

## **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 Ping Kong, Fu Tei Pai and Tai Wo”, to Category A at an estimated cost of \$226.8 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 Ping Kong, Fu Tei Pai and Tai Wo is a source of water pollution to the Ng Tung River nearby 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 **339DS** to Category A at an estimated cost of \$226.8 million in money-of-the-day (MOD) prices for implementing sewerage works in three unsewered areas in North District and Tai Po.

## PROJECT SCOPE AND NATURE

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

- (a) about 8.3 kilometres (km) of sewers for the three unsewered areas, namely Ping Kong, Fu Tei Pai and Tai Wo;
- (b) about 500 metres (m) of gravity trunk sewers along Tai Wo Service Road East;
- (c) two sewage pumping stations (SPSs), one at Ping Kong and the other at Tai Wo;
- (d) about 250 m of twin rising mains in association with construction of the two SPSs in (c) above; and
- (e) ancillary works.

— A site plan showing the proposed works of **339DS** 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 December 2011 for completion in November 2015.

5. We will retain the remainder of **339DS** in Category B, which covers further extension of the sewerage by about 41.5 km to 19 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 .....

## JUSTIFICATION

6. At present, the sewage from Ping Kong, Fu Tei Pai and Tai Wo is often treated and disposed of by means of private treatment facilities (such as septic tanks and soakaway systems). These facilities are often ineffective in removing pollutants due to their close proximity to watercourses<sup>1</sup> and inadequate maintenance<sup>2</sup>. This is detrimental to the water quality of the Ng Tung River nearby and the receiving waters of Deep Bay. Environmental hygiene in the vicinity is also adversely affected.

7. Under the North District Sewerage Master Plan, the Environmental Protection Department has planned to extend the sewerage to these three unsewered areas as long-term solutions. The proposed works aim to collect the sewage generated from these three unsewered areas and convey it to the Shek Wu Hui sewage treatment works for treatment before disposal. The significant reduction in the amount of pollutants discharged into the streams nearby and the receiving waters will bring about sustainable improvements to our water quality.

8. Based on the village properties survey results and the potential house development information within the three unsewered areas obtained in October 2010 and March 2011 respectively, the proposed sewerage facilities mentioned in paragraph 3 above will be able to serve some 480 village houses comprising about 380 existing houses, 70 planned houses and 30 potential houses<sup>3</sup>.

## FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be \$226.8 million in MOD prices (please see paragraph 10 below), broken down as follows –

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

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

<sup>3</sup> The 30 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.

		<b>\$ million</b>
(a)	Construction of sewers	98.9
(b)	Construction of gravity trunk sewers	16.2
(c)	Construction of two sewage pumping stations	34.8
	(i) civil works	25.8
	(ii) electrical and mechanical works	9.0
(d)	Construction of rising mains	1.1
(e)	Ancillary works	1.0
(f)	Environmental mitigation measures	4.2
(g)	Consultants' fees for	2.5
	(i) contract administration	1.1
	(ii) management of resident site staff	1.4
(h)	Remuneration of resident site staff	19.5
(i)	Contingencies	17.8
	Sub-total	196.0 (in September 2010 prices)
(j)	Provision for price adjustment	30.8
	Total	226.8 (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 2010)</b>	<b>Price adjustment factor</b>	<b>\$ million (MOD)</b>
2011 – 2012	9.7	1.04525	10.1
2012 – 2013	67.9	1.10143	74.8
2013 – 2014	77.6	1.16201	90.2
2014 – 2015	25.3	1.22592	31.0
2015 – 2016	9.7	1.29335	12.5
2016 – 2017	2.9	1.36448	4.0
2017 – 2018	2.9	1.43953	4.2
	196.0		226.8

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 2011 to 2018. 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 \$2.0 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 District Development and Environmental Improvement Committee of North District Council (DC) on 23 May 2005 in respect of the proposed works in Ping Kong and Fu Tei Pai. The committee supported the proposed works in principle, but requested the Administration to consider the comments and concerns raised by members, particularly on the existing arrangement that individual village house owners would need to complete the house-to-sewerage connection works for their premises at their cost. We attended subsequent meetings of the Committee on 18 July 2005 and 26 September 2005, as well as the meetings of North DC on 13 October 2005 and 9 December 2005 to explain the arrangements. At these meetings, we emphasised that the Government has all along been committed to improving the environment in rural areas and borne the capital cost of extending the public sewerage to serve these areas. The house-to-sewerage connections, however, would be made for exclusive use by the occupants. All sewer connection works within a lot boundary and associated maintenance are therefore private works that are the responsibility of the house owner. This arrangement has been applied to all property owners in Hong Kong on equal basis for years. Where feasible, our aim is to provide the branch sewer up to the lot boundary of a small house so as to facilitate the owner to carry out the house-to-sewerage connection works as far as possible.

14. We also consulted the Tai Po Rural Committee and the Environment, Housing and Works Committee of Tai Po DC on 11 May 2007 and 14 September 2007 respectively in respect of the proposed works in Tai Wo. Both committees supported the proposed works.

15. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation under four schemes between April 2008 and August 2009. Three of them met with no objections and were subsequently authorised between August 2008 and January 2011. The remaining scheme received three objections concerning land resumption and sewer alignment issues of the proposed works in Ping Kong. Having met with the objectors and considered their ground of the objections, we prepared the first, second and third amendment schemes and all objectors have withdrawn their objections unconditionally after we completed gazettal of these amendment schemes. Since all the objections have been resolved, the Director of Environmental Protection authorised the proposed works in September 2009.

16. We consulted the Legislative Council Panel on Environmental Affairs on 23 May 2011 on the proposed works. Members raised no objection to the proposed works. As regards Members' enquiries about the progress of village sewerage programmes, the village population involved, as well as the nature and amount of compensation to be offered under the proposed works, the Administration provided the supplementary information to the Panel on 3 June 2011.

## **ENVIRONMENTAL IMPLICATIONS**

17. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). We have completed the Environmental Reviews in 2003 and 2008 for the proposed works, which set out the mitigation measures necessary for the proposed works. With such mitigation measures in place, the proposed works would not have long-term environmental impacts.

18. 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(f) above a sum of \$4.2 million (in September 2010 prices) in the project estimates for implementing the environmental mitigation measures.

19. 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 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>4</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.

20. 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.

21. We estimate that the proposed works will generate in total about 48 370 tonnes of construction waste. Of these, we will reuse about 24 095 tonnes (50%) of inert construction waste on site and deliver 21 400 tonnes (44%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 2 875 tonnes (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 about \$940,000 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>5</sup> at landfills).

**/HERITAGE .....**

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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.

<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.



## HERITAGE IMPLICATIONS

22. 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.

## LAND ACQUISITION

23. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We have resumed 64 private agricultural lots and will resume another 48 lots (with a total area of about 6 643 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. The cost of land resumption and clearance is about \$22.93 million which has been or will be charged to **Head 701 – Land Acquisition**. A breakdown of the land resumption and clearance costs is at Enclosure 3.

## BACKGROUND INFORMATION

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

25. 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.

26. 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. The construction works of **219DS** and **330DS** were completed in December 2002 and January 2006 respectively.

27. 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 phase 2C and stage 2 phase 1” and **345DS** “North District sewerage, stage 2 part 2A”.

28. 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.

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

30. 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.

31. In January 2009, we upgraded part of **339DS** to Category A as **366DS** “Kau Lung Hang sewerage – trunk sewers, pumping station and rising mains” at an APE of \$103.2 million in MOD prices. The construction works commenced in February 2009 for completion by September 2012.

32. The proposed works will involve the felling of eight trees. All trees to be felled are not important trees<sup>6</sup>. We will incorporate planting proposals as part of the project, including estimated quantities of 210 shrubs and 50 m<sup>2</sup> of grassed area.

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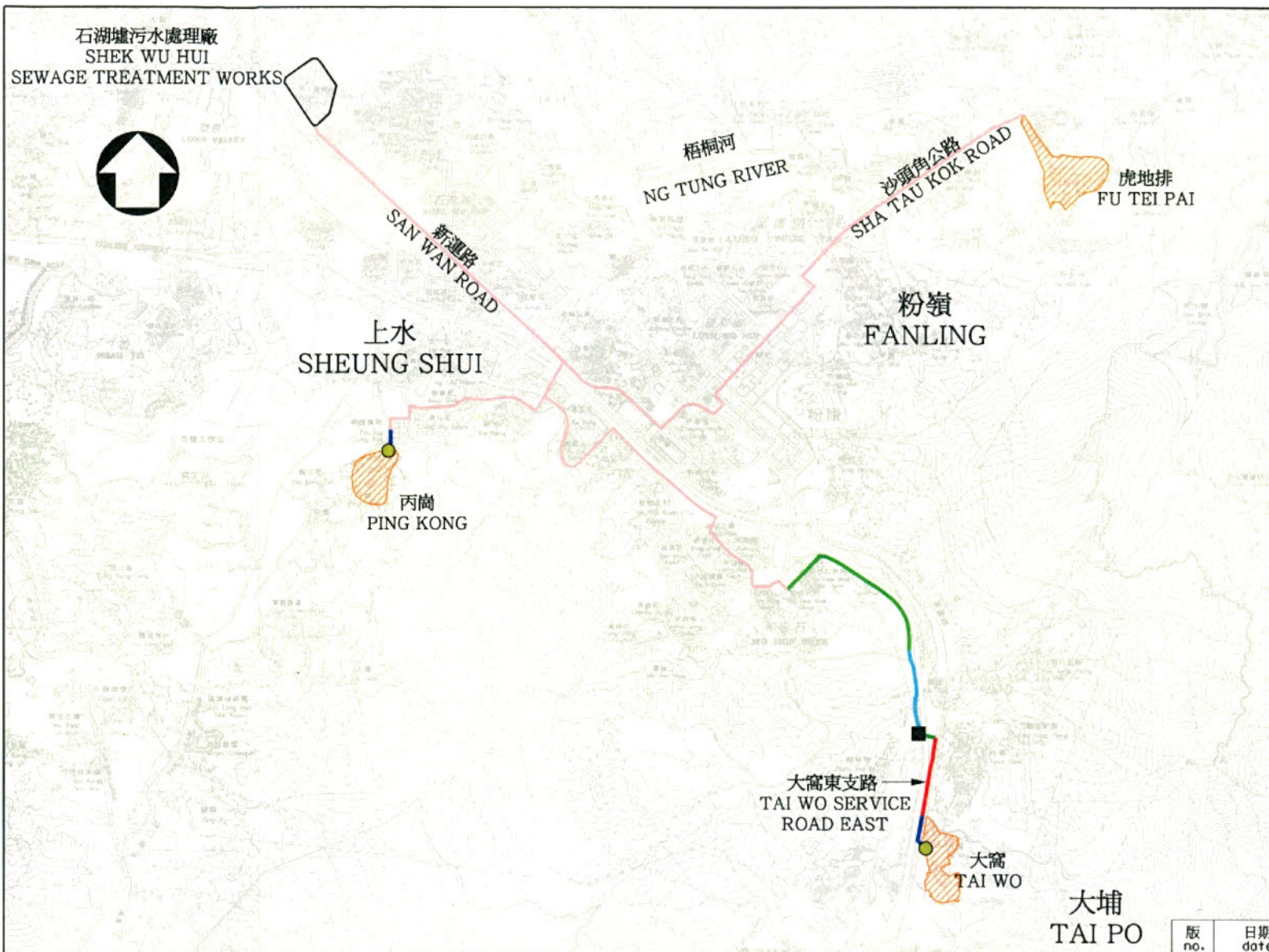
<sup>6</sup> “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (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.

33. We estimate that the proposed works will create about 78 jobs (63 for labourers and another 15 for professional/technical staff), providing a total employment of 3 150 man-months.

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Environment Bureau  
June 2011



**圖例**  
LEGEND:

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

**擬建工程**  
PROPOSED WORKS

▨ 擬建的鄉村污水收集系統範圍 \*  
PROPOSED VILLAGE SEWERAGE AREA \*

● 擬建的污水泵房  
PROPOSED SEWAGE PUMPING STATION

— 擬建的無壓污水幹渠  
PROPOSED GRAVITY TRUNK SEWERS

— 擬建的加壓污水管  
PROPOSED RISING MAINS

**建造中相關工程 (項目366DS)**  
RELATED WORKS UNDER CONSTRUCTION (ITEM 366DS)

— 無壓污水幹渠  
GRAVITY TRUNK SEWERS

— 加壓污水管  
RISING MAINS

■ 南華莆污水泵房  
NAM WA PO SEWAGE PUMPING STATION

**備註**  
REMARKS

\* 鄉村內的污水渠並不顯示以便清晰展現效果

\* DETAILS OF VILLAGE SEWERAGE NOT SHOWN FOR CLARITY

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

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## Enclosure 2 to PWSC(2011-12)20

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

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

			Estimated man-months	Average MPS* salary point	Multiplier <small>(Note 1)</small>	Estimated fee (\$ million)
(a)	Consultants' fees for contract administration <small>(Note 2)</small>	Professional	-	-	-	0.9
		Technical	-	-	-	0.2
					Sub-total	1.1
(b)	Resident site staff costs <sup>(Note 3)</sup>	Professional	108	38	1.6	10.1
		Technical	339	14	1.6	10.8
					Sub-total	20.9
Comprising –						
	(i) Consultants' fees for management of resident site staff				1.4	
	(ii) Remuneration of resident site staff				19.5	
					<b>Total</b>	<b>22.0</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 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 **339DS** to Category A.
3. The actual man-months and actual costs will only be known after 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**

		<b>\$ million</b>
<b>(I) Estimated resumption cost</b>		<b>20.09</b>
(a) Agricultural land ex-gratia compensation in Fu Tei Pai	7.75	
<p>64 agricultural lots (with a total area of 2 902 m<sup>2</sup>) resumed vide G.N. 1085 dated 25.2.2010</p> <p>2 902 m<sup>2</sup> x \$2,669/m<sup>2</sup> (see Note 1)</p>		
(b) Agricultural land ex-gratia compensation in Ping Kong and Tai Wo	12.34	
<p>48 agricultural lots (with a total area of 3 741 m<sup>2</sup>) will be resumed</p> <p>3 741 m<sup>2</sup> x \$3,299/m<sup>2</sup> (see Notes 2 and 3)</p>		
<b>(II) Estimated clearance cost</b>		<b>0.49</b>
(a) Ex-gratia allowance of crop compensation	0.32	
(b) Ex-gratia allowance for farm structures and miscellaneous permanent improvements to farms	0.11	
(c) Ex-gratia allowance for “Tun Fu”	0.06	
<b>(III) Interest and Contingency Payment</b>		<b>2.06</b>
(a) Interest payment on various ex-gratia compensations for private land	0.0001	
(b) Contingency on the above costs	2.06	
<b>(IV) Compensation for temporary occupation area (by valuation)</b>		<b>0.29</b>
<b>Total costs</b>		<b>22.93</b>

## Enclosure 3 to PWSC(2011-12)20

### Notes

1. In accordance with G.N. 1739 dated 16 March 2010 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 \$496 per square foot (or \$5,338 per square metre). Hence the ex-gratia compensation rate adopted for resuming the 64 lots in Fu Tei Pai affected by **339DS** is \$2,669 per square metre.
2. 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. Most of the land to be resumed in the project **339DS** is agricultural land currently within Zone C, while the remaining land is currently within Zone D. The land required is for implementing sewerage works, which are for local improvement. We will seek approval from the Committee on Planning and Land Development<sup>i</sup> to upgrade the ex-gratia compensation rate for the land concerned from Zone D to Zone C.
3. In accordance with G.N. 1888 dated 14 March 2011 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 \$613 per square foot (or \$6,598 per square metre). Hence the ex-gratia compensation rate used for estimating the resumption cost of the 48 lots in Ping Kong and Tai Wo affected by **339DS** is \$3,299 per square metre.

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<sup>i</sup> The Committee on Planning and Land Development is an internal committee chaired by the Secretary for Development and comprising representatives from relevant Bureaux and Departments. One of its functions is to consider and review policies on production, acquisition, use and disposal of land.