aforesaid situation will persist unless sewerage infrastructure is made available to collect and treat sewage from these areas properly. The Environmental Protection Department has formulated as a long-term measure a programme under the Tolo Harbour Sewerage Master Plan to provide public sewerage for these areas.

8. We now propose to upgrade part of **125DS** to Category A for taking forward the proposed works at nine unsewered areas in Sha Tin, namely Siu Lek Yuen, Ngau Pei Sha, Tsok Pok Hang, Sha Tin Heights, Fui Yiu Ha, Kwai Tei New Village, Sha Tin Fishermen's New Village (also known as Ah Kung Kok Fishermen Village), Kau To and Tin Liu, as well as two unsewered areas in Tai Po, namely Ha Wun Yiu and Shan Tong. Upon completion of the proposed works, sewage collected from the areas concerned will be conveyed to the Sha Tin sewage treatment works (STW) and Tai Po STW for proper treatment and disposal. This will minimise the release of pollutants into the environment and bring about sustainable improvement to the water quality of Tolo Harbour.

/9.

¹ STS systems operate by allowing the effluent to percolate through gravels whereby pollutants are removed in a natural manner. However, if a STS system is located in an area where the ground water table is high, such as an area in proximity to watercourses, it will not function properly due to ineffective percolation.

² Inadequate maintenance of STS systems would affect their pollutant removal efficiency and may even lead to overflow of effluent.

9. Based on the village properties survey results and the potential village house development information within the unsewered areas in Sha Tin and Tai Po obtained in December 2008, the proposed sewerage facilities mentioned in paragraph 3 above will be able to serve some 1 011 village houses comprising about 880 existing houses, 60 planned houses and 71 potential houses³.

FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the proposed works to be \$364.7 million in MOD prices (see paragraph 11 below), made up as follows –

	\$ million
(a) Construction of sewers within villages	190.0
(b) Construction of SPS	39.8
(i) civil works	30.8
(ii) electrical and mechanical works	9.0
(c) Construction of rising mains	2.5
(d) Ancillary works	0.6
(e) Environmental mitigation measures	3.7
(f) Consultants' fees for	1.6
(i) contract administration	0.2
(ii) management of resident site staff	1.4

/(g)

³ The 71 potential houses are houses that may be developed on the vacant lands which are adjacent to the proposed sewer alignment. There is currently no development programme for these houses, which is subject to landowners' will and Lands Department's approval. In the event that some of these potential houses are not built, the abortive cost is not expected to be significant because, according to the designed sewer alignment, the proposed sewers will in any case need to pass through the vacant lands to serve the existing and planned houses.

		\$ million	
(g)	Remuneration of resident site staff	33.8	
(h)	Contingencies	23.9	
	Sub-total	295.9	(in September 2012 prices)
(i)	Provision for price adjustment	68.8	
	Total	364.7	(in MOD prices)

_____ A breakdown of the estimates for the consultants' fees and resident site staff costs by man-months is at Enclosure 2.

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

Year	\$ million (Sept 2012)	Price adjustment factor	\$ million (MOD)
2013 – 2014	20.0	1.06225	21.2
2014 – 2015	57.5	1.12599	64.7
2015 – 2016	72.3	1.19354	86.3
2016 – 2017	86.4	1.26516	109.3
2017 – 2018	25.1	1.34107	33.7
2018 – 2019	25.1	1.41147	35.4
2019 – 2020	9.5	1.48205	14.1
	295.9		364.7

/12.

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 the prices of public sector building and construction output for the period from 2013 to 2020. We will deliver the works under two contracts, one for civil engineering works and the other for electrical and mechanical works. We will deliver the civil engineering works under a re-measurement contract because of the uncertain underground conditions that may affect the alignments of the sewers. The contract will provide for price adjustments. We will deliver the electrical and mechanical works under a lump-sum contract as the scope of works can be well defined.

13. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$2.4 million. The recurrent expenditure attributable to sewage charges has been taken into account in determining the sewage charges for the years 2008-09 to 2017-18 stipulated in the Sewage Services (Sewage Charge) Regulation (Cap. 463A) and the recurrent expenditure attributable to trade effluent surcharges will be taken into account in reviewing the trade effluent surcharge rates in future.

PUBLIC CONSULTATION

14. We consulted the Development and Housing Committee under Sha Tin District Council and the Environment, Housing and Works Committee under Tai Po District Council on 30 April 2009 and 13 May 2009 respectively. We also consulted Sha Tin Rural Committee and Tai Po Rural Committee on the proposed works on 13 March and 7 April 2009 respectively. All committees supported the proposed works. Besides, throughout the design stage of the project, we have maintained communication and liaison with the concerned village representatives, residents' representatives, members of Sha Tin and Tai Po Rural Committees and District Councils, as well as other local residents. Meetings have been held with these stakeholders between 2008 and 2013 and they raised no objection to the proposed works.

15. We gazetted the proposed works in Siu Lek Yuen and Ngau Pei Sha, Tin Liu and Kau To in accordance with the Water Pollution Control (Sewerage) Regulation (WPC(S)R) under three schemes between December 2011 and January 2013. For the scheme that covers the proposed works in Siu Lek Yuen and Ngau Pei Sha, four objections were received on land resumption and sewer alignment issues. We met with the objectors and prepared an amendment scheme in September 2012 in response to their concerns. Upon gazettal of the amendment scheme, all four objectors withdrew their objections unconditionally. As all the objections had been resolved, the Director of Environmental Protection (DEP) authorised the proposed works in Siu Lek Yuen and Ngau Pei Sha in November 2012. No objection was received on the proposed works in Tin Liu and the scheme was subsequently authorised in March 2013. For the scheme that covers the proposed works in Kau To, one objection was received on the project scope. The objector subsequently withdrew the objection unconditionally upon clarification. DEP authorised the proposed works in Kau To in April 2013. The proposed works in the remaining areas only requires limited road closures. With the delegation of power from DEP, Drainage Services Department (DSD) authorised the proposed works in March 2013.

16. We consulted the Legislative Council Panel on Environmental Affairs on 25 March 2013 on the proposed works. Members raised no objection to the proposed works. As regards Members' enquiries about the average connection rate of village sewerage, protection of the Wun Yiu Site of Archaeological Interest, as well as the improvements to the water quality of Shing Mun River, the Administration provided the supplementary information to the Panel on 22 May 2013.

ENVIRONMENTAL IMPLICATIONS

17. The proposed sewerage works in Tsok Pok Hang (Shui Chuen Au Street) under **125DS** constitute a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and an Environmental Permit (EP) is required for its construction and operation. Having regard to the project profile prepared and submitted by DSD, DEP was satisfied that the environmental impacts of the works concerned could meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process. With the consent of the Secretary for the Environment, the permission to apply directly for an EP was granted on 12 December 2012 and the EP was issued on 5 February 2013. DSD shall implement the mitigation measures as set out in the EP and comply with any requirements therein accordingly.

18. As regards the parts of works under **125DS** which are not designated projects under the EIAO, DSD completed a Preliminary Environmental Report in December 2009. It was concluded that, with the implementation of appropriate mitigation measures, these sewerage works would not have long-term adverse environmental impacts.

19. For short-term environmental impacts during construction, we will control noise, dust, and site run-off to levels within the established standards and guidelines through implementation of environmental mitigation measures, such as the use of silenced construction equipment and noise barriers to reduce noise generation, water-spraying to reduce emission of fugitive dust, and proper treatment of site run-off before discharge. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices will be properly implemented. We have included in paragraph 10(e) above a sum of \$3.7 million (in September 2012 prices) in the project estimates of the proposed works for implementing the environmental mitigation measures.

20. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to design the alignment of the proposed sewers in such a manner that excavation and demolition of existing structures will be minimised) 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 minimise the disposal of inert construction waste at public fill reception facilities⁴. 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.

21. 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.

/22.

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

22. We estimate that the proposed works will generate in total 53 105 tonnes of construction waste. Of these, we will reuse about 26 399 tonnes (49.7%) of inert construction waste on site and deliver 24 261 tonnes (45.7%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 2 445 tonnes (4.6%) 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 \$960,672 for the proposed works (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne⁵ at landfills).

HERITAGE IMPLICATION

23. The proposed works in Ha Wun Yiu fall within the Wun Yiu Site of Archaeological Interest. We will conduct rescue excavation for recording and preserving archaeological information within the area before commencement of the proposed sewerage works. We will also conduct an archaeological watching brief in the course of the proposed sewerage works in Ha Wun Yiu to ensure that archaeological resources, if identified, could be properly recorded and recovered. Besides, the proposed works at Tin Liu will be in close vicinity to some graded buildings at Pai Tau (adjacent to Tin Liu). We will closely work with the Antiquities and Monuments Office to formulate and implement necessary precautionary and protective measures during the works to minimise any anticipated impact on the graded buildings.

24. Subject to the actual site condition, the mitigation measures for archaeological resources, including but not limited to the rescue excavation and the watching brief, will be conducted in sequence or in parallel at the same or different locations with archaeological potential.

LAND ACQUISITION

25. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume 14 private agricultural lots, six mixed lots (affecting agricultural portion only) and one garden land (with a total area of about 531.2 square metres (m²)) for carrying out the proposed works. The land resumption and clearance will not affect any households. The cost of land resumption and clearance is about \$6.18 million which will be charged to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

/BACKGROUND

⁵ 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 per m³), nor the cost to provide new landfills, (which is likely to be more expensive) when the existing ones are filled.

BACKGROUND INFORMATION

26. We included **125DS** in Category C in August 1990 for implementing long-term water pollution abatement works in the Tolo Harbour Catchment.

Stage 1 phase 1 works

27. In February 1991, we upgraded part of **125DS** to Category A as **137DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 1 – consultants’ fees and design” at an approved project estimate (APE) of \$11.9 million for employing consultants to carry out the detailed design, site investigation and EIA for the stage 1 phase 1 works.

28. The phases 1A, 1B, 1C and 1D works were respectively upgraded to Category A as **163DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 1A”, **177DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 1B”, **284DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 1C” and **328DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phases 1D and 2B” in January 1993, June 1994, January 1997 and April 2001 respectively. Works for these phases have been completed. The total APEs of the stage 1 phase 1 works is about \$251.7 million.

Stage 1 phase 2 works

29. In July 1994, we upgraded part of **125DS** to Category A as **179DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 2 – consultants’ fees and investigations” at an APE of \$19.0 million for employing consultants to carry out the detailed design, site investigation and EIA for the stage 1 phase 2 works.

30. The phases 2A, 2B and 2C works were respectively upgraded to Category A as **213DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 2A”, **328DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phases 1D and 2B” and **365DS** “Tolo Harbour sewerage of unsewered areas, stage 1 phase 2C” in May 1997, April 2001 and November 2008 respectively. Works for stage 1 phase 2A and 2B were completed in March 2001 and June 2005 respectively. Works for stage 1 phase 2C will be completed in December 2014. The total APEs of the stage 1 phases 2A, 2B and 2C works is about \$589.4 million.

/Stage

Stage 2 works

31. We have employed consultants to carry out the detailed design and site investigation for the stage 2 works at an estimated cost of \$14.3 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** “Drainage works, studies and investigations for items in Category D of the Public Works Programme”. We have substantially completed the detailed design of the proposed works mentioned in paragraph 3 above.

32. Of the 1 465 trees within the project boundary for the proposed works, 1 437 trees will be preserved. The proposed works will involve the felling of 28 trees. All the trees to be removed are not important trees⁶. We will incorporate planting proposals as part of the project, including the planting of 36 trees.

33. We estimate that the proposed works will create about 100 jobs (80 for labourers and another 20 for professional/technical staff), providing a total employment of 4 280 man-months.

Environment Bureau
May 2013

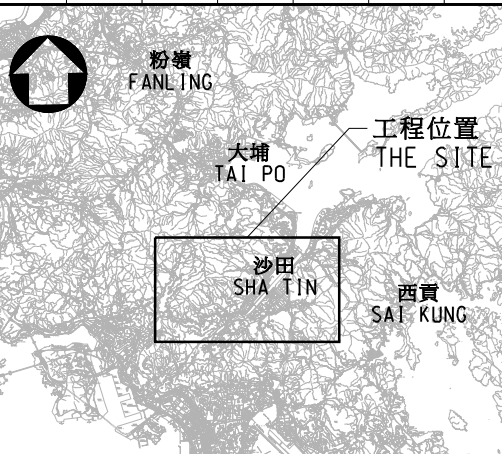
⁶ “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or event;
- (c) trees of precious or rare species;
- (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
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.

0 CM




10

20



索引圖 KEY PLAN
比例 SCALE 1 : 400 000

圖例 LEGEND:

-  擬建的鄉村污水收集系統範圍
PROPOSED AREA FOR IMPLEMENTATION OF VILLAGE SEWERAGE WORKS
-  擬建的污水泵房
PROPOSED SEWAGE PUMPING STATION
-  擬建的污水泵喉
PROPOSED RISING MAINS

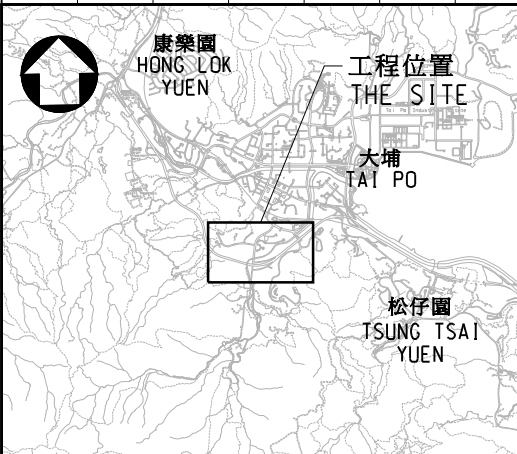
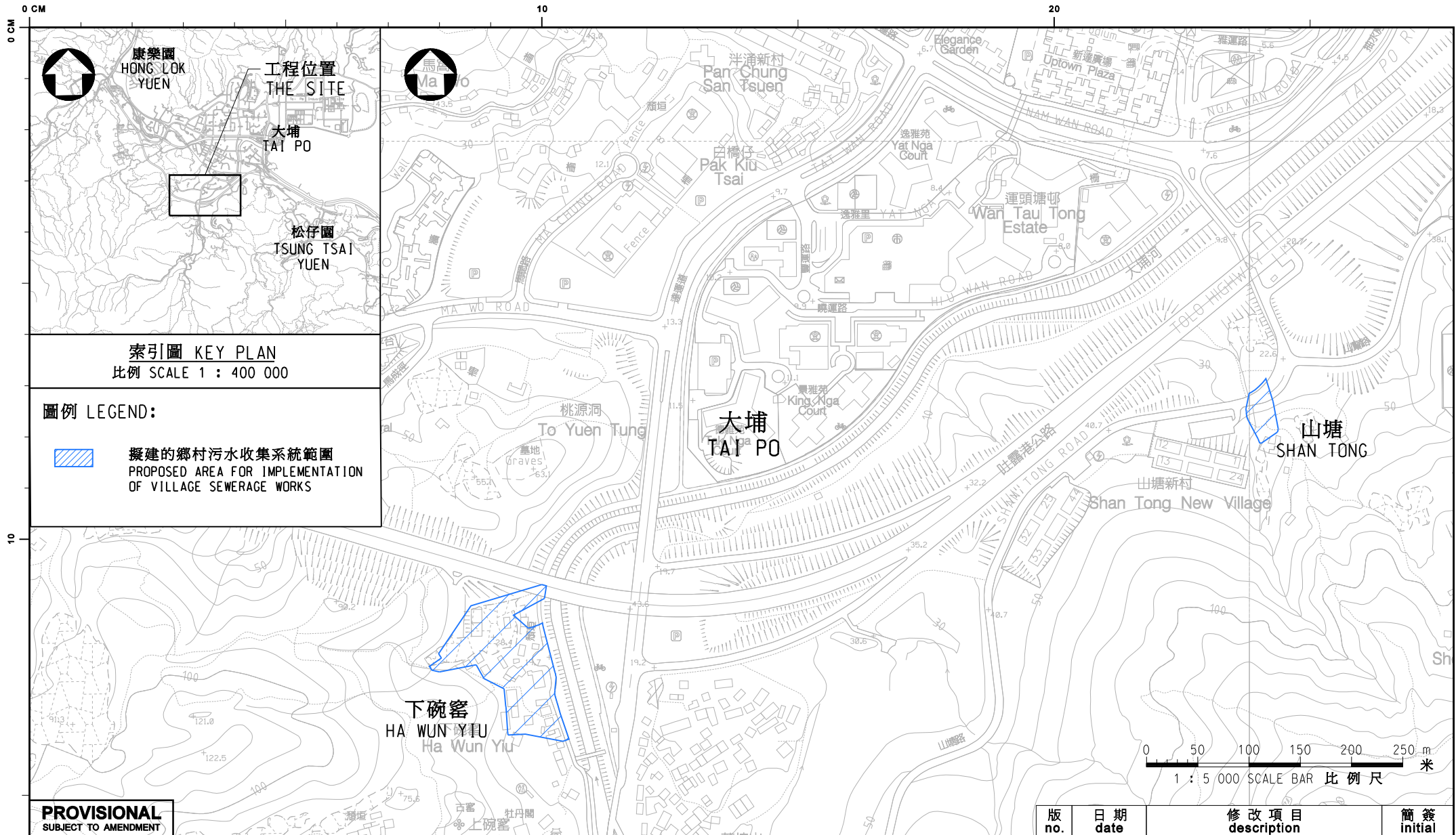
PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title
工務計劃項目第125DS號
- 吐露港未敷設污水設施地區的污水收集系統，第2階段
PWP ITEM NO. 125DS
- TOLO HARBOUR SEWERAGE OF UNSEWERED AREAS, STAGE 2


繪畫 drawn	日期 date	圖則編號 drawing no.	比例 scale
W. Y. HUI		DCM/2013/015	如圖示 AS SHOWN
核對 checked	日期 date	保留版權 COPYRIGHT RESERVED	
K. W. LI		香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG	
批核 approved	日期 date	SPECIAL ADMINISTRATIVE REGION	
C. K. LOUIE			
部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION			

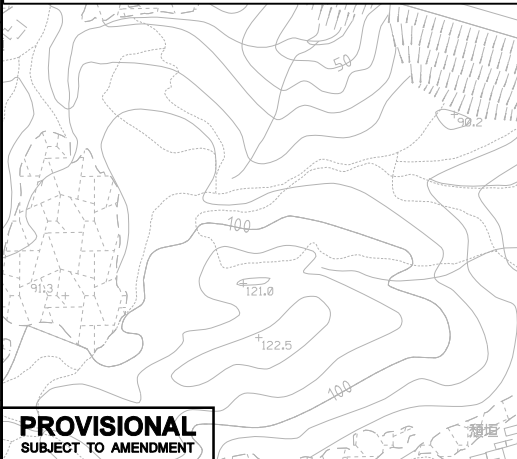


附件 1 (全二張其一) ENCLOSURE 1 (SHEET 1 OF 2)



索引圖 KEY PLAN
比例 SCALE 1 : 400 000

圖例 LEGEND:
 擬建的鄉村污水收集系統範圍
 PROPOSED AREA FOR IMPLEMENTATION OF VILLAGE SEWERAGE WORKS



PROVISIONAL
SUBJECT TO AMENDMENT

圖則名稱 drawing title
 工務計劃項目第125DS號
 - 吐露港未敷設污水設施地區的污水收集系統，第2階段
 PWP ITEM NO. 125DS
 - TOLO HARBOUR SEWERAGE OF UNSEWERED AREAS, STAGE 2

版 no.	日期 date	修改項目 description	簡簽 initial
		圖則編號 drawing no.	比例 scale
		DCM/2013/016	如圖示 AS SHOWN
		保留版權 COPYRIGHT RESERVED	
		香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG	
		部門 office 顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	



附件 1 (全二張其二) ENCLOSURE 1 (SHEET 2 OF 2)

Enclosure 2 to PWSC(2013-14)13

125DS – Tolo Harbour sewerage of unsewered areas, stage 2

**Breakdown of estimate 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)
Consultants' staff costs						
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.2
					Sub-total	0.2
(b)	Resident site staff costs (Note 3)	Professional	164	38	1.6	17.2
		Technical	502	14	1.6	18.0
					Sub-total	35.2
Comprising –						
(i)	Consultants' fees for management of resident site staff				1.4	
(ii)	Remuneration of resident site staff				33.8	
					Total	35.4

* 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. (As at now, MPS point 38 = \$65,695 per month and MPS point 14 = \$22,405 per month)
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **125DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

125DS – Tolo Harbour sewerage of unsewered areas, stage 2

Breakdown of the land resumption and clearance costs

		\$ million	
(I) Estimated resumption cost			5.42
(a)	Agricultural land ex-gratia compensation	5.42	
	21 lots (with a total area of 531.2 m ²) will be resumed, including 14 private agricultural lots (362.5 m ²), 6 mixed lots (162.7 m ² , affected agricultural portion only) and 1 garden land (6.0 m ²)		
	531.2 m ² x \$10,204 per m ² (see Notes 1 to 4)		
(II) Estimated clearance cost			0.20
(a)	Ex-gratia allowance of crop compensation	0.17	
(b)	Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.03	
(III) Contingency payment			0.56
(a)	Contingency on the above costs	0.56	
Total costs			6.18

Note:

1. Mixed lots refer to lots containing both agricultural land and building land. Under **125DS**, only agricultural land in these mixed lots would be resumed.
2. Garden land refers New Grant lot for the purpose of garden. The Compensation Rate adopted in land resumption of garden land is the same as that in agricultural land within the same zone.
3. There are four ex-gratia compensation zones, namely Zones A, B, C and D, for land resumption in the New Territories as approved by the Executive Council in 1985 and 1996. The boundaries of these zones are shown on the Zonal Plan for Calculation of Compensation Rates. The land to be resumed in the project **125DS** is agricultural land currently within Zone A.
4. In accordance with G.N. 1568 dated 15 March 2013 on the revised ex-gratia compensation rates for resumed land, the ex-gratia compensation rate of agricultural land for Zone A is 120% of the Basic Rate at \$790 per square foot (or \$8,503.48 per m²). Hence, the ex-gratia compensation rate used for estimating the resumption cost of the 21 lots (Zone A) affected by **125DS** is \$10,204 per m².