For discussion **PWSC(2005-06)29**
on 23 November 2005

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
215DS – Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers

Members are invited to recommend to Finance Committee the upgrading of **215DS** to Category A at an estimated cost of $389.4 million in money-of-the-day prices for provision of public sewerage at Kam Tin and Nam Sang Wai and upgrading of the existing sewers at Au Tau, Yuen Long.

PROBLEM

There is no public sewerage at Kam Tin and Nam Sang Wai. The existing sewerage at Au Tau is inadequate to cope with the increasing population in the area.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade **215DS** to Category A at an estimated cost of $389.4 million in money-of-the-day (MOD) prices for provision of public sewerage at Kam Tin and Nam Sang Wai and upgrading of the existing sewers at Au Tau, Yuen Long.

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PROJECT SCOPE AND NATURE

3. The scope of the proposed works comprises the construction of –

(a) about 7.5 kilometres (km) of trunk sewers in Au Tau, Kam Tin and Nam Sang Wai; and

(b) three sewage pumping stations and about 5.7 km of twin rising mains at Kam Tin and Nam Sang Wai.

4. We plan to start the construction works in December 2005 for completion in May 2009. A layout plan showing the proposed works is at Enclosure 1.

JUSTIFICATION

5. There is no public sewerage at Kam Tin and Nam Sang Wai. The sewage is treated and disposed of by means of privately owned sewage treatment plants or septic tank and soakaway systems[1]. We propose to construct trunk sewers to convey sewage in these areas to the existing Yuen Long Sewage Treatment Works (YLSTW) for treatment before disposal. Owing to the flat topography in Kam Tin and Nam Sang Wai areas and the presence of Kam Tin River and Shan Pui River, we would need three sewage pumping stations and rising mains at strategic locations to convey sewage to the YLSTW. The proposed works will cater for the planned housing development with a total projected population in-take of about 26 000 starting from 2009/10, and will provide the trunk sewer networks for future extension to the existing unsewered areas in Kam Tin and Nam Sang Wai.

6. The existing sewers at Au Tau are unable to cope with the sewage flow arising from a projected population of about 12 000 in the upcoming residential developments in the area. We therefore propose to upgrade some of the existing trunk sewers at Au Tau to cope with the demand.

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[1] Septic tank and soakaway systems operate by utilising the microorganisms in the septic tank to degrade the suspended solids in the wastewater. Effluent leaving the septic tank would then percolate through the gravel in the soakaway pit where the organic pollutants and pathogens will be further degraded and removed by the microorganisms in a natural manner. Sludge generated in the septic tank will be tankered away periodically.

FINANCIAL IMPLICATIONS

7. We estimate the capital cost of this project to be $389.4 million in MOD prices (see paragraph 8 below), made up as follows –

		$ million	
(a)	Trunk sewers		91.8
	(i) by open trench method (about 6.1 km)	42.3	
	(ii) by trenchless method[2] (about 1.4 km)	49.5	
(b)	Twin rising mains		108.2
	(i) by open trench method (about 4.8 km)	54.0	
	(ii) by trenchless method (about 0.9 km)	54.2	
(c)	Three sewage pumping stations		132.2
	(i) civil works	83.7	
	(ii) electrical and mechanical works	48.5	
(d)	Consultants' fees for		23.5
	(i) contract administration	3.6	
	(ii) site supervision	16.9	
	(iii) environmental monitoring and audit	2.0	
	(iv) investigation and surveys for environmental monitoring and audit	1.0	

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[2] Trenchless method refers to techniques of constructing underground pipes without opening up the road surface along the alignments of the pipes, such as pipe-jacking, micro-tunnelling or boring. Although the method is more expensive than the conventional open cut method, the trenchless method, if feasible, is preferred for carrying out works at busy road sections since it will greatly reduce the need for road opening and thus minimise disruption to traffic during the construction phase.

		$ million	
(e)	Environmental mitigation measures	5.8	
(f)	Contingencies	26.6	
	Sub-total	388.1	(in September 2005 prices)
(g)	Provision for price adjustment	1.3	
	Total	389.4	(in MOD prices)

A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

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

Year	**$ million (Sept 2005)**	**Price adjustment factor**	**$ million (MOD)**
2005 – 2006	7.0	1.00000	7.0
2006 – 2007	67.7	1.00125	67.8
2007 – 2008	110.4	1.00125	110.5
2008 – 2009	111.0	1.00125	111.1
2009 – 2010	52.7	1.00125	52.8
2010 – 2011	29.1	1.01627	29.6
2011 – 2012	10.2	1.03659	10.6
	388.1		389.4

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9. We have derived the MOD estimate on the basis of the Government's latest forecast of the trend rate of change in the prices of the public sector building and construction output for the period from 2005 to 2012. We will implement the works under two contracts: a civil works contract and an electrical and mechanical (E&M) works contract. We will tender the civil works on a remeasurement basis because of uncertain ground conditions. The civil works contract will provide for price adjustments because the contract period will exceed 21 months. We will tender the E&M works contract for the supply and installation of E&M equipment for the sewage pumping stations on a lump-sum basis without any price adjustment.

10. We estimate the annual recurrent expenditure arising from the proposed works to be about $4.5 million.

11. Based on the current level of expenditure on operation and maintenance of sewerage facilities, the proposed works by themselves will lead to an increase in the recurrent cost of providing sewage services by about 0.28%, which will need to be taken into account in determining future sewage charges.

PUBLIC CONSULTATION

12. We consulted the Kam Tin Rural Committee and the Shap Pat Heung Rural Committee on 30 April 2004 and 7 May 2004 respectively. They had no objection to the implementation of the proposed works. On 17 March 2004 and 17 May 2004, we consulted the Environmental Improvement Committee of the Yuen Long District Council on the project. Members supported in principle the implementation of the proposed works.

13. We gazetted the proposed Kam Tin trunk sewerage phase 1 works of the project under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 16 July 2004. Three objections were received during the statutory objection period. One objector objected that the sewer passed through his land lot where his application for land rectification was being processed by the District Lands Office, Yuen Long (DLO/YL). He withdrew his objection following the completion of boundary rectification by DLO/YL. We then gazetted the amended land resumption plan on 20 May 2005 to remove this part from the land resumption boundary. No further objection to the amended resumption plan was received. Details of the other two unresolved objections are as follows –

/(a) .....

(a) one objector was concerned that the proposed sewerage works would affect the vehicular access to his lots. We explained to him that the existing access would be maintained during the construction stage and that temporary traffic diversions would be carefully arranged to minimise traffic impacts. The objector maintained his objection to the proposed project; and

(b) the other objector is a tenant who operates a motorcar workshop on private agricultural land under a short term waiver arrangement. As part of his workshop will be cleared for the construction of the proposed sewage pumping station, we accepted his request to provide an alternative access to the remaining portion of his workshop. He also requested us to assist him in getting the adjacent Government land for his business. We declined this request as the Government land would only be offered through open tender. Whilst the objector replied that he would withdraw his objection, he continued requesting us to sell/lease the adjacent land to him.

14. After considering the objections, the Chief Executive in Council authorised the proposed works without modification on 8 November 2005.

15. We consulted the Legislative Council Panel on Environmental Affairs on the proposed works on 24 March 2005. Members supported the implementation of the proposed project.

ENVIRONMENTAL IMPLICATIONS

16. Among the proposed works, only a section of the proposed sewerage works at Kam Tin and Nam Sang Wai constitutes a number of designated projects under the Environmental Impact Assessment (EIA) Ordinance. We completed an EIA report, which concluded that the project would not have any significant residual environmental impacts with full implementation of the recommended mitigation measures and the environmental monitoring and auditing programme. An environmental permit under the EIA Ordinance has been obtained on 29 June 2005.

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We will implement the mitigation measures as recommended in the study. We will incorporate pollution control measures in the works contracts to control noise, dust and site run-off during the construction stage. For long term odour impact, we will install deodorisation facilities in the sewage pumping stations and dose chemicals to control sewage septicity. We will conduct environmental monitoring and auditing to ascertain the effectiveness of the mitigation measures. We have included about $5.8 million (in September 2005 prices) in the project estimate for implementation of the environmental mitigation measures.

17. We have considered ways of minimising construction and demolition (C&D) materials and maximising the use of recycled C&D materials. We will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will require the contractor to reuse the excavated material as filling material on site or on other construction sites as far as possible. To further minimise the generation of C&D materials, we will encourage the contractor to use non-timber formwork and recyclable material for temporary works. We will control the disposal of public fill and C&D waste to public fill reception facilities and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

18. We estimate that the project will generate about 206 800 tonnes of C&D materials. Of these, we will reuse about 152 300 tonnes (73.6%) on site, and deliver 38 400 tonnes (18.6%) to public fill reception facilities[3] for subsequent reuse. In addition, we will dispose of 16 100 tonnes (7.8%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about $3.0 million for this project (based on an unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[4] at landfills).

/**TRAFFIC** .....

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[3] Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

[4] 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 $90/$m^3$), nor the cost to provide new landfills, (which is likely to be more expensive) when the existing ones are filled.

TRAFFIC IMPLICATIONS

19. We have completed a traffic impact assessment and worked out mitigation measures to minimise possible disruption to traffic during construction. To minimise the traffic impacts on the busy areas at Kam Tin and Au Tau, we have carefully selected the alignments of the proposed sewers and rising mains so that all existing vehicular entry and exit points, pedestrian routes and pedestrian crossing facilities will be maintained, and temporary traffic arrangements will be designed according to prevailing site constraints and up to the required standards. Existing public transport routes will not be affected by the works. A telephone hotline will be set up for public enquiries or complaints. Construction works in busy road sections will be carried out in non-peak hours. To expedite works progress without inducing unacceptable nuisance to the public, we will adopt the trenchless method to construct sewers at critical locations such as at Kam Tin Road near Ko Po Tsuen, the Castle Peak Road – Au Tau Section, and the Yuen Long Highway at Au Tau.

20. We will establish a Traffic Management Liaison Group (TMLG) under the contract to discuss, scrutinise and agree on the proposed temporary traffic management measures. The Yuen Long District Council Members and representatives from the Transport Department, Hong Kong Police Force, Highways Department, District Offices, various public transport operators, utility undertakings and the rural committees concerned will be invited to attend the TMLG meetings. The TMLG will also take into account all relevant factors such as site restrictions, existing and future traffic conditions, pedestrian safety, access to building/shop fronts and provision of emergency vehicular access in working out the temporary traffic arrangements.

LAND ACQUISITION

21. We will resume about 0.5 hectares of private agricultural land. The land acquisition and clearance will affect one household involving four persons and 68 temporary structures. Under the existing policy, the Director of Housing will offer eligible families accommodation in public housing estates. We will charge the land acquisition and clearance costs, estimated at about $11.1 million, to **Head 701 - Land Acquisition**.

BACKGROUND INFORMATION

22. In January 1999, Environmental Protection Department completed the study “Review of Yuen Long and Kam Tin sewerage and sewage disposal requirements”. The study has recommended a package of sewerage improvement

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works to provide and upgrade the sewer systems in the areas to meet future development needs in the Northwest New Territories.

23. In July 1999, we created a Category D item at an estimated cost of $4.11 million in MOD prices under **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme" for engaging consultants to carry out the environmental impact assessment and the traffic impact assessment studies of the project. We started the studies in December 1999 and completed them in March 2003. We have completed the detailed design for the proposed works using in-house resources.

24. The proposed sewerage works will involve removal of 35 trees including five trees to be felled and 30 trees to be replanted within the project site. All trees to be removed are not important trees[5]. We will incorporate a planting proposal as part of the project, including estimated quantities of about 285 trees and 35 600 shrubs.

25. We estimate that the proposed works will create about 242 jobs (210 for labourers and another 32 for professional/technical staff) providing a total employment of 7 820 man-months.

Environment, Transport and Works Bureau
November 2005

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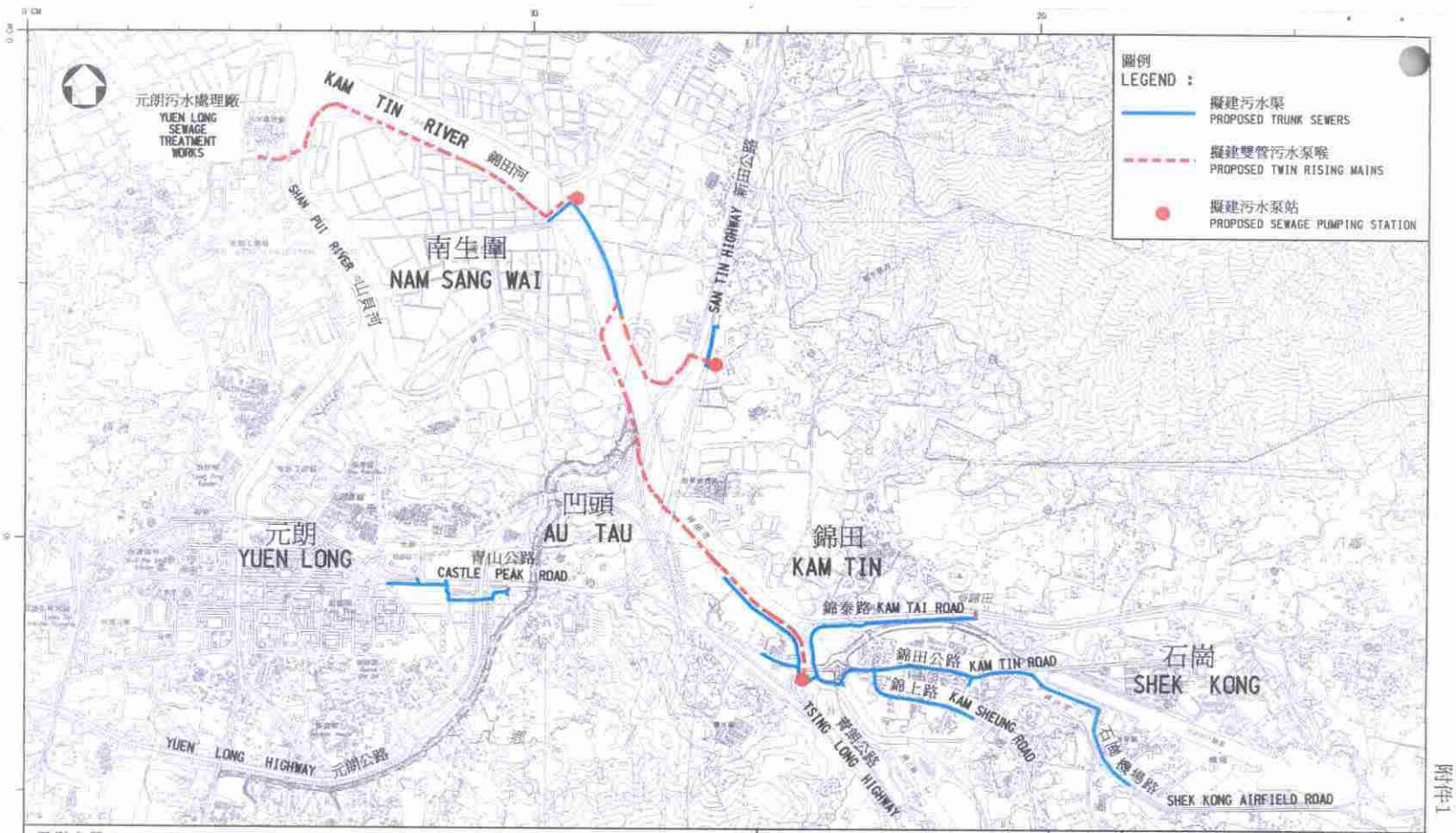
[5] Important trees include trees on the Register of Old and Valuable Trees, and any other trees which meet one or more of the following criteria –

(a) trees over 100 years old;
(b) trees of cultural, historical or memorable significance;
(c) trees of precious or rare species;
(d) trees of outstanding form; or
(e) trees with trunk diameter exceeding one metre (measured at one metre above ground level).



圖則名稱 drawing title

工務工程計劃第215DS號
元朗及錦田污水收集及排放計劃
- 錦田污水主幹渠第1期及凹頭污水幹渠工程

PWP ITEM NO.215DS
YUEN LONG AND KAM TIN SEWERAGE AND SEWAGE DISPOSAL
- KAM TIN TRUNK SEWERAGE PHASE 1 AND AU TAU TRUNK SEWERS

繪畫 drawn	SIGNED	K. F. NG	日期 date 31AUG2005
核對 checked	SIGNED	S. K. LEUNG	日期 date 01SEP2005
批核 approved	SIGNED	K. T. LAM	日期 date 01SEP2005
部門 office	污水工程部 SEWERAGE PROJECTS DIVISION		

圖則編號 drawing no. DDN/215DS/9979

比例 scale N.T.S.

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

附件1 ENCLOSURE 1

215DS – Yuen Long and Kam Tin sewerage and sewage disposal – Kam Tin trunk sewerage phase 1 and Au Tau trunk sewers

Breakdown of estimates for consultants' fees

Consultants' staff costs (Note 2)			**Estimated man-months**	**Average MPS* salary point**	**Multiplier** (Note 1)	**Estimated Fee ($million)**
(a)	Contract administration	Professional	28	38	2.0	3.0
		Technical	17	14	2.0	0.6
(b)	Site supervision by resident site staff employed by the consultants	Professional	89	38	1.6	7.7
		Technical	319	14	1.6	9.2
(c)	Environmental monitoring and audit during construction	Professional	11	38	2.0	1.2
		Technical	22	14	2.0	0.8
					Sub-total	22.5
Investigation and surveys						
(d)	Environmental monitoring and audit					1.0
					Sub-total	1.0
					Total consultants' fees (Note 3)	23.5

* MPS = Master Pay Scale

Notes

1. A multiplier factor of 2.0 is applied to the average MPS point to estimate the full staff costs including the consultant's overheads and profit, as the staff will be employed in the consultant's offices. A multiplier of 1.6 is applied in the case of resident site staff supplied by the consultants. (As at 1 January 2005, MPS Pt. 38 = $54,255 per month and MPS Pt. 14 = $18,010 per month).

2. The consultants' staff costs include contract administration, site supervision by resident site staff employed by the consultants, and supervision of investigation works and environmental monitoring works.

3. We will only know the actual man-months and actual fees when we have selected the consultant through the usual competitive lump-sum fee bid system.