

For discussion  
on 18 May 2011

PWSC(2011-12)6

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

### **HEAD 704 – DRAINAGE**

#### **Environmental Protection – Sewerage and sewage treatment**

#### **235DS – Yuen Long and Kam Tin sewerage and sewage disposal**

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **235DS**, entitled “Trunk sewerage at Lau Fau Shan”, to Category A at an estimated cost of \$196.3 million in money-of-the-day prices; and
- (b) the retention of the remainder of **235DS** in Category B.

### **PROBLEM**

Sewage from the unsewered areas in Lau Fau Shan is a source of water pollution to the nearby watercourses and the receiving waters of Deep Bay.

**/PROPOSAL .....**

## PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade part of **235DS** to Category A at an estimated cost of \$196.3 million in money-of-the-day (MOD) prices for the provision of trunk sewerage at Lau Fau Shan.

## PROJECT SCOPE AND NATURE

3. The part of **235DS** which we propose to upgrade to Category A comprises the construction of –

- (a) about 1.5 kilometres (km) of gravity trunk sewers with diameters from 450 millimetres (mm) to 525 mm and 500 metres of twin rising mains with 200 mm diameter at Lau Fau Shan;
- (b) a new sewage pumping station near Deep Bay Road; and
- (c) ancillary works.

— A site plan showing the locations of the above works of **235DS** proposed to be part-upgraded is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee, we plan to commence the proposed works in September 2011 for completion in December 2015.

5. We will retain the remainder of **235DS** in Category B, which covers the provision of trunk sewerage at Ngau Tam Mei, San Tin, Pat Heung, Kam Tin and Mong Tseng, expansion of the existing San Wai sewage treatment works and modification of the existing Yuen Long sewage treatment works. Planning and design of the relevant works is in progress. Funding for the remainder of **235DS** will be sought at a later stage after completion of the design and preparatory works.

**/JUSTIFICATION .....**

## JUSTIFICATION

6. Apart from Yuen Long town centre and Tin Shui Wai, the remaining areas in the Northwest New Territories (NWNT) are largely not served by public sewers. Sewage from these unsewered areas is currently treated and discharged by means of privately owned sewage treatment plants or septic tanks and soakaway (STS) systems. These private facilities are often ineffective in removing pollutants due to their close proximity to watercourses<sup>1</sup> and inadequate maintenance<sup>2</sup>. Sewage discharged from these unsewered areas is a source of water pollution to the nearby watercourses and the receiving waters of Deep Bay. The lack of public sewerage also hinders future development in these areas.

7. As a long term measure to address water pollution problems and to meet future development needs in the NWNT, we propose the provision of trunk sewerage and a new sewage pumping station in Lau Fau Shan. The sewage collected from Lau Fau Shan will be conveyed to the San Wai sewage treatment works for treatment before discharge, thereby mitigating water pollution in the nearby watercourses and the receiving waters of Deep Bay and improving the living environment.

## FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be \$196.3 million in MOD prices (please see paragraph 9 below), broken down as follows –

	<b>\$ million</b>
(a) Construction of sewers	91.6
(b) Construction of a new sewage pumping station	23.1
(i) civil works	14.1
(ii) electrical and mechanical works	9.0
	/(c) .....

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

<sup>2</sup> Inadequate maintenance of STS systems would affect their pollutant removal efficiency and might even lead to an overflow of effluent.

		<b>\$ million</b>	
(c)	Ancillary works	4.0	
(d)	Environmental mitigation measures	4.3	
(e)	Consultants' fees for	1.9	
	(i) contract administration	0.8	
	(ii) management of resident site staff	1.1	
(f)	Remuneration of resident site staff	23.2	
(g)	Contingencies	14.7	
	Sub-total	162.8	(in September 2010 prices)
(h)	Provision for price adjustment	33.5	
	Total	196.3	(in MOD prices)

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

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

<b>Year</b>	<b>\$ million (Sept 2010)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2011 – 2012	9.8	1.04525	10.2
2012 – 2013	29.3	1.10143	32.3
2013 – 2014	40.7	1.16201	47.3
2014 – 2015	40.7	1.22592	49.9

/2015 .....

Year	\$ million (Sept 2010)	Price adjustment factor	\$ million (MOD)
2015 – 2016	24.4	1.29335	31.6
2016 – 2017	11.4	1.36448	15.6
2017 – 2018	6.5	1.43953	9.4
	162.8		196.3

10. 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 2011 to 2018. 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 as well as the depth of the foundation of the pumping station. 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 is well defined.

11. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$1.3 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**

12. We consulted Ping Shan Rural Committee (RC) and Ha Tsuen RC on 17 October 2007 and 5 March 2008 respectively. Both RCs supported the proposed works. We also briefed the Environmental Improvement Committee of Yuen Long District Council on 19 May 2008 and 14 March 2011 and the Committee supported the proposed works.

13. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (WPC(S)R) on 26 September 2008 and received six objections. All the objectors were concerned about the location of the proposed sewage pumping station and its associated resumption of private lands. We revised the proposed works by relocating the proposed sewage pumping station to address the objectors' concerns. We gazetted the first amendment scheme under WPC(S)R on 19 June 2009 and received no objection. Subsequent to the gazette of the first amendment scheme, five of the six objectors to the original sewerage scheme withdrew their objections unconditionally but one objector did not withdraw his objection. We gazetted the second amendment scheme under WPC(S)R on 12 March 2010 to further refine the limit of works area such that resumption of private land is not necessary. We received no objection to the second amendment scheme but the remaining objector to the original sewerage scheme did not withdraw his objection. After considering the objection, the Chief Executive in Council authorised the proposed works of the original sewerage scheme as amended by the first and second amendment schemes without modification on 5 October 2010.

14. We consulted the Legislative Council Panel on Environmental Affairs on 28 February 2011 on the proposed works. Members raised no objection to the proposed works.

## **ENVIRONMENTAL IMPLICATIONS**

15. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We have completed the Preliminary Environmental Review for the proposed works, which concludes that they would not have any long term adverse environmental impacts.

16. 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 or acoustic shed 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 inspection to ensure that these recommended mitigation measures and good site practices are properly implemented on site. We have included in paragraph 8(d) above a sum of \$4.3 million (in September 2010 prices) in the project estimates for implementing the environmental mitigation measures.

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. For example, in addition to the need for meeting the hydraulic and traffic requirements, we have also designed the alignment of the proposed sewerage works in such a manner that excavation and demolition of existing structures will be minimised. 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 facilities<sup>3</sup>. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimise the generation of construction waste.

18. 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.

19. We estimate that the proposed works will generate in total about 11 500 tonnes of construction waste. Of these, we will reuse about 5 250 tonnes (46%) of inert construction waste on site and deliver 5 680 tonnes (49%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 570 tonnes (5%) 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 about \$200,000 for the proposed works (based on a unit cost of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne<sup>4</sup> at landfills.)

**/HERITAGE .....**

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<sup>3</sup> 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 public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

<sup>4</sup> The 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 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

20. The proposed works 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.

## TRAFFIC IMPLICATIONS

21. We have completed a traffic impact assessment (TIA) for the proposed works and worked out mitigation measures to minimise possible disruption to traffic during construction of the works. The TIA has concluded that the proposed works would not cause any significant traffic impact. We will establish a Traffic Management Liaison Group (TMLG) under the contract and invite representatives from Transport Department, Hong Kong Police Force, Highways Department, Yuen Long District Office, public transport operators and utility undertakings to attend the TMLG meetings. Every temporary traffic arrangement will be agreed by the TMLG before implementation. The TMLG will also take into account relevant factors such as site restrictions, traffic conditions, pedestrian safety, access to buildings/shop fronts and provision of emergency vehicular access in considering the temporary traffic arrangements.

22. During construction, we will maintain smooth traffic flow through implementing temporary traffic management measures as appropriate. We will display notice boards on site to explain the reason of temporary traffic arrangements and indicate the expected completion date of the concerned section of works. We will also employ trenchless methods to construct the sections of sewers at major roads and junctions to avoid affecting the busy traffic there. In addition, we will set up telephone hotlines for public enquiries related to the proposed works.

## LAND ACQUISITION

23. The proposed works do not require any land resumption but clearance works are required. Ex-gratia Allowances (EGA) will be paid to the eligible claimants and the affected cultivators under current EGA policy. The estimated cost of land clearance is about \$100,000, which will be charged to **Head 701 – Land Acquisition**. A breakdown of the land clearance costs is at Enclosure 3.

**/BACKGROUND .....**



**BACKGROUND INFORMATION**

24. In September 1998, we upgraded **215DS** “Yuen Long and Kam Tin sewerage and sewage disposal” to Category B for the provision and upgrading of sewerage facilities in the NWNT.

25. In January 1999, the Environmental Protection Department completed the study “Review of Yuen Long and Kam Tin sewerage and sewage treatment requirements”. The study recommended a package of sewerage improvement works to provide trunk sewer systems and to upgrade relevant sewerage facilities to abate the water pollution problems and to meet future development needs in the NWNT.

26. From July 1999 to March 2004, we engaged consultants to carry out environmental impact assessment, ground investigations and traffic impact assessment studies for **215DS** at a total cost of \$8.1 million in MOD prices. We charged this amount to block allocation **Subhead 4100DX** “Drainage works, studies and investigations for items in Category D of the Public Works Programme”.

27. In February 2004, we split **215DS** into **215DS** “Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers” and **235DS** “Yuen Long and Kam Tin sewerage and sewage disposal”. We upgraded **235DS** to Category B in October 2005.

28. In July 2006, we upgraded part of **235DS** to Category A as **350DS** “Yuen Long and Kam Tin sewerage and sewage disposal – consultants’ fees and investigations” at an approved project estimate (APE) of \$28.0 million in MOD prices for engaging consultants to undertake detailed design and necessary investigations. The consultancy works are being carried out in phases.

29. In May 2009, we upgraded part of **235DS** to Category A as **368DS** “Yuen Long South sewerage and expansion of Ha Tsuen sewage pumping station” at an APE of \$550.8 million in MOD prices for construction of trunk sewers in Yuen Long South and Ha Tsuen areas, a new sewage pumping station near Shui Tsiu San Tsuen Road in Yuen Long South, and expansion of the existing Ha Tsuen sewage pumping station. The construction works commenced in September 2009 for completion in October 2013.

30. We have completed under **350DS** the design of the proposed works mentioned in paragraph 3 above.

31. Of the 218 trees within the project boundary, 210 trees will be preserved. The proposed works will involve the felling of eight trees. All trees to be removed are not important trees<sup>5</sup>. We will incorporate planting proposals as part of the project, including planting of eight trees.

32. We estimate that the proposed works will create about 55 jobs (45 for labourers and another ten for professional/technical staff), providing a total employment of 2 400 man-months.

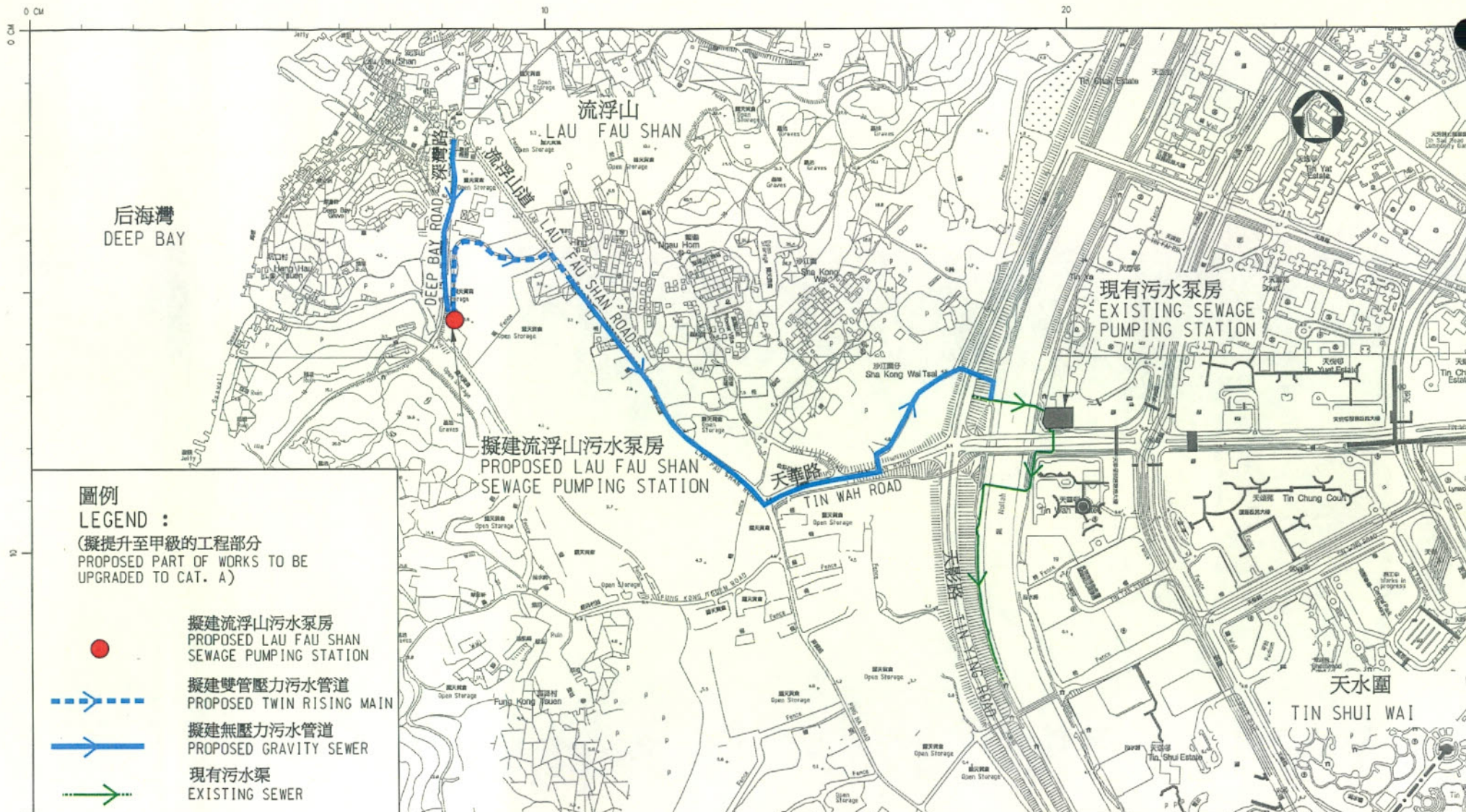
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Environment Bureau  
May 2011





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<sup>5</sup> “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 over 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 an important person 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 metre (m) (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.



**圖例**  
**LEGEND :**  
 (擬提升至甲級的工程部分  
 PROPOSED PART OF WORKS TO BE  
 UPGRADED TO CAT. A)

-  擬建流浮山污水泵房  
PROPOSED LAU FAU SHAN  
SEWAGE PUMPING STATION
-  擬建雙管壓力污水管道  
PROPOSED TWIN RISING MAIN
-  擬建無壓力污水管道  
PROPOSED GRAVITY SEWER
-  現有污水渠  
EXISTING SEWER

圖則名稱 drawing title

工務計劃項目第235DS號  
 元朗及錦田污水收集系統及污水排放計劃  
 PWP ITEM NO. 235DS  
 YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL

版 no.	日期 date	修改項目 description	簡簽 initial
		圖則編號 drawing no.	比例 scale
		DDN/235DS1/8011	1:10000
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 香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION			

繪畫 drawn	SIGNED C. L. KWAN	日期 date	28 JAN 2011
核對 checked	SIGNED Ir K. C. LAM	日期 date	28 JAN 2011
批核 approved	SIGNED Ir W. M. LEE	日期 date	28 JAN 2011
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

附件一 ENCLOSURE 1

## Enclosure 2 to PWSC(2011-12)6

### 235DS – Yuen Long and Kam Tin sewerage and sewage disposal

#### Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2010 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Consultants' fees for contract	Professional	–	–	–	0.6
	administration <sup>(Note 2)</sup>	Technical	–	–	–	0.2
					Sub-total	0.8
(b)	Resident site staff costs <sup>(Note 3)</sup>	Professional	120	38	1.6	11.2
		Technical	410	14	1.6	13.1
					Sub-total	24.3
Comprising –						
(i)	Consultants' fees for management of resident site staff					1.1
(ii)	Remuneration of resident site staff					23.2
					<b>Total</b>	<b>25.1</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. (As at now, MPS salary point 38 = \$58,195 per month and MPS salary point 14 = \$19,945 per month)
2. The consultants' staff cost for the 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 part of 235DS to Category A.
3. The actual man-months and actual costs will be known after completion of the construction works.

**Enclosure 3 to PWSC(2011-12)6**

**235DS – Yuen Long and Kam Tin sewerage and sewage disposal**

**Breakdown of estimated land clearance costs**

	(\$)
<b>Land clearance costs</b>	
(a) Ex-gratia allowance for crops	83,000
(b) Ex-gratia allowance for miscellaneous permanent improvement items	8,000
(c) Contingency on the above costs	9,000
Total	100,000