For discussion
on 29 May 2019

PWSC(2019-20)11

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
354DS – Outlying Islands sewerage, stage 2 – upgrading of Cheung Chau and Tai O sewage collection, treatment and disposal facilities
389DS – Upgrading of West Kowloon and Tsuen Wan sewerage – phase 2
391DS – West Kowloon and Tsuen Wan village sewerage
214DS – Tseung Kwan O sewerage for villages
414DS – Rehabilitation of underground sewers

Civil Engineering – Drainage and erosion protection
172CD – Rehabilitation of underground stormwater drains

Members are invited to recommend to the Finance Committee –

(a) the upgrading of **389DS** and **214DS** to Category A at estimated costs of $2,285.5 million and $289.5 million in money-of-the-day (MOD) prices respectively;

(b) the upgrading of part of **354DS**, entitled "Outlying Islands sewerage, stage 2 – upgrading of Cheung Chau sewage treatment and disposal facilities", to Category A at an estimated cost of $2,606.9 million in MOD prices;

(c) the upgrading of part of **391DS**, entitled "West Kowloon and Tsuen Wan village sewerage – phase 1", to Category A at an estimated cost of $104.1 million in MOD prices;

(d) the upgrading of part of **414DS**, entitled "Rehabilitation of underground sewers – stage 2" to Category A at an estimated cost of $306.1 million in MOD prices;

/(e) …..

(e) the upgrading of part of **172CD**, entitled "Rehabilitation of underground stormwater drains – stage 2" to Category A at an estimated cost of $515.1 million in MOD prices, and

(f) the retention of the remainders of **354DS**, **391DS**, **414DS** and **172CD** in Category B.

PROBLEM

The existing sewage treatment facilities at Cheung Chau and sewerage network at West Kowloon and Tsuen Wan do not have sufficient capacity to support the population growth and ongoing development needs of these areas, and there are still many unsewered areas in Tseung Kwan O. There is also a need to rehabilitate the ageing sewers and stormwater drains in districts of Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin (the Six Districts) to minimize safety hazards arising from pipe collapse.

PROPOSAL

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

(a) part of **354DS** at an estimated cost of $2,606.9 million in MOD prices for the upgrading of Cheung Chau sewage treatment and disposal facilities;

(b) **389DS** at an estimated cost of $2,285.5 million in MOD prices for the phase 2 upgrading of West Kowloon and Tsuen Wan sewerage;

(c) part of **391DS** at an estimated cost of $104.1 million in MOD prices for the provision of dry weather flow interceptors in Tsuen Wan and Kwai Chung;

(d) **214DS** at an estimated cost of $289.5 million in MOD prices for the provision of village sewerage in Tseung Kwan O; and

(e) part of **414DS** at an estimated cost of $306.1 million in MOD prices for the rehabilitation of ageing underground sewers in the Six Districts.

/4. …..

4. The DDS, with the support of the Secretary for Development, also proposes to upgrade part of **172CD** to Category A at an estimated cost of $515.1 million in MOD prices for the condition survey and rehabilitation of ageing underground stormwater drains in the Six Districts.

PROJECT SCOPE AND NATURE

5. To cater for population growth and development needs of Hong Kong and to safeguard public health and the environment, we need to maintain and enhance the capacity and coverage of the sewerage infrastructure. At present, the public sewerage system of Hong Kong has reached over 93% of the population. There is a continual need to upgrade the system to improve its performance and extend the existing infrastructure further to serve expansions in existing developed areas, new development areas and more rural villages throughout the territory. In addition, there is a need to rehabilitate some ageing underground sewers and stormwater drains in the Six Districts to prevent pollution and minimise safety hazards.

6. This paper consists of –

(a) four sewerage projects covering districts of Cheung Chau, West Kowloon, Tsuen Wan and Tseung Kwan O; and

(b) two rehabilitation projects for some ageing underground sewers and stormwater drains in the Six Districts.

7. These projects will be implemented in a coordinated manner with all other concurrent sewerage and drainage projects in the same district to avoid repeated excavation or road closure, and to shorten their overall construction period and minimise the impact and inconvenience to the public.

8. Details of the above proposals are provided at Enclosures 1 to 6 respectively.

Environment Bureau
Development Bureau
May 2019

354DS – Outlying Islands sewerage stage 2 – upgrading of Cheung Chau and Tai O sewage collection, treatment and disposal facilities

PROJECT SCOPE AND NATURE

The part of **354DS** that we propose to upgrade to Category A comprises –

(a) the upgrading of the existing Cheung Chau Sewage Treatment Works (STW) to increase its treatment capacity to 9 800 cubic metres per day (m^3/day) and to upgrade its treatment standard to secondary level[1];

(b) the upgrading of existing Pak She Sewage Pumping Station (SPS) to increase its capacity from 29 000 m^3/day to 42 000 m^3/day; and

(c) ancillary works[2].

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

3. Subject to the funding approval by the Finance Committee, we aim to commence the proposed works in the fourth quarter of 2019 for completion in the first quarter of 2025.

4. We will retain the remainder of **354DS** in Category B, which comprises the upgrading of the Tai O STW and provision of public sewerage system for 10 areas in Cheung Chau and seven areas in Tai O. Funding for the remainder of **354DS** will be sought later after completion of the design and preparatory work.

/ JUSTIFICATION …..

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1 Secondary treatment mainly use biological processes to remove dissolved and colloidal organic matters in wastewater.

2 Ancillary works include the utilities diversion, road and drainage works, provision of manholes, temporary closure and reinstatement of carriageways/footpaths/open space, necessary architectural, building services and landscaping works that are required to complete the proposed works.

JUSTIFICATION

5. Both the existing Cheung Chau STW and Pak She SPS have been operating for over 30 years, with most of their facilities reaching the end of their design life. Cheung Chau STW is a primary sewage treatment works with a design capacity of 4 000 m^3/day serving around 65% of Cheung Chau's existing population of 22 000 with access to public sewerage network.

6. To cope with the gradual expansion of village sewerage network to other unsewered areas of Cheung Chau in the future, we propose to construct additional treatment facilities at the Cheung Chau STW to increase its treatment capacity to 9 800 m^3/day and upgrade its treatment standard to secondary level to serve Cheung Chau's projected population of approximately 38 200. The treated effluent will be discharged into the sea through the existing submarine outfall of the Cheung Chau STW, which has sufficient flow capacity. We also propose to upgrade and retrofit all the electrical and mechanical equipment of the existing Pak She SPS.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $2,606.9 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

		$ million (in MOD prices)
(a)	Upgrading of Cheung Chau STW	1,749.6
	(i) civil works	896.6
	(ii) electrical and mechanical works	853.0
(b)	Upgrading of Pak She SPS	33.1
(c)	Ancillary works	274.8
(d)	Environmental mitigation measures	44.8
(e)	Consultants' fees for	15.5
	(i) contract administration	6.7
	(ii) management of resident site staff (RSS)	8.8
(f)	Remuneration of RSS	252.3

/(g) …..

		$ million (in MOD prices)
(g)	Contingencies	236.8
	Total	2,606.9

8. We propose to engage consultants to undertake the contract administration and site supervision of the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 1.

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

Year	**$ million (MOD)**
2019 – 2020	3.8
2020 – 2021	80.2
2021 – 2022	463.3
2022 – 2023	818.1
2023 – 2024	510.8
2024 – 2025	315.7
2025 – 2026	139.5
2026 – 2027	146.1
2027 – 2028	129.4
	2,606.9

/10. …..

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 2019 to 2028. We will deliver the proposed works under a New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from the project to be $14 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

12. We have been consulting relevant members of the Cheung Chau Rural Committee and the Islands District Council (IsDC) about the proposed works since June 2011. We provided updates at the IsDC meetings held in September 2014, September 2016 and March 2018, in which the proposed works were supported. We further consulted the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee of the IsDC on 26 November 2018. The Committee also supported the proposed works.

13. We consulted the Legislative Council Panel on Environmental Affairs on 25 March 2019 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. The project is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and an environmental permit (EP) is required for the construction and operation of the project. In December 2013, the Environmental Impact Assessment (EIA) report for the project was approved under EIAO. The EIA report concluded that the environmental impact of the project could be controlled to within the criteria under EIAO and the Technical Memorandum on EIA Process. An EP for the project was issued in May 2014. We will implement the measures recommended in the approved EIA report and stipulated in the EP as well as the environmental monitoring and audit programme to ascertain the effectiveness of the mitigation measures. We have included in paragraph 7(d) a sum of $44.8 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

/15. …..

[3] 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.

15. For the construction phase, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through implementation of the recommended mitigation measures in the relevant contract. These measures include 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.

16. For the operation phase, we will also implement the measures recommended in the approved EIA report and stipulated in the EP. The key measures include enclosing all process equipment inside building structure, equipping the upgraded STW with deodourisation unit, fitting exhaust fans with acoustic louvre/silencer and removing sewage sludge off-site regularly in fully enclosed containers. We will also prepare an emergency response plan to cater for any emergency discharge.

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will require 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 to the public fill reception facilities (PFRF[4]). 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 require 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 require the contractors to separate 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.

/19. …..

[4] 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 in total about 82 300 tonnes of construction waste. Of these, we will reuse about 12 600 tonnes (15%) of inert construction waste on site, and deliver 68 900 tonnes (84%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 800 tonnes (1%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $5.1 million for the proposed work (based on an 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 and buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

21. The proposed works will only involve government land. No land resumption is required.

BACKGROUND INFORMATION

22. In November 2006, we upgraded **354DS** to Category B.

23. In February 2008, we engaged consultants to undertake site investigation, surveys and impact assessments for **354DS**. The final cost of this work is $7.4 million in MOD prices.

24. In December 2010, we engaged other consultants to undertake detailed design for **354DS**. The detailed design of the proposed works has been substantially completed and the latest estimated cost is $13.5 million in MOD prices.

25. We have charged the amounts mentioned in paragraphs 23 and 24 above to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme".

26. The proposed works will involve the felling of 14 trees and transplanting of one tree. All the trees to be removed and transplanted are not important trees[5]. We will incorporate a planting proposal as part of the project, including an estimated total of 25 trees. The proposed upgrading works at the existing Pak She SPS will not involve any tree removal.

27. We estimate that the proposed works will create about 260 jobs (210 for labourers and 50 for professional or technical staff), providing a total employment of 15 200 man-months.

Environment Bureau
May 2019

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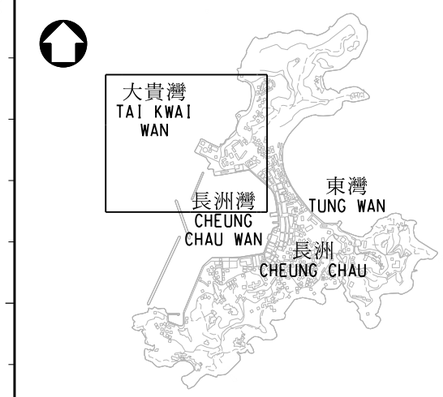
[5] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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 : 50 000

820 000 E

820 500 E

808 500 N

808 000 N

大貴灣
TAI KWAI WAN

擬議進行改善工程的長洲污水處理廠
PROPOSED UPGRADING OF
CHEUNG CHAU SEWAGE TREATMENT WORKS

現有的海底排放管
EXISTING SUBMARINE OUTFALL

北角咀路
PAK KOK TSUT ROAD

排廠路 PAI CHONG ROAD

北社海傍路 PAK SHE PRAYA ROAD

長洲灣
CHEUNG CHAU WAN

擬議進行改善工程的北社污水泵房
PROPOSED UPGRADING OF
PAK SHE SEWAGE PUMPING STATION

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	14 MAY 2019
核對 checked	*SIGNED* Ir C. H. CHUNG	14 MAY 2019
批核 approved	*SIGNED* Ir L. CHEN	14 MAY 2019

圖則名稱 drawing title

工務工程計劃編號 354DS
- 離島污水收集系統第2階段
長洲及大澳污水收集處理及排放改善工程

PWP ITEM NO. 354DS
- OUTLYING ISLANDS SEWERAGE, STAGE 2 - UPGRADING OF CHEUNG CHAU AND TAI O SEWAGE COLLECTION, TREATMENT AND DISPOSAL FACILITIES

圖則編號 drawing no.	比例 scale
DCM/2019/034	1 : 4 000

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

354DS – Outlying Islands sewerage stage 2 – upgrading of Cheung Chau and Tai O sewage collection, treatment and disposal facilities

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 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	-	-	-	1.3
					Sub-total	5.3#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	871	38	1.6	114.2
		Technical	2 040	14	1.6	93.8
					Sub-total	208.0
	Comprising –					
	(i) Consultants' fees for management of RSS				7.0#	
	(ii) Remuneration of RSS				201.0#	
					Total	**213.3**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **354DS** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 7 of Enclosure 1.

389DS – Upgrading of West Kowloon and Tsuen Wan sewerage – phase 2

PROJECT SCOPE AND NATURE

The proposed scope of works under **389DS** comprises –

(a) the construction of about 33.5 kilometres (km) of gravity sewers with diameters ranging from 225 millimetres (mm) to 1 500 mm in West Kowloon and Tsuen Wan;

(b) the demolition of about 19 km of existing gravity sewers;

(c) the provision of internal lining at 28 existing sewer crossings within stormwater box culverts; and

(d) ancillary works[1].

2. Site plans showing the locations of the proposed works are at Annex 1 to Enclosure 2.

3. Subject to funding approval of the Finance Committee, we aim to commence construction of the proposed works in the fourth quarter of 2019 for completion in the second quarter of 2026.

/ JUSTIFICATION …..

[1] Ancillary works include the utilities diversion, road and drainage works, provision of manholes, temporary closure and reinstatement of carriageways/footpaths/open space required to facilitate the sewerage works.

JUSTIFICATION

4. Owing to natural population growth and planned housing development, sewage flow in the West Kowloon and Tsuen Wan region[2] (the region) is projected to increase by 33% from 2006 to 2036. Upgrading works of the existing sewerage system in the region can make available sufficient capacity to accommodate the projected flow increase and to reduce the risk of pollution caused by leakage from ageing sewers.

5. We propose to implement the sewerage upgrading works, which involve the demolition and replacement of about 19 km of existing gravity sewers by larger sewers and the construction of another 14.5 km of new gravity sewers in the region. The diameters of these replacement and new sewers range from 225 mm to 1 500 mm. Trenchless technologies will be deployed, where appropriate, to reduce inconvenience to the public.

6. To minimise the risk of sewage leakage causing pollution to the stormwater drainage system and coastal waters, we also propose to install internal lining to existing sewer in the region at 28 locations where the sewer pipes cross through stormwater box culverts, which will further improve the coastal water quality and the associated odour problem in these areas.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $2,285.5 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

	$ million (in MOD prices)
(a) Construction of gravity sewers	1,645.7
(b) Demolition of existing gravity sewers	9.2
(c) Installation of internal lining	36.1

/(d) …..

[2] The region covers districts of Sham Shui Po, Kowloon City, Mong Kok, Yau Ma Tei, Tsuen Wan and Kwai Chung with a total planned population of 2.8 million.

		$ million (in MOD prices)
(d) Ancillary works		111.4
(e) Environmental mitigation measures		33.9
(f) Consultants' fees for		14.9
(i) contract administration	6.5	
(ii) management of resident site staff (RSS)	8.4	
(g) Remuneration of RSS		230.4
(h) Contingencies		203.9
Sub-total		2,285.5

8. We propose to engage consultants to undertake contract administration and site supervision for the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 2.

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

Year	**$ million (MOD)**
2019 – 2020	1.6
2020 – 2021	96.0
2021 – 2022	191.5
2022 – 2023	336.5
2023 – 2024	427.8
2024 – 2025	404.8

/ **Year** …..

Year	$ million (MOD)
2025 – 2026	365.6
2026 – 2027	259.2
2027 – 2028	161.3
2028 – 2029	35.8
2029 – 2030	5.4
	2,285.5

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 2019 to 2030. We will deliver the proposed works under a New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from this project to be about $3.78 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/ PUBLIC….

[3] 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 relevant Committees of five District Councils during the period from October 2018 to January 2019 as follows. These Committees supported the proposed works.

Date	District Council	Committee
16 Oct 2018	Kwai Tsing	Planning and District Facilities Management Committee
1 Nov 2018	Tsuen Wan	Environmental and Health Affairs Committee
5 Nov 2018	Tsuen Wan	Traffic and Transport Committee
8 Nov 2018	Kowloon City	Housing and Infrastructure Committee
15 Nov 2018	Yau Tsim Mong	Traffic, Transport and Housing Committee
6 Dec 2018	Sham Shui Po	Transport Affairs Committee
3 Jan 2019	Yau Tsim Mong	Traffic, Transport and Housing Committee

13. We consulted the Legislative Council Panel on Environmental Affairs on 25 March 2019 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap.499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in March 2016. The PER concluded and the Director of Environmental Protection agreed that, with the implementation of appropriate mitigation measures as mentioned in the following paragraphs, the proposed works would not have any long-term adverse environmental impacts. We have included in paragraph 7(e) a sum of $ 33.9 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures.

/15. …..

15. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisance to within the established standards and guidelines through the implementation of the recommended mitigation measures in the relevant contract. These measures include 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 be properly implemented on site.

16. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. use of common trenches to minimise excavation works) where possible. In addition, we will require 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 to the public fill reception facilities (PFRF[4]). 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.

17. We will also require 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 require the contractors to separate 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. …..

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[4] 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.

18. We estimate that the proposed works will generate in total about 279 500 tonnes of construction waste. Of these, we will reuse about 103 420 tonnes (37%) of inert construction waste on site, and deliver about 156 520 tonnes (56%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 19 560 tonnes (7%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $15.0 million for the proposed works (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 and buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

20. The implementation of the proposed works will only involve government land and a drainage reserve area held by the Hong Kong Polytechnic University. No land resumption is required.

BACKGROUND INFORMATION

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

22. In July 2014, we engaged consultant to undertake site investigation, surveys, impact assessment and detailed design for the proposed works. The total estimated cost was $28.6 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". The consultancy works were carried out in phases.

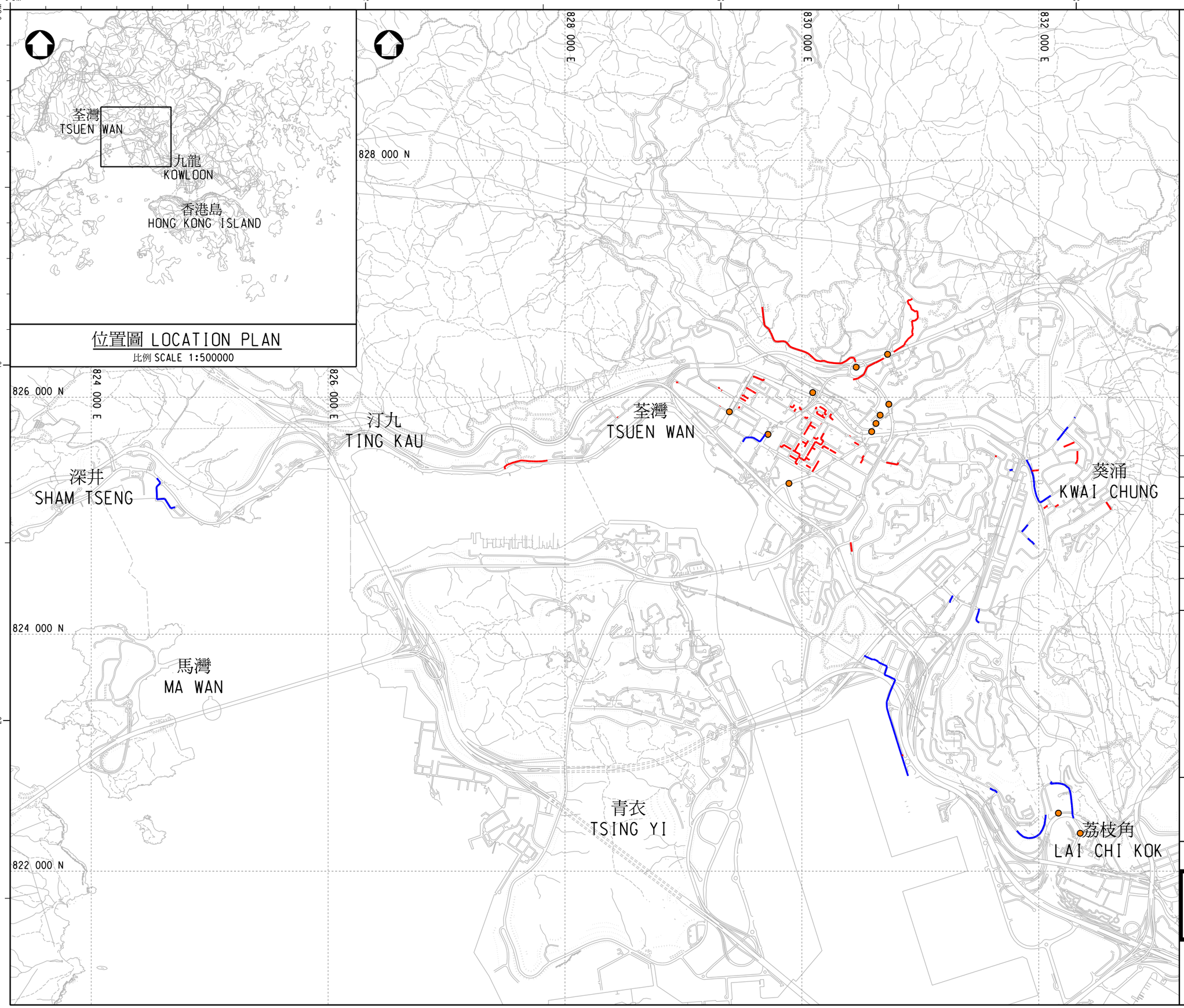
/23. …..

23. In May 2017, we upgraded part of **389DS** to Category A as **418DS** "Upgrading of West Kowloon and Tsuen Wan sewerage – phase 1" at an estimated cost of $277.4 million in MOD prices for the construction of eight new dry weather flow interceptors (DWFIs) and modification of 43 existing DWFIs at West Kowloon and Tsuen Wan. The construction works under **418DS** has commenced in September 2017 for target completion in the second quarter of 2022. We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.

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

25. We estimate that the proposed works will create about 280 jobs (225 for labourers and 55 for professional or technical staff), providing a total employment of 19 200 man-months.

Environment Bureau
May 2019



圖例
LEGEND :

- 擬議改善污水渠 PROPOSED SEWERS TO BE UPGRADED
- 擬議新污水渠 PROPOSED NEW SEWERS
- 擬議污水渠與箱形雨水渠的相交處鋪設內搪層 PROPOSED INTERNAL LINING AT SEWER CROSSINGS WITHIN STORMWATER BOX CULVERTS

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	21 MAY 2019
核 對 checked	*SIGNED* Ir K. M. FU	21 MAY 2019
批 核 approved	*SIGNED* Ir H. H. CHEUNG	21 MAY 2019

圖 則 名 稱 drawing title

工務工程計劃編號 389DS
- 九龍西部及荃灣污水系統改善工程 - 第二期

PWP ITEM NO. 389DS
- UPGRADING OF WEST KOWLOON AND TSUEN WAN SEWERAGE - PHASE 2

全二張其一 (SHEET 1 OF 2)

圖 則 編 號 drawing no.	比例 scale
DCM/2019/035	1 : 30 000 OR AS SHOWN

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

0 CM 10 20 30

832 000 E 834 000 E 836 000 E

822 000 N

820 000 N

818 000 N

荔枝角
LAI CHI KOK

長沙灣
CHEUNG SHA WAN

深水埗
SHAM SHUI PO

九龍塘
KOWLOON TONG

旺角
MONG KOK

大角咀
TAI KOK TSUI

油麻地
YAU MA TEI

何文田
HO MAN TIN

佐敦
JORDAN

尖沙咀
TSIM SHA TSUI

荃灣
TSUEN WAN

九龍
KOWLOON

香港島
HONG KONG ISLAND

位置圖 LOCATION PLAN
比例 SCALE 1:500000

圖例
LEGEND :

擬議改善污水渠
PROPOSED SEWERS TO BE UPGRADED

擬議新污水渠
PROPOSED NEW SEWERS

擬議污水渠與箱形雨水渠的相交處鋪設內搪層
PROPOSED INTERNAL LINING AT SEWER CROSSINGS WITHIN STORMWATER BOX CULVERTS

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	21 MAY 2019
核對 checked	*SIGNED* Ir K. M. FU	21 MAY 2019
批核 approved	*SIGNED* Ir H. H. CHEUNG	21 MAY 2019

圖則名稱 drawing title

工務工程計劃編號 389DS
- 九龍西部及荃灣污水系統改善工程 - 第二期

PWP ITEM NO. 389DS
- UPGRADING OF WEST KOWLOON AND TSUEN WAN SEWERAGE - PHASE 2

全二張其二 (SHEET 2 OF 2)

圖則編號 drawing no.
DCM/2019/036

比例 scale
1 : 20 000 OR AS SHOWN

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 – phase 2

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.0
		Technical	-	-	-	3.9
					Sub-total	4.9#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	580	38	1.6	76.1
		Technical	2 311	14	1.6	106.2
					Sub-total	182.3
	Comprising –					
	(i) Consultants' fees for management of RSS				6.4#	
	(ii) Remuneration of RSS				175.9#	
					Total	**187.2**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **389DS** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 7 of Enclosure 2.

Enclosure 3 to PWSC(2019-20)11

391DS – West Kowloon and Tsuen Wan village sewerage

PROJECT SCOPE AND NATURE

The part of **391DS** that we propose to upgrade to Category A comprises –

(a) the construction of eight dry weather flow interceptors (DWFIs)[1] in Tsuen Wan and Kwai Chung; and

(b) ancillary works[2].

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

3. Subject to funding approval of the Finance Committee, we aim to commence construction of the proposed works in the fourth quarter of 2019 for completion in the fourth quarter of 2023.

4. We will retain the remainder of **391DS** in Category B for the provision of public sewerage system for the other nine unsewered areas in Tsuen Wan and Kwai Chung. Funding for the remainder of **391DS** will be sought at a later stage after completion of the design and preparatory work.

JUSTIFICATION

5. Sewage discharge from the unsewered villages in Tsuen Wan and Kwai Chung is one of the sources of pollution at the coastal area of Tsuen Wan Bay and Rambler Channel, and the provision of sewerage system for these areas can reduce pollution to the receiving water.

/6. …..

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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 utilities diversion, road and drainage works required to complete the construction of the DWFIs.

6. Eight villages/areas in Tsuen Wan and Kwai Chung (namely Kwong Pan Tin Tsuen, San Tsuen Northeast, Fu Yung Shan, Wo Yi Hop Upper Village, Hon Man Squatter Area, Sam Tung Uk, Sheung Yat Chuen and Shek Lei Hang) with around 1 200 inhabitants living mostly in temporary structures have no access to public sewerage system. Only a few village houses thereat are equipped with individual and simple on-site facilities such as septic tank and soakaway (STS) systems[3] and it is not appropriate to provide permanent sewers for temporary structures.

7. To improve the situation, we propose to construct eight DWFIs at critical locations to intercept the polluted stormwater and convey it to the Stonecutters Island Sewage Treatment Works for proper treatment and disposal. Upon completion, it is envisaged that these DWFIs can remove about 70% of the total annual pollution loading arising from the corresponding stormwater drainage system, thereby improving the water quality of the receiving waters of Tsuen Wan Bay and Rambler Channel.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be $104.1 million in money-of-the-day (MOD) prices (please see paragraph 10 below), broken down as follows –

		$ million (in MOD prices)
(a)	Construction of DWFIs	69.0
(b)	Ancillary works	9.2
(c)	Environmental mitigation measures	1.7
(d)	Consultants' fees for	1.8
	(i) contract administration	1.3
	(ii) management of resident site staff (RSS)	0.5
(e)	Remuneration of RSS	13.1

/(f) …..

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[3] STS systems operate by allowing the effluent to percolate through soil layers so that pollutants may be removed in a natural manner. However, if a STS system is located in an area where the ground water table is high, such as an area in proximity to the seaside or watercourses, it will not function properly due to ineffective percolation. There are also maintenance problems with some STS systems.

		$ million (in MOD prices)
(f)	Contingencies	9.3
	Total	104.1

9. We propose to engage consultants to undertake contract administration and site supervision for the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 3.

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

Year	**$ million (MOD)**
2019 – 2020	6.3
2020 – 2021	6.7
2021 – 2022	31.3
2022 – 2023	38.3
2023 – 2024	7.8
2024 – 2025	6.9
2025 – 2026	3.9
2026 – 2027	2.9
	104.1

/11. …..

11. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2019 to 2027. We will deliver the proposed works under a New Engineering Contract (NEC)[4] form of contract with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be about $310,000. The recurrent expenditure 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 of Tsuen Wan District Council and Community Affairs Committee of Kwai Tsing District Council on 7 July 2016 and 26 July 2016 respectively. Both Committees supported the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on 25 March 2019 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

15. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap.499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in September 2016. The PER concluded and the Director of Environmental Protection agreed, with the implementation of appropriate mitigation measures as mentioned in the following paragraphs, that the proposed works would not impose long-term adverse environmental impacts. We have included in paragraph 8(c) a sum of $1.7 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures.

/16. …..

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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.

16. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisances 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 where possible (e.g. the proposed DWFIs were properly designed to minimise excavation works). In addition, we will require 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 to the public fill reception facilities (PFRF[5]). 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 require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from the 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 in total about 2 420 tonnes of construction waste. Of these, we will reuse about 1 760 tonnes (73%) of inert construction waste on site, and deliver 630 tonnes (26%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 30 tonnes (1%) non-inert construction waste to landfill. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $50,730 for the proposed works (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

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

LAND ACQUISITION

21. The proposed works will only involve government land. No land resumption is required.

BACKGROUND INFORMATION

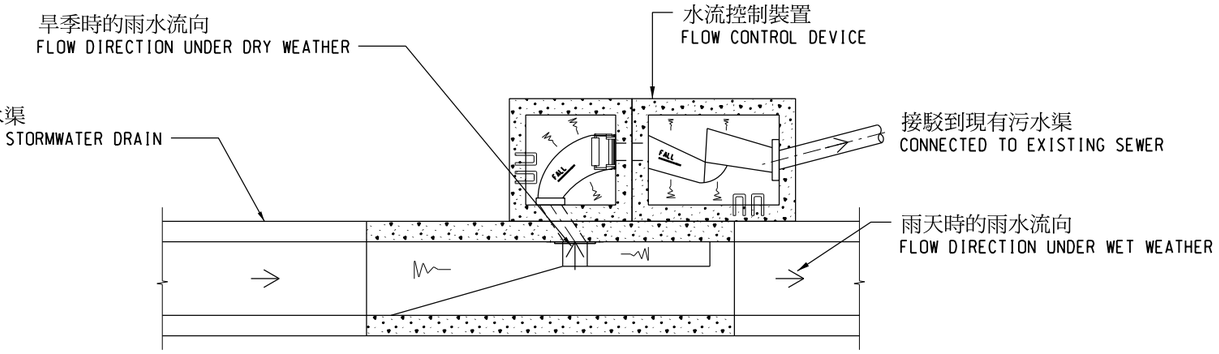
22. We upgraded **391DS** to Category B in September 2012.

23. In January 2014, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $26 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above, and are working on the design of the remaining works under **391DS**.

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

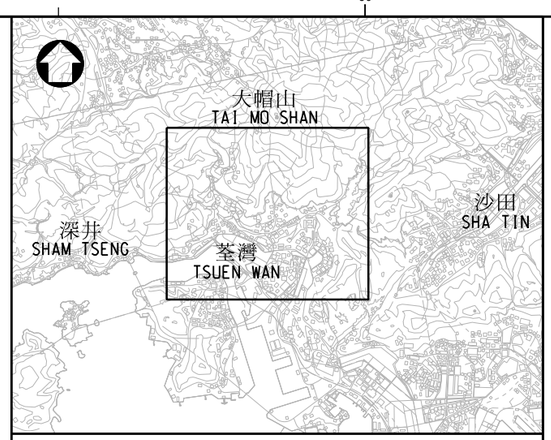
25. We estimate that the proposed works will create about 26 jobs (20 for labourers and six for professional or technical staff), providing a total employment of 930 man-months.

Environment Bureau
May 2019



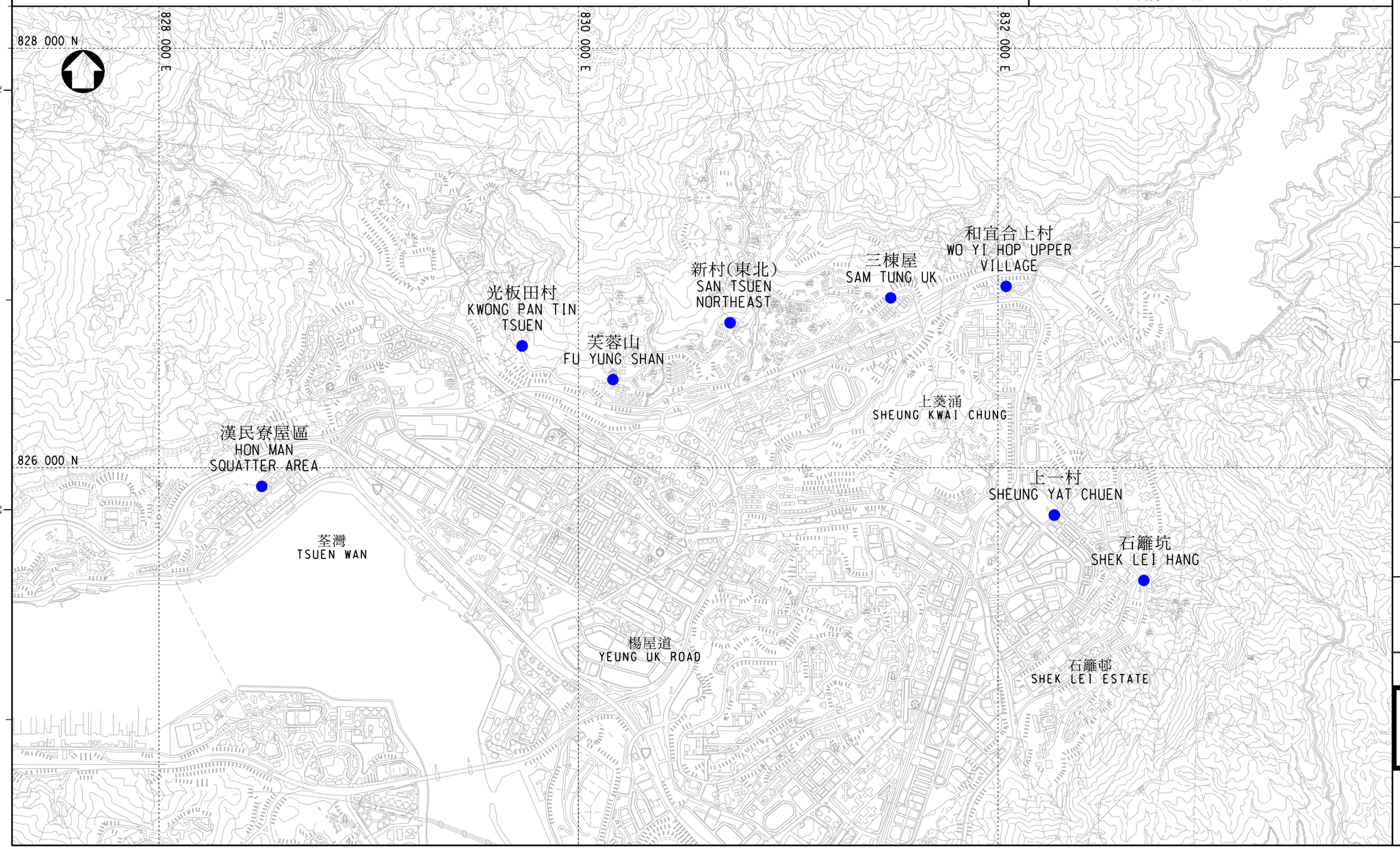
旱季截流器示意圖
INDICATIVE LAYOUT OF DRY WEATHER FLOW INTERCEPTOR

N.T.S.



位置圖 LOCATION PLAN

比例 SCALE 1 : 200 000



圖例 LEGEND :

- 擬建的旱季截流器 PROPOSED 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* W. H. CHAN	15 MAY 2019
核對 checked	*SIGNED* Ir C. H. WONG	15 MAY 2019
批核 approved	*SIGNED* Ir H. H. CHEUNG	15 MAY 2019

圖則名稱 drawing title

工務工程計劃編號 391DS
- 九龍西部及荃灣鄉村污水收集系統工程

PWP ITEM NO. 391DS
- WEST KOWLOON AND TSUEN WAN VILLAGE SEWERAGE

圖則編號 drawing no.	比例 scale
DCM/2019/033	1 : 20 000 OR AS SHOWN

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

Annex 2 to Enclosure 3 to PWSC(2019-20)11

391DS – West Kowloon and Tsuen Wan village sewerage

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.4
		Technical	-	-	-	0.7
					Sub-total	1.1#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	45	38	1.6	5.9
		Technical	117	14	1.6	5.4
					Sub-total	11.3
	Comprising –					
	(i) Consultants' fees for management of RSS				0.4#	
	(ii) Remuneration of RSS				10.9#	
					Total	**12.4**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **391DS** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 8 of Enclosure 3.

214DS — Tseung Kwan O sewerage for villages

PROJECT SCOPE AND NATURE

The proposed scope of works under **214DS** comprises –

(a) the construction of about 6.4 kilometres of gravity sewers with diameters ranging from 150 millimetres (mm) to 250 mm for ten unsewered areas in Tseung Kwan O;

(b) the construction of a sewage pumping station (SPS) with a design capacity of 130 cubic meters per day at Au Tau;

(c) the construction of about 700 metres of twin rising mains with a diameter of 150 mm at Au Tau and Sun Tei Village; and

(d) ancillary works[1].

2. A site plan showing the locations of the proposed works is at Annex 1 to Enclosure 4.

3. Subject to the funding approval of the Finance Committee, we aim to commence construction of the proposed works in the first quarter of 2020 for completion in the second quarter of 2024.

JUSTIFICATION

4. Currently, the majority part of Tseung Kwan O is covered by public sewerage system, but some village areas in the district are still unsewered, with their sewage disposed of by individual and simple facilities on-site such as septic tanks and soakaway (STS) systems[2]. Extension of the public sewerage system to these areas can help improve environmental hygiene and further reduce the amount of pollutants being discharged into the receiving waters of Tseung Kwan O.

/5. …..

1 Ancillary works include the utilities diversion, road and drainage works, provision of manholes, temporary closure and reinstatement of carriageways/footpaths/open space, necessary architectural, building services and landscaping works that are required to complete the proposed works.

2 STS systems operate by allowing the effluent to percolate through soil layers so that pollutants may be removed in a natural manner. However, if a STS system is located in an area where the ground water table is high, such as an area in proximity to the seaside or watercourses, it will not function properly due to ineffective percolation. There are also maintenance problems with some STS systems.

5. We propose to provide public sewerage system for ten unsewered areas in Tseung Kwan O, namely Shui Bin Village, Ming Oi New Village, Mau Wu Tsai Village, Tseung Kwan O Upper Old Village, Tseung Kwan O Village, Boon Kin Village, Hang Hau Lower Old Village, Wo Tong Kong, Au Tau and Sun Tei Village through the proposed works. The proposed sewerage system will serve an estimated ultimate population of 3 200.

6. Upon completion of the proposed works, sewage from Au Tau and Sun Tei Village will be pumped by the proposed SPS to the existing Kwun Tong Preliminary Treatment Works (PTW) while sewage from the remaining eight areas will be conveyed to the Tseung Kwan O PTW for proper treatment.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $289.5 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

			$ million (in MOD prices)
(a)	Construction of gravity sewers		172.0
(b)	Construction of SPS		18.7
	(i) civil works	9.7	
	(ii) electrical and mechanical works	9.0	
(c)	Construction of twin rising mains		19.2
(d)	Ancillary works		10.0
(e)	Environmental mitigation measures		4.4
(f)	Consultants' fees for		4.0
	(i) contract administration	1.5	
	(ii) management of resident site staff (RSS)	2.5	
(g)	Remuneration of RSS		34.9
(h)	Contingencies		26.3
	Total		289.5

/8. …..

8. We propose to engage consultants to undertake contract administration and site supervision for the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 2 to Enclosure 4.

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

Year	$ million (MOD)
2019 – 2020	5.7
2020 – 2021	48.4
2021 – 2022	50.8
2022 – 2023	53.7
2023 – 2024	55.0
2024 – 2025	29.8
2025 – 2026	27.8
2026 – 2027	11.3
2027 – 2028	7.0
	289.5

10. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2019 to 2028. We will deliver the proposed works under a New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from this project to be $2.46 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/ **PUBLIC** …..

3 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. Following the previous consultations with the Hang Hau Rural Committee (HHRC) and the Housing and Environmental Hygiene Committee of the Sai Kung District Council (SKDC) in 2009, we consulted the HHRC again on 16 October 2018 and reported progress of the proposed works to the SKDC on 15 November 2018. Both Committees maintained their support of the proposed works and urged the Government to expedite progress.

13. We gazetted the proposed sewerage works for five unsewered areas in two packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL). The first package for Tseung Kwan O Village, Boon Kin Village and Wo Tong Kong was gazetted in January 2013 and amended by further gazette in June 2014. It was authorised in November 2015 after the three objections received against the proposal were satisfactorily resolved. The second package for Sun Tei Village and Au Tau was gazetted in March 2013 and amended by further gazette in September 2013. It was authorised in January 2014 after the one objection received against the proposal was satisfactorily resolved. The proposed sewerage works for the remaining five unsewered areas, namely Shui Bin Village, Ming Oi New Village, Mau Wu Tsai Village, Tseung Kwan O Upper Old Village and Hang Hau Lower Old Village, which will not affect any private land, was authorised in March 2019 to be executed as minor works under Cap. 358AL.

14. We consulted the Legislative Council Panel on Environmental Affairs on 25 March 2019 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

15. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in 2009 and updated the PER in January 2019. The updated PER concluded and the Director of Environmental Protection agreed, with the implementation of appropriate mitigation measures as mentioned in the following paragraphs, that the proposed works would not cause long-term adverse environmental impacts. We have included in paragraph 7(e) a sum of $4.4 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures.

/16. …..

16. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include 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 where possible. In addition, we will require 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 (PFRF)[4]. 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 require 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 require 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. We estimate that the proposed works will generate in total about 30 640 tonnes of construction waste. Of these, we will reuse about 18 380 tonnes (60%) of inert construction waste on site, and deliver about 11 950 tonnes (39%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 310 tonnes (1%) of non-inert construction waste at landfills. The total cost for disposal of the construction waste at PFRF and landfill sites is estimated to be $910,000 for the proposed works (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 …..

4 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

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

LAND ACQUISITION

21. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 410 square metres (m^2) of private agricultural land and clear about 12 940 m^2 of government land for implementing the proposed works. Site clearance at Tseung Kwan O Village, Boon Kin Village, Wo Tong Kong, Shui Bin Village, Ming Oi New Village, Mau Wu Tsai Village, Tseung Kwan O Upper Old Village and Hang Hau Lower Old Village will not affect any household or structure. Site clearance at Sun Tei Village and Au Tau will not affect any household, but will affect four structures. We will charge the cost of land acquisition and clearance, estimated at $5.3 million, to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at Annex 3 to Enclosure 4.

BACKGROUND INFORMATION

22. We upgraded **214DS** to Category B in August 2007.

23. In June 2008, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $8.2 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". We have substantially completed the detailed design of the proposed works.

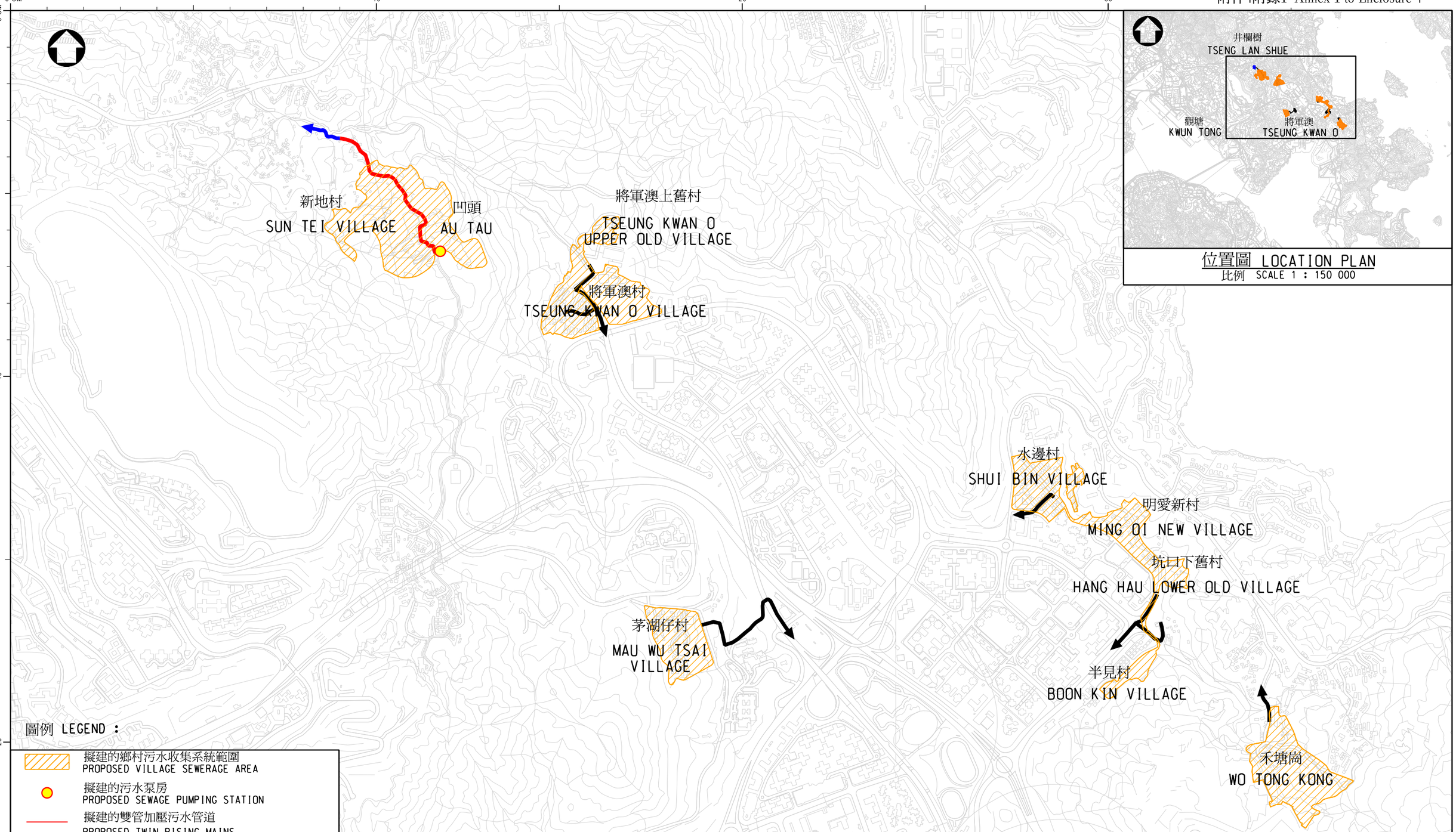
/24. …..

24. The proposed works will involve the felling of 35 trees. All the trees to be removed are not important trees[5]. We will incorporate a planting proposal as part of the project, including an estimated total of 35 trees.

25. We estimate that the proposed works will create 60 jobs (45 for labourers and 15 for professional or technical staff), providing a total employment of about 2 500 man-months.

Environment Bureau
May 2019

5 "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 : 150 000

圖例 LEGEND :

- 擬建的鄉村污水收集系統範圍 PROPOSED VILLAGE SEWERAGE AREA
- 擬建的污水泵房 PROPOSED SEWAGE PUMPING STATION
- 擬建的雙管加壓污水管道 PROPOSED TWIN RISING MAINS
- 輸送至將軍澳基本污水處理廠 CONVEY SEWAGE TO TSEUNG KWAN O PRELIMINARY TREATMENT WORKS
- 輸送至觀塘基本污水處理廠 CONVEY SEWAGE TO KWUN TONG PRELIMINARY TREATMENT WORKS

圖則名稱 drawing title

工務工程計劃編號214DS
將軍澳鄉村污水收集系統
PWP ITEM NO. 214DS
TSEUNG KWAN O SEWERAGE FOR VILLAGES

版 no.	日期 date	修改項目 description	簡簽 initial

繪畫 drawn *SIGNED* H. Y. LEE	日期 date 28 FEB 2019	圖則編號 drawing no. DPM/4214DS/0008
核對 checked *SIGNED* C. F. YEUNG	日期 date 28 FEB 2019	比例 scale N.T.S.
批核 approved *SIGNED* C. H. CHAN	日期 date 28 FEB 2019	
部門 office 工程管理部 PROJECT 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

A3 420x297

214DS – Tseung Kwan O sewerage for villages

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.4
		Technical	-	-	-	0.8
					Sub-total	1.2#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	135	38	1.6	17.7
		Technical	262	14	1.6	12.0
					Sub-total	29.7
	Comprising –					
	(i) Consultants' fees for management of RSS				2.0#	
	(ii) Remuneration of RSS				27.7#	
					Total	**30.9**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **214DS** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 7 of Enclosure 4.

214DS – Tseung Kwan O sewerage for villages

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land acquisition (resumption of private land)**		**4.65**
(II)	**Estimated cost for land clearance**		**0.12**
(a)	Ex-gratia allowances (EGAs) e.g. crop compensation, disturbance allowance for cultivators, and "Tun Fu" ceremonial fees, etc.	0.12	
(III)	**Interest and Contingency payment**		**0.48**
	Total		**5.25 (say 5.3)**

Note
The above estimated land acquisition cost is based on the prevailing rates as at April 2019.

414DS – Rehabilitation of underground sewers

PROJECT SCOPE AND NATURE

The part of **414DS** that we propose to upgrade to Category A comprises –

(a) the rehabilitation of about 6 kilometres (km) of underground sewers and associated manholes in Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin districts (the Six Districts); and

(b) ancillary works[1].

2. A plan showing the locations of the proposed works is at Annex 1 to Enclosure 5.

3. Subject to the funding approval by the Finance Committee, we aim to commence the proposed works in the first quarter of 2020 for completion in the third quarter of 2024.

4. We will retain the remainder of **414DS** in Category B, which comprises the rehabilitation of about 6 km of underground gravity sewers in other districts. Funding for the remainder of **414DS** will be sought later after completion of the detailed design of the remaining works.

JUSTIFICATION

5. There are about 1 800 km underground sewers in Hong Kong. Routine inspection and maintenance are conducted on these sewers, and repairs will be made when defects are detected. As many of these sewers have been in service for many years and are suffering from ageing and deterioration at an increasing rate, it is necessary to carry out detailed surveys to ensure that defects can be timely detected and thoroughly rectified. In the past few years, there have

/been …..

[1] Ancillary works include temporary closure and reinstatement of carriageways/footpaths/open space necessary for completion of the proposed works.

been incidents of ageing pipe collapse, resulting in road subsidence and overflow of raw sewage, and hence disruptions to traffic and nuisance to the public. Such incidents are expected to become more frequent as the sewers age further.

6. In 2015, the "Enhanced Management of Underground Sewer and Drain Networks - Feasibility Study" (the Study) has evaluated the risks of failure of the existing underground sewers. The Study categorised the gravity sewers and sewage rising mains according to their condition and risk of structural failure, and a territory-wide replacement and rehabilitation (R&R) programme was formulated. The status of the implementation of R&R programme is summarised at Annex 2 to Enclosure 5.

7. We now propose to rehabilitate about 6 km of gravity sewers in the Six Districts that have been confirmed by past inspection records as having high risks of structural failure. The rehabilitation works involve the installation of internal lining through the sewers. Trenchless technologies will be employed as far as possible to reduce road excavation works and minimise traffic impact.

8. Other than the above proposed works, we will continue to schedule regular inspection plans to monitor the conditions of underground sewers throughout the territory and review their R&R needs according to the prevailing conditions of sewers.

FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be $306.1 million in the money-of-the-day (MOD) prices (please see paragraph 11 below), broken down as follows –

			$ million (in MOD prices)
(a)	Rehabilitation of gravity sewers		224.8
(b)	Ancillary works		9.8
(c)	Environmental mitigation measures		1.0
(d)	Consultants' fees for		1.7
	(i) contract administration	1.0	
	(ii) management of resident site staff (RSS)	0.7	

/(e) …..

		$ million (in MOD prices)
(e)	Remuneration of RSS	41.0
(f)	Contingencies	27.8
	Total	306.1

10. We propose to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 5.

11. Subject to funding approval, we plan to phase the expenditure as follows –

Year	**$ million (MOD)**
2019 – 2020	1.2
2020 – 2021	47.5
2021 – 2022	56.6
2022 – 2023	48.1
2023 – 2024	47.7
2024 - 2025	47.3
2025 – 2026	26.4
2026 – 2027	17.2
2027 – 2028	14.1
	306.1

/12. …..

12. 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 2019 to 2028. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

13. We estimate the additional annual recurrent expenditure arising from the project to be $990,000. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

14. We consulted the relevant Committees of all six District Councils during the period from December 2018 to February 2019 as listed in Annex 4 to Enclosure 5. These Committees supported the proposed works.

15. We consulted the Legislative Council Panel on Environmental Affairs on 29 April 2019 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

16. The proposed works is not a designated project under the Environmental Impact Assessment Ordinance (Cap.499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in March 2019. The PER concluded and the Director of Environmental Protection agreed that, with the implementation of appropriate mitigation measures, the proposed works would not have any long-term adverse environmental impact. We have included in paragraph 9(c) a sum of $1 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

/17. …..

[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.

17. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisances to within the established standards and guidelines through implementation of the recommended mitigation measures in the relevant contract. These measures include the use of temporary noise barriers and silenced construction equipment 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.

18. At the planning and design stages, we have considered ways to reduce generation of construction waste wherever possible including the use of trenchless construction method to minimise the extent of excavation and the avoidance of demolition of existing structures as far as practicable. In addition, we will require 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 to the public fill reception facilities (PFRF[3]). 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.

19. We will also require the contractors to submit for approval a plan setting out waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the 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. …..

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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.

20. We estimate that the proposed works will generate in total about 6 000 tonnes of construction waste. Of these, we will reuse about 3 900 tonnes (65%) of inert construction waste on site, and deliver about 1 450 tonnes (24%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 650 tonnes (11%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be about $233,000 for the proposed works (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

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

LAND ACQUISITION

22. The proposed works will only involve government land. No land resumption is required.

BACKGROUND INFORMATION

23. In September 2015, we upgraded **414DS** to Category B.

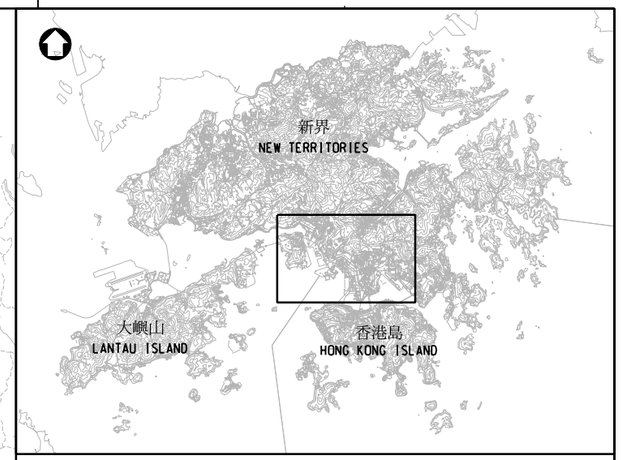
24. In June 2018, we upgraded part of **414DS** to Category A as **426DS** "Rehabilitation of underground sewers stage 1" at an approved project estimate of $391.9 million in MOD prices for implementing part of the rehabilitation works throughout the territory. The stage 1 works commenced in January 2019 for target completion by 2022.

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

/26. …..

26. 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 2 600 man-months.

Environment Bureau
May 2019



位置圖LOCATION PLAN

比例 SCALE 1 : 700 000

荃灣
TSUEN WAN

葵涌
KWAI CHUNG

深水埗
SHAM SHUI PO

黃大仙
WONG TAI SIN

旺角
MONG KOK

油麻地
YAU MA TEI

九龍城
KOWLOON CITY

尖沙咀
TSIM SHA TSUI

圖例 LEGEND :

擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

圖則名稱 drawing title

工務工程計劃編號414DS — 地下污水渠修復工程
PWP ITEM NO.414DS - REHABILITATION OF UNDERGROUND SEWERS

繪畫 drawn	SIGNED H.Y. LEE	日期 date 15 FEB 2019
核對 checked	SIGNED K.Y. CHEN	日期 date 15 FEB 2019
批核 approved	SIGNED K.W. FUNG	日期 date 15 FEB 2019
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION	

圖則編號 drawing no. DPM/4414DS/2014

比例 scale 1:40 000

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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414DS – Rehabilitation of underground sewers

Territory-wide Replacement and Rehabilitation (R&R) Programme for Sewers

Works Package	**Scope of Replacement and Rehabilitation Works**
Public Works Project (PWP) Item No.: **381DS** (under construction)	● Construction of about 6.5 kilometres (km) of an additional sewage rising main with 1 200 millimetres (mm) diameter from Tung Chung to Siu Ho Wan ● Rehabilitation of about 6.3 km of the existing sewage rising main with 1 200 mm diameter from Tung Chung to Siu Ho Wan
PWP Item No.: **393DS** (under construction)	● Rehabilitation of about 1.7 km of gravity sewers in Ngau Chi Wan, To Kwa Wan, Sha Tin and Sai Kung
PWP Item No.: **390DS** (under construction)	● Rehabilitation of about 4.2 km of sewage box culvert in Tuen Mun ● Rehabilitation of about 360 metres (m) of gravity sewers with diameters ranging from 400 mm to 1100 mm across Tuen Mun River Channel ● Construction of about 600 m of gravity sewers with 1 200 mm diameter in Tuen Mun
PWP Item No.: **426DS** (under construction)	● Condition surveys of about 75 km of gravity sewers in different regions of the territory ● Rehabilitation of about 7 km of gravity sewers in different regions of the territory
PWP Item No.: **414DS** (partly included in the proposed works)	● Rehabilitation of about 12 km of gravity sewers in different regions of the territory that have been confirmed by past inspection records as having high risks of structural failure
Other PWP items (under planning)	● Rehabilitation of about 20 km of sewage rising mains in different regions of the territory ● Rehabilitation of gravity sewers confirmed by further condition surveys to have high risk of structural failure
R&R works to be carried out by the maintenance teams of DSD (on-going)	● Rehabilitation of about 40 km of gravity sewers in different regions of the territory ● Condition surveys of about 60 km of gravity sewers in different regions of the territory

414DS – Rehabilitation of underground sewers

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.6
		Technical	-	-	-	0.2
					Sub-total	0.8#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	140	38	1.6	18.4
		Technical	328	14	1.6	15.1
					Sub-total	33.5
	Comprising –					
	(i) Consultants' fees for management of RSS				0.6#	
	(ii) Remuneration of RSS				32.9#	
					Total	**34.3**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **414DS** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 9 of Enclosure 5.

414DS - Rehabilitation of Underground Sewers

Consultation with District Councils

Date	District Council	Committee
18 December 2018	Kwai Tsing	Planning and District Facilities Management Committee
18 December 2018	Wong Tai Sin	Food and Environmental Hygiene Committee
3 January 2019	Tsuen Wan	Environmental and Health Affairs Committee
10 January 2019	Kowloon City	Housing and Infrastructure Committee
17 January 2019	Yau Tsim Mong	Food, Environmental Hygiene and Public Works Committee
14 February 2019	Sham Shui Po	Environment and Hygiene Committee

172CD – Rehabilitation of underground stormwater drains

PROJECT SCOPE AND NATURE

The part of **172CD** which we propose to upgrade to Category A comprises –

(a) a condition survey of about 55 kilometres (km) of underground stormwater drains and associated manholes in Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin districts (the Six Districts);

(b) rehabilitation of about 11 km of underground stormwater drains and associated manholes in the Six Districts; and

(c) ancillary works[1].

2. A plan showing locations of the proposed works is at Annex 1 to Enclosure 6.

3. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed works in the first quarter of 2020 for completion in the third quarter of 2024.

4. We will retain the remainder of **172CD** in Category B. We will seek funding for the remainder of **172CD** after completion of the detailed design of the remaining works.

JUSTIFICATION

5. There are about 2 400 km of underground stormwater drains in Hong Kong. Routine inspection and maintenance are conducted on these stormwater drains, and repairs will be made when defects are detected. As many of these stormwater drains have been in service for years and are suffering from ageing and deterioration at an increasing rate, it is necessary to carry out detailed

/surveys …..

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[1] Ancillary works include temporary closure and reinstatement of carriageways/footpaths/open space, etc.

surveys to ensure that defects can be timely detected and thoroughly rectified. In the past few years, there have been incidents of ageing pipe collapse, resulting in road subsidence and hence disruptions to traffic and nuisance to public. Such incidents are expected to become more frequent as the stormwater drains age further.

6. In 2015, the "Enhanced Management of Underground Sewer and Drain Networks - Feasibility Study" (the Study) evaluated the risks of failure of the underground stormwater drains. The Study categorised one group of underground stormwater drains as confirmed to have high risk of structural failure, requiring prioritized rehabilitation, while another group of underground stormwater drains is categorised as predicted to have high risk of structural failure but their conditions and needs for rehabilitation would have to be verified by further on-site condition surveys. In this regard, a territory-wide replacement and rehabilitation (R&R) programme has been formulated. Details of the R&R programme are outlined in Annex 2 to Enclosure 6.

7. There are other drainage projects in the Six Districts with the construction works about to start or have commenced. The proposed and other drainage works could be implemented in a coordinated manner with a view to avoiding repeated excavation or road closure and shortening the overall time for the drainage works, thereby alleviating the impact of the works to the Six Districts as well as minimizing inconvenience to the public.

8. The proposed works include the rehabilitation of about 11 km of underground stormwater drains in the Six Districts, which have been confirmed by previous inspections as having high risk of structural failure. The rehabilitation works would involve the installation of internal lining through the drains. Trenchless technologies will be employed as far as possible to reduce road excavation works and minimise traffic impact. Besides, the proposed works include conducting a condition survey for 55 km of stormwater drains in the Six Districts.

9. Other than the above proposed works and on-going works, we will continue to schedule regular inspection plans to monitor the conditions of underground stormwater drains throughout the territory and review the respective R&R needs according to the prevailing conditions of stormwater drains.

FINANCIAL IMPLICATIONS

10. We estimate the capital cost of the proposed works to be $515.1 million in the money-of-the-day (MOD) prices (please see paragraph 12 below), broken down as follows –

			$ million (in MOD prices)
(a)	Condition survey of stormwater drains		48.5
(b)	Rehabilitation of stormwater drains		329.8
(c)	Ancillary works		16.8
(d)	Environmental mitigation measures		1.6
(e)	Consultants' fees for		2.7
	(i) contract administration	1.6	
	(ii) management of resident site staff (RSS)	1.1	
(f)	Remuneration of RSS		68.9
(g)	Contingencies		46.8
	Total		515.1

11. We propose to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 6.

/12. …..

12. Subject to funding approval, we plan to phase the expenditure as follows –

Year	$ million (MOD)
2019 – 2020	1.8
2020 – 2021	80.3
2021 – 2022	95.6
2022 – 2023	85.2
2023 – 2024	72.8
2024 - 2025	79.9
2025 – 2026	43.2
2026 – 2027	30.5
2027 – 2028	25.8
	515.1

13. 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 2019 to 2028. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

14. We estimate the additional annual recurrent expenditure arising from the proposed project to be $930,000.

/PUBLIC …..

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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.

PUBLIC CONSULTATION

15. We consulted the relevant Committees of all six District Councils between December 2018 and February 2019, as listed in Annex 4 to Enclosure 6. Members of the Committees supported the proposed works.

16. We consulted the Legislative Council Panel on Development on 30 April 2019 and Members supported the project.

ENVIRONMENTAL IMPLICATIONS

17. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department completed a Preliminary Environmental Review (PER) for the proposed works in March 2019. The PER 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 10(d) a sum of $1.6 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

18. For short-term environmental impacts during construction, we will minimise environmental nuisance to within established standards and guidelines through the implementation of appropriate mitigation measures in the contract. These measures include the use of temporary noise barriers and silenced construction equipment, water-spraying to the construction site and on-site treatment of site run-off. We will carry out regular site inspections to ensure these measures and good site practices will be properly implemented on site.

19. At the planning and design stages, we have considered measures to reduce generation of construction waste wherever possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to the public fill reception facilities (PFRF)[3]. 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.

/20. …..

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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.

20. At the construction stage, we will require the contractor to submit for approval a plan setting out waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

21. We estimate that the proposed works will generate a total of about 9 800 tonnes of construction waste. Of these, we will reuse about 4 800 tonnes (49%) of inert construction waste on site, deliver about 2 450 tonnes (25%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 2 550 tonnes (26%) of non-inert construction waste to landfills for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $680,000 for the proposed works (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

22. 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

23. The proposed works will only involve government land. No land resumption is required.

BACKGROUND INFORMATION

24. In September 2015, we upgraded **172CD** to Category B.

25. In June 2018, we upgraded part of **172CD** to Category A as **180CD** "Rehabilitation of underground stormwater drains stage 1" at an approved project estimate of $122.8 million in MOD prices for implementing part of the rehabilitation works throughout the territory. The stage 1 works commenced in January 2019 for completion by 2022.

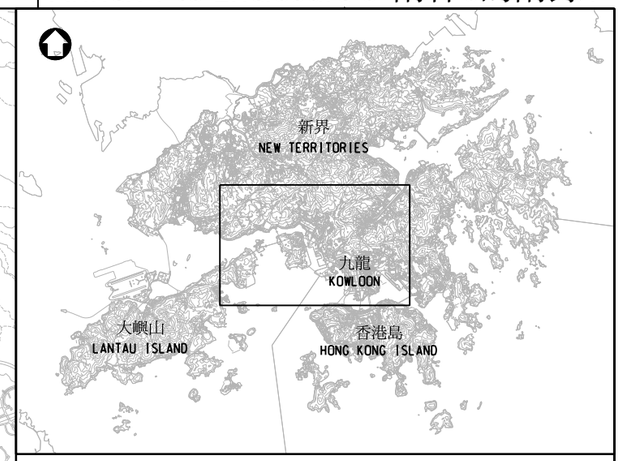
/26. …..

26. We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.

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

28. We estimate that the proposed works will create about 80 jobs (65 for labourers and 15 for professional or technical staff), providing a total employment of 3 800 man-months.

Development Bureau
May 2019



位置圖 LOCATION PLAN

比例 SCALE 1 : 700 000

荃灣 TSUEN WAN
深井 SHAM TSENG
葵涌 KWAI CHUNG
青衣 TSING YI
馬灣 MA WAN
黃大仙 WONG TAI SIN
深水埗 SHAM SHUI PO
旺角 MONG KOK
九龍城 KOWLOON CITY
油麻地 YAU MA TEI
尖沙咀 TSIM SHA TSUI
竹篙灣 PENNY'S BAY

圖例 LEGEND :

- 擬勘測之雨水渠 PROPOSED STORMWATER DRAINS FOR CONDITION SURVEY
- 擬修復之雨水渠 PROPOSED STORMWATER DRAINS FOR REHABILITATION

圖則名稱 drawing title

172CD 號工程計劃「地下雨水渠修復工程」

172CD REHABILITATION OF UNDERGROUND STORMWATER DRAINS

繪畫 drawn	SIGNED H.Y. LEE	日期 date	15 FEB 2019
核對 checked	SIGNED K.Y. CHEN	日期 date	16 MAY 2019
批核 approved	SIGNED K.W. FUNG	日期 date	16 MAY 2019
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no. DPM/4172CD/2008

比例 scale 1:55 000

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

172CD – Rehabilitation of underground stormwater drains

Territory-wide Replacement and Rehabilitation Programme for Stormwater Drains

Works Package	Scope of Replacement and Rehabilitation (R&R) Works
180CD "Rehabilitation of underground stormwater drains - stage 1" [On-going]	• Condition surveys of 35 km of stormwater drains in various areas of the territory • Rehabilitation of 11 km of stormwater drains in various areas of the territory
172CD "Rehabilitation of underground stormwater drains" [Proposed]	• Condition surveys of 55 km of stormwater drains in the Six Districts[#] • Rehabilitation of 11 km of stormwater drains in the Six Districts[#] # Tsuen Wan, Kwai Tsing, Sham Shui Po, Yau Tsim Mong, Kowloon City and Wong Tai Sin districts
Remainder of 172CD	• Condition surveys of 78 km of stormwater drains in areas other than the Six Districts • Rehabilitation of 19 km of stormwater drains in areas other than the Six Districts (FC's approval will be sought for the above proposed works later after completion of the detailed design.)
R&R works to be carried out by maintenance teams of Drainage Services Department	• Condition surveys of 78 km of stormwater drains in various areas of the territory • Rehabilitation of 30 km of stormwater drains in various areas of the territory
Other R&R works under planning	• Rehabilitation of stormwater drains confirmed by condition surveys to have high risk of structural failure

172CD – Rehabilitation of underground stormwater drains

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.9
		Technical	-	-	-	0.4
					Sub-total	1.3#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	228	38	1.6	29.9
		Technical	572	14	1.6	26.3
					Sub-total	56.2
	Comprising –					
	(i) Consultants' fees for management of RSS				0.9#	
	(ii) Remuneration of RSS				55.3#	
					Total	**57.5**

* 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 = $81,975 per month and MPS salary point 14 = $28,725 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 **172CD**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **172CD** to Category A.

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

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 10 of Enclosure 6.

172CD – Rehabilitation of underground stormwater drains

Consultation with District Councils

Date	District Council	Committee
18 December 2018	Kwai Tsing	Planning and District Facilities Management Committee
18 December 2018	Wong Tai Sin	Food and Environmental Hygiene Committee
3 January 2019	Tsuen Wan	Environmental and Health Affairs Committee
10 January 2019	Kowloon City	Housing and Infrastructure Committee
17 January 2019	Yau Tsim Mong	Food, Environmental Hygiene and Public Works Committee
14 February 2019	Sham Shui Po	Environment and Hygiene Committee