

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment

339DS – North District sewerage, stage 1 phase 2C and stage 2 phase 1

Members are invited to recommend to Finance Committee –

- (a) the upgrading of part of **339DS**, entitled “Sewerage in Nam Wa Po and Wai Tau Tsuen”, to Category A at an estimated cost of \$319.1 million in money-of-the-day prices; and
- (b) the retention of the remainder of **339DS** in Category B.

PROBLEM

Sewage from the unsewered areas in Nam Wa Po and Wai Tau Tsuen in Tai Po is a source of water pollution to Ng Tung River as well as the receiving waters of Deep Bay.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade part of **339DS** to Category A at an estimated cost of \$319.1 million in money-of-the-day (MOD) prices for implementing sewerage works in the two unsewered areas in Tai Po.

/PROJECT

PROJECT SCOPE AND NATURE

3. The part of **339DS** that we propose to upgrade to Category A comprises the construction of –

- (a) about 7.3 kilometres (km) of sewers ranging from 150 millimetres (mm) to 300 mm in diameter for two unsewered areas in Tai Po, namely Nam Wa Po and Wai Tau Tsuen;
- (b) two sewage pumping stations (SPSs) at Nam Wa Po and Wai Tau Tsuen in Tai Po;
- (c) about 170 metres (m) of twin rising mains of 150 mm in diameter in association with construction of the SPS at Nam Wa Po; 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 July 2013 for completion by September 2017.

5. We will retain the remainder of **339DS** in Category B, which involves laying of about 21.6 km of sewers in 14 other unsewered areas in North District and Tai Po. Planning and design of the relevant works are in progress. Funding for the remainder of **339DS** will be sought at a later stage after completion of the design and preparatory works.

JUSTIFICATION

6. At present, sewage from the village areas in Kau Lung Hang, 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 could 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 Ng Tung River and the receiving waters of Deep Bay.

/7.

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 might even lead to overflow of effluent.

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 North District Sewerage Master Plan to provide public sewerage in Kau Lung Hang in phases. The proposed works aim to collect the sewage generated from two unsewered areas, namely Nam Wa Po and Wai Tau Tsuen, and convey it to the Shek Wu Hui sewage treatment works 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 Ng Tung River and Deep Bay.

8. Based on the village properties survey results and the potential village house development information within the two unsewered areas obtained in October 2010 and November 2011 respectively, the proposed sewerage facilities in Nam Wa Po and Wai Tau Tsuen mentioned in paragraph 7 above will be able to serve some 660 village houses comprising about 585 existing houses, 45 planned houses and 30 potential houses³.

FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be \$319.1 million in MOD prices (please see paragraph 10 below), broken down as follows –

	\$ million
(a) Construction of sewers within villages	107.2
(b) Construction of two SPSs	90.8
(i) civil engineering works	72.8
(ii) electrical and mechanical works	18.0

/(c)

³ The 30 potential houses are houses that may be developed on vacant land 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 land to serve the existing and planned houses.

		\$ million
(c)	Construction of rising mains	2.8
(d)	Ancillary works	1.4
(e)	Environmental mitigation measures	3.0
(f)	Consultants' fees for	1.7
(i)	contract administration	0.5
(ii)	management of resident site staff	1.2
(g)	Remuneration of resident site staff	27.0
(h)	Contingencies	<u>22.0</u>
	Sub-total	255.9 (in September 2012 prices)
(i)	Provision for price adjustment	63.2
	Total	<u>319.1</u> (in MOD prices)

————— 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 –

Year	\$ million (Sept 2012)	Price adjustment factor	\$ million (MOD)
2013 – 2014	13.0	1.06225	13.8
2014 – 2015	44.6	1.12599	50.2
2015 – 2016	65.4	1.19354	78.1

/2016

Year	\$ million (Sept 2012)	Price adjustment factor	\$ million (MOD)
2016 – 2017	63.3	1.26516	80.1
2017 – 2018	31.3	1.34107	42.0
2018 – 2019	26.3	1.41147	37.1
2019 – 2020	12.0	1.48205	17.8
	255.9		319.1

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 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.

12. We estimate the additional annual recurrent expenditure arising from the proposed works to be \$2.5 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 Tai Po Rural Committee on 11 May 2007 and the Environment, Housing and Works Committee under Tai Po District Council on 14 September 2007. Both committees supported the proposed works. Besides, we consulted a coordination group established under the Tai Po Rural Committee with members from the Tai Po Rural Committee and Tai Po District Council at its *ad hoc* meetings held in June 2011 and May 2012. The coordination group raised no objection to the proposed works.

/14.

14. We gazetted the proposed works in accordance with the Water Pollution Control (Sewerage) Regulation in February 2011 under a single scheme, and received six objections concerning land resumption and sewer alignment issues. We met with the six objectors and they all withdrew their objections unconditionally. An amendment scheme was subsequently prepared in August 2012 to further optimise the scheme. No objection to the amendment scheme was received. The Director of Environmental Protection therefore authorised the proposed works in Nam Wa Po and Wai Tau Tsuen in November 2012.

15. 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. Supplementary information indicating the location of the nearest village house to the pumping station at Nam Wa Po; and on the public consultation was issued to the Panel on 22 May 2013.

ENVIRONMENTAL IMPLICATIONS

16. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We completed the Preliminary Environmental Review in September 2008. It was concluded that the proposed works would not have long-term adverse environmental impacts upon implementation of appropriate mitigation measures.

17. 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 9(e) above a sum of \$3.0 million (in September 2012 prices) in the project estimate for implementing the 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 facilities⁴. 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.

20. We estimate that the proposed works will generate in total about 38 650 tonnes of construction waste. Of these, we will reuse 17 872 tonnes (46%) of inert construction waste on site and deliver 18 810 tonnes (49%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 1 968 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 \$753,870 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

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 public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

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.

HERITAGE IMPLICATION

21. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archeological interest and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

22. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume 96 private agricultural lots (with a total area of about 5 044 square metres (m²)) for carrying out the proposed works. The land resumption and clearance will not affect any households or domestic structures. The cost of land resumption and clearance is about \$25.3 million which will be charged to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

BACKGROUND INFORMATION

23. In October 1994, we upgraded **203DS** “North District sewerage” to Category B to implement sewerage works recommended under the comprehensive study of the sewerage systems in the North District in two stages.

24. We deployed in-house resources to conduct detailed design for the stage 1 phase 1 works. In December 1998, we engaged consultants to carry out detailed design for the stage 1 phase 2 works and necessary investigations at an estimated cost of \$13.1 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”. The consultancy works are being carried out in phases.

25. In December 1998 and February 2002, we upgraded part of **203DS** to Category A as **219DS** “North District sewerage, stage 1 phase 1A” at an approved project estimate (APE) of \$124.7 million and **330DS** “North District sewerage, stage 1 phases 1B and 2A” at an APE of \$125.1 million in MOD prices respectively. The construction works of **219DS** and **330DS** were completed in December 2002 and January 2006 respectively.

26. Between 2004 and 2006, we re-packaged the remaining works under **203DS** with due regard to the priority of the works and availability of resources. In October 2004 and October 2005, we split **203DS** into **203DS** “North District sewerage, stage 2 part 2B”, **339DS** “North District sewerage, stage 1 phases 2B and 2C and stage 2 phase 1” and **345DS** “North District sewerage, stage 2 part 2A”.

27. In January 2006, we engaged consultants to carry out detailed design and necessary investigations for the stage 2 phase 1 works at an estimated cost of \$9.84 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”. The consultancy works are being carried out in phases.

28. In January 2007, we upgraded part of **339DS** to Category A as **359DS** “North District sewerage, stage 1 phase 2B” at an APE of \$130.0 million in MOD prices. The construction works were completed in January 2011. The remainder of **339DS** is retitled as “North District sewerage, stage 1 phase 2C and stage 2 phase 1”.

29. In January 2009, we upgraded part of **339DS** to Category A as **366DS** “Kau Lung Hang sewerage – trunk sewers, pumping station and rising main” at an APE of \$103.2 million in MOD prices. The construction works commenced in February 2009 and were substantially completed in December 2012.

30. In June 2011, we upgraded part of **339DS** to Category A as **375DS** “Sewerage in Ping Kong, Fu Tei Pai and Tai Wo” at an APE of \$226.8 million in MOD prices. The construction works commenced in November 2011 for completion in November 2015.

31. In May 2012, we upgraded part of **339DS** to Category A as **386DS** “Village sewerage in Kau Lung Hang San Wai, Kau Lung Hang Lo Wai and Tai Hang, and southern trunk sewer between Wai Tau Tsuen and Nam Wa Po” at an APE of \$316.8 million in MOD prices. The construction works commenced in June 2012 for completion in December 2016.

32. We have substantially completed the detailed design of the proposed works mentioned in paragraph 3 above.

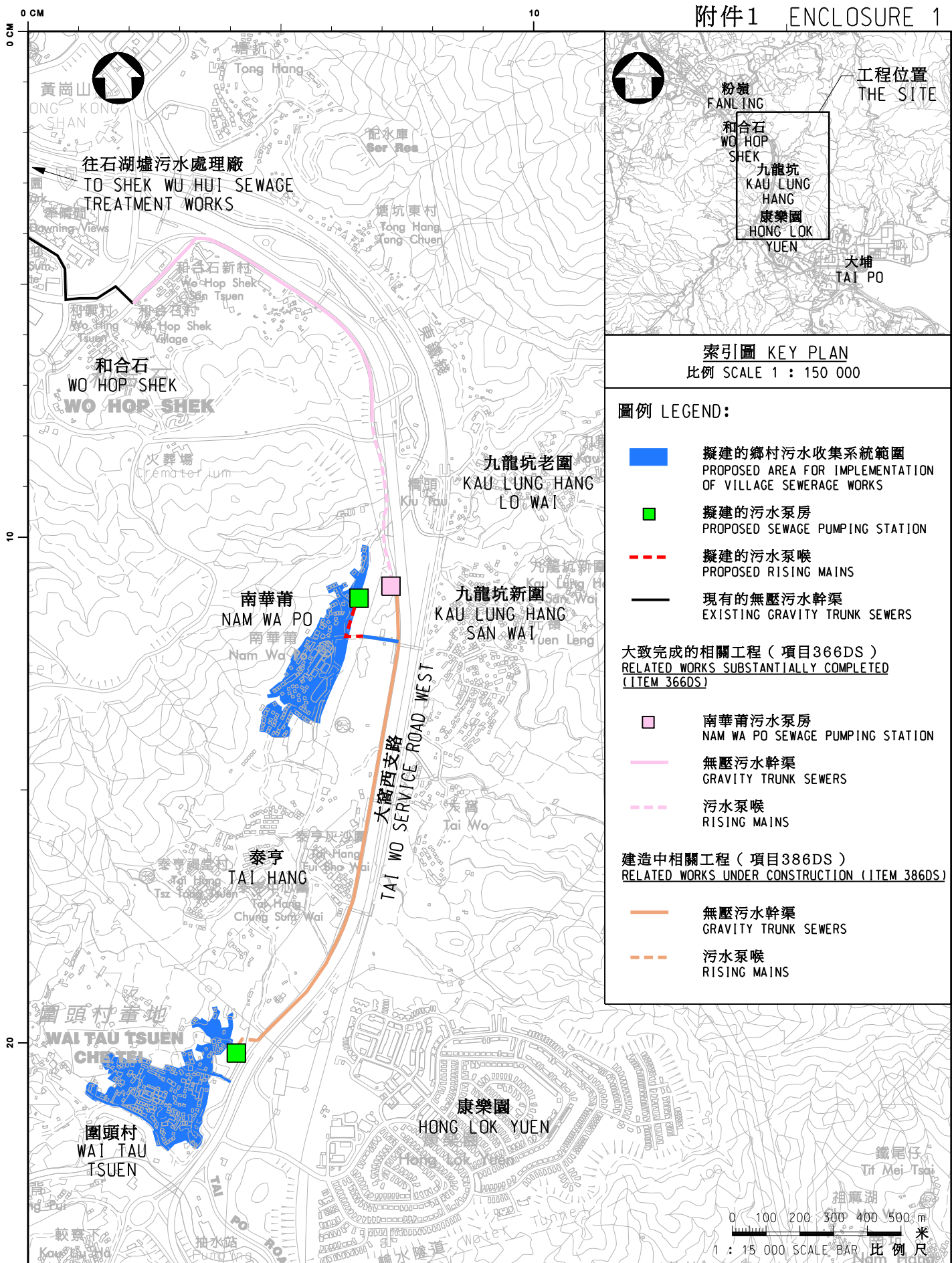
33. The proposed works will involve the felling of one tree. This tree to be felled is not an important tree⁶. We will incorporate planting proposals as part of the project, including an estimated quantity of 142 shrubs and 60 m² of grassed area.

34. We estimate that the proposed works will create about 90 jobs (75 for labourers and another 15 for professional/technical staff), providing a total employment of 3 850 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.



索引圖 KEY PLAN
比例 SCALE 1 : 150 000

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
- 現有的無壓污水幹渠
EXISTING GRAVITY TRUNK SEWERS

大致完成的相關工程 (項目366DS)
RELATED WORKS SUBSTANTIALLY COMPLETED (ITEM 366DS)

- 南華莆污水泵房
NAM WA PO SEWAGE PUMPING STATION
- 無壓污水幹渠
GRAVITY TRUNK SEWERS
- 污水泵喉
RISING MAINS

建造中相關工程 (項目386DS)
RELATED WORKS UNDER CONSTRUCTION (ITEM 386DS)

- 無壓污水幹渠
GRAVITY TRUNK SEWERS
- 污水泵喉
RISING MAINS



<p>PROVISIONAL SUBJECT TO AMENDMENT</p> <p>圖則名稱 drawing title 工務計劃項目第339DS號 - 北區污水收集系統第1階段第2C期 及第2階段第1期 PWP ITEM No. 339DS - NORTH DISTRICT SEWERAGE, STAGE 1 PHASE 2C AND STAGE 2 PHASE 1</p>	<p>繪畫 drawn 日期 date W. Y. HUI</p>	<p>日期 date</p>	<p>修改項目 description</p>	<p>簡簽 initial</p>
	<p>核對 checked 日期 date S. C. WONG</p>	<p>日期 date</p>	<p>圖則編號 drawing no. DCM/2012/128</p>	<p>比例 scale 如圖示 AS SHOWN</p>
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<p>CONSULTANTS MANAGEMENT DIVISION</p>				

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Enclosure 2 to PWSC(2013-14)14

339DS – North District sewerage, stage 1 phase 2C and stage 2 phase 1

**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)	Professional	-	-	-	0.4
		Technical	-	-	-	0.1
					Sub-total	0.5
(b)	Resident site staff costs (Note 3)	Professional	78	38	1.6	8.2
		Technical	560	14	1.6	20.0
					Sub-total	28.2
	Comprising –					
(i)	Consultants' fees for management of resident site staff				1.2	
(ii)	Remuneration of resident site staff				27.0	
					Total	28.7

* 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 **339DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

339DS – North District sewerage, stage 1 phase 2C and stage 2 phase 1

Breakdown of the land resumption and clearance costs

	\$ million	
(I) Estimated land resumption cost		21.45
(a) Agricultural land ex-gratia compensation in Nam Wa Po and Wai Tau Tsuen	21.45	
96 agricultural lots (with a total area of 5 044 m ²) will be resumed		
5 044 m ² x \$4,252 per m ² (see Notes 1 and 2)		
(II) Estimated clearance cost		0.64
(a) Ex-gratia allowance of crop compensation	0.45	
(b) Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.15	
(c) Ex-gratia allowance for “Tun Fu”	0.04	
(III) Contingency payment		2.21
(a) Contingency on the above costs	2.21	
(IV) Compensation for temporary occupation area (subject to Estate Surveyor’s valuation)		1.00
Total costs		25.3

Note:

- 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. 5,044m² of the land to be resumed in the project **339DS** 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 \$8,503.48 per square metre). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 96 lots in Nam Wa Po and Wai Tau Tsuen affected by **339DS** is \$4,252 per square metre.