For discussion
on 31 May 2017

PWSC(2017-18)6

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
380DS – Construction of dry weather flow interceptor at Cherry Street box culvert
389DS – Upgrading of West Kowloon and Tsuen Wan sewerage
393DS – Rehabilitation of trunk sewers in Kowloon, Sha Tin and Sai Kung
394DS – Upgrading of Kwun Tong preliminary treatment works
413DS – Enhancement works for Kwun Tong sewage pumping station

Members are invited to recommend to the Finance Committee –

(a) the upgrading of **380DS**, **393DS**, **394DS** and **413DS** to Category A at estimated costs of $664.6 million, $678.5 million, $349.9 million and $1,054.4 million in money-of-the-day (MOD) prices respectively;

(b) the upgrading of part of **389DS**, entitled "Upgrading of West Kowloon and Tsuen Wan sewerage – Phase 1", to Category A at estimated cost of $277.4 million in MOD prices; and

(c) the retention of the remainder of **389DS** in Category B.

/PROBLEM …..

PROBLEM

We need to improve water quality and reduce odour in Victoria Harbour as soon as possible by means of dry weather flow inceptors and sewer rehabilitation to reduce residual pollution discharge. In addition, we need to upgrade and enhance the sewage treatment facilities in Kwun Tong to meet the development needs in East Kowloon.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for the Environment, proposes to upgrade the following projects to Category A –

(a) **380DS** at an estimated cost of $664.6 million in MOD prices for the construction of dry weather flow interceptor at Cherry Street box culvert;

(b) part of **389DS** at an estimated cost of $277.4 million in MOD prices for the phase 1 upgrading of West Kowloon and Tsuen Wan sewerage;

(c) **393DS** at an estimated cost of $678.5 million in MOD prices for the rehabilitation of trunk sewers in Kowloon, Sha Tin and Sai Kung;

(d) **394DS** at an estimated cost of $349.9 million in MOD prices for the upgrading of Kwun Tong preliminary treatment works; and

(e) **413DS** at an estimated cost of $1,054.4 million in MOD prices for the enhancement works for Kwun Tong sewage pumping station.

3. Details of the above proposals are provided at Enclosures 1 to 5 respectively.

Environment Bureau
May 2017

380DS – Construction of dry weather flow interceptor at Cherry Street box culvert

PROJECT SCOPE AND NATURE

The proposed scope of works comprises the construction of –

(a) an underground dry weather flow interceptor[1] (DWFI) with automatic penstocks[2] at Cherry Street box culvert (CSBC);

(b) a pumping station;

(c) an underground stormwater bypass box culvert;

(d) about 270 metres (m) of underground twin rising main from the pumping station in (b) above to an existing sewer at Lin Cheung Road; and

(e) the ancillary works[3].

2. A site plan and a photomontage of the proposed works are at Annex 1 and Annex 2 to Enclosure 1 respectively.

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2017 for completion in the fourth quarter of 2022. To meet the works programme, we have invited tenders for the proposed works in April 2017. Tender will only be awarded after obtaining the FC's funding approval.

/**JUSTIFICATION** …..

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[1] DWFI is a device that intercepts and diverts polluted dry weather flow from stormwater drain / channel into the sewerage system during non-rainy days for treatment.

[2] Penstocks are tidal barriers to prevent the seawater from entering the box culvert and polluted stormwater from leaving it during normal operation. During heavy rain, the penstocks will automatically open for discharging the stormwater.

[3] Ancillary works include building services and landscaping works required to complete the construction of the DWFI.

JUSTIFICATION

4. Polluted urban runoff[4] from the stormwater systems that serve Kowloon Tong, Mong Kok and Yau Ma Tei districts is a major cause of the deterioration in water quality and associated odour problem at New Yau Ma Tei Typhoon Shelter (NYMTTS) and coastal area of West Kowloon.

5. At present, the stormwater systems that serve Kowloon Tong, Mong Kok and Yau Ma Tei districts are connected to CSBC for discharge into the NYMTTS. The "Review of West Kowloon and Tsuen Wan Sewerage Master Plans" completed in 2010 confirmed that the flow in the CSBC was polluted and adversely affected the quality of the waters of West Kowloon, particularly the waters in NYMTTS. It recommended the construction of a new DWFI at the outlet of the CSBC to intercept the discharge of polluted urban runoff into the NYMTTS as a remedial measure.

6. We propose to construct an underground DWFI and pumping station along the seafront of NYMTTS to intercept and pump the polluted stormwater from the CSBC during a dry weather period into a nearby sewerage system at Lin Cheung Road that leads to Stonecutters Island sewage treatment works for proper treatment and disposal. It is estimated that the DWFI, equipped with automatic penstocks and desilting facilities, can remove about 70% of the total annual pollution load that enters NYMTTS through the CSBC. An underground stormwater bypass box culvert will also be constructed to meet the operational needs during exceptionally heavy rainstorms and emergency situations[5]. The underground DWFI will be set back for an about 85-metre long waterfront promenade. The area above the proposed DWFI will be designed with landscaped features and open to the public for enjoyment. Upon completion of the DWFI, this portion of the harbourfront would be made available for public access.

FINANCIAL …..

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[4] Sources of polluted urban runoff include expedient connections to sewers, leakage from sewers, discharge by street hawkers, open wet markets, rear lane / street cleansing activities such as vehicle and rubbish bin washing, etc.

[5] The stormwater bypass box culvert will provide an additional cell in case one of the penstocks in the DWFI malfunctions.

FINANCIAL IMPLICATIONS

7. We estimate that the cost of the proposed works to be $664.6 million in MOD prices (please see paragraph 9 below), broken down as follows –

		$ million		
(a)	DWFI and pumping station		325.1	
	(i) civil works	204.9		
	(ii) electrical and mechanical works	120.2		
(b)	Stormwater bypass box culvert		4.7	
(c)	Twin rising main		10.8	
(d)	Ancillary works		39.9	
(e)	Environmental mitigation measures		5.5	
(f)	Consultants' fees for		6.9	
	(i) contract administration	4.0		
	(ii) management of resident site staff (RSS)	2.9		
(g)	Remuneration of RSS		73.3	
(h)	Contingencies		46.3	
	Sub-total		512.5	(in September 2016 prices)
(i)	Provision for price adjustment		152.1	
	Total		664.6	(in MOD prices)

8. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 1.

/9. ….

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

Year	$ million (Sept 2016)	Price adjustment factor	$ million (MOD)
2017 – 2018	7.6	1.05750	8.0
2018 – 2019	61.5	1.12095	68.9
2019 – 2020	87.1	1.18821	103.5
2020 – 2021	112.8	1.25950	142.1
2021 – 2022	92.3	1.32562	122.4
2022 – 2023	61.5	1.39190	85.6
2023 – 2024	46.1	1.46150	67.4
2024 – 2025	43.6	1.52909	66.7
	512.5		664.6

10. We have derived the MOD estimates 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 2017 to 2025. We will deliver the proposed works under a New Engineering Contract (NEC)[6] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from the project to be $4 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in recurrent cost of providing sewage services by about 0.19% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/PUBLIC …..

[6] NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.

PUBLIC CONSULTATION

12. We consulted the Task Force on Harbourfront Developments in Kowloon, Tsuen Wan and Kwai Tsing of the Harbourfront Commission on 22 January 2013 and 16 May 2013, and the Food and Environmental Hygiene Committee of the Yau Tsim Mong District Council on 7 March 2013. All parties supported the proposed works.

13. We gazetted the proposed works under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127) on 1 August 2014 and did not receive any objection during the statutory objection period. The proposed works was subsequently authorised on 13 January 2017.

14. We consulted the Legislative Council Panel on Environmental Affairs on 24 April 2017 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

15. The proposed works is a designated project and requires an environmental permit (EP) under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) for its construction and operation. Having regard to the project profile, the Director of Environmental Protection (DEP) is satisfied that the impact of the proposed works and the mitigation measures meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process. The permission to apply directly for an EP was granted on 17 September 2015 with conditions, and the EP was granted on 23 December 2016 under the EIAO. We will implement the environmental mitigation measures and the environmental monitoring and audit programme in accordance with the EP conditions. We have included in paragraph 7(e) a sum of $5.5 million (in September 2016 prices) in the project estimates for implementation of the environmental mitigation measures.

16. For the construction phase, we will request the contractors to implement the recommended mitigation measures including the use of silenced construction equipment and temporary noise barriers to reduce noise impact. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to minimise potential water quality impact. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good practices will be properly implemented on site.

/17. …..

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to minimise the size of the proposed DWFI to minimise excavation works) where possible. In addition, we will request the contractors to reuse inert construction waste (e.g. excavated soil) on site or in other suitable sites as far as possible in order to minimise the need for disposal of inert construction waste to the public fill reception facilities[7] (PFRF). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

18. We will also request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures 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 request the contractors to separate the inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

19. We estimate that the proposed works will generate 4 550 tonnes of construction waste. Of these, we will reuse 850 tonnes (19%) on site, and deliver the 3 250 tonnes (71%) of inert construction waste to PFRF for subsequent reuse and 450 tonnes (10%) non-inert construction waste to landfill site for disposal. The total cost for accommodating the aforementioned construction waste at PFRF and landfill sites is estimated to be $320,000 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

20. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

/LAND …..

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[7] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

LAND ACQUISITION

21. Only government lands will be involved for implementation of the proposed works. No land resumption is required.

BACKGROUND INFORMATION

22. We upgraded **380DS** to Category B in September 2011.

23. In August 2012, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $13.5 million. 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". We have substantially completed the detailed design for the proposed works.

24. All the 14 trees within the project boundary will be felled and they are not important trees[8]. We will incorporate a planting proposal as part of the project, including an estimated total of 17 trees.

25. We estimate that the proposed works will create about 100 jobs (80 for labourers and 20 for professional or technical staff), providing a total employment of 5 400 man-months.

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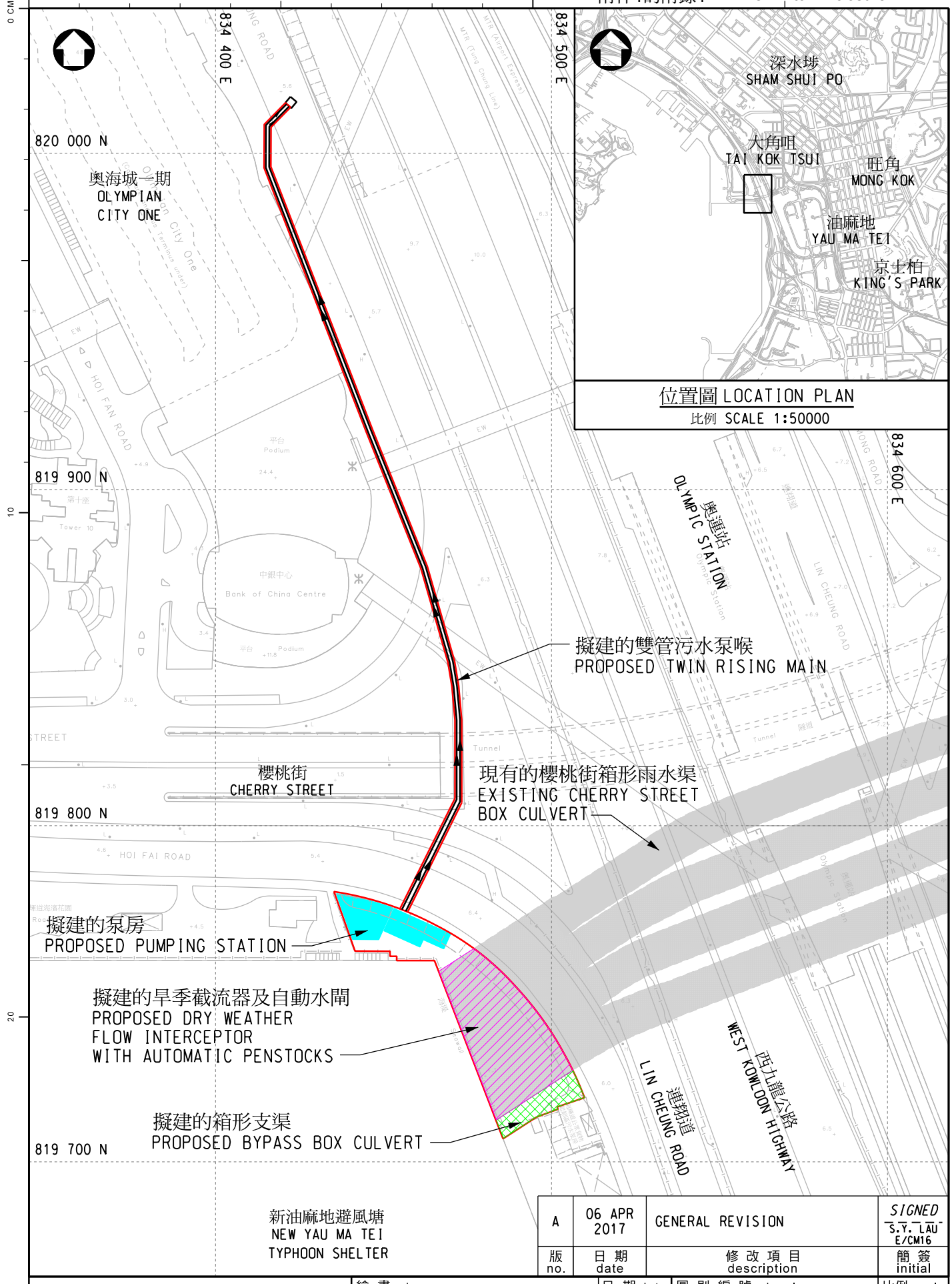
[8] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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.

附件1的附錄1 Annex 1 to Enclosure 1



版 no.	日 期 date	修 改 項 目 description	簡 簽 initial
A	06 APR 2017	GENERAL REVISION	SIGNED S.Y. LAU E/CM16

圖 則 名 稱 drawing title

工務工程計劃編號 4380DS
- 建造櫻桃街箱形雨水渠旱季截流器

PWP ITEM NO. 4380DS
- CONSTRUCTION OF DRY WEATHER FLOW INTERCEPTOR AT CHERRY STREET BOX CULVERT

繪 畫 drawn	SIGNED K. S. LEUNG	日 期 date 3 MAR 2017
核 對 checked	SIGNED Ir S. Y. LAU	日 期 date 3 MAR 2017
批 核 approved	SIGNED Ir H. L. WONG	日 期 date 3 MAR 2017

部 門 office 顧問工程管理部
CONSULTANTS MANAGEMENT DIVISION

圖 則 編 號 drawing no. DCM/2017/077A

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

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版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title

工務工程計劃編號 4380DS - 建造櫻桃街箱形雨水渠旱季截流器(電腦模擬圖)
PWP ITEM NO. 4380DS - CONSTRUCTION OF DRY WEATHER FLOW INTERCEPTOR AT CHERRY STREET BOX CULVERT (PHOTOMONTAGE)

繪畫 drawn	*SIGNED* K. S. LEUNG	日期 date	8 MAY 2017
核對 checked	*SIGNED* Ir S. Y. LAU	日期 date	8 MAY 2017
批核 approved	*SIGNED* Ir H. L. WONG	日期 date	8 MAY 2017
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION		

圖則編號 drawing no. DCM/2017/086
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

380DS – Construction of dry weather flow interceptor at Cherry Street box culvert

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2016 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	3.2
		Technical	-	-	-	0.8
					Sub-total	4.0
(b)	Resident site staff (RSS) costs (Note 3)	Professional	370	38	1.6	45.8
		Technical	712	14	1.6	30.4
					Sub-total	76.2
	Comprising –					
	(i) Consultants' fees for management of RSS				2.9	
	(ii) Remuneration of RSS				73.3	
					Total	**80.2**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $77,320 per month and MPS salary point 14 = $26,700 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 **380DS** to Category A.

3. The actual man-months and actual costs will only be known after the completion of the construction works.

389DS – Upgrading of West Kowloon and Tsuen Wan sewerage

PROJECT SCOPE AND NATURE

The part of **389DS** that we propose to upgrade to Category A comprises the phase 1 upgrading of West Kowloon and Tsuen Wan sewerage –

(a) construction of four dry weather flow interceptors[1](DWFIs) in Tsuen Wan;

(b) construction of four DWFIs in West Kowloon;

(c) modification of 43 existing DWFIs in West Kowloon; and

(d) ancillary works[2].

2. A site plan showing the locations of the proposed works is at Annex 1 to Enclosure 2.

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2017 for completion in the second quarter of 2022. To meet the works programme, we have invited tenders for the proposed works in May 2017. Tender will only be awarded after obtaining the FC's funding approval.

4. We will retain the remainder of **389DS** in Category B for the future upgrading of West Kowloon and Tsuen Wan sewerage to increase sewers capacity. The remainder of **389DS** comprises the upgrading of existing sewers and provision of internal lining at sewer crossings within stormwater box culverts in West Kowloon and Tsuen Wan. Funding for the remainder of **389DS** will be sought at a later stage after completion of the detailed design.

/JUSTIFICATION …..

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[1] DWFI is a device that intercepts and diverts polluted dry weather flow from a stormwater drain / channel into the sewerage system during non-rainy days for treatment.

[2] Ancillary works include the utility diversion, road and drainage works required to complete the construction / modification / decommissioning of the DWFIs.

JUSTIFICATION

5. Polluted urban runoff[3] from the stormwater systems that serve Mong Kok, Yau Ma Tei, Sham Shui Po and Tsuen Wan districts is a major cause of the deterioration in water quality and associated odour problem in the coastal area of West Kowloon and Tsuen Wan Bay.

6. At present, the stormwater systems that serve Mong Kok, Yau Ma Tei and Sham Shui Po districts are equipped with 43 small-scaled DWFIs. Their operational effectiveness has been declining with time and the continual redevelopment of these areas. The "Review of West Kowloon and Tsuen Wan Sewerage Master Plans" (the Review) completed in 2010 confirmed that the interception efficiency of these existing DWFIs was relatively low, principally owing to seawater inflows during high tides, debris accumulation and insufficient intercepting capacity. The Review recommended that existing DWFIs in West Kowloon should be modified and new DWFIs be constructed at critical locations in West Kowloon and Tsuen Wan to intercept the polluted stormwater and convey it to Stonecutters Island sewage treatment works for proper treatment and disposal.

7. To improve the situation, we propose to construct eight new DWFIs each with a flow restricting device and modify the 43 existing DWFIs in West Kowloon and Tsuen Wan. Modification of the existing DWFIs includes enhancement of 28 existing DWFIs while decommissioning the remaining 15[4]. The enhancement works include mainly the construction of chambers for desilting, flow limiting devices and associated works whereas decommissioning works include the removal of existing dry weather flow intercepting features and associated sewerage works. Upon completion, it is estimated that the new and modified DWFIs can remove about 70% of the total annual pollution loading from their respective stormwater systems.

FINANCIAL IMPLICATIONS

8. We estimate that the cost of the proposed works to be $277.4 million in MOD prices (please see paragraph 10 below), broken down as follows –

/$ million …..

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[3] Sources of polluted urban runoff include expedient connections to sewers, leakage from sewers, discharge by street hawkers, open wet markets, rear lane / street cleansing activities such as vehicle and rubbish bin washing, etc.

[4] The 15 DWFIs to be decommissioned will be replaced by new DWFIs / sewers.

		$ million		
(a)	DWFIs		160.4	
	(i) construction of new DWFIs	106.0		
	(ii) modification of existing DWFIs	54.4		
(b)	Environmental mitigation measures		4.5	
(c)	Consultants' fees for		3.0	
	(i) contract administration	1.9		
	(ii) management of resident site staff (RSS)	1.1		
(d)	Remuneration of RSS		29.9	
(e)	Contingencies		18.8	
	Sub-total		216.6	(in September 2016 prices)
(f)	Provision for price adjustment		60.8	
	Total		277.4	(in MOD prices)

9. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 2.

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

Year	**$ million (Sept 2016)**	**Price adjustment factor**	**$ million (MOD)**
2017 – 2018	1.9	1.05750	2.0
2018 – 2019	20.1	1.12095	22.5
2019 – 2020	38.7	1.18821	46.0
2020 – 2021	78.0	1.25950	98.2
2021 – 2022	34.7	1.32562	46.0

/Year …..

Year	$ million (Sept 2016)	Price adjustment factor	$ million (MOD)
2022 – 2023	18.8	1.39190	26.2
2023 – 2024	12.2	1.46150	17.8
2024 – 2025	12.2	1.52909	18.7
	216.6		277.4

11. We have derived the MOD estimates 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 2017 to 2025. We will deliver the proposed works under a New Engineering Contract (NEC)[5] form of contract with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be $610,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.03% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

13. We consulted the Environmental and Health Affairs Committee and the Traffic and Transport Committee of Tsuen Wan District Council on 2 July 2015 and 9 May 2016 respectively, the Food and Environmental Hygiene Committee of Yau Tsim Mong District Council and the Environment and Hygiene Committee of Sham Shui Po District Council on 16 July 2015. All parties supported the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on 24 April 2017 and Members supported the proposed works.

/ENVIRONMENTAL …..

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[5] NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.

ENVIRONMENTAL IMPLICATIONS

15. The proposed works is not a designated project under the Environmental Impact Assessment Ordinance (EIAO) (Cap.499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in March 2016. The PER has concluded and the Director of Environmental Protection agreed that the proposed works would not have any long-term adverse environmental impacts. We have included in paragraph 8(b) a sum of $4.5 million (in September 2016 prices) in the project estimates for implementation of the necessary environmental mitigation measures.

16. 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 the recommended mitigation measures including the use of silenced construction equipment and temporary noise barriers to reduce noise impact. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to minimise potential water quality impact. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good practices will be properly implemented on site.

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to minimise the size of the proposed DWFIs to minimise excavation works) where possible. In addition, we will request 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 need for disposal of inert construction waste to public fill reception facilities[6] (PFRF). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

18. We will also request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures 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 request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

/19. …..

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[6] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

19. We estimate that the proposed works will generate 2 850 tonnes of construction waste. Of these, we will reuse 700 tonnes (24%) on site, and deliver 2 100 tonnes (74%) of inert construction waste to PFRF for subsequent reuse and 50 tonnes (2%) non-inert construction waste to landfills sites for disposal. The total cost for accommodating the aforementioned construction waste at PFRF and landfill is estimated to be $160,000 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

20. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

21. Only government lands will be involved for implementation of the proposed works. No land resumption is required.

BACKGROUND INFORMATION

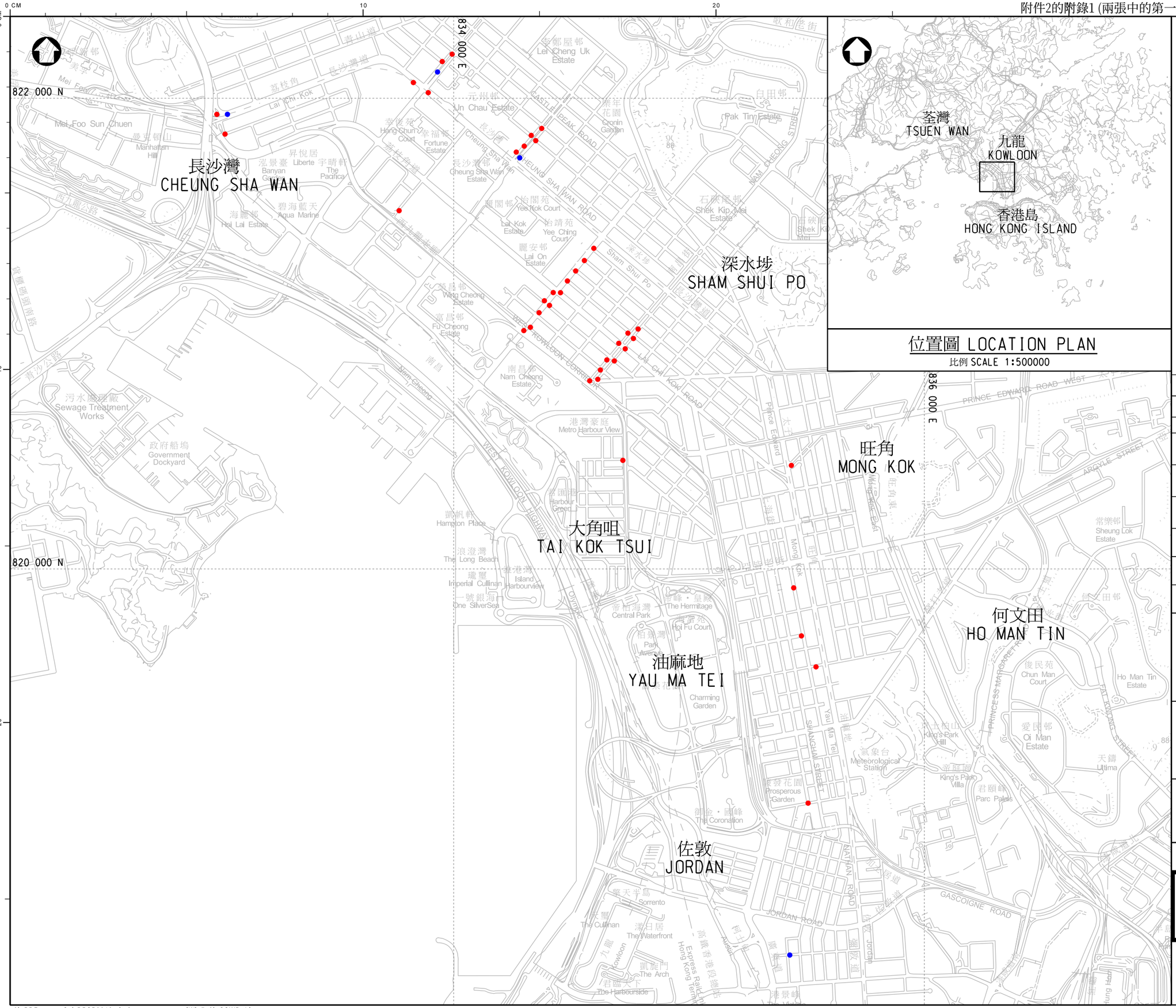
22. We upgraded **389DS** to Category B in September 2012.

23. In July 2014, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $28.6 million. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigation for items in Category D of the Public Works Programme". We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above. The consultants are working on the design of the remaining works under **389DS**.

24. The proposed works will not involve any tree removal or planting proposals.

/25. …..

25. We estimate that the proposed works will create about 60 jobs (45 for labourers and 15 for professional or technical staff) providing a total employment of 3 100 man-months.



位置圖 LOCATION PLAN

比例 SCALE 1:500000

註 NOTES :

圖例 LEGEND :

- 擬建旱季截流器
  PROPOSED CONSTRUCTION OF NEW DRY WEATHER FLOW INTERCEPTOR
- 擬改建之現有旱季截流器
  PROPOSED MODIFICATION OF EXISTING DRY WEATHER FLOW INTERCEPTOR

版 no.	日期 date	修改項目 description	簡簽 initial
修訂 REVISION			

	姓名 name	日期 date
繪畫 drawn	*SIGNED* K. S. LEUNG	8 MAY 2017
核對 checked	*SIGNED* Ir Y. L. WONG	8 MAY 2017
批核 approved	*SIGNED* Ir K. F. SEIT	8 MAY 2017

合約編號 contract no.

檔案編號 file no.

工程編號 project no.

合約名稱 contract

圖則名稱 drawing title

工務工程計劃編號 4389DS
- 九龍西部及荃灣污水系統改善工程

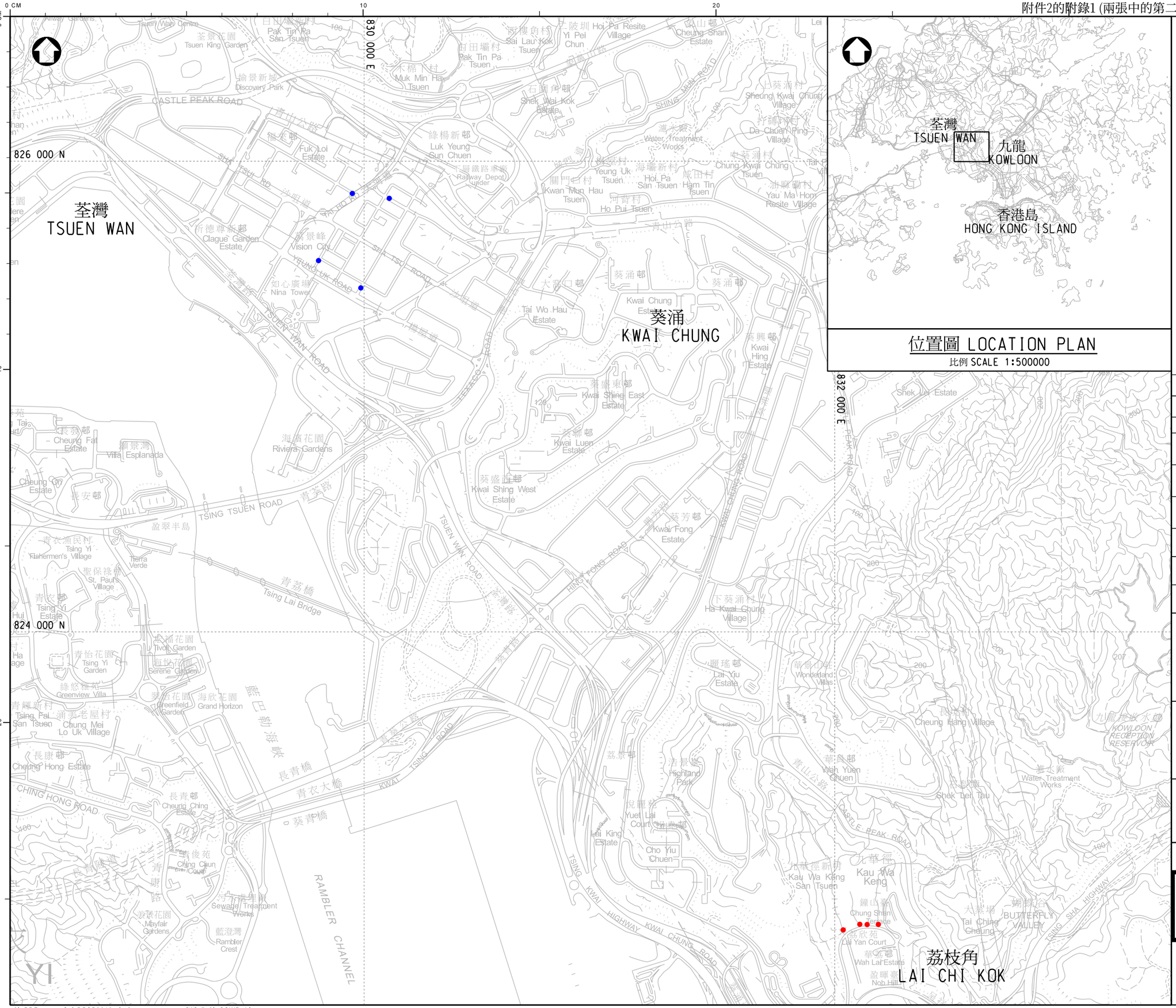
PWP ITEM NO. 4389DS
- UPGRADING OF WEST KOWLOON AND TSUEN WAN SEWERAGE

(SHEET 1 OF 2)

圖則編號 drawing no.	比例 scale
DCM/2017/093	N.T.S.

部門 office
顧問工程管理部
CONSULTANTS MANAGEMENT DIVISION

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



位置圖 LOCATION PLAN

比例 SCALE 1:500000

註 NOTES :

圖例 LEGEND :

- 擬建旱季截流器
  PROPOSED CONSTRUCTION OF NEW DRY WEATHER FLOW INTERCEPTOR
- 擬改建之現有旱季截流器
  PROPOSED MODIFICATION OF EXISTING DRY WEATHER FLOW INTERCEPTOR

版 no.	日 期 date	修 改 項 目 description	簡 簽 initial

修 訂 REVISION

	姓 名 name	日期 date
繪 畫 drawn	*SIGNED* K. S. LEUNG	8 MAY 2017
核 對 checked	*SIGNED* Ir Y. L. WONG	8 MAY 2017
批 核 approved	*SIGNED* Ir K. F. SEIT	8 MAY 2017

合 約 編 號 contract no.

檔 案 編 號 file no.

工 程 編 號 project no.

合 約 名 稱 contract

圖 則 名 稱 drawing title

工務工程計劃編號 4389DS
- 九龍西部及荃灣污水系統改善工程

PWP ITEM NO. 4389DS
- UPGRADING OF WEST KOWLOON AND TSUEN WAN SEWERAGE (SHEET 2 OF 2)

圖 則 編 號 drawing no.	比例 scale
DCM/2017/094	N.T.S.

部 門 office

顧 問 工 程 管 理 部
CONSULTANTS MANAGEMENT DIVISION

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

389DS – Upgrading of West Kowloon and Tsuen Wan sewerage

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2016 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.5
		Technical	-	-	-	0.4
					Sub-total	1.9
(b)	Resident site staff (RSS) costs (Note 3)	Professional	150	38	1.6	18.6
		Technical	291	14	1.6	12.4
					Sub-total	31.0
	Comprising –					
	(i) Consultants' fees for management of RSS				1.1	
	(ii) Remuneration of RSS				29.9	
					Total	**32.9**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $77,320 per month and MPS salary point 14 = $26,700 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 part upgrade **389DS** to Category A.

3. The actual man-months and actual costs will only be known after the completion of the construction works.

393DS – Rehabilitation of trunk sewers in Kowloon, Sha Tin and Sai Kung

PROJECT SCOPE AND NATURE

The proposed scope of works comprises –

(a) rehabilitation of a 1 050 millimetres (mm) diameter sewer of about 400 metres (m) long along Lung Cheung Road near Ngau Chi Wan;

(b) rehabilitation of a 1 kilometre (km) long sewer consisting of a section of 700 m long with 1 650 mm diameter and a section of 300 m long with 1 950 mm diameter from Kwei Chow Street to To Kwa Wan preliminary treatment works;

(c) rehabilitation of a 1 500 mm diameter sewer of about 50 m long and the construction of an additional 1 500 mm diameter sewer of about 400 m long along Yuen Wo Road near Sha Tin sewage pumping station;

(d) rehabilitation of a 600 mm diameter submarine sewer of about 200 m long and the construction of an additional 900 mm diameter sewer of about 400 m long across Sai Kung Hoi linking Sai Kung Town and Tui Min Hoi; and

(e) ancillary works[1].

2. A site plan showing the locations of the proposed works is at Annex 1 to Enclosure 3.

3. Subject to the funding approval of the Finance Committee, we aim to commence construction of the proposed works in the fourth quarter of 2017 for completion in the first quarter of 2022.

/**JUSTIFICATION** …..

[1] Ancillary works include the utility diversion, road and drainage works required to facilitate the rehabilitation of the existing sewers.

JUSTIFICATION

4. Four existing sewers in Sai Kung, Sha Tin and Kowloon with diameters ranging from 600 mm to 1 950 mm have been in service for about 30 to 40 years. These sewers had registered 12 incidents of sewer collapses and one incident of sewer cracking in the past ten years. Recent inspections have revealed that they are in poor structural conditions. Structural failure of the sewers may result in road subsidence and overflow of raw sewage. Apart from leading to traffic congestion on main traffic lines including Lung Cheung Road and road safety concern, it may bring about environmental and hygiene problems, as well as adverse impact on the water quality of Victoria Harbour, Shing Mun River and Sai Kung Hoi.

5. We propose to rehabilitate these sewers by specialised methods such as installation of internal lining and laying diversion sewers to free up the existing sewers for conducting the rehabilitation works. The diversion sewers to be constructed at Yuen Wo Road and Sai Kung Hoi as mentioned in paragraphs 1(c) and 1(d) above will be retained for permanent use. Trenchless technologies will be employed, where appropriate, for rehabilitation works and sewer laying to reduce inconvenience to the public. Upon completion of the proposed works, the risk of sewage overflow from these sewers will be greatly reduced.

FINANCIAL IMPLICATIONS

6. We estimate that the cost of the proposed works to be $678.5 million in MOD prices (please see paragraph 8 below), broken down as follows –

			$ million
(a)	Rehabilitation of existing trunk sewers		272.7
(b)	Construction of trunk sewers		116.9
(c)	Ancillary works		1.9
(d)	Environmental mitigation measures		7.8
(e)	Consultants' fees for		4.8
	(i) contract administration	2.1	
	(ii) management of resident site staff (RSS)	2.7	

/(f) …..

		$ million	
(f)	Remuneration of RSS	73.1	
(g)	Contingencies	47.0	
	Sub-total	524.2	(in September 2016 prices)
(h)	Provision for price adjustment	154.3	
	Total	678.5	(in MOD prices)

7. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 3.

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

Year	**$ million (Sept 2016)**	**Price adjustment factor**	**$ million (MOD)**
2017 – 2018	1.9	1.05750	2.0
2018 – 2019	55.0	1.12095	61.7
2019 – 2020	70.0	1.18821	83.2
2020 – 2021	122.0	1.25950	153.7
2021 – 2022	171.0	1.32562	226.7
2022 – 2023	45.0	1.39190	62.6
2023 – 2024	30.0	1.46150	43.8
2024 – 2025	29.3	1.52909	44.8
	524.2		678.5

/9. …..

9. We have derived the MOD estimates 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 2017 to 2025. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

10. We estimate the additional annual recurrent expenditure arising from the project to be $210,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in recurrent cost of providing sewage services by about 0.01% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

11. We consulted the Housing and Infrastructure Committee of the Kowloon City District Council on 23 July 2015, Traffic and Transport Committee of the Kwun Tong District Council on 17 September 2015, Traffic and Transport Committee of the Wong Tai Sin District Council on 31 May 2016, Housing and Environmental Hygiene Committee of the Sai Kung District Council on 14 July 2016, as well as Traffic and Transport Committee of the Sha Tin District Council on 7 March 2017. All these Committees supported the proposed works.

12. We consulted the Legislative Council Panel on Environmental Affairs on 24 April 2017 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

13. The proposed works is not a designated project under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). The proposed works at Ngau Chi Wan and To Kwa Wan are expected to have very little potential for giving rise to adverse environmental impacts but standard pollution control measures promulgated by the Director of Environmental Protection (DEP) will be implemented. For the proposed works at Sai Kung and Sha Tin, we have completed the Preliminary Environmental Reviews (PERs) in April 2015 and

/April …..

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[2] NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.

April 2017 respectively. The PERs concluded and DEP agreed that the proposed works would not have any long-term adverse environmental impacts. We have included in paragraph 6(d) a sum of $7.8 million (in September 2016 prices) in the project estimates of the proposed works for implementation of the environmental mitigation measures.

14. For the construction phase, we will request the contractors to implement the recommended mitigation measures including the use of silenced construction equipment and temporary noise barriers to reduce noise impact. In addition, regular water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to minimise potential water quality impact. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good practices will be properly implemented on site.

15. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will request 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 need for disposal of inert construction waste to public fill reception facilities[3] (PFRF). We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

16. We will also request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures 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 request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

/17. …..

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[3] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

17. We estimate that the proposed works will generate 9 110 tonnes of construction waste. Of these, we will reuse 3 000 tonnes (33%) on site, and deliver 3 260 tonnes (36%) of inert construction waste to PFRF for subsequent reuse and 2 850 tonnes (31%) non-inert construction waste to landfill sites for disposal. The total costs for accommodating the aforementioned construction waste at PFRF and landfill sites are estimated to be $800,000 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

18. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

19. Only government lands will be involved for implementation of the proposed works. No land resumption is required.

BACKGROUND INFORMATION

20. We upgraded **393DS** to Category B in September 2012.

21. In April 2013, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $15.8 million. 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". We have substantially completed the detailed design of the proposed works.

/22. …..

22. Of the 647 trees within the project boundary, 644 trees will be preserved. The proposed works will involve transplanting of the remaining three trees. All the trees to be transplanted are not important trees[4]. We will incorporate planting of the three trees as part of the project.

23. We estimate that the proposed works will create about 160 jobs (130 for labourers and 30 for professional or technical staff), providing a total employment of 7 500 man-months.

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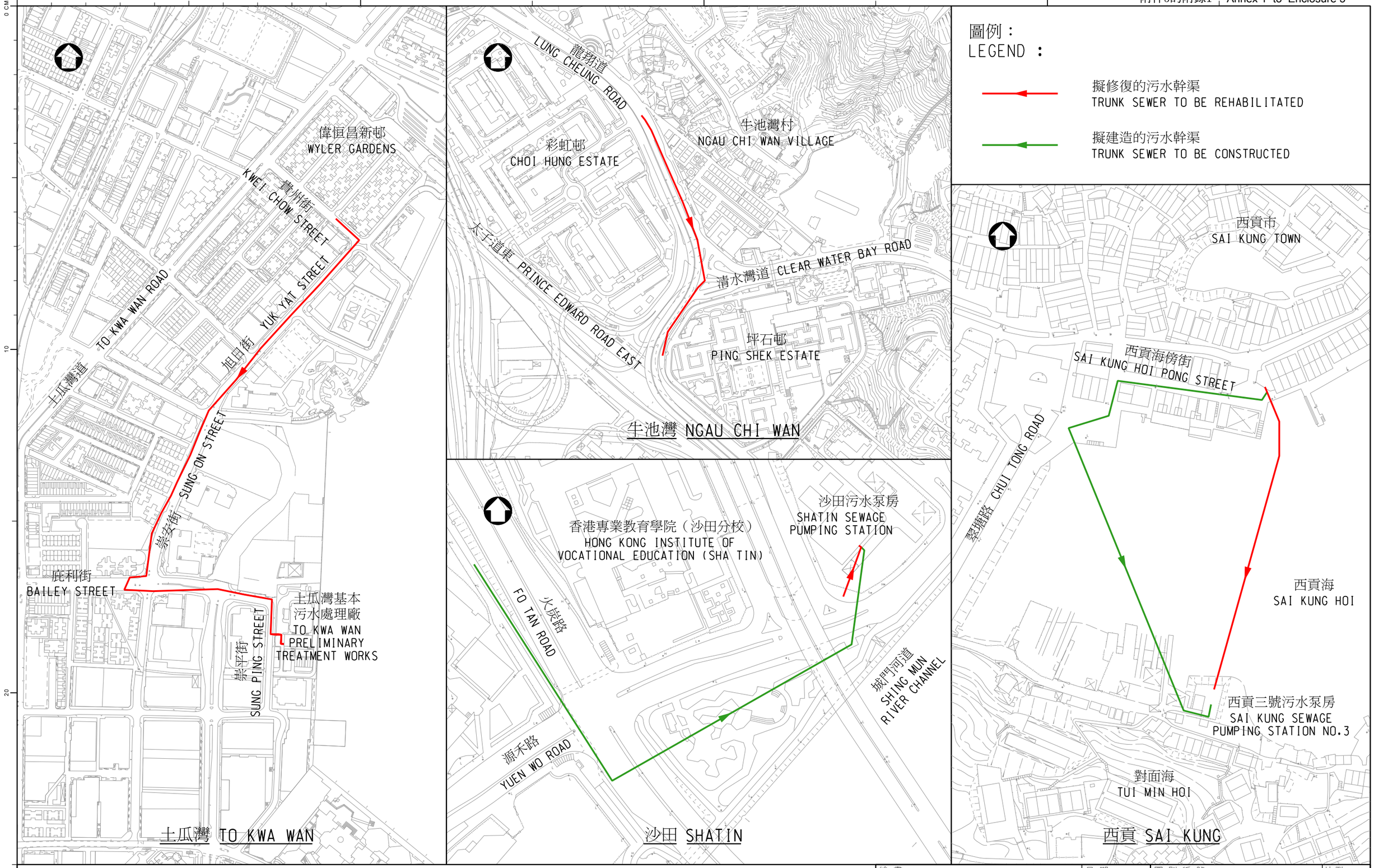
[4] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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.



圖則名稱 drawing title

工務工程計劃編號 4393DS
- 九龍、沙田及西貢污水幹渠修復工程

PWP ITEM NO. 4393DS
- REHABILITATION OF TRUNK SEWERS IN KOWLOON, SHATIN AND SAI KUNG

繪畫 drawn	SIGNED T.M. SIU	日期 date 15 FEB 2017
核對 checked	SIGNED Y.T. CHAN	日期 date 15 FEB 2017
批核 approved	SIGNED Y.M. FUNG	日期 date 15 FEB 2017
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION	

圖則編號 drawing no. DPM/393DS/0031

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

393DS – Rehabilitation of trunk sewers in Kowloon, Sha Tin and Sai Kung

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2016 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.5
		Technical	-	-	-	0.6
					Sub-total	2.1
(b)	Resident site staff (RSS) costs (Note 3)	Professional	156	38	1.6	19.3
		Technical	1 322	14	1.6	56.5
					Sub-total	75.8
	Comprising –					
	(i) Consultants' fees for management of RSS				2.7	
	(ii) Remuneration of RSS				73.1	
					Total	**77.9**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $77,320 per month and MPS salary point 14 = $26,700 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 **393DS** to Category A.

3. The actual man-months and actual costs will only be known after the completion of the construction works.

394DS – Upgrading of Kwun Tong preliminary treatment works

PROJECT SCOPE AND NATURE

The proposed scope of works comprises the provision of –

(a) preliminary treatment facilities, including an inlet screw pumping system [1], a grit removal system, deodorisation facilities, influent channels and an emergency seawall bypass system[2], to increase the treatment capacity of Kwun Tong preliminary treatment works (KTPTW) from 330 000 to 440 000 cubic metres (m^3) per day;

(b) architectural and landscaping modification works for the existing KTPTW; and

(c) ancillary works[3].

2. A site plan and a photomontage of the proposed works are at Annex 1 and Annex 2 to Enclosure 4 respectively.

3. Subject to the funding approval of the Finance Committee (FC), we plan to commence construction of the proposed works in the second quarter of 2017 for completion in the second quarter of 2022. To meet the works programme, we have invited tenders for the upgrading works in March 2017. Tender will only be awarded after obtaining the FC's funding approval.

/**JUSTIFICATION** …..

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[1] An inlet screw pumping system is installed at the outset of the preliminary treatment plant for providing the necessary pressure for downstream sewage treatment processes.

[2] An emergency seawall bypass system is installed to handle emergency conditions such as power failure, malfunction of plant equipment under which the sewage bypasses the sewage treatment processes.

[3] Ancillary works include the drainage works and boundary wall, etc., required to facilitate the modification of the existing influent channel and emergency seawall bypass system, as well as upgrading works of KTPTW.

JUSTIFICATION

4. KTPTW is a component of the Harbour Area Treatment Scheme (HATS) Stage 1 system. KTPTW provides preliminary treatment to the sewage generated from Kwun Tong and Wong Tai Sin. The preliminarily treated sewage from KTPTW is discharged into the HATS Stage 1 tunnel system for conveyance to Stonecutters Island sewage treatment works for chemically enhanced primary treatment and disinfection before final disposal to the western part of Victoria Harbour through a submarine outfall.

5. The design treatment capacity of the existing KTPTW is 330 000 m^3 per day. It is currently operating at about 90% of its design capacity. KTPTW is expected to reach its design capacity by 2021 based on the flow projection derived from the latest planning data. We estimate that the ongoing and proposed developments beyond 2021 in the catchment area of KTPTW, when fully occupied, will generate an additional sewage of around 100 000 m^3. The existing KTPTW will not be able to handle the additional sewage flow. We therefore propose to increase the treatment capacity of KTPTW from 330 000 m^3 per day to 440 000 m^3 per day to meet the development needs.

FINANCIAL IMPLICATIONS

6. We estimate the cost of the proposed works to be $349.9 million in MOD prices (please see paragraph 8 below), broken down as follows –

		$ million	
(a)	Upgrading of inlet screw pumping system		52.0
	(i) civil works	0.3	
	(ii) electrical and mechanical works	51.7	
(b)	Grit removal system with associated facilities and deodorisation facilities		82.1
	(i) civil works	13.5	
	(ii) electrical and mechanical works	68.6	
(c)	Influent channels		2.4

/(d) …..

		$ million		
(d)	Modification of emergency seawall bypass		22.0	
(e)	Architectural and landscape works		21.3	
(f)	Ancillary works		34.4	
(g)	Environmental mitigation measures		2.5	
(h)	Consultants' fees for		6.4	
	(i) contract administration	5.0		
	(ii) management of resident site staff (RSS)	1.4		
(i)	Remuneration of RSS		26.5	
(j)	Contingencies		23.6	
	Sub-total		273.2	(in September 2016 prices)
(k)	Provision for price adjustment		76.7	
	Total		349.9	(in MOD prices)

7. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 4.

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

Year	**$ million (Sep 2016)**	**Price adjustment factor**	**$ million (MOD)**
2017 – 2018	14.7	1.05750	15.5
2018 – 2019	24.4	1.12095	27.4
2019 – 2020	43.2	1.18821	51.3
2020 – 2021	51.9	1.25950	65.4

/Year …..

Year	$ million (Sep 2016)	Price adjustment factor	$ million (MOD)
2021 – 2022	76.5	1.32562	101.4
2022 – 2023	43.4	1.39190	60.4
2023 – 2024	10.6	1.46150	15.5
2024 – 2025	8.5	1.52909	13.0
Total	273.2		349.9

9. We have derived the MOD estimates 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 2017 to 2025. We will deliver the proposed works under a New Engineering Contract (NEC)[4] form of contract with provision for price adjustment.

10. We estimate the additional annual recurrent expenditure arising from the project to be $20 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.95% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

11. We consulted the Environment and Hygiene Committee of the Kwun Tong District Council on 16 July 2015. The Committee supported the proposed works.

12. We obtained the support of the Task Force on Kai Tak Harbourfront Development of the Harbourfront Commission on 18 November 2016.

/13. …..

[4] NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.

13. We also consulted the Legislative Council Panel on Environmental Affairs on 27 February 2017 and Members supported the proposed works. The supplementary information on the detailed breakdown of the cost of the proposed works requested by Panel Members is provided in paragraph 6 above.

ENVIRONMENTAL IMPLICATIONS

14. The proposed works under this item and "**413DS** - Enhancement works for Kwun Tong sewage pumping station" as described in Enclosure 5 require an environmental permit (EP) under the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) for its construction and operation. Having regard to the project profile, the Director of Environmental Protection is satisfied that the impact of the proposed works and the mitigation measures meets the requirements of the Technical Memorandum on Environmental Impact Assessment Process. The permission to apply directly for an EP was granted on 25 May 2016 with conditions, and the EP was granted on 22 June 2016 under the EIAO. We will implement the environmental mitigation measures and the environmental monitoring and audit programme in accordance with the relevant EP conditions. We have included in paragraph 6(g) a sum of $2.5 million (in September 2016 prices) in the project estimates of the proposed works under this item for implementation of the environmental mitigation measures.

15. For the construction phase, we will request the contractors to implement the recommended mitigation measures including the use of silenced construction equipment and noise barriers to reduce noise impact. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to avoid potential water quality impact. For the operation phase, we will upgrade the existing deodorisation systems and provide new deodorisation facilities for KTPTW to prevent potential odour nuisances.

16. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible, including avoiding as far as practicable demolition of existing structure. In addition, we will request the contractors 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[5] (PFRF). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste and non-timber formwork to further reduce the generation of construction waste.

/17. …..

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[5] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

17. We will also request the contractors 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 request the contractors to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

18. We estimate that the proposed works will generate 20 300 tonnes of construction waste. Of these, we will reuse 6 000 tonnes (30%) on site, and deliver 14 000 tonnes (69%) of inert construction waste to PFRF for subsequent reuse and 300 tonnes (1%) non-inert construction waste to landfill sites for disposal. The total cost for accommodating the aforementioned construction waste at PFRF and landfill sites is estimated to be $1.1 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

19. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

20. Only government lands will be involved for implementation of the proposed works. No land resumption is required.

BACKGROUND INFORMATION

21. In September 2012, we upgraded **394DS** to Category B.

22. In April 2014, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $13.3 million. 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". We have completed the detailed design for the proposed works.

/23. …..

23. Owing to the proposed works and the setback of the site boundary for the proposed waterfront promenade, there will be no space for on-site compensatory tree planting. All 41 trees within the project boundary will be felled and they are not important trees[6]. We will incorporate a planting proposal as part of the project "**413DS** – Enhancement works for Kwun Tong sewage pumping station" as detailed in Enclosure 5, including an estimated total of 41 trees.

24. We estimate that the proposed works will create about 25 jobs (20 for labourers and five for professional or technical staff), providing a total employment of 1 500 man-months.

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[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 –

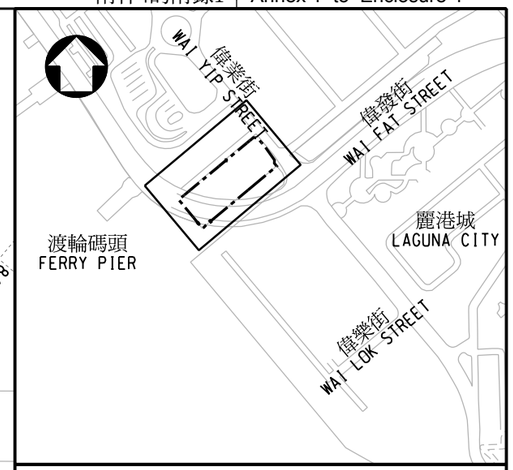
(a) trees of 100 years old or above;

(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.



位置圖 LOCATION PLAN
比例 SCALE 1:10000

提供一個額外除砂系統和相關的砂礫處理設施
PROVISION OF AN ADDITIONAL GRIT REMOVAL SYSTEM TOGETHER WITH ASSOCIATED GRIT HANDLING FACILITY

建造新的砂礫處理大樓
CONSTRUCTION OF A NEW GRIT BUILDING

改建現有的進水槽
MODIFICATION OF EXISTING INFLUENT CHANNEL

榮業街 WING YIP STREET

改善進水口螺旋泵系統
UPGRADING OF INLET SCREW PUMPING SYSTEM

建造新的進水槽
CONSTRUCTION OF A NEW INFLUENT CHANNEL

建造新氣味控制室及辟味設施
CONSTRUCTION OF A NEW ODOUR CONTROL ROOM AND DEODORISATION FACILITIES

改善緊急海堤旁通管道系統
MODIFICATION OF EMERGENCY SEAWALL BYPASS SYSTEM

圖例 LEGEND :

觀塘基本污水處理廠
KWUN TONG PRELIMINARY TREATMENT WORKS

版 no.	日期 date	修改項目 description	簽 initial
A	8 MAY 2017	GENERAL REVISION	SIGNED T.Y. LAU E/CM18

圖則名稱 drawing title

工務工程計劃編號 4394DS - 觀塘基本污水處理廠改善工程
PWP ITEM NO. 4394DS - UPGRADING OF KWUN TONG PRELIMINARY TREATMENT WORKS

繪畫 drawn	SIGNED K. S. LEUNG	日期 date 13 APR 2017
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部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

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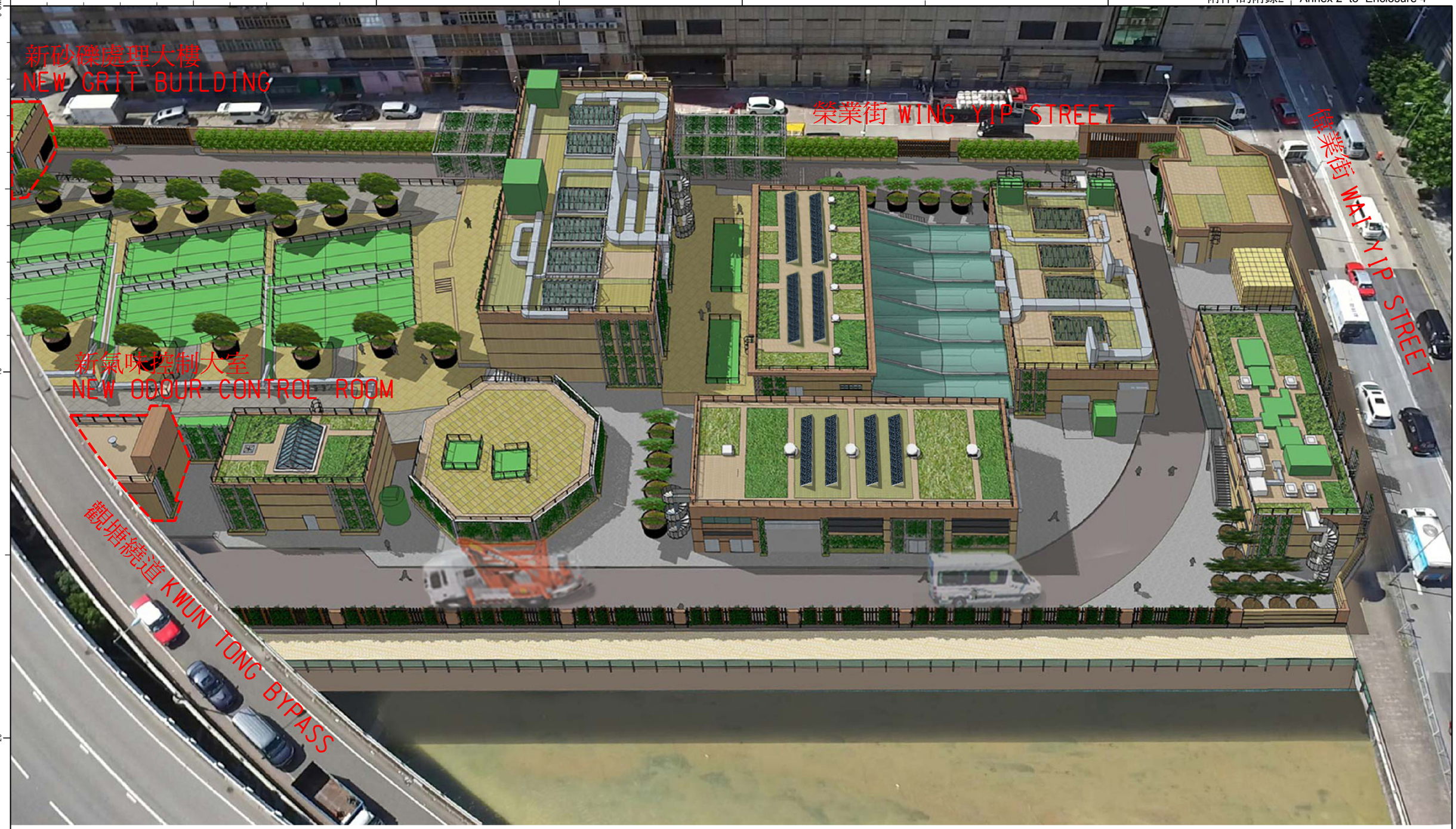
比例 scale N.T.S.

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



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圖則名稱 drawing title

工務工程計劃編號 4394DS - 觀塘基本污水處理廠改善工程 (電腦模擬圖)
PWP ITEM NO. 4394DS - UPGRADING OF KWUN TONG PRELIMINARY TREATMENT WORKS (PHOTOMONTAGE)

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部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION		

圖則編號 drawing no. DCM/2017/083

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

394DS – Upgrading of Kwun Tong preliminary treatment works

Breakdown of estimate for consultants' fees and resident site staff costs (in September 2016 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	4.0
		Technical	-	-	-	1.0
					Sub-total	5.0
(b)	Resident site staff (RSS) costs (Note 3)	Professional	95	38	1.6	11.8
		Technical	377	14	1.6	16.1
					Sub-total	27.9
	Comprising –					
	(i) Consultants' fees for management of RSS				1.4	
	(ii) Remuneration of RSS				26.5	
					Total	**32.9**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $77,320 per month and MPS salary point 14 = $26,700 per month).

2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the investigation, design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **394DS** to Category A.

3. The actual man-months and actual costs will only be known after the completion of the construction works.

413DS – Enhancement works for Kwun Tong sewage pumping station

PROJECT SCOPE AND NATURE

The proposed scope of works comprises the provision of –

(a) a balancing facility with a capacity of 16 000 cubic metres (m^3) and its associated facilities[1];

(b) a plant house with ventilation system and landscaped deck at the roof of plant house;

(c) deodorisation facilities; and

(d) ancillary works[2].

2. A site plan and a photomontage of the proposed works are at Annex 1 and Annex 2 to Enclosure 5 respectively.

3. Subject to the funding approval of the Finance Committee, we aim to commence construction of the proposed works in third quarter of 2017 for completion in the fourth quarter of 2022[3].

/**JUSTIFICATION** .....

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1 A balancing facility is a regulating device to provide temporary storage of excessive preliminarily treated sewage and balance the sewage flow rate during extreme peak flow condition, i.e. during hours of highest flows of a day and/or heavy rains. Its associated facilities include the pumping and sewer systems for pumping sewage between the Kwun Tong preliminary treatment works (KTPTW) and the balancing facility, plant and equipment facilitating the operation and maintenance of the balancing facility, and etc.

2 Ancillary works include the diversion works and road works, etc. required to facilitate the construction of the balancing facility and plant house.

3 We plan to complete the construction of the balancing facility by the fourth quarter of 2021 for testing and commissioning and the construction of the landscaped deck by the fourth quarter of 2022.

JUSTIFICATION

4. KTPTW and Kwun Tong sewage pumping station (KTSPS) are components of the Harbour Area Treatment Scheme (HATS) Stage 1 system. KTPTW provides preliminary treatment to the sewage generated from Kwun Tong and Wong Tai Sin, and KTSPS receives treated sewage from Chai Wan preliminary treatment works (PTW) and Shau Kei Wan PTW. The preliminarily treated sewage from KTPTW and KTSPS is separately discharged into the HATS stage 1 tunnel system for conveyance to Stonecutter Island sewage treatment works for chemically enhanced primary treatment and disinfection before final disposal to the western part of Victoria Harbour through a submarine outfall.

5. We estimate that the ongoing and proposed developments beyond 2021 in the catchment area of KTPTW, when fully occupied, will generate an additional sewage of around 100 000 m^3. The existing KTPTW with treatment capacity of 330 000 m^3 per day will not be able to handle the additional sewage flow. Upon completion of the proposed upgrading works in KTPTW under **394DS** as detailed in Enclosure 4, the treatment capacity of KTPTW will be increased from 330 000 m^3 per day to 440 000 m^3 per day to meet the development needs. In addition, the HATS Stage 1 tunnel system will no longer be able to cope with the extreme peak flow of the preliminarily treated sewage during hours of highest flow of a day and/or heavy rains. It is therefore necessary to construct an underground balancing facility with a temporary storage capacity of 16 000 m^3 at the KTSPS site to regulate the excessive preliminarily treated sewage from KTPTW during its extreme peak flow periods. The temporarily stored preliminarily treated sewage would be pumped into the HATS Stage 1 tunnel system via KTPTW during off-peak hours. The balancing facility can also be used in an unexpected emergency situation where sewage will be temporarily stored, thereby raising the reliability and resilience of the sewage conveyance systems.

6. To improve the environmental performance, we plan to construct a plant house at KTSPS to fully enclose the existing pumping facilities and the proposed balancing facility with the provision of ventilation and odour control equipment to alleviate any potential odour impact. In addition, we propose to construct the roof top of the plant house as a landscaped deck with unhindered public access with a view to enhancing the visual appearance of KTSPS and a park of about 10 000 square metres will be provided within the landscaped deck for public enjoyment. The park, to be managed by the Leisure and Cultural Services Department, will include greenery, seating, shades, children playing, elderly exercises and ancillary facilities.

/FINANCIAL …..

FINANCIAL IMPLICATIONS

7. We estimate that the cost of the proposed works to be $1,054.4 million in MOD prices (please see paragraph 9 below), broken down as follows –

		$ million		
(a)	Balancing facility and associated facilities		303.1	
	(i) civil works	255.0		
	(ii) electrical and mechanical works	48.1		
(b)	Plant house and ventilation system		217.2	
	(i) civil works	199.3		
	(ii) electrical and mechanical works	17.9		
(c)	Deodorisation facilities		31.8	
(d)	Architectural and landscape works		75.1	
(e)	Ancillary works		13.3	
(f)	Environmental mitigation measures		9.1	
(g)	Consultants' fees for		7.0	
	(i) contract administration	4.1		
	(ii) management of resident site staff (RSS)	2.9		
(h)	Remuneration of RSS		101.8	
(i)	Contingencies		75.8	
	Sub-total		834.2	(in September 2016 prices)
(j)	Provision for price adjustment		220.2	
	Total		1,054.4	(in MOD prices)

8. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 5.

/9. …..

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

Year	$ million (Sep 2016)	Price adjustment factor	$ million (MOD)
2017 – 2018	43.1	1.05750	45.6
2018 – 2019	92.1	1.12095	103.2
2019 – 2020	195.2	1.18821	231.9
2020 – 2021	179.2	1.25950	225.7
2021 – 2022	153.5	1.32562	203.5
2022 – 2023	104.5	1.39190	145.5
2023 – 2024	41.7	1.46150	60.9
2024 – 2025	24.9	1.52909	38.1
Total	834.2		1,054.4

10. We have derived the MOD estimates 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 2017 to 2025. We will deliver the proposed works under a New Engineering Contract (NEC)[4] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from the proposed works to be $16.4 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.47% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/**PUBLIC** …..

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4 NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasises cooperation, mutual trust and collaborative risk management between contracting parties.

PUBLIC CONSULTATION

12. We consulted the Environment and Hygiene Committee of the Kwun Tong District Council on 15 November 2016. The Committee supported the proposed works.

13. We obtained the support of the Task Force on Kai Tak Harbourfront Development of the Harbourfront Commission on 18 November 2016.

14. We also consulted the Legislative Council Panel on Environmental Affairs on 27 February 2017 and Members supported the proposed works. The supplementary information on the detailed breakdown of the cost of the proposed works requested by Panel Members is provided in paragraph 7 above.

ENVIRONMENTAL IMPLICATIONS

15. The proposed works under this item and "**394DS –** Upgrading of KTPTW" as described in Enclosure 4 require an environmental permit **(**EP) under the Environmental Impact Assessment Ordinan**c**e **(**EIAO) (Cap. 499) for its construction and operation. Having regard to the project profile, the Director of Environmental Protection (DEP) is satisfied that the impact of the proposed works and the mitigation measures meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process. The permission to apply directly for an EP was granted on 25 May 2016 with conditions, and the EP was granted on 22 June 2016 under the EIAO. We will implement the environmental mitigation measures and the environmental monitoring and audit programme in accordance with the relevant EP conditions. We have included in paragraph 7(f) a sum of $9.1 million (in September 2016 prices) in the project estimates of the proposed works under this item for implementation of the environmental mitigation measures.

16. For the construction phase, we will request the contractors to implement the recommended mitigation measures including the use of silenced construction equipment and noise barriers to reduce noise impact. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to avoid potential water quality impact. For the operation phase, we will provide new deodorisation facilities for KTSPS accordingly to prevent potential odour nuisances.

/17. …..

17. For the proposed use of the landscaped deck of KTSPS for public enjoyment, we have completed the Preliminary Environmental Review (PER) in December 2016. The PER has concluded and DEP has agreed that the proposed use would not have any long-term adverse environmental impact.

18. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible, including optimisation of the balancing facility design to minimise the extent of excavation and to avoid as far as practicable demolition of existing structure. In addition, we will request the contractors 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[5] (PFRF). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste and non-timber formwork to further reduce the generation of construction waste.

19. We will also request the contractors 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 request the contractors to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

20. We estimate that the proposed works will generate 48 880 tonnes of construction waste. Of these, we will reuse 8 000 tonnes (16%) on site and deliver 40 100 tonnes (82%) of inert construction waste to PFRF for subsequent reuse and 780 tonnes (2%) non-inert construction waste to landfill sites for disposal. The total cost for accommodating the aforementioned construction waste at PFRF and landfill sites is estimated to be $3 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

/HERITAGE …..

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[5] PFRF are specified in Schedule 4 of Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste in PFRF requires a licence issued by the Director of Civil Engineering and Development.

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

22. Only government lands will be involved for implementation of the proposed works. No land resumption is required.

BACKGROUND INFORMATION

23. In September 2015, we upgraded **413DS** to Category B.

24. In March 2016, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $15.7 million. 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". We have substantially completed the detailed design for the proposed works.

25. Of the 271 trees within the project boundary, three trees will be preserved, 14 trees will be transplanted and 254 trees will be felled. All trees to be removed are not important trees[6]. We will incorporate planting proposals as part of the project, including an estimated total of 142 trees and 5 600 square metres of grassed area within the project boundary, and the remaining 126 trees will be planted off-site. Another 41 trees removed under "**394DS** – Upgrading of KTPTW" as detailed in Enclosure 4 will be compensated within the project boundary of **413DS**.

/26. …..

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[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.

26. We estimate that the proposed works will create about 140 jobs (110 for labourers and 30 for professional or technical staff), providing a total employment of 7 800 man-months.

擬建雙管污水渠
PROPOSED TWIN GRAVITY PIPES

擬建雙管壓力污水管
PROPOSED TWIN RISING MAINS

翠屏河
TSUI PING RIVER

擬建污水調節設施
PROPOSED BALANCING FACILITY

觀塘繞道
KWUN TONG BYPASS

觀塘基本污水處理廠
KWUN TONG PRELIMINARY TREATMENT WORKS

擬建雙管污水渠
PROPOSED TWIN GRAVITY PIPES

擬建雙管
壓力污水管
PROPOSED TWIN RISING MAINS

現有濕井
EXISTING WET WELL

擬建辟味設施
PROPOSED DEODORIZATION FACILITIES

現有控制室
EXISTING CONTROL ROOM

現有豎井
EXISTING DROP SHAFT

現有直立豎井
EXISTING RISER SHAFT

擬建配套設施
PROPOSED ASSOCIATED FACILITIES

偉業街
WAI YIP STREET

偉發街
WAI FAI STREET

偉樂街
WAI LOK STREET

麗港城
LAGUNA CITY

渡輪碼頭
FERRY PIER

麗港公園
LAGUNA PARK

位置圖 LOCATION PLAN

比例 SCALE 1:10000

圖例 LEGEND :

- 現有結構及喉管 EXISTING STRUCTURES / PIPELINES
- 工程範圍 PROJECT BOUNDARY
- 擬建廠房 PROPOSED PLANT HOUSE

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圖則名稱 drawing title

工務工程計劃編號 4413DS - 觀塘污水泵房優化工程
PWP ITEM NO. 4413DS - ENHANCEMENT WORKS FOR KWUN TONG SEWAGE PUMPING STATION

繪畫 drawn	SIGNED K. S. LEUNG	日期 date 13 APR 2017
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部門 office 顧問工程管理部
CONSULTANTS MANAGEMENT DIVISION

圖則編號 drawing no. DCM/2017/084A

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

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圖則名稱 drawing title

工務工程計劃編號 4413DS - 觀塘污水泵房優化工程 (電腦模擬圖)
PWP ITEM NO. 4413DS - ENHANCEMENT WORKS FOR KWUN TONG SEWAGE PUMPING STATION
(PHOTOMONTAGE)

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部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION		

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

413DS – Enhancement works for Kwun Tong sewage pumping station

Breakdown of estimate for consultants' fees and resident site staff costs (in September 2016 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	3.3
		Technical	-	-	-	0.8
					Sub-total	4.1
(b)	Resident site staff (RSS) costs (Note 3)	Professional	290	38	1.6	35.9
		Technical	1 610	14	1.6	68.8
					Sub-total	104.7
	Comprising –					
	(i) Consultants' fees for management of RSS				2.9	
	(ii) Remuneration of RSS				101.8	
					Total	**108.8**

* 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 = $77,320 per month and MPS point 14 = $26,700 per month).

2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the investigation, design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **413DS** to Category A.

3. The actual man-months and actual costs will only be known after the completion of the construction works.