

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### Head 704 – DRAINAGE

#### Environmental Protection – Sewerage and sewage treatment

#### 355DS – Outlying Islands sewerage, stage 2 – Lamma village sewerage phase 2

Members are invited to recommend to the Finance Committee –

- (a) the upgrading of part of **355DS**, entitled “Outlying Islands sewerage, stage 2 – Lamma village sewerage phase 2, package 1”, to Category A at an estimated cost of \$340.2 million in money-of-the-day prices; and
- (b) the retention of the remainder of **355DS** in Category B.

### PROBLEM

Sewage from the unsewered areas in Yung Shue Wan of Lamma Island is a source of water pollution to nearby watercourses as well as the receiving waters of Lamma Island.

### PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade part of **355DS** to Category A at an estimated cost of \$340.2 million in money-of-the-day (MOD) prices for implementing sewerage works at 13 unsewered areas in Yung Shue Wan of Lamma Island.

/PROJECT .....

**PROJECT SCOPE AND NATURE**

3. The part of **355DS** that we propose to upgrade to Category A comprises the construction of –

- (a) about 9.1 kilometres (km) of sewers ranging from 150 millimetres (mm) to 250 mm in diameter for 13 unsewered areas in Yung Shue Wan of Lamma Island, namely Sha Po New Village, Sha Po Old Village, Yung Shue Wan Back Street, Tai Shan West, Tai Shan East, Tai Shan Central, Ko Long, Tai Yuen Village, O Tsai, Po Wah Yuen, Yung Shue Long New Village, Yung Shue Long Old Village and Tai Peng;
- (b) one sewage pumping station (SPS) at O Tsai;
- (c) about 50 metres (m) of twin rising mains of 100 mm in diameter 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 the proposed works in December 2013 for completion in July 2018.

5. We will retain the remainder of **355DS** in Category B, which comprises the construction of about 6.3 km of sewers, 800 m of twin rising mains and two SPSs for seven other unsewered areas in Yung Shue Wan. Planning and design of the relevant works are in progress. Funding for the remainder of **355DS** 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 Yung Shue Wan 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 watercourses<sup>1</sup> and inadequate maintenance<sup>2</sup>. Sewage from such unsewered areas has therefore been identified as a source of water pollution to nearby watercourses and the receiving waters of Lamma Island.

7. The aforesaid situation will persist unless sewerage infrastructure is made available to collect and treat sewage from the areas concerned properly. In this regard, the Environmental Protection Department has formulated as a long-term measure a programme under the Outlying Islands Sewerage Master Plan to provide public sewerage for these areas. Upon completion of the proposed works, sewage collected from these areas will be conveyed to the Yung Shue Wan sewage treatment works for proper treatment and disposal. This will minimise the release of pollutants into the environment and bring about sustainable improvements to the water quality of the nearby streams and near-shore water of Lamma Island.

8. Based on the village properties survey results and the potential village house development information within the 13 unsewered areas reviewed in June 2012, the proposed sewerage facilities mentioned in paragraph 3 above will be able to serve some 535 village houses comprising 463 existing houses, 8 planned houses and 64 potential houses<sup>3</sup>.

**/FINANCIAL .....**

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<sup>1</sup> 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.

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

<sup>3</sup> The 64 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.

**FINANCIAL IMPLICATIONS**

9. We estimate the cost of the proposed works to be \$340.2 million in MOD prices (see paragraph 10 below), broken down as follows –

	<b>\$ million</b>	
(a) Construction of sewers within villages	169.6	
(b) Construction of SPS	33.9	
(i) civil engineering works	25.6	
(ii) electrical and mechanical works	8.3	
(c) Construction of rising mains	1.6	
(d) Ancillary works	0.9	
(e) Environmental mitigation measures	2.9	
(f) Consultants' fees for	1.7	
(i) contract administration	0.6	
(ii) management of resident site staff	1.1	
(g) Remuneration of resident site staff	26.2	
(h) Contingencies	21.3	
Sub-total	258.1	(in September 2012 prices)
(i) Provision for price adjustment	82.1	
Total	340.2	(in MOD prices)

/A .....

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

10. Subject to 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 – 2014	8.3	1.06225	8.8
2014 – 2015	31.0	1.12599	34.9
2015 – 2016	31.0	1.19354	37.0
2016 – 2017	41.3	1.26516	52.3
2017 – 2018	61.9	1.34107	83.0
2018 – 2019	38.1	1.41147	53.8
2019 – 2020	25.8	1.48205	38.2
2020 – 2021	20.7	1.55615	32.2
	258.1		340.2

11. 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 2021. 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.

/12. ....

12. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$1.7 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**

13. We consulted the Lamma Island (North) Rural Committee and the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee of the Islands District Council on 29 May and 18 July 2011 respectively. Both committees supported the proposed works.

14. We gazetted the proposed works in accordance with the Water Pollution Control (Sewerage) Regulation (Cap.358AL) under two schemes in August 2012 and January 2013. Both schemes received one objection each. For the objection to the second scheme, the objector has withdrawn his objection unconditionally and the Director of Environmental Protection authorised the proposed works in April 2013. For the first scheme, the objection covered noise issues. We have invited the objector twice to attend objection hearing meetings to give his further comments on the scheme but he did not show up. The objection remained unresolved, and the Chief Executive-in-Council authorised the first scheme without modification on 30 April 2013.

15. We consulted the Legislative Council Panel on Environmental Affairs on 22 April 2013 on the proposed works. Members raised no objection to the proposed works. As regards Members' enquiries about the details of the compensation for the resumption of the 35 private agricultural lots and cost comparison between the proposed works and other similar sewerage projects, the Administration provided the supplementary information to the Panel on 27 May 2013.

## **ENVIRONMENTAL IMPLICATIONS**

16. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We completed a Preliminary Environmental Review (PER) for the proposed works in December 2010. It was concluded that, with the implementation of appropriate mitigation measures, the proposed works would not have long-term adverse environmental impacts.

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17. For short-term environmental impacts during construction, we will control noise, dust and site run-off to levels within 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 on site. We have included in paragraph 9(e) above a sum of \$2.9 million (in September 2012 prices) in the project estimate for implementation of the necessary environmental mitigation measures.

18. 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 facilities<sup>4</sup>. We will encourage the contractor to maximise the use of recycled/recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

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

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<sup>4</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.

20. We estimate that the proposed works will generate in total about 42 160 tonnes of construction waste. Of these, we will reuse about 34 690 tonnes (82.3%) of inert construction waste on site and deliver another 6 580 tonnes (15.6%) to public fill reception facilities for subsequent reuse. We will dispose of the remaining 890 tonnes (2.1%) of non-inert construction waste at landfills. The total cost of accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$288,910 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>5</sup> at landfills).

## HERITAGE IMPLICATION

21. Part of the proposed works will be located within the Yung Shue Wan site of archaeological interest. However, there are no proposed monuments, declared monuments, graded historical buildings or Government historic sites identified by the Antiquities and Monuments Office (AMO) within the works area. Based on the PER, areas to be impacted by the proposed works are assessed to be of no, very low or some archaeological potential. The areas identified to have some archaeological potential would require mitigation measures including rescue excavation along a section of the proposed sewer alignment before commencement of the proposed sewerage works at Sha Po Old Village, and an archaeological watching brief along the proposed sewer alignments in Yung Shue Long New Village, Sha Po Old Village and Sha Po New Village during the construction works. We will closely work with the AMO to formulate and implement the above mitigation measures to minimise the adverse impact on the site of archaeological interest.

## LAND ACQUISITION

22. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume 35 private agricultural lots (with a total area of about 773 square metres (m<sup>2</sup>)) for carrying out the proposed works. The land resumption and clearance will not affect any households or domestic structures. We will charge the cost of land resumption and clearance estimated at \$4.69 million to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

**/BACKGROUND .....**

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<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 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.



**BACKGROUND INFORMATION**

23. In October 2005, we upgraded **331DS** “Outlying Islands sewerage stage 2” to Category B.

24. In November 2006, we split **331DS** into **331DS** “Outlying Islands sewerage stage 2 – South Lantau sewerage works”, **353DS** “Outlying Islands sewerage stage 2 – upgrading of Mui Wo village sewerage phase 2 and Mui Wo sewage treatment works”, **354DS** “Outlying Islands sewerage stage 2 – upgrading of Cheung Chau and Tai O sewage collection, treatment and disposal facilities” and **355DS** “Outlying Islands sewerage stage 2 – Lamma village sewerage phase 2” to Category B.

25. In January 2008, we commissioned a consultancy to carry out the investigations, studies and design for **355DS** at an estimated cost of \$3.3 million in MOD prices. We charged the 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 in May 2013 mentioned in paragraph 3 above.

26. The proposed works will involve the felling of two trees and transplanting of two trees. All of them are not important trees<sup>6</sup>. We will incorporate planting proposals as part of the project, including the planting of four trees, an estimated quantity of 80 shrubs and 24 m<sup>2</sup> of grassed area.

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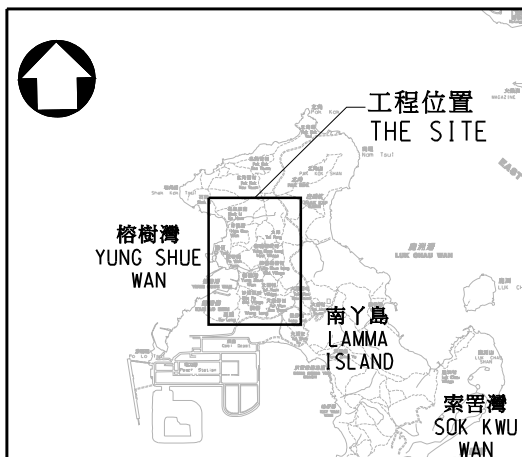
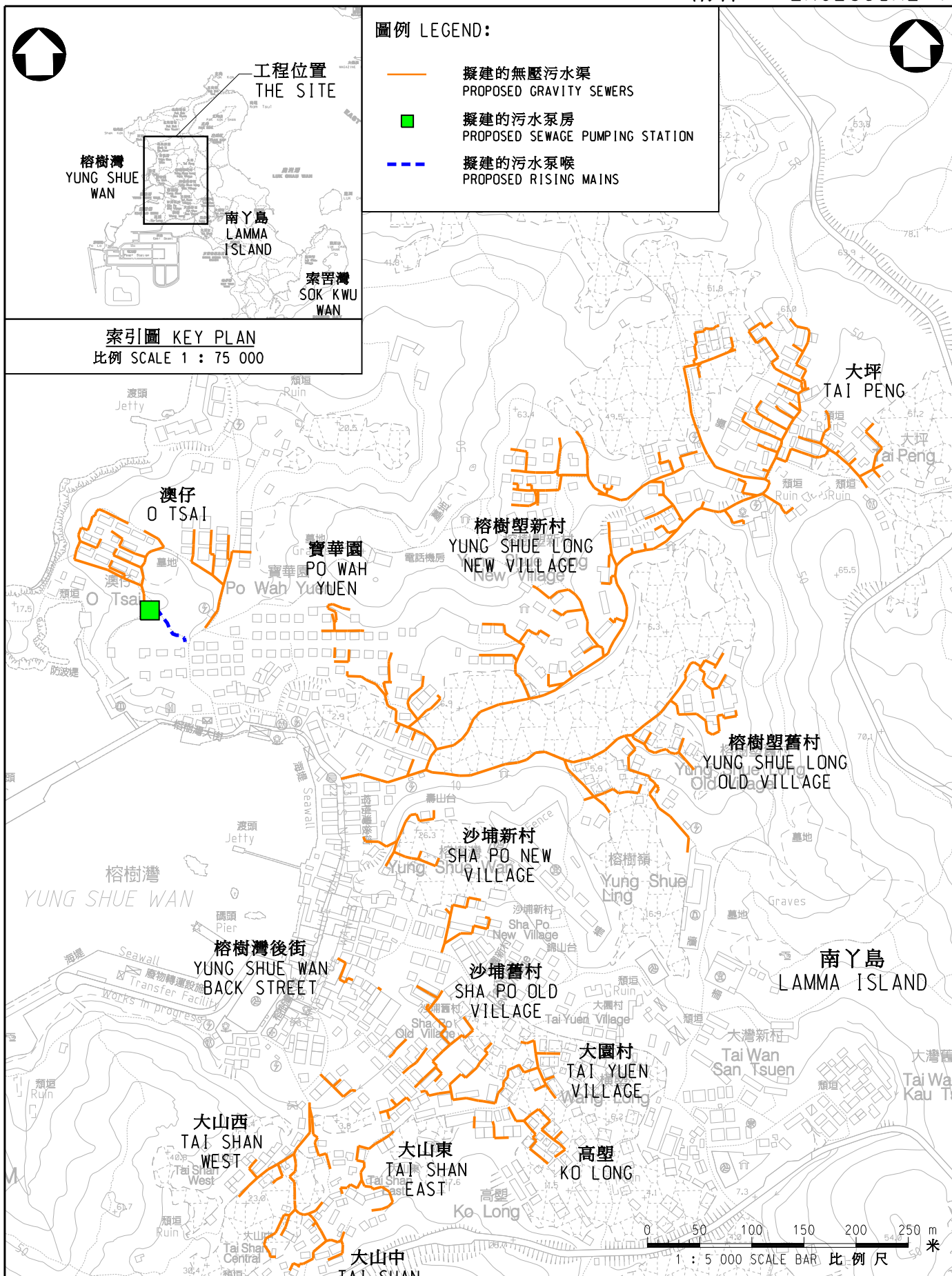
<sup>6</sup> “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- trees of 100 years old or above;
- 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;
- trees of precious or rare species;
- 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
- 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.

27. We estimate that the proposed works will create about 96 jobs (78 for labourers and another 18 for professional/technical staff), providing a total employment of 4 680 man-months.

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Environment Bureau  
May 2013



索引圖 KEY PLAN  
比例 SCALE 1 : 75 000

**圖例 LEGEND:**

- 擬建的無壓污水渠  
PROPOSED GRAVITY SEWERS
- 擬建的污水泵房  
PROPOSED SEWAGE PUMPING STATION
- - - 擬建的污水泵喉  
PROPOSED RISING MAINS

<p><b>PROVISIONAL</b> SUBJECT TO AMENDMENT</p> <p>圖則名稱 drawing title 工程計劃項目355DS號 - 離島污水收集系統第2階段 - 南丫 鄉村污水收集系統第2期工程 PWP ITEM No. 355DS - OUTLYING ISLANDS SEWERAGE, STAGE 2 - LAMMA VILLAGE SEWERAGE PHASE 2</p>	<p>繪畫 drawn 日期 date W. Y. HUI</p>	<p>核對 checked 日期 date K. H. YAU</p>	<p>批核 approved 日期 date W. Y. CHAN</p>	<p>修改項目 description 圖則編號 drawing no. DCM/2013/007</p>	<p>簡簽 initial</p>
	<p>部門 office 顧問工程管理部 <b>CONSULTANTS MANAGEMENT DIVISION</b></p>			<p>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 SPECIAL ADMINISTRATIVE REGION</p>	

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**Enclosure 2 to PWSC(2013-14)15**

**355 DS – Outlying Islands sewerage, stage 2 – Lamma village sewerage phase 2**

**Breakdown of 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 (Note 2)	-	-	-	0.6
				Sub-total	0.6
(b)	Resident site staff costs (Note 3)	115	38	1.6	12.1
		424	14	1.6	15.2
				Sub-total	27.3
	Comprising –				
	(i) Consultants’ fees for management of resident site staff			1.1	
	(ii) Remuneration of resident site staff			26.2	
				<b>Total</b>	27.9

\* 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 **355DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

**355DS – Outlying Islands sewerage, stage 2 – Lamma village sewerage phase 2****Breakdown of the land resumption and clearance costs**

	<b>\$ million</b>	
<b>(I) Estimated resumption cost</b>		<b>3.29</b>
(a) Agricultural land ex-gratia compensation in Sha Po New Village, Sha Po Old Village, Ko Long, Yung Shue Long New Village and Yung Shue Long Old Village	3.29	
35 agricultural lots (with a total area of about 773 m <sup>2</sup> ) will be resumed		
773 m <sup>2</sup> x \$4,252 per m <sup>2</sup> (see Notes 1 and 2)		
<b>(II) Estimated clearance cost</b>		<b>0.97</b>
(a) Ex-gratia allowance of crop compensation	0.71	
(b) Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.12	
(c) Ex-gratia allowance for “Tun Fu”	0.14	
<b>(III) Contingency payment</b>		<b>0.43</b>
(a) Contingency on the above costs	0.43	
<b>Total costs</b>		<b>4.69</b>

**Notes:**

- There are four ex-gratia compensation zones, namely Zones A, B, C and D, for land resumption 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. About 773 m<sup>2</sup> of the land to be resumed in the project **355DS** is agricultural land currently within Zone C.
- 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 C is 50% of the Basic Rate at \$790 per square foot (or about \$8,503.48 per m<sup>2</sup>). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 35 lots in Sha Po New Village, Sha Po Old Village, Ko Long, Yung Shue Long New Village and Yung Shue Long Old Village affected by **355DS** is \$4,252 per m<sup>2</sup>.