For discussion **PWSC (2006-07)52**
on 19 December 2006

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

Head 704 – DRAINAGE
Environmental Protection - Sewerage and sewage treatment
339DS - North District sewerage, stage 1 phases 2B and 2C and stage 2 phase 1

Members are invited to recommend to Finance Committee –

(a) the upgrading of part of **339DS**, entitled "North District sewerage, stage 1 phase 2B", to Category A at an estimated cost of $130.0 million in money-of-the-day prices; and

(b) the retention of the remainder of **339DS**, retitled "North District sewerage, stage 1 phase 2C and stage 2 phase 1", in Category B.

PROBLEM

Inadequately treated domestic sewage from unsewered areas in North District is discharged into nearby watercourses and contributes to water pollution in Deep Bay.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, Transport and Works, proposes to upgrade part of **339DS** to Category A at an estimated cost of $130.0 million in money-of-the-day (MOD) prices for implementing the North District sewerage, stage 1 phase 2B works.

/PROJECT .....

PROJECT SCOPE AND NATURE

3. The part of the project proposed to be upgraded to Category A comprises the construction of –

(a) about 11 kilometres (km) of sewers, ranging from 150 millimetres (mm) to 400 mm in diameter for 12 unsewered areas[1] in North District;

(b) three sewage pumping stations, respectively in San Wai, Tung Kok Wai and Wing Ning Tsuen; and

(c) about 1.4 km of rising mains, ranging from 100 mm to 250 mm in diameter, in association with the construction of the three sewage pumping stations in (b) above.

A location plan is at Enclosure 1.

4. The remainder of **339DS** proposed for retention in Category B comprises –

(a) construction of stage 1 phase 2C sewerage works for the provision of public sewerage to 15 unsewered areas in North District; and

(b) construction of stage 2 phase 1 sewerage works for the laying of about four kilometres of trunk sewer at Tai Wo Service Road West and Tai Wo Service Road East between Fanling and Tai Po and provision of public sewerage to seven unsewered areas in Tai Po District.

5. We plan to start the construction works in paragraph 3 above in March 2007 for completion in November 2010. We will continue with the planning and design for the remaining works under **339DS**.

/JUSTIFICATION .....

[1] The villages covered by the proposed works include San Tong Po, Kan Lung Tsuen, San Wai, San Uk Tsuen, Ma Mei Ha, Ma Mei Ha Leng Tsui, Tung Kok Wai, Lo Wai, Tsz Tong Tsuen, Wing Ning Tsuen, Wing Ning Wai and Ma Wat Wai.

JUSTIFICATION

6. At present, domestic sewage from unsewered areas in North District is discharged into nearby watercourses after treatment by private treatment facilities. Most of these private treatment facilities are septic tanks and soakaway systems in village houses. The facilities in these areas are often ineffective in removing pollutants due to their close proximity to watercourses[2] and inadequate maintenance[3]. Sewage discharged from these unsewered areas is a source of pollution to the existing watercourses and the receiving waters at Deep Bay.

7. In 1994, the Environmental Protection Department completed the North District Sewerage Master Plan Study (the Study) which reviewed the sewerage requirement in the North District. As long-term measures to address the water pollution problem in this district, the Study recommended, among others, the extension of the existing trunk sewer along Castle Peak Road and Sha Tau Kok Road, and provision of pumping stations and village sewerage to collect and convey sewage from the unsewered areas in North District to the Shek Wu Hui sewage treatment plant for proper treatment and disposal. Apart from the proposed works in North District, the Study also recommended the provision of sewerage for seven unsewered areas in the northern part of Tai Po District as the sewage generated from these unsewered areas is another source of pollution of the watercourses in North District. Upon completion of the proposed works recommended under the Study, we would be able to alleviate the water pollution problem in North District.

8. Upon completion, the sewerage facilities in paragraph 3 will serve about 11 300 people in the 12 unsewered areas.

FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be $130.0 million in MOD prices (see paragraph 10 below), made up as follows –

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[2] Soakaway systems operate by allowing the effluent to percolate through the gravel so that pollutants would be removed in a natural manner. However, if a system is located in an area where the underground water table is high such as an area in close proximity to watercourses, it cannot function properly.

[3] Inadequate maintenance of septic tanks or soakaway systems would affect the pollutant removal efficiency of a system and may even lead to an overflow of effluent.

			$ million		
(a)	Sewers and rising mains			65.0	
(b)	Sewage pumping stations			29.6	
	(i)	civil engineering works	21.0		
	(ii)	electrical and mechanical works	8.6		
(c)	Environmental mitigation measures			4.0	
(d)	Consultants' fees			17.4	
	(i)	construction stage	1.8		
	(ii)	resident site staff	15.6		
(e)	Contingency			9.0	
		Sub-total		125.0	(in September 2006 prices)
(f)	Provision for price adjustment			5.0	
		Total		130.0	(in MOD prices)

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

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

Year	**$ million (Sept 2006)**	**Price adjustment factor**	**$ million (MOD)**
2007 – 2008	24.7	1.01250	25.0
2008 – 2009	31.4	1.02769	32.3

/2009 – 2010 .....

Year	$ million (Sept 2006)	Price adjustment factor	$ million (MOD)
2009 – 2010	37.6	1.04310	39.2
2010 – 2011	18.8	1.05875	19.9
2011 – 2012	10.0	1.08257	10.8
2012 – 2013	2.5	1.10964	2.8
	125.0		130.0

11. We have derived the MOD estimate on the basis of the Government's latest forecasts of trend rate of change in the prices of public sector building and construction output for the period from 2007 to 2013. We will implement the works under two contracts: a civil engineering works contract and an electrical and mechanical (E&M) works contract. We will tender the proposed civil engineering works as a re-measurement contract because of the uncertainties of the existence and location of various underground utilities. The contract will provide for price adjustments because the contract period will exceed 21 months. We will tender the proposed E&M works on a fixed-price lump-sum basis because we can clearly define the scope of works in advance.

12. We estimate the annual recurrent expenditure arising from the proposed works to be $2.5 million.

13. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works by themselves will lead to an increase in the recurrent cost of providing sewage services by about 0.14%, which will need to be taken into account in determining sewage charges.

PUBLIC CONSULTATION

14. We consulted the District Development and Environmental Improvement Committee of the North District Council (the Committee) on 23 May 2005 on the proposed sewerage works for the unsewered areas in the North District. Members supported the implementation of the proposed works. Subsequent to the meeting of 23 May 2005, some members of the Committee

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reflected that a number of the villages did not agree to the current policy that individual house owners would need to complete and pay for the final sewer connection works for their own houses. They requested the Government to consider constructing the final sewer connections for individual houses as part of the proposed sewerage works. We attended the Committee meeting on 18 July 2005 and the North District Council meetings on 13 October and 8 December 2005, explaining to the members that as the sewer connections would be made within private property and would be for private use, it would be neither fair nor reasonable for the taxpayer to bear the cost. Furthermore, for the Government to undertake the work could raise long-term liability issues in respect of maintenance. Taking these factors into account, and also considering that the value of the improvement to the property would accrue to the property owner, it is a firmly established policy that the property owners should carry out the connections at their own cost.

15. We gazetted the proposed works in paragraph 3 above under the Water Pollution Control (Sewerage) Regulation [WPC(S)R] on 9 December 2005. We received 12 objections during the statutory objection period. All the objections were related to land resumption and sewer alignment issues. None of them had to do with the policy that property owners have to carry out the connections at their own cost. After several meetings with the objectors, seven of them withdrew their objections unconditionally. Having considered the ground of the remaining five objections, we gazetted two amendments on 18 August 2006 and 15 September 2006 respectively in order to address the remaining objectors' concerns. Subsequently, these objectors withdrew their objections unconditionally. The Director of Environmental Protection authorised the proposed works in accordance with the WPC(S)R on 24 November 2006.

16. We consulted the Legislative Council Panel on Environmental Affairs on 27 November 2006 on the proposed works. Members raised no objection to our plan to submit the funding proposal to the Public Works Subcommittee.

ENVIRONMENTAL IMPLICATIONS

17. We completed an Environmental Review for the North District Sewerage Master Plan Study in 1994. The Environmental Review concluded that the proposed works would not cause unacceptable environmental impact and no Environmental Impact Assessment was required. Notwithstanding the above, in April 2006 we completed an environmental assessment report which reaffirmed that environmental impacts identified were generally within acceptable environmental standards. For short-term impact during construction, we will

control noise, dust and site run-off within established standards and guidelines through implementation of mitigation measures, such as the use of temporary noise barriers and silenced construction plant to reduce noise generation, water-spraying to reduce emission of fugitive dust and strict control on diversion of site run-off in the works contract.

18. We estimated the cost of implementing the environmental mitigation measures to be $4.0 million which has been included in the overall project estimate.

19. We have given due consideration to the need to minimise the construction and demolition (C&D) materials in the planning and design stages of the proposed works. We will require the contractor to reuse inert C&D materials (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of C&D materials to public fill reception facilities[4]. We will encourage the contractor to maximise the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimise the generation of construction waste.

20. In addition, 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 control the disposal of public fill and C&D waste to designated 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.

21. We estimate that the project will generate about 52 600 tonnes of C&D materials. Of these, we will reuse about 45 200 tonnes (86%) on site, and deliver 6 900 tonnes (13%) to public fill reception facilities for subsequent reuse. In addition, we will dispose of 500 tonnes (1%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites is estimated to be about $250,000 for this project (based on a unit cost of $27/tonne for disposal at public fill reception facilities and $125/tonne[5] at landfills.)

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[4] 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.

[5] 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 $90/$m^3$), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

LAND ACQUISITION

22. The proposed works require resumption of about 2 300 square metres of agricultural land. The project will not involve any clearance of dwellings. We will charge the resumption and clearance cost for the project, estimated to be $8.2 million**,** to **Head 701 – Land Acquisition**.

BACKGROUND INFORMATION

23. We completed a comprehensive study of the sewerage systems in the North District under **113DS** "North District sewerage master plan – consultants' fees and investigation" in August 1994. We upgraded **203DS** "North District sewerage" to Category B in October 1994 to implement sewerage works recommended under the study 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. We funded this consultancy under block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme".

25. In December 1998, we upgraded part of **203DS** to Category A as **219DS** "North District sewerage, stage 1 phase 1A" at an estimated cost of $124.7 million. The construction works started in November 1999 and were completed in December 2002.

26. In February 2002, we upgraded another part of **203DS** to Category A as **330DS** "North District sewerage, stage 1 phases 1B and 2A" at an estimated cost of $125.1 million. The construction works started in April 2002 and were completed in January 2006.

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, we retained part of **203DS** in Category B and re-designated it as **339DS**, the scope and the implementation programme of which are given in paragraphs 3 to 5 above. In September 2005, we upgraded part of the remainder of **203DS** to Category B and re-designated it as **345DS** entitled "North District sewerage stage 2 part 2A" for provision of public sewerage to 14 unsewered areas in North District. We plan to commence construction in February 2011 for

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completion in June 2015. The rest of **203DS** which will provide public sewerage to 18 unsewered areas in North District was also upgraded to Category B in September 2006.

28. We estimate that the proposed stage 1 phase 2B works will create about 79 jobs (64 for labourers and another 15 for professional/technical staff) providing a total employment of 2 772 man-months.

29. Of the 44 trees within the project boundary, 32 trees will be preserved. The proposed sewerage works will involve the removal of 12 common trees including nine trees to be felled and three trees to be replanted within the project site. All trees to be removed are not important trees[6]. We will incorporate a planting proposal as part of the project, including estimated quantities of 50 trees and 250 shrubs.

Environment, Transport and Works Bureau
December 2006

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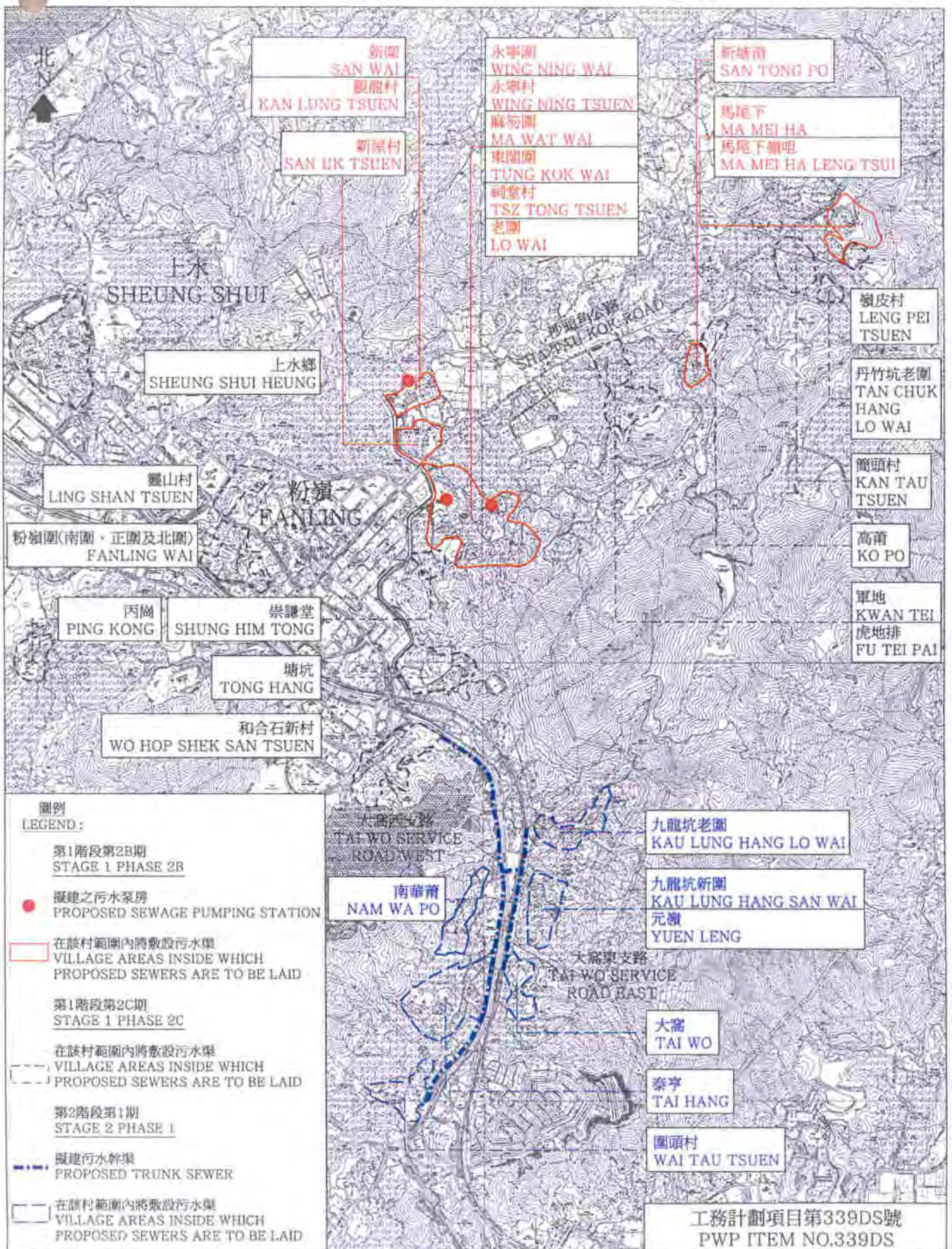
[6] "Important trees" include trees on the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –
(a) trees over 100 years old;
(b) trees of cultural, historical or memorable significance; e.g. Fung Shui tree, tree as landmark of monastery or heritage 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 size, 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 (measured at 1.3 metre above ground level), or with height/canopy spread equal or exceeding 25m.



工務計劃項目第339DS號
PWP ITEM NO.339DS

圖則名稱 drawing title

北區污水收集系統第1階段
第2B及2C期及第2階段第1期
NORTH DISTRICT SEWERAGE
STAGE 1 PHASES 2B & 2C
AND STAGE 2 PHASE 1

繪圖 drawn	ORIGINAL SIGNED C.W. CHAN	日期 date 13-09-2006
核對 checked	ORIGINAL SIGNED A. HO	日期 date 13-09-2006
批核 approved	ORIGINAL SIGNED S.S. LAM	日期 date 13-09-2006

部門 office 顧問工程管理部
CONSULTANTS MANAGEMENT DIVISION

圖則編號 drawing no. DCM/2006/069

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

Enclosure 2 to PWSC(2006-07)52

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

Breakdown of estimate for consultants' fees

Consultants' staff costs			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for construction stage	Professional	13	38	1.6	1.1
		Technical	24	14	1.6	0.7
(b)	Site supervision by resident site staff employed by the consultants	Professional	100	38	1.6	8.7
		Technical	240	14	1.6	6.9
					Total consultants' staff costs (Note 2)	17.4

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to arrive at the full staff costs, including the consultants' overheads and profit, for staff employed in the consultant's offices. MPS points 38 and 14 are used as the average MPS salary points for professionals and technical staff respectively. (As at 1 January 2006, MPS point 38 = $54,255 per month and MPS point 14 = $18,010 per month)

2. The consultants' fees for contract administration are estimated in accordance with the existing consultancy agreement for the design and construction of the project. We will only know the actual man-months and actual costs for site supervision after completion of the works.