For discussion
on 19 May 2018

PWSC(2018-19)16

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
392DS – Expansion of Sha Tau Kok Sewage Treatment Works – phase 1
345DS – North District sewerage stage 2 part 2A
398DS – Sewerage to Lei Yue Mun Village
343DS – Outlying Islands sewerage stage 2 – Peng Chau village sewerage phase 2
390DS – Rehabilitation of trunk sewers in Tuen Mun
403DS – Upgrading of sewage pumping stations and sewerage along Ting Kok Road
414DS – Rehabilitation of underground sewers
344DS – Upgrading of Central and East Kowloon sewerage – phase 3

Members are invited to recommend to the Finance Committee –

(a) the upgrading of **392DS**, **398DS**, **390DS**, **403DS** and **344DS** to Category A at estimated costs of $2,040.9 million, $260.2 million, $806.6 million, $847.3 million and $680.9 million in money-of-the-day (MOD) prices respectively;

(b) the upgrading of part of **345DS**, entitled "North District sewerage stage 2 part 2A – village sewerage for Tong To", to Category A at an estimated cost of $34 million in MOD prices;

/(c) …..

(c) the upgrading of part of **343DS**, entitled "Outlying Islands sewerage stage 2 – Peng Chau village sewerage phase 2 package 1", to Category A at an estimated cost of $133.7 million in MOD prices;

(d) the upgrading of part of **414DS**, entitled "Rehabilitation of underground sewers stage 1" to Category A at an estimated cost of $391.9 million in MOD prices; and

(e) the retention of the remainders of **345DS**, **343DS** and **414DS** in Category B.

PROBLEM

There is a need to expand Sha Tau Kok Sewage Treatment Works and to provide village sewerage to the unsewered areas in Tong To, Lei Yue Mun Village and Peng Chau in order to improve water quality of the receiving waters of Starling Inlet, Lei Yue Mun and Peng Chau respectively. There is also an urgent need to rehabilitate the ageing underground sewers throughout the territory and the existing trunk sewerage system in Tuen Mun and upgrade the sewerage systems in Central and East Kowloon and along Ting Kok Road in Tai Po in order to maintain an adequate level of sewerage service for these areas. These projects form part of the overall sewerage and sewage treatment and disposal plan for Hong Kong.

PROPOSAL

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

(a) **392DS** at an estimated cost of $2,040.9 million in MOD prices for the phase 1 expansion of Sha Tau Kok Sewage Treatment Works;

/(b) …..

(b) part of **345DS** at an estimated cost of $34 million in MOD prices for the provision of village sewerage in Tong To, Sha Tau Kok;

(c) **398DS** at an estimated cost of $260.2 million in MOD prices for the provision of village sewerage in Lei Yue Mun Village;

(d) part of **343DS** at an estimated cost of $133.7 million in MOD prices for the provision of village sewerage in part of Peng Chau;

(e) **390DS** at an estimated cost of $806.6 million in MOD prices for the rehabilitation of trunk sewers in Tuen Mun;

(f) **403DS** at an estimated cost of $847.3 million in MOD prices for the upgrading of sewage pumping stations and sewerage system along Ting Kok Road in Tai Po;

(g) part of **414DS** at an estimated cost of $391.9 million in MOD prices for the condition survey and rehabilitation of ageing underground sewers throughout the territory; and

(h) **344DS** at an estimated cost of $680.9 million in MOD prices for the upgrading of existing sewers in Central and East Kowloon.

PROJECT SCOPE AND NATURE

3. The eight projects form part and parcel of the overall sewerage and sewage treatment and disposal plan for Hong Kong and serve to maintain and enhance the capacity of the existing sewerage and sewage treatment systems to cater for population growth and development needs in the relevant areas of Hong Kong and for safeguarding water quality. These projects are now ready to be taken forward for construction. The nature and scope of these projects are largely similar in that they will all adopt effective means to sustain, improve and extend the functions of the existing sewerage systems and sewage treatment works with a view to affording better protection for public health and reducing pollution load to the receiving waterbody in relevant areas of Hong Kong. Putting these projects in this composite paper would present the Government's holistic and systemic efforts in expanding and/or improving the sewerage system; and enhancing water quality in the concerned areas and facilitate discussion.

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

Environment Bureau
May 2018

392DS – Expansion of Sha Tau Kok Sewage Treatment Works - phase 1

PROJECT SCOPE AND NATURE

The proposed scope of works under **392DS** comprises -

(a) the reconstruction of the existing Sha Tau Kok Sewage Treatment Works (STKSTW) to increase its capacity to 5 000 cubic metres (m^3) per day and provide allowance to facilitate a further increase to 10 000 m^3 per day in the future;

(b) the construction of approximately 1.7 kilometres (km) of submarine outfall with diameter of 450 millimetres (mm) for the disposal of treated effluent from STKSTW;

(c) the demolition of an existing sewage pumping station and the decommissioning of approximately 500 metres (m) of twin rising mains with 200 mm diameter and an existing submarine outfall with 250 mm diameter;

(d) the construction of approximately 520 m gravity sewers with diameters ranging from 300 mm to 450 mm in Sha Tau Kok town; and

(e) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2018 for completion in the first quarter of 2025. To meet the tight works programme, we will invite tender for the proposed works in parallel. The tender will only be awarded after obtaining FC's funding approval.

/JUSTIFICATION …..

[1] Ancillary works include the utilities diversion, provision of manholes, temporary closure and reinstatement of carriageways/footpaths/open space, necessary building services and landscaping works that are required to complete the proposed works and the provision of temporary sewage treatment facilities to maintain the current level of sewage treatment service for Sha Tau Kok town during the reconstruction of STKSTW.

JUSTIFICATION

4. The existing STKSTW has a capacity of 1 660 m^3 per day and discharges its treated effluent through a short submarine outfall into Starling Inlet. At present, it only serves the Sha Tau Kok town area.

5. The existing capacity of STKSTW is expected to be used up by 2019 and the sewage flow would reach 5 000 m^3 per day after 2031 as a result of population growth, completion of village sewerage along Sha Tau Kok Road and the potential housing developments in Sha Tau Kok town. We propose to reconstruct STKSTW to increase its capacity by 3 340 m^3 to 5 000 m^3 per day to serve a projected population of about 20 000 with an allowance to further increase the capacity by another 5 000 m^3 to 10 000 m^3 per day in the future. We also propose to construct a larger and longer submarine outfall to provide sufficient capacity for discharging the increased treated effluent and to improve the dilution of effluent by water current.

6. The proposed works will also include the provision of temporary sewage treatment facilities to maintain the current level of sewage treatment services for Sha Tau Kok town during the reconstruction of existing STKSTW, the upgrading of STKSTW treatment level and alteration to the trunk sewer system within Sha Tau Kok town.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $2,040.9 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

		$ million (in MOD prices)
(a)	Upgrading of sewage treatment works	739.5
	(i) civil works	371.3
	(ii) electrical and mechanical works	368.2
(b)	Submarine outfall	436.2
(c)	Demolition and decommissioning works	4.4

/(d) …..

			$ million (in MOD prices)
(d)	Gravity sewers		34.4
(e)	Ancillary works		149.5
(f)	Environmental mitigation measures		184.1
(g)	Consultants' fees for		15.0
	(i) contract administration	5.7	
	(ii) management of resident site staff (RSS)	9.3	
(h)	Remuneration of RSS		292.8
(i)	Contingencies		185.0
	Total		2,040.9

8. 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 2 to Enclosure 1.

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

Year	**$ million (MOD)**
2018 – 2019	106.9
2019 – 2020	149.5
2020 – 2021	295.6
2021 – 2022	330.1
2022 – 2023	285.4
2023 – 2024	235.4

/2024-2025 …..

Year	$ million (MOD)
2024 – 2025	201.5
2025 – 2026	187.3
2026 – 2027	146.9
2027 – 2028	102.3
	2,040.9

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 2018 to 2028. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from the project to be $32.6 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 1.55% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

12. We conducted two public forums in August 2015. We also consulted the Sha Tau Kok District Rural Committee and the District Minor Works and Environmental Improvement Committee of North District Council on 15 July and 14 September 2015 respectively. Both the Rural Committee and the District Council supported the project.

/13. …..

[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.

13. We gazetted the proposed works for the submarine outfall under Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127) on 18 March 2016. A total of four objections were received during the statutory objection period. Among the four objections received, one objection was resolved while the remaining three objections were unresolved. The three unresolved objections were mainly on the length of the submarine outfall. The proposed works were subsequently authorised by the Chief Executive-in-Council without modification on 25 April 2017 after considering the unresolved objections submitted by members of the public.

14. We consulted the Legislative Council Panel on Environmental Affairs (EA Panel) on 27 November 2017 and Members supported the proposed works. The Government has thoroughly considered the feasibility of further extending the submarine outfall for an extra kilometre. According to the Environmental Impact Assessment (EIA) Report for the project, the proposed 1.7 km submarine outfall could fully meet all relevant environmental requirements and extending the submarine outfall for an extra kilometre does not result in any significant environmental gain. The additional one km of the submarine outfall will cost $250 million (in MOD prices) and is not considered cost-effective and justifiable. Supplementary information on the predicted water quality in the Starling Inlet and the effect and cost of further extending the proposed submarine outfall is set out in Annex 3 to Enclosure 1.

ENVIRONMENTAL IMPLICATIONS

15. The proposed works 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 February 2017, the EIA Report for the project was approved with conditions 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 February 2017. 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(f) a sum of $184.1 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

16. For the construction phase, we will adopt the non-dredge trenchless method for the outfall construction to avoid disturbing the seabed and will conduct removal of sediment at the proposed outfall diffuser within fully drained water-tight cofferdam to

/avoid …..

avoid any adverse impact on water quality. We will conduct pre-construction survey of the nearby Night Roosting Site for Great Egret and schedule demolition and construction works within 100 m of the Roosting Site to avoid disturbance to the Great Egret or other ardeids using the Roosting Site. We will make use of low-noise technology and equipment to minimise noise impact from the demolition works. To further minimise dust and noise impacts, the section of the new sewer near Tin Hau Temple will be constructed using trenchless method. 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. 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 expanded STKSTW with deodourisation unit, fitting exhaust fans with acoustic louvre/silencer and removing sewage sludge off-site regularly in fully enclosed trucks. We will also prepare an Emergency Response Plan to cater for any emergency discharge.

18. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will request the 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 request the contractors to submit for approval a plan setting out the waste management measures, including appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

/20. …..

[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 115 200 tonnes of construction waste. Of these, we will reuse 23 000 tonnes (20%) on site, and deliver 91 700 tonnes (79.6%) of inert construction waste to PFRF for subsequent reuse and 500 tonnes (0.4%) non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $6.6 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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.

22. We have conducted a Built Heritage Impact Assessment (BHIA) within the boundary of the project. The BHIA has identified a number of historic buildings, comprising 11 historic buildings at Ha Tam Shui Hang and 27 historic buildings at Sha Tau Kok and no declared monuments is identified. The identified historic buildings at Ha Tam Shui Hang and Sha Tau Kok are located over 150 m and 80 m away from the proposed works respectively except the Tin Hau Temple at Sha Tau Kok. Appropriate mitigation measures to preserve the Tin Hau Temple will be implemented in accordance with the recommendations of the BHIA.

LAND ACQUISITION

23. The implementation of the proposed works will only involve government land. No land resumption is required. The estimated amount of ex-gratia allowance (EGA) for fishermen is about $3.2 million. If the water quality in Sha Tau Kok Fish Culture Zone is adversely affected by marine works and the prescribed criteria are met, mariculturists of the affected fish culture zone may be eligible for EGA. The maximum total amount of EGA payable to eligible mariculturists is estimated to be $31.8 million if all mariculturists in the Sha Tau Kok Fish Culture Zone opt to cease operation. We will charge the total estimated cost of $35.0 million to **Head 701 - Land Acquisition**, relevant breakdown is at Annex 4 to Enclosure 1.

/BACKGROUND …..

BACKGROUND INFORMATION

24. We upgraded **392DS** to Category B in September 2012.

25. In June 2013, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $27.9 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 for the proposed works.

26. The proposed works will involve the felling of 14 trees. All the trees to be removed are not important trees[4]. We will incorporate a planting proposal as part of the project, including an estimated total of 31 trees.

27. We estimate that the proposed works will create about 200 jobs (160 for labourers and 40 for professional or technical staff), providing a total employment of 13 700 man-months.

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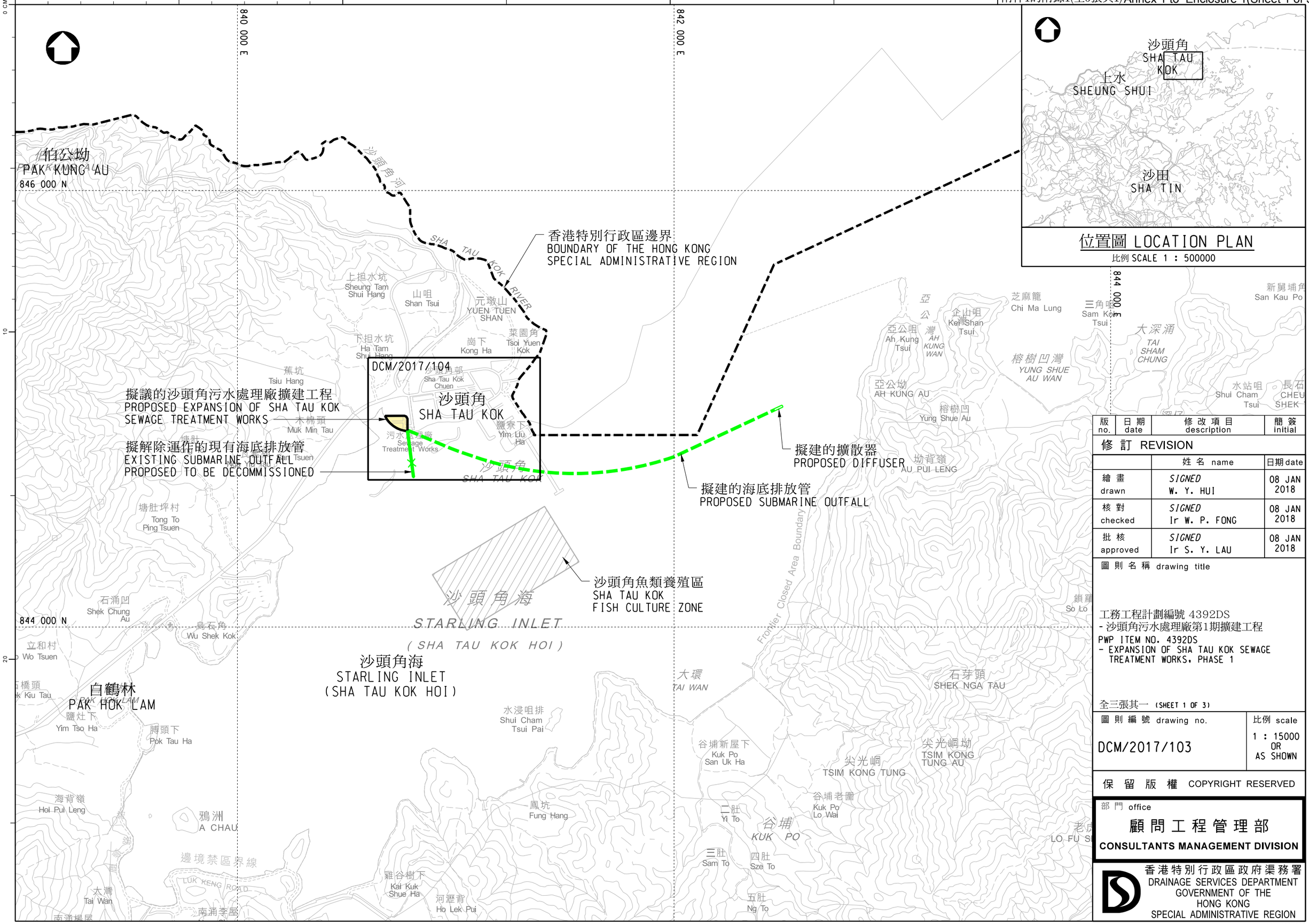
[4] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(a) trees of 100 years old or above;
(b) trees of cultural, historical or memorable significance, e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or event;
(c) trees of precious or rare species;
(d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
(e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.



位置圖 LOCATION PLAN

比例 SCALE 1 : 500000

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. Y. HUI	08 JAN 2018
核對 checked	*SIGNED* Ir W. P. FONG	08 JAN 2018
批核 approved	*SIGNED* Ir S. Y. LAU	08 JAN 2018

圖則名稱 drawing title

工務工程計劃編號 4392DS
- 沙頭角污水處理廠第1期擴建工程

PWP ITEM NO. 4392DS
- EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS, PHASE 1

全三張其一 (SHEET 1 OF 3)

圖則編號 drawing no.	比例 scale
DCM/2017/103	1 : 15000 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

A3 420x297

392DS – Expansion of Sha Tau Kok Sewage Treatment Works – phase 1

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	3.3
		Technical	-	-	-	1.1
					Sub-total	4.4#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	655	38	1.6	82.6
		Technical	3 430	14	1.6	150.8
					Sub-total	233.4
	Comprising –					
	(i) Consultants' fees for management of RSS				7.2#	
	(ii) Remuneration of RSS				226.2#	
					Total	**237.8**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $78,775 per month and MPS salary point 14 = $27,485 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 **392DS**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **392DS** 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.

392DS – Expansion of Sha Tau Kok Sewage Treatment Works – phase 1

Predicted water quality in the Starling Inlet and the estimated cost of different submarine outfall options

Parameter	Water Quality Objectives (WQOs) for Mirs Bay Water Control Zone	Outfall Options		
		Before the proposed works	After the proposed works (ultimate scenario assumed)	
		Existing 250m outfall (Depth **1.5m**) [1]	Recommended option – 1.7km outfall (Depth **5-6m)** [2]	Fallback option – 2.7km outfall (Depth **5-6m)** [2]
Measured / Predicted Water Quality at		EPD's Monitoring Station (Starling Inlet) [3]	Sha Tau Kok Fish Culture Zone (STKFCZ)	Sha Tau Kok Fish Culture Zone
Dissolved Oxygen (DO) (for 90% of the sampling occasions during the year, in mg/L)	≥ 2 (bottom) ≥ 4 (Depth-averaged) ≥ 5 (Fish Culture Subzone)	5.5	5.01	5.01
Total Inorganic Nitrogen (TIN) (Annual Mean in mg/L)	< 0.3	0.12	0.21	0.19
Unionised Ammonia (NH_3-N) (Annual Mean in mg/L)	< 0.021	0.002	0.006	0.005
Suspended solids (SS) (Annual Mean in mg/L)	Discharge not to raise the natural ambient SS level by 30% nor cause the accumulation of SS which may adversely affect aquatic communities	8.0	Increased by 11% (max.)	Increased by 8% (max.)
Salinity (Change)	Discharge not to change the natural ambient salinity level by more than 10%	Not Applicable (existing discharge)	Decreased by 0.18% (max.)	Increased by 0.01% (max.)
E coli. (Annual Geometric Mean in cfu / 100mL)	< 610 (Fish Culture Subzone)	15	23	22
Construction Cost ($million, in money-of-the-day prices)	---	---	About 440	About 690

[1] Measured water quality for existing outfall are the 2016 annual mean figures from EPD's monitoring programme and fully complied with the relevant WQOs.

[2] Both the 1.7km and 2.7km outfall options fully complied with the relevant WQOs and 1.7km option is more cost-effective.

[3] The EPD's marine water quality monitoring station of Starling Inlet is located about 1.5km away from the STKFCZ.

392DS – Expansion of Sha Tau Kok Sewage Treatment Works – phase 1

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land clearance**		**31.8**
(a)	Ex-gratia allowances for fishery undertaking	31.8	
(II)	**Interest and Contingency Payment**		**3.2**
(a)	Contingency on estimated land acquisition cost	3.2	
		Total	**35.0**

Note
The above estimated land acquisition cost is based on the prevailing rates as at March 2018.

345DS – North District sewerage, stage 2 part 2A

PROJECT SCOPE AND NATURE

The part of **345DS** that we propose to upgrade to Category A comprises –

(a) the construction of about one kilometre of gravity sewers with 250 millimetres diameter for Tong To in Sha Tau Kok; and

(b) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2018 for completion in the fourth quarter of 2021. To meet the tight works programme, we will invite tender for the proposed works in parallel. The tender will only be awarded after obtaining FC's funding approval.

4. We will retain the remainder of **345DS** in Category B for the provision of public sewerage system for another five unsewered areas in North District. Funding for the remainder of **345DS** will be sought at a later stage after completion of the design and preparatory work.

JUSTIFICATION

5. Tong To is an unsewered area in Sha Tau Kok and the sewage from this area is currently disposed of by many individual and simple on-site facilities such as septic tank and soakaway (STS) systems[2]. The effluent from some STS systems has been identified as a source of pollution to nearby streams as well as the receiving waters of Starling Inlet.

/6. …..

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[1] Ancillary works include the utilities diversion, road and drainage works required to facilitate the sewerage 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.

6. The "North District Sewerage Master Plan" recommended that Tong To should be served by a public sewerage system. We now propose to install a public sewerage system for Tong To to collect and convey its sewage to Sha Tau Kok Sewage Treatment Works for proper treatment and disposal. The proposed sewerage system will serve an estimated ultimate population of 1 000.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $34 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

			$ million (in MOD prices)
(a)	Gravity sewers		25.3
(b)	Ancillary works		1.0
(c)	Environmental mitigation measures		0.2
(d)	Consultants' fees for		0.3
	(i) contract administration	0.2	
	(ii) management of resident site staff (RSS)	0.1	
(e)	Remuneration of RSS		4.1
(f)	Contingencies		3.1
	Total		34.0

8. 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 2 to Enclosure 2.

/9. …..

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

Year	$ million (MOD)
2018 – 2019	0.5
2019 – 2020	2.9
2020 – 2021	13.6
2021 – 2022	10.3
2022 – 2023	2.6
2023 – 2024	2.7
2024 – 2025	1.4
	34.0

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 2018 to 2025. 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 $90,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by less than 0.01% which 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 Sha Tau Kok District Rural Committee (STKDRC) and the District Minor Works and Environmental Improvement Committee (DMW&EIC) of North District Council which supported the project, we consulted the Chairman of STKDRC, the relevant North District Council member and the village representative again on 26 October 2017. They maintained their support of the project.

13. We consulted DMW&EIC on the proposed works again on 20 November 2017 and they remained in support of the project.

14. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 20 May 2011 and did not receive any objection during the statutory objection period. The proposed works were subsequently authorised on 19 August 2011.

15. We consulted the Legislative Council Panel on Environmental Affairs on 27 November 2017 and Members supported the project.

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 August 2012. The PER concluded that 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 7(c) a sum of $200,000 (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

17. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through the 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.

/18. …...

18. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will request the 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.

19. We will also request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

20. We estimate that the proposed works will generate 6 360 tonnes of construction waste. Of these, we will reuse 3 800 tonnes (60%) on site and deliver 2 500 tonnes (39%) to PFRF for subsequent reuse and 60 tonnes (1%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of the construction waste at PFRF and landfill sites is estimated to be $189,500 (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 or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

22. We conducted a Built Heritage Impact Assessment (BHIA) in October 2009 and identified that several proposed sewers will be located in the vicinity of some village houses and shrine. Appropriate mitigation measures will be implemented in accordance with the recommendations of the BHIA.

/LAND …..

[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.

LAND ACQUISITION

23. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 1 101 square metres (m^2) of private agricultural land and clear about 1 928.9 m^2 of government land for carrying out the proposed works. The land resumption and clearance will not require clearance of any households or domestic structures. We will charge the cost of land acquisition and clearance, estimated at $6.8 million, to **Head 701 – Land Acquisition**. A breakdown of the land acquisition and clearance cost is at Annex 3 to Enclosure 2.

BACKGROUND INFORMATION

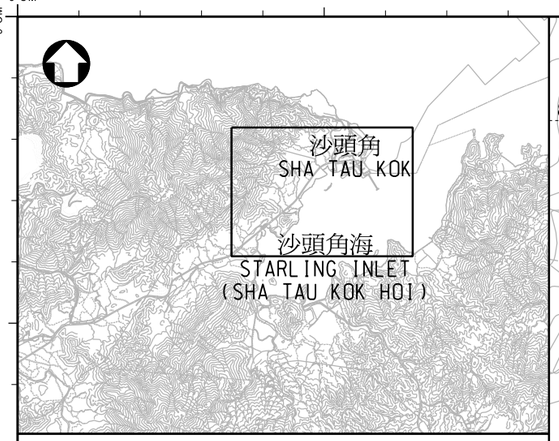
24. In October 1994, we upgraded **203DS** "North District sewerage" to Category B for implementation of sewerage works recommended under a comprehensive study of the sewerage works in the North District in two stages.

25. In October 2005, we splitted parts of the works under **203DS** into **345DS** "North District sewerage, stage 2 part 2A" and **203DS** "North District sewerage, stage 2 part 2B".

26. In April 2008, we engaged consultants to carry out necessary investigations and detailed design for the works of **345DS** (stage 2 part 2A) and **203DS** (stage 2 part 2B) and other sewerage works at an estimated cost of $7.7 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** "Drainage works, studies and investigations for items in Category D of the Public Works Programme". The consultancy works are being carried out in phases. We have substantially completed the detailed design for the proposed works mentioned in paragraph 1 above, and are working on the design of the remaining works under **345DS**.

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

28. We estimate that the proposed works will create 12 jobs (ten for labourers and two for professional or technical staff), providing a total employment of about 400 man-months.



位置圖 LOCATION PLAN
比例 SCALE 1 : 100000

香港特別行政區邊界
BOUNDARY OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

現有的雙管污水泵喉
EXISTING TWIN RISING MAINS

蕉坑
TSIU HANG

沙頭角
SHA TAU KOK

沙頭角污水處理廠
SHA TAU KOK SEWAGE TREATMENT WORKS

現有的海底排放管
EXISTING SUBMARINE OUTFALL

現有的沙頭角污水泵房
EXISTING SHA TAU KOK SEWAGE PUMPING STATION

塘肚
TONG TO

現有的無壓污水渠
EXISTING GRAVITY SEWERS

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

石涌凹
SHEK CHUNG AU

沙頭角海
STARLING INLET
(SHA TAU KOK HOI)

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	15 NOV 2017
核 對 checked	*SIGNED* Ir C. TSE	15 NOV 2017
批 核 approved	*SIGNED* Ir H. L. WONG	15 NOV 2017

圖 則 名 稱 drawing title

工務工程計劃編號4345DS
- 北區污水收集系統第2階段第2A期
PWP ITEM NO. 4345DS
- NORTH DISTRICT SEWERAGE STAGE 2 PART 2A

圖 則 編 號 drawing no.
DCM/2017/105

比例 scale
1 : 7500 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

345DS – North District sewerage, stage 2 part 2A

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.1
		Technical	-	-	-	0.1
					Sub-total	0.2#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	10	38	1.6	1.3
		Technical	50	14	1.6	2.2
					Sub-total	3.5
	Comprising – (i) Consultants' fees for management of RSS				0.1#	
	(ii) Remuneration of RSS				3.4#	
					Total	**3.7**

* 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 = $78,775 per month and MPS salary point 14 = $27,485 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 this part of **345DS** 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.

345DS – North District sewerage, stage 2 part 2A

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land acquisition (resumption of private land)**		**6.16**
(II)	**Estimated cost for land clearance**		**0.08**
(a)	Ex-gratia allowances for agricultural undertakings	0.06	
(b)	Ex-gratia allowances for miscellaneous villager matter (Tun Fu ceremonies / removal of graves and Urns (Kam Taps))	0.02	
(III)	**Interest and Contingency payment**		**0.60**
(a)	Contingency on the estimated land acquisition cost	0.60	
	Total		**6.84 (say, 6.8)**

Note

The above estimated land acquisition cost is based on the prevailing rates as at April 2018.

398DS – Sewerage to Lei Yue Mun Village

PROJECT SCOPE AND NATURE

The proposed scope of works under **398DS** comprises –

(a) the construction of approximately one kilometre of gravity sewers with diameters ranging from 280 millimetres (mm) to 560 mm and nine dry weather flow interceptors (DWFIs[1]);

(b) the construction of approximately 460 metres (m) of twin rising mains with 225 mm diameter and four sewage pumping chambers;

(c) the upgrading of approximately 400 m of existing gravity sewers with diameters ranging from 225 mm to 300 mm to gravity sewers with 560 mm diameter at Lei Yue Mun (LYM) Praya Road and LYM Path;

(d) the upgrading of the existing Sam Ka Tsuen Sewage Pumping Chamber (SKTSPC); and

(e) ancillary works[2].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2018 for completion in the first quarter of 2023. To meet the tight works programme, we have invited tender for the proposed works in April 2018. The tender will only be awarded after obtaining FC's funding approval.

/JUSTIFICATION …..

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

2 Ancillary works include the utility diversion, road and drainage works required to facilitate the sewerage works.

JUSTIFICATION

4. LYM Village has no public sewerage system. Only the restaurants and a few village houses thereat are equipped with their individual and simple on-site facilities such as septic tanks and soakaway (STS) systems[3]. Many squatter houses discharge their sewage directly into the stormwater system. As a result, the Sam Ka Tsuen Typhoon Shelter has been suffering from water pollution.

5. The Tourism Commission plans to launch the "Lei Yue Mun Waterfront Enhancement Project" ("LYM Project") to further improve the facilities along the LYM waterfront areas with a view to enhancing the attractiveness of LYM as a tourist attraction. During the gazettal of the dredging works of the LYM Project under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127) in October 2009, objections were received raising concerns primarily about the sewerage problem in the LYM area. To address this concern of the objectors, the Environmental Protection Department and the Drainage Services Department (DSD) were tasked to work out a sewerage plan for the area.

6. We propose to construct a public sewerage system and upgrade the existing SKTSPC and sewers at LYM Praya Road and LYM Path to serve the restaurants, shops, village houses and structures along both sides of the main access road at LYM Village, including On Li Sai Tsuen, Ma Wan Tsuen, Che Ting Tsuen and Ma Pui Tsuen. We also propose to construct nine DWFIs to intercept the polluted flow from the stormwater system. The proposed sewerage system will serve an ultimate residential population of 3 100 as well as commercial and tourist activities.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $260.2 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

/(a) …..

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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)
(a)	DWFIs and sewage pumping chambers		73.0
	(i) civil works	35.0	
	(ii) electrical and mechanical works	38.0	
(b)	Twin rising mains		34.9
(c)	Gravity sewers		64.8
(d)	Ancillary works		9.6
(e)	Environmental mitigation measures		3.8
(f)	Consultants' fees for		4.0
	(i) contract administration	2.2	
	(ii) management of resident site staff (RSS)	1.8	
(g)	Remuneration of RSS		46.5
(h)	Contingencies		23.6
	Total		260.2

8. 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 2 to Enclosure 3.

/9. …..

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

Year	$ million (MOD)
2018 – 2019	6.9
2019 – 2020	55.5
2020 – 2021	54.4
2021 – 2022	41.5
2022 – 2023	41.3
2023 – 2024	22.8
2024 – 2025	21.0
2025 – 2026	16.8
	260.2

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 2018 to 2026. We will deliver the proposed works under a New Engineering Contract (NEC)[4] form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from this project to be $3.4 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.16% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/**PUBLIC** …..

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

PUBLIC CONSULTATION

12. We consulted the Environment and Hygiene Committee of Kwun Tong District Council and the Task Force on Harbourfront Developments in Kowloon, Tsuen Wan and Kwai Tsing on 20 and 22 September 2016 respectively. All parties supported the project.

13. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 20 October 2017 and did not receive any objection during the statutory objection period. The proposed works was subsequently authorised on 12 January 2018.

14. We consulted the Legislative Council Panel on Environmental Affairs on 27 November 2017 and Members supported the project.

ENVIRONMENTAL IMPLICATIONS

15. The proposed works is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The DSD completed a Preliminary Environmental Review (PER) for the proposed works in July 2017. The PER concluded that 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 7(e) a sum of $3.8 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

16. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through the 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. …..

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to minimise the size of the proposed DWFIs to minimise excavation works) where possible. In addition, we will request the 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 request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

19. We estimate that the proposed works will generate 14 500 tonnes of construction waste. Of these, we will reuse 3 600 tonnes (25%) of inert construction waste on site, and deliver 9 600 tonnes (66%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 300 tonnes (9%) of non-inert construction wastes at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $941,600 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

/LAND …..

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[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.

LAND ACQUISITION

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

BACKGROUND INFORMATION

22. We upgraded **398DS** to Category B in September 2013.

23. In December 2014, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $6.5 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. The proposed works will not involve any tree removal or planting proposals.

25. We estimate that the proposed works will create about 50 jobs (40 for labourers and ten for professional or technical staff), providing a total employment of 2 400 man-months.

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842 200 E
842 400 E
842 600 E
842 800 E
843 000 E
817 000 N
816 800 N
816 600 N
816 400 N

三家村避風塘
SAM KA TSUEN
TYPHOON SHELTER

安里西村
ON LI SAI TSUEN

鯉魚門徑 LEI YUE MUN PATH

鯉魚門海傍道 LEI YUE MUN PRAYA ROAD

鯉魚門村
LEI YUE MUN
VILLAGE

馬環村
MA WAN TSUEN

崖頂村
CHE TING TSUEN

馬背村
MA PUI TSUEN

鯉魚門
LEI YUE MUN

觀塘仔灣
KWUN TONG
TSAI WAN

三家村避風塘
SAM KA TSUEN
TYPHOON SHELTER

鯉魚門
LEI YUE MUN

位置圖 LOCATION PLAN

比例 SCALE 1 : 30000

圖例 LEGEND :

- 擬改善現有的三家村污水泵井 PROPOSED UPGRADE OF EXISTING SAM KA TSUEN SEWAGE PUMPING CHAMBER
- 擬建的污水泵井 PROPOSED SEWAGE PUMPING CHAMBERS
- 擬建的旱季截流器 PROPOSED DRY WEATHER FLOW INTERCEPTORS (DWFIs)
- 擬建的無壓污水渠 PROPOSED GRAVITY SEWERS
- 擬建的雙管污水泵喉 PROPOSED TWIN RISING MAINS
- 擬改善現有的無壓污水渠 PROPOSED UPGRADE OF EXISTING GRAVITY SEWERS

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	15 NOV 2017
核 對 checked	*SIGNED* Ir W. K. AU YEUNG	15 NOV 2017
批 核 approved	*SIGNED* Ir K. F. SEIT	15 NOV 2017

圖 則 名 稱 drawing title

工務工程計劃編號 4398DS
- 鯉魚門村污水收集系統工程
PWP ITEM NO. 4398DS
- SEWERAGE TO LEI YUE MUN VILLAGE

圖 則 編 號 drawing no.	比例 scale
DCM/2017/106	1 : 3000 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

A3 420x297

398DS – Sewerage to Lei Yue Mun Village

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.8
		Technical	-	-	-	1.0
					Sub-total	1.8#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	105	38	1.6	13.2
		Technical	594	14	1.6	26.1
					Sub-total	39.3
	Comprising –					
	(i) Consultants' fees for management of RSS				1.5#	
	(ii) Remuneration of RSS				37.8#	
					Total	**41.1**

* 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 = $78,775 per month and MPS salary point 14 = $27,485 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 **398DS** 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 3.

343DS – Outlying Islands sewerage stage 2 –
Peng Chau village sewerage phase 2

PROJECT SCOPE AND NATURE

The part of **343DS** that we propose to upgrade to Category A comprises –

(a) the construction of approximately 3.4 kilometres of gravity sewers with 225 millimetres diameter for six unsewered areas in Peng Chau, namely Nam Wan San Tsuen, Tai Yat San Tsuen (part), Wai Tsai Tseng San Tsuen, Central Peng Chau, Nam Wan Shan Ting Tsuen, and Tung Wan Village (part); and

(b) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the fourth quarter of 2018 for completion in the fourth quarter of 2022. To meet the tight works programme, we will invite tender for the proposed works in parallel. The tender will only be awarded after obtaining FC's funding approval.

4. We will retain the remainder of **343DS** in Category B for the provision of public sewerage system for another five unsewered areas in Peng Chau. Funding for the remainder of **343DS** will be sought at a later stage after completion of the design and preparatory work.

JUSTIFICATION

5. There is an existing sewage pumping station and a sewage treatment works (STW) with secondary treatment level in Peng Chau, but many densely populated areas are still unsewered. Domestic sewage from these unsewered areas

/is …..

[1] Ancillary works include the utilities diversion, road and drainage works required to facilitate the sewerage works.

is currently disposed of by many individual and simple on-site facilities such as septic tank and soakaway (STS) systems[2], and some of them have been identified as a source of water pollution to the receiving waters of Peng Chau.

6. The "Outlying Islands Sewerage Master Plan Stage 2 Review" recommended that public sewerage system should be provided for the unsewered areas in Peng Chau. We propose to construct public sewerage system for six unsewered areas mentioned in paragraph 1 above and convey their sewage to the existing Peng Chau STW for proper treatment and disposal. The proposed sewerage system will serve an estimated ultimate population of 2 500.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $133.7 million in money-of-the-day (MOD) prices (please see paragraph 8 below), broken down as follows –

		$ million (in MOD prices)
(a)	Gravity sewers	115.8
(b)	Ancillary works	2.2
(c)	Environmental mitigation measures	3.5
(d)	Contingencies	12.2
	Total	133.7

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

Year	**$ million (MOD)**
2018 – 2019	4.2
2019 – 2020	21.1
2020 – 2021	22.2

/2021-2022 …..

[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.

Year	$ million (MOD)
2021 – 2022	30.8
2022 – 2023	25.8
2023 – 2024	12.9
2024 – 2025	8.5
2025 – 2026	8.2
	133.7

9. We have derived the MOD estimates on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2018 to 2026. We will deliver the proposed works under a New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

10. We estimate the additional annual recurrent expenditure arising from this project to be $380,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.02% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

11. Following the previous consultations with the Peng Chau Rural Committee (PCRC) and the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee of the Islands District Council (IsDC) which supported the project, we consulted the PCRC again on 22 January 2016 and reported progress of the proposed works to the IsDC on 24 October 2016. All parties supported the project and urged the Government to expedite progress.

/12. …..

[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.

12. We gazetted the proposed works in two packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 28 March 2013 and 30 May 2014 respectively. The first package gazetted in March 2013 was authorised on 6 September 2013 after the two objections received against the proposal were satisfactorily resolved. There was no objection received to the second package gazetted in May 2014 and it was subsequently authorised on 29 August 2014.

13. We consulted the Legislative Council Panel on Environmental Affairs on 27 November 2017 and Members supported the project.

ENVIRONMENTAL IMPLICATIONS

14. The proposed works is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499) and will not have any long-term adverse environmental impacts. We have included in paragraph 7(c) a sum of $3.5 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

15. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through the 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.

16. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will request the 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.

/17. …..

[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.

17. We will also request the contractors to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractors to separate inert and non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

18. We estimate that the proposed works will generate 13 600 tonnes of construction waste. Of these, we will reuse 9 600 tonnes (71%) on site and deliver 3 800 tonnes (28%) to PFRF for subsequent reuse and 200 tonnes (1%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of the construction waste at PFRF and landfill sites is estimated to be $309,800 (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

20. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 222 square metres (m^2) of private agricultural land and clear about 19 152 m^2 of government land for implementing the proposed works. Site clearance will not affect any household, but will affect approximate 30 structures. We will charge the cost of land acquisition, estimated at $1.9 million, to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at Annex 2 to Enclosure 4.

BACKGROUND INFORMATION

21. We upgraded **343DS** to Category B in September 2005.

/22. …..

22. In March 2007, we engaged consultants and deployed the term contractors to undertake the hydraulic review and site investigation respectively to facilitate the detailed design for the proposed works. The total estimated cost was $1 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". In addition, we utilised in-house resources to undertake surveys, impact assessments and detailed design for the proposed works. We have substantially completed the detailed design for the proposed works mentioned in paragraph 1 above, and are working on the design of the remaining works under **343DS.**

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

24. We estimate that the proposed works will create 40 jobs (35 for labourers and five for professional or technical staff), providing a total employment of about 1 700 man-months.

816800N

816400N

816000N

821400E

821800E

822200E

822600E

823000E

坪洲污水處理廠
PENG CHAU SEWAGE TREATMENT WORKS

東灣村
TUNG WAN VILLAGE

坪洲(中)
CENTRAL PENG CHAU

圍仔井新村
WAI TSAI TSENG SAN TSUEN

第一新村
TAI YAT SAN TSUEN

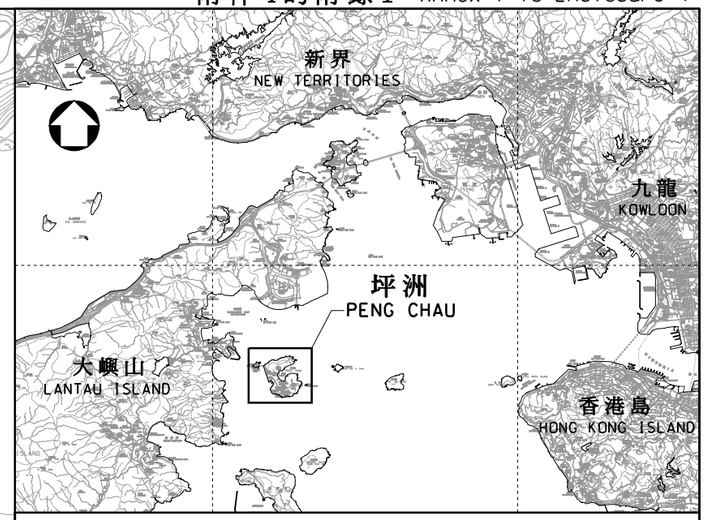
南灣新村
NAM WAN SAN TSUEN

南灣山頂村
NAM WAN SHAN TING TSUEN

坪洲
PENG CHAU

東灣
TUNG WAN

NGAU CHAU



位置圖
LOCATION PLAN
比例 1 : 200000
SCALE 1 : 200000

圖例
LEGEND :

- 現有的無壓污水渠 EXISTING GRAVITY SEWERS
- 現有的污水泵喉 EXISTING RISING MAINS
- 現有的海底排放管 EXISTING SUBMARINE OUTFALL
- 現有的污水泵房 EXISTING SEWAGE PUMPING STATION
- 擬建的鄉村污水收集系統範圍 PROPOSED VILLAGE SEWERAGE AREA

圖則名稱 drawing title

工務工程計劃編號4343DS
離島污水收集系統第2階段 - 坪洲鄉村污水收集系統第2期
PWP ITEM NO. 4343DS
OUTLYING ISLANDS SEWERAGE STAGE 2 - PENG CHAU VILLAGE SEWERAGE PHASE 2

版 no.	日期 date	修改項目 description	簡簽 initial

繪畫 drawn K. Y. LING	日期 date 18 JAN 2018	圖則編號 drawing no. DDN/343DS1/8096
核對 checked Ir C. S. FOK	日期 date 18 JAN 2018	比例 scale N.T.S.
批核 approved Ir P. K. CHEUNG	日期 date 18 JAN 2018	
部門 office 污水工程部 SEWERAGE PROJECTS 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

343DS – Outlying Islands sewerage stage 2 – Peng Chau village sewerage phase 2

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land acquisition (resumption of private land)**		**1.25**
(II)	**Estimated cost for land clearance**		**0.40**
(a)	Ex-gratia allowances for crop compensation	0.30	
(b)	Ex-gratia allowances for farm structures and miscellaneous permanent improvements to farms	0.10	
(III)	**Interest and Contingency payment**		**0.17**
(a)	Contingency on the estimated land acquisition cost	0.17	
	Total		**1.82 (say 1.9)**

Note

The above estimated land acquisition cost is based on the prevailing rates as at April 2018.

390DS – Rehabilitation of trunk sewers in Tuen Mun

PROJECT SCOPE AND NATURE

The proposed scope of works under **390DS** comprises –

(a) the rehabilitation of about 4.2 kilometres (km) of sewage box culvert, with dimension of 2.5 metres (m) in width by 2.5 m in height, along Tin Hau Road and Lung Mun Road;

(b) the rehabilitation of about 360 m of sewers with diameters ranging from 400 millimetres (mm) to 1 100 mm across Tuen Mun River Channel and associated chamber modification works;

(c) the construction of about 600 m of sewers with 1 200 mm diameter along Tin Hau Road and across Tuen Mun River Channel; and

(d) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the fourth quarter of 2018 for completion in the first quarter of 2023. To meet the tight works programme, we will invite tender for the proposed works in parallel. The tender will only be awarded after obtaining FC's funding approval.

JUSTIFICATION

4. The existing sewerage system collecting and transferring sewage from central Tuen Mun to Pillar Point Sewage Treatment Works has been in continuous service for more than 30 years. It comprises about 4.2 km of an underground

/sewage .....

[1] Ancillary works include the utility diversion, provision of manholes, temporary closure and reinstatement of carriageways/footpaths/open space that are required to complete the proposed works.

sewage box culvert along Tin Hau Road and Lung Mun Road, and about 360 m of sewers across Tuen Mun River Channel at two locations. Recent inspection results reveal that this sewerage system is in poor structural conditions with a high risk of collapse, which may result in road subsidence and overflow of raw sewage that would be detrimental to public road safety and the environment.

5. We propose to conduct structural repair and install internal lining to rehabilitate and strengthen the existing sewage box culvert and sewers. To facilitate these works, we also propose to construct about 600 m of diversion sewers along Tin Hau Road and across Tuen Mun River Channel for arranging the temporary diversion of sewage from this sewerage system. These diversion sewers will be retained for permanent use to enhance the future operational flexibility of the sewerage system. Trenchless technologies and no-dig methods will be used as far as possible to reduce road excavation works and traffic impact.

FINANCIAL IMPLICATIONS

6. We estimate the cost of the proposed works to be $806.6 million in money-of-the-day (MOD) prices (please see paragraph 8 below), broken down as follows –

		$ million (in MOD prices)
(a)	Rehabilitation of	545.0
	(i) existing box culvert	535.3
	(ii) existing sewers across Tuen Mun River Channel	9.7
(b)	Construction of sewers	79.8
(c)	Ancillary works	0.2
(d)	Environmental mitigation measures	2.7
(e)	Consultants' fees for	5.2
	(i) contract administration	2.8
	(ii) management of resident site staff (RSS)	2.4
(f)	Remuneration of RSS	103.0
(g)	Contingencies	70.7
	Total	806.6

/7. …..

7. 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 2 to Enclosure 5.

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

Year	$ million (MOD)
2018 – 2019	8.0
2019 – 2020	169.5
2020 – 2021	203.6
2021 – 2022	131.2
2022 – 2023	127.6
2023 – 2024	80.4
2024 - 2025	47.0
2025 – 2026	39.3
	806.6

9. We have derived the MOD estimates on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2018 to 2026. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

10. We estimate the additional annual recurrent expenditure arising from the project to be $71,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by less than 0.01% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/PUBLIC …..

[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

11. We consulted the Environment, Hygiene and District Development Committee of the Tuen Mun District Council on 17 July, 10 September 2015 and 20 May 2016. The Committee supported the proposed works.

12. We consulted the Legislative Council Panel on Environmental Affairs on 22 January 2018 and Members supported the project.

ENVIRONMENTAL IMPLICATIONS

13. 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 February 2016. The PER concluded and the Director of Environmental Protection agreed that with appropriate mitigation measures, the proposed works would not have any long-term adverse environmental impacts. We have included in paragraph 6(d) a sum of $2.7 million (in MOD prices) in the project estimate for the implementation of the necessary environmental mitigation measures.

14. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisance to within the established standards and guidelines through the 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.

15. At the planning and design stages, we have considered ways to reduce the generation of construction waste where 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 request the contractors to reuse inert construction waste (e.g. excavated soil) on site or in

/other …..

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.

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

17. We estimate that the proposed works will generate 34 300 tonnes of construction waste. Of these, we will reuse 21 000 tonnes (61%) on site and deliver 9 500 tonnes (28%) of inert construction waste to PFRF for subsequent reuse and 3 800 tonnes (11%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $1.4 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

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

/BACKGROUND …..

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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.

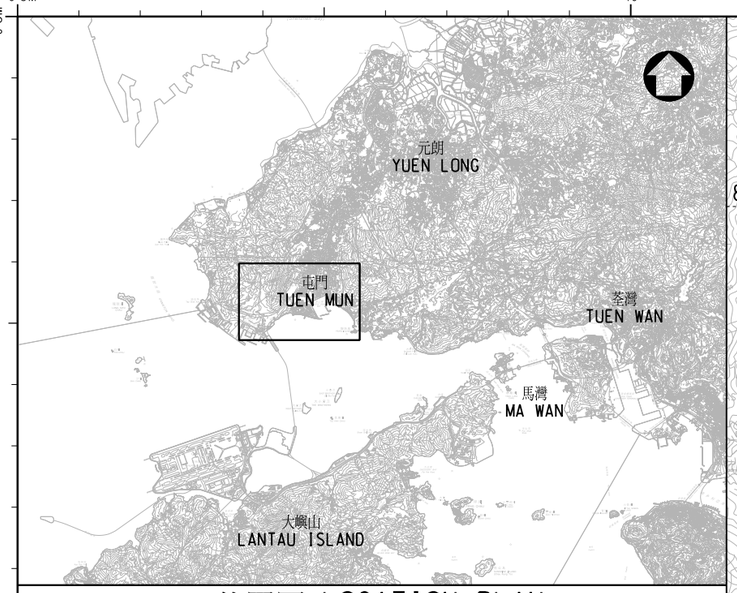
BACKGROUND INFORMATION

20. We upgraded **390DS** to Category B in September 2012.

21. In May 2013, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $13.8 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.

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

23. We estimate that the proposed works will create about 200 jobs (160 for labourers and 40 for professional or technical staff), providing a total employment of 9 500 man-months.



位置圖 LOCATION PLAN

比例 SCALE 1:300 000

828 000 N

826 500 N

825 000 N

811 500 E

813 000 E

814 500 E

816 000 E

天后路
TIN HAU ROAD

屯門市中心
TUEN MUN TOWN CENTER

TUEN MUN RIVER CHANNEL
屯門河

屯義街
TUEN YEE STREET

龍門路
LUNG MUN ROAD

白角污水泵房
PAK KOK SEWAGE
PUMPING STATION

蝴蝶灣泳灘
BUTTERFLY BEACH

望后石污水處理廠
PILLAR POINT
SEWAGE TREATMENT WORKS

圖例：
LEGEND：

- 擬修復的現有箱形污水暗渠
  EXISTING SEWAGE BOX CULVERT TO BE REHABILITATED
- 擬建造的污水渠
  SEWER TO BE CONSTRUCTED
- 擬修復的現有橫過屯門河道的污水渠
  EXISTING SEWERS ACROSS TUEN MUN RIVER CHANNEL TO BE REHABILITATED
- 現有的污水處理廠 / 污水泵房
  EXISTING SEWAGE TREATMENT WORKS / SEWAGE PUMPING STATION

圖則名稱 drawing title

工務工程計劃編號 4390DS
- 屯門污水幹渠修復工程

PWP ITEM NO. 4390DS
- REHABILITATION OF TRUNK SEWERS IN TUEN MUN

繪畫 drawn	SIGNED H.Y. LEE	日期 date	07 DEC 2017
核對 checked	SIGNED H.T. CHUNG	日期 date	07 DEC 2017
批核 approved	SIGNED H.S. WONG	日期 date	07 DEC 2017
部門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION		

圖則編號 drawing no. DPM/390DS/0010

比例 scale 1:15000

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

390DS – Rehabilitation of trunk sewers in Tuen Mun

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.8
		Technical	-	-	-	0.5
					Sub-total	2.3#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	179	38	1.6	22.6
		Technical	1 445	14	1.6	63.5
					Sub-total	86.1
	Comprising –					
	(i) Consultants' fees for management of RSS				2.0#	
	(ii) Remuneration of RSS				84.1#	
					Total	**88.4**

* 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 = $78,775 per month and MPS salary point 14 = $27,485 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 **390DS** 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 6 of Enclosure 5.

403DS – Upgrading of sewage pumping stations and sewerage along Ting Kok Road

PROJECT SCOPE AND NATURE

The proposed scope of works under **403DS** comprises –

(a) the construction of three new sewage pumping stations (Ting Kok Road Sewage Pumping Station (TKRSPS) Nos. 5, 7 and 8)[1];

(b) the demolition of three existing sewage pumping stations (TKRSPS Nos. 5, 7 and 8);

(c) the construction of about 4.2 kilometres (km) of rising mains with diameters ranging from 300 millimetres (mm) to 400 mm;

(d) the construction of about 2.1 km of gravity sewers with diameters ranging from 225 mm to 750 mm; and

(e) ancillary works[2].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the third quarter of 2018 for completion in the fourth quarter of 2023. To meet the tight works programme, we will invite tenders for the proposed works in parallel. The tender will only be awarded after obtaining FC's funding approval.

/JUSTIFICATION …..

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1 The existing TKRSPS No. 5 will be re-constructed in situ. Before the commissioning of the new TKRSPS No. 5, the conveyance of sewage flow will be taken up by a temporary sewage pumping station.

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

JUSTIFICATION

4. The existing Ting Kok Road sewerage system in Tai Po consists of four sewage pumping stations (SPSs) (i.e. TKRSPS Nos. 5 – 8) together with associated rising mains and gravity sewers. The existing sewerage system serves people in Shuen Wan and Tai Mei Tuk areas. The capacity of the existing sewerage system is 11 500 cubic metres (m^3) per day and is projected to serve at most a population of 34 500 in the Shuen Wan and Tai Mei Tuk areas. The system is anticipated to be fully utilised after 2021. The projected sewage flow could reach 21 200 m^3 per day by 2036 as a result of population growth, potential developments, and progressive implementation of sewerage works for the villages and other unsewered areas within the Shuen Wan and Tai Mei Tuk areas. Therefore, we propose to increase the capacity of the existing sewerage system by 10 500 m^3 to 22 000 m^3 per day so as to serve a projected ultimate population of 64 000.

FINANCIAL IMPLICATIONS

5. We estimate the cost of the proposed works to be $847.3 million in money-of-the-day prices (please see paragraph 7 below), broken down as follows –

			$ million (in MOD prices)	
(a)	SPSs			402.1
	(i)	civil works		
		TKRSPS No. 5	106.7	
		TKRSPS No. 7	74.0	
		TKRSPS No. 8	50.0	
	(ii)	electrical and mechanical works		
		TKRSPS No. 5	96.8	
		TKRSPS No. 7	36.4	
		TKRSPS No. 8	28.2	
	(iii)	demolition	10.0	
(b)	Rising mains			118.9
(c)	Gravity sewers			113.0
(d)	Ancillary works			12.0
(e)	Environmental mitigation measures			10.4

/(f) …..

			$ million (in MOD prices)
(f)	Consultants' fees for		10.3
	(i) contract administration	5.2	
	(ii) management of resident site staff (RSS)	5.1	
(g)	Remuneration of RSS		103.3
(h)	Contingencies		77.3
	Total		847.3

6. 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 2 to Enclosure 6.

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

Year	**$ million (MOD)**
2018-2019	29.9
2019-2020	113.8
2020-2021	198.9
2021-2022	205.4
2022-2023	86.5
2023-2024	57.0
2024-2025	53.9
2025-2026	52.3
2026-2027	49.6
	847.3

/8. …..

8. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2018 to 2027. We will deliver the proposed works under two contracts, one for civil engineering works and the other for electrical and mechanical works. Both contracts will adopt New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

9. We estimate the additional annual recurrent expenditure arising from the project to be $4.4 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.21% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

10. We consulted the Environment, Housing and Works Committee of the Tai Po District Council on 12 July 2017. The Committee supported the project.

11. We gazetted the proposed works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 28 July 2017 and did not receive any objection during the statutory objection period. The proposed works were subsequently authorised on 20 October 2017.

12. We consulted the Legislative Council Panel on Environmental Affairs on 26 February 2018. Members supported the proposed works and requested supplementary information on the detailed cost breakdown and implementation timetable, the traffic and environmental impacts, the flow projection and the areas to be served. The cost breakdown is given at paragraph 5 and other information requested are at Annex 3 to Enclosure 6.

/ENVIRONMENTAL …..

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[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.

ENVIRONMENTAL IMPLICATIONS

13. The proposed works is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (Cap. 499). Having regard to the project profile (PP), the Director of Environmental Protection (DEP) is satisfied that the environmental impact of the project can meet the requirements of the Technical Memorandum on Environmental Impact Assessment Process. With the consent of the Secretary for the Environment, the permission to apply directly for an environmental permit (EP) was granted on 24 January 2018. An EP for the project was subsequently issued on 15 February 2018. We will implement the mitigation measures set out in the PP and as required by the DEP. We have included in paragraph 5(e) a sum of $10.4 million (in MOD prices) in the project estimate for the implementation of the necessary environmental mitigation measures.

14. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisances to within the established standards and guidelines through the 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.

15. For the operation phase, we will also implement the measures recommended in the PP and stipulated in the EP. The key measures include enclosing all process equipment inside building structure, equipping the new and upgraded SPSs with deodourisation unit and fitting exhaust fans with acoustic louvre/ silencer.

16. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to design the alignment of the proposed rising mains and gravity sewers in such a manner that excavation and modification of existing structures will be minimised) where possible. In addition, we will request the contractors to reuse inert construction waste (e.g. excavated soil) on site or in

/other …..

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. At the construction stage, we will also request the contractors to submit for approval a plan setting out the waste management measures, including appropriate mitigation means to avoid, reduce, reuse, and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will request the contractors to separate 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.

18. We estimate that the proposed works will generate 50 000 tonnes of construction waste. Of these, we will reuse 21 000 tonnes (42.0%) on site and deliver 26 600 tonnes (53.2%) to PFRF for subsequent reuse and 2 400 tonnes (4.8%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $2.4 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap.354N)).

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

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

/BACKGROUND …..

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4 PFRF are specified in Schedule 4 of the 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.

BACKGROUND INFORMATION

21. We upgraded **403DS** to Category B in September 2013.

22. In August 2014, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $10.7 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 for the proposed works.

23. The proposed works will involve the felling of 34 trees and transplanting of one tree. All the trees to be felled and transplanted are not important trees[5]. We will incorporate a planting proposal as part of the project, including an estimated total of 38 trees.

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

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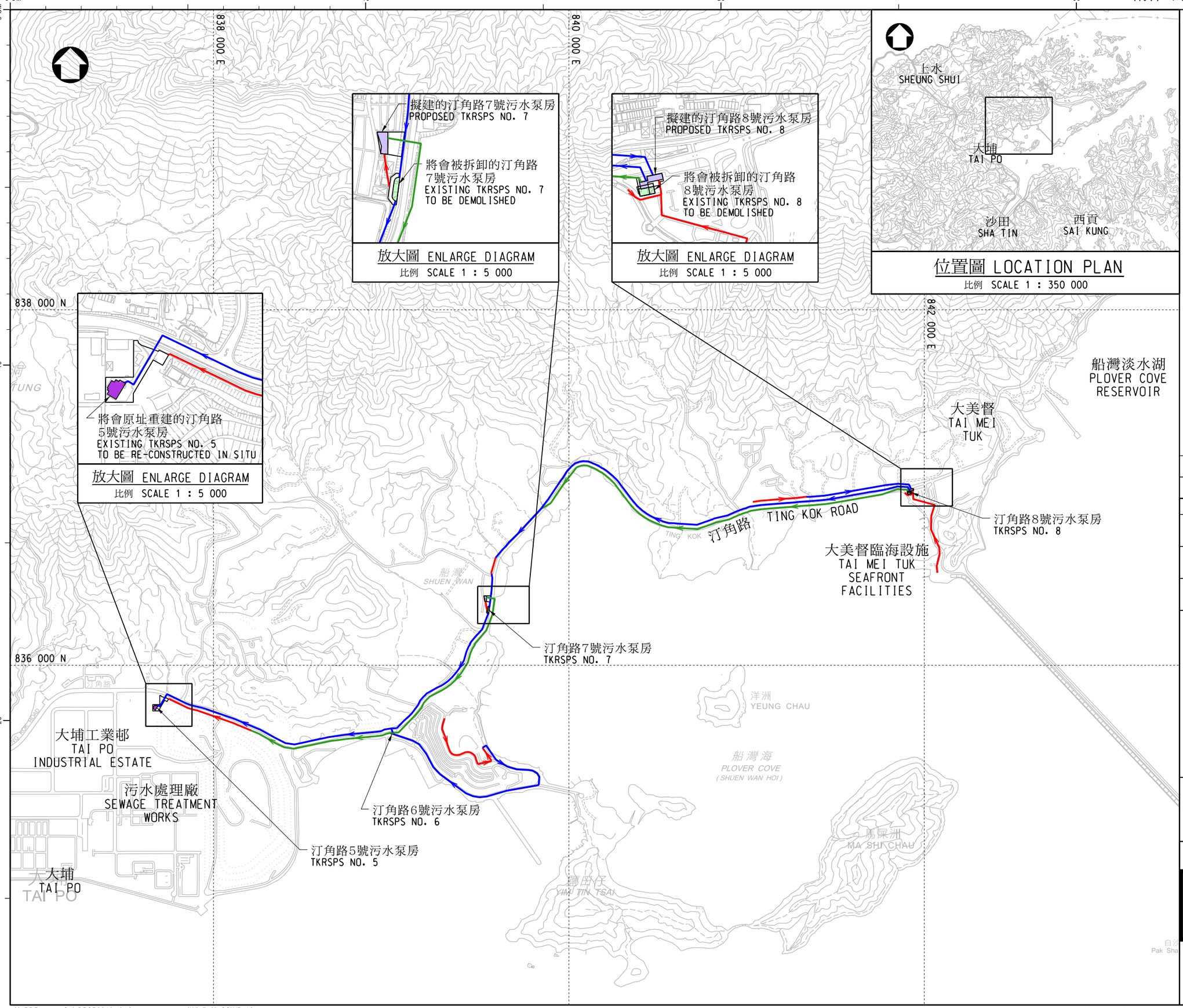
[5] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

(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 an important person or event;
(c) trees of precious or rare species;
(d) trees of outstanding form (taking account of the 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 a trunk diameter equal to or exceeding 1.0 m (measured at 1.3 m above ground level), or with a height/canopy spread equal to or exceeding 25 m.



圖例
LEGEND :

- 現有的污水渠 EXISTING SEWER
- 擬建的無壓污水渠 PROPOSED GRAVITY SEWER
- 擬建的污水泵喉 PROPOSED RISING MAINS
- 現有的泵房 EXISTING SPS
- 擬建的泵房 PROPOSED SPS
- 原址重建的泵房 PROPOSED SPS TO BE RE-CONSTRUCTED IN SITU

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. Y. HUI	15 FEB 2018
核 對 checked	*SIGNED* Ir K. S. NG	15 FEB 2018
批 核 approved	*SIGNED* Ir W. F. WONG	15 FEB 2018

圖 則 名 稱 drawing title

工務工程計劃編號 4403DS
- 汀角路污水泵房及污水收集系統改善工程
PWP ITEM NO. 4403DS
- UPGRADING OF SEWAGE PUMPING STATIONS AND SEWERAGE ALONG TING KOK ROAD

圖 則 編 號 drawing no.	比例 scale
DCM/2018/006	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

403DS – Upgrading of sewage pumping stations and sewerage along Ting Kok Road

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	3.0
		Technical	-	-	-	1.2
					Sub-total	4.2#
(b)	Resident Site Staff (RSS) costs (Note 3)	Professional	245	38	1.6	30.9
		Technical	1 283	14	1.6	56.4
					Sub-total	87.3
	Comprising –					
	(i) Consultants' fees for management of RSS				4.1#	
	(ii) Remuneration of RSS				83.2#	
					Total	91.5

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of resident site staff supplied by the consultants (as at now, MPS point 38 = $78,775 per month and MPS point 14 = $27,485 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 **403DS** 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 5 of Enclosure 6.

Annex 3 to Enclosure 6 to PWSC(2018-19)16

403DS – Upgrading of sewage pumping stations and sewerage along Ting Kok Road

Supplementary Information requested by Legislative Council Panel on Environmental Affairs on 26 February 2018

(1) Implementation timetable of the proposed works

Works activity	Estimated duration	Tentative completion date
Construction and demolition of Ting Kok Road Sewage Pumping Station (TKRSPS) No. 5	63 months	Fourth quarter of 2023
Construction and demolition of TKRSPS No. 7	48 months	Third quarter of 2022
Construction and demolition of TKRSPS No. 8	54 months	First quarter of 2023
Construction of rising mains and gravity sewers*	49 months	Fourth quarter of 2022

* The estimated duration of works on carriageway is 3 years.

(2) Assessment of odour and noise impacts on Tai Po East Fire Station

The odour and noise impacts on the Tai Po East Fire Station adjacent to the proposed TKRSPS No. 5 have been considered and could be alleviated with the implementation of the mitigation measures recommended in the project profile and stipulated in the environmental permit.

(3) Assessment of impact on the existing cycle track along Ting Kok Road

Cycle track will be partially closed but this closure will be confined to 10:00 to 16:00 on Monday to Friday only. Warning signs will be erected to inform cyclists to dismount, and appropriate lighting, signing and guarding will be provided throughout the construction period. Excavated trench will also be covered with ground flushed steel plate.

(4) Number of affected parking spaces in the public car park at Tai Mei Tuk

The proposed works will involve the permanent relocation of 24 public car parking spaces (four for coaches, four for private vehicles and 16 for motor cycles) within Tai Mei Tuk public car park before the commencement of the construction of TKRSPS No. 8.

(5) Breakdown of additional population and flow projection

		Projected population	**Estimated flow (m^3/day)**
(a)	**Potential developments**	**25 800**	**9 200**
	(i) Residential developments at Tung Tsz within TKRSPS No. 5 catchment	19 400	6 900
	(ii) Residential developments at Shuen Wan within TKRSPS No. 6 catchment	1 700	600
	(iii) Residential developments at Ting Kok within TKRSPS No. 8 catchment	3 600	1 300
	(iv) Recreational facilities at Ting Kok within TKRSPS No. 8 catchment	1 100	400
(b)	**Village Sewerage Programme and others, including contingency (all catchment)**	**3 700**	**1 300**
	Total	**29 500**	**10 500**

The catchment area of TKRSPS Nos. 5 – 8 is at Sketch 1 of this Annex.

註釋
LEGEND:
集水區範圍
CATCHMENT AREA

838 000 E
840 000 E
842 000 E
844 000 E
838 000 N
836 000 N
834 000 N

沙羅洞
SHA LO TUNG

汀角路7號污水泵房集水區
TKRSPS NO. 7 CATCHMENT

汀角路8號污水泵房集水區
TKRSPS NO. 8 CATCHMENT

大美督
TAI MEI TUK

蘆慈田
LO TSZ TIN

汀角路5號污水泵房
集水區
TKRSPS NO. 5
CATCHMENT

大美督臨海設施
TAI MEI TUK
SEAFRONT FACILITIES

汀角路8號污水泵房
TKRSPS NO. 8

汀角路7號污水泵房
TKRSPS NO. 7

洋洲
YEUNG CHAU

汀角路5號污水泵房
TKRSPS NO. 5

大埔工業邨
TAI PO
INDUSTRIAL ESTATE

汀角路6號污水泵房集水區
TKRSPS NO. 6 CATCHMENT

污水處理廠
SEWAGE TREATMENT
WORKS

汀角路6號污水泵房
TKRSPS NO. 6

大埔
TAI PO

鹽田仔
YIM TIN TSAI

414DS – Rehabilitation of underground sewers

PROJECT SCOPE AND NATURE

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

(a) the condition surveys of about 75 kilometres (km) of underground gravity sewers and associated manholes distributed throughout the territory;

(b) the rehabilitation of about 7 km of underground gravity sewers distributed throughout the territory; and

(c) ancillary works[1].

2. A plan showing the locations of the proposed works is at Annex 1 to Enclosure 7.

3. Subject to funding approval by the Finance Committee, we aim to commence the proposed works in the fourth quarter of 2018 for completion in the fourth quarter of 2022.

4. We will retain the remainder of **414DS** in Category B, which comprises the rehabilitation of about 12 km of underground gravity sewers throughout the territory. Funding for the remainder of **414DS** will be sought later after completion of the design and preparatory work.

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 using more

/sophisticated …..

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

sophisticated techniques 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 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. The "Enhanced Management of Underground Sewer and Drain Networks - Feasibility Study" (the Study) has evaluated the risks of failure of the existing underground sewers in 2015. The Study categorised one group of gravity sewers and sewage rising mains as confirmed to have high risks of structural failure, requiring priority rehabilitation, while another group of gravity sewers is predicted to have high risks of structural failure but their conditions and need for rehabilitation would have to be verified by further on-site surveys. In this regard, a territory-wide replacement and rehabilitation (R&R) programme has been formulated. The details of the R&R programme are outlined in Annex 2 to Enclosure 7.

7. **414DS** forms part of the R&R programme and covers the condition surveys of about 75 km of gravity sewers and rehabilitation of about 19 km of gravity sewers. The proposed part of **414DS** to be upgraded includes the condition surveys for all 75 km of gravity sewers and the rehabilitation of about 7 km among the 19 km of gravity sewers 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 need according to the prevailing conditions of sewers.

FINANCIAL IMPLICATIONS

9. We estimate the cost of the proposed works to be $391.9 million in money-of-the-day (MOD) prices (please see paragraph 11 below), broken down as follows –

/(a) …..

			$ million (in MOD prices)
(a)	Condition surveys of gravity sewers		213.0
(b)	Rehabilitation of gravity sewers		70.5
(c)	Ancillary works		19.4
(d)	Environmental mitigation measures		2.0
(e)	Consultants' fees for		2.5
	(i) contract administration	1.6	
	(ii) management of resident site staff (RSS)	0.9	
(f)	Remuneration of RSS		50.4
(g)	Contingencies		34.1
	Total		391.9

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 7.

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

Year	**$ million (MOD)**
2018 – 2019	5.0
2019 – 2020	38.6
2020 – 2021	63.2
2021 – 2022	95.9

/2022 – 2023 …..

Year	$ million (MOD)
2022 – 2023	91.8
2023 – 2024	53.0
2024 - 2025	33.3
2025 – 2026	11.1
	391.9

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 2018 to 2026. 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 $1.2 million. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.05% which 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 18 District Councils during the period from November 2017 to March 2018 as listed in Annex 4 to Enclosure 7. These Committees supported the proposed works.

15. We consulted the Legislative Council Panel on Environmental Affairs on 23 April 2018. Members supported the proposed works and requested supplementary information on the R&R programme. The information requested are at Annex 2 to Enclosure 7.

/ENVIRONMENTAL …..

[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.

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 April 2018. The PER concluded and the Director of Environmental Protection agreed that with appropriate mitigation measures, the proposed works would not have any long-term adverse environmental impact. We have included in paragraph 9(d) a sum of $2 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

17. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisance to within the established standards and guidelines through the 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 minimize 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 where 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 contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimise the need for disposal of inert construction waste to 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.

/19. …..

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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.

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

20. We estimate that the proposed works will generate 5 100 tonnes of construction waste. Of these, we will reuse 400 tonnes (8%) on site, and deliver 200 tonnes (4%) of inert construction waste to PFRF for subsequent reuse and 4 500 tonnes (88%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $0.9 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

21. The proposed works will not pose insurmountable impact on any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites and buildings, sites of archaeological interest or known areas of archaeological potential and government historic sites identified by the Antiquities and Monuments Office (AMO). Appropriate mitigation measures, including but not limited to structural monitoring, will be carried out to ensure the built heritage in the vicinity of the proposed works will not be directly or indirectly affected during the course of works. Appropriate mitigation measures will also be recommended if areas of archaeological potential are identified. We will work closely with AMO to formulate and implement the mitigation measures as and when required.

LAND ACQUISITION

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

/**BACKGROUND** …..

BACKGROUND INFORMATION

23. We upgraded **414DS** to Category B in September 2015.

24. In May 2017, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for **414DS** at an estimated cost of $13.6 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". We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.

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

26. We estimate that the proposed works will create about 110 jobs (90 for labourers and 20 for professional or technical staff) providing a total employment of 4 500 man-months.

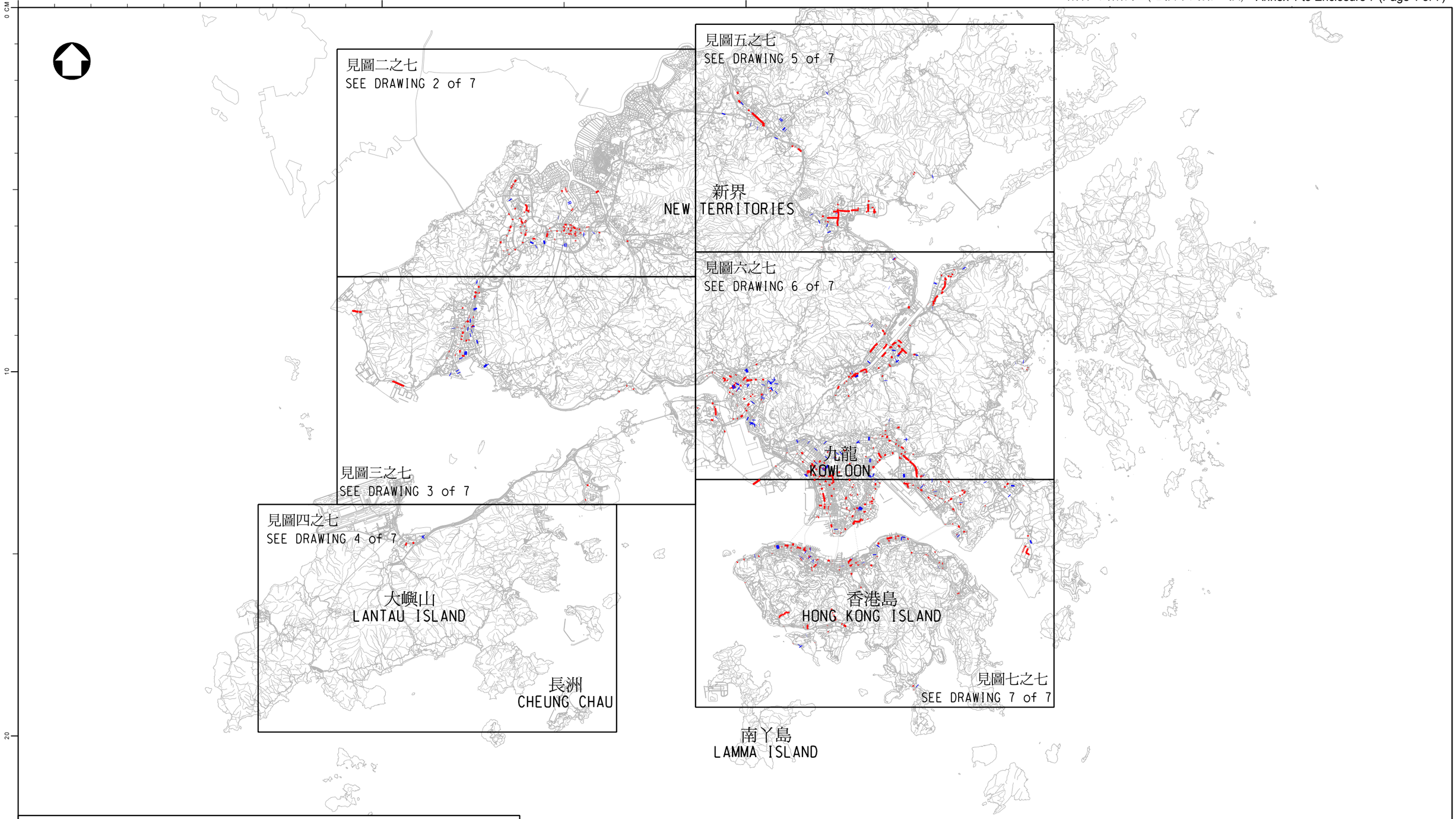

圖 例 LEGEND :

- 擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY
- 擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

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

圖 則 名 稱 drawing title

工務計劃項目第4414DS號 －
地下污水渠修復工程 (圖一之七)
PWP ITEM NO.4414DS -
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 1 OF 7)

繪 畫 drawn	*SIGNED* H.Y. LEE	日 期 date 21 MAR 2018	圖 則 編 號 drawing no. DPM/4414DS/1004
核 對 checked	*SIGNED* K.Y. CHEN	日 期 date 21 MAR 2018	比例 scale 1:200000
批 核 approved	*SIGNED* K.W. FUNG	日 期 date 21 MAR 2018	
部 門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION		

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GOVERNMENT OF THE
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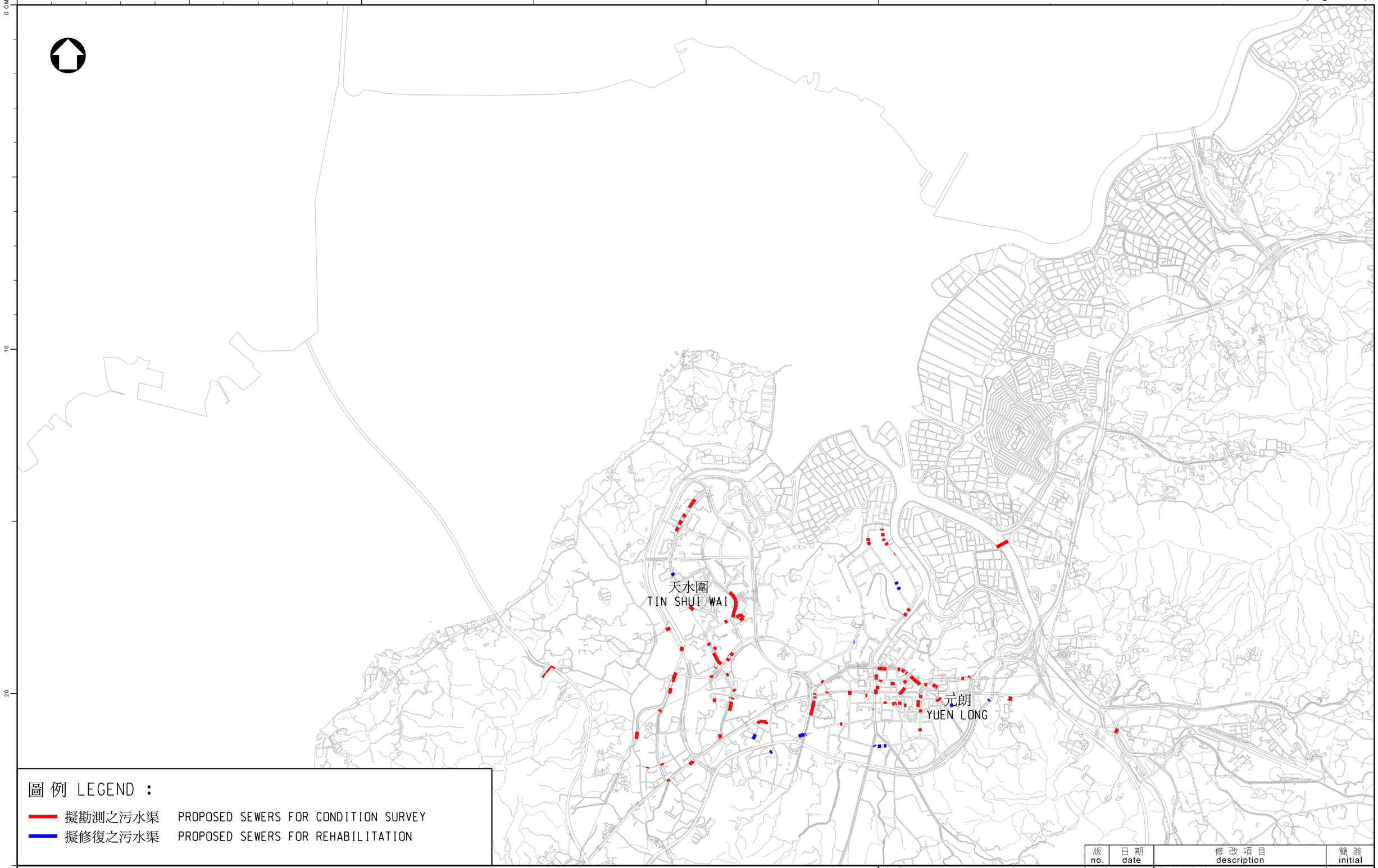

圖 例 LEGEND :

擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY

擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

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

圖 則 名 稱 drawing title

工務計劃項目第4414DS號 –
地下污水渠修復工程 (圖二之七)
PWP ITEM NO.4414DS –
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 2 OF 7)

繪 畫 drawn	*SIGNED* H.Y. LEE	日 期 date	21 MAR 2018
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部 門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION		

圖 則 編 號 drawing no.	比例 scale
DPM/4414DS/1005	1:50000

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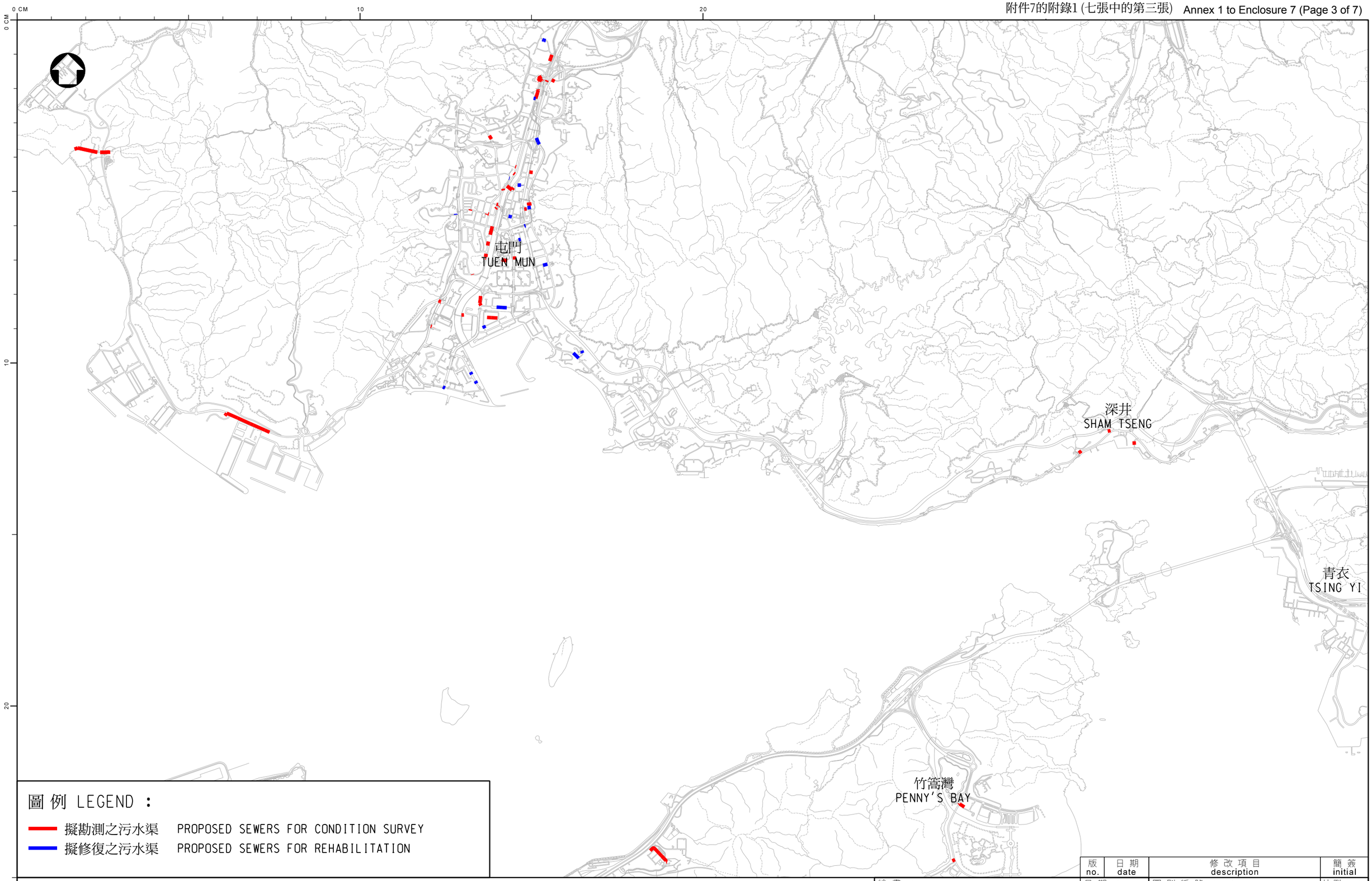

圖 例 LEGEND :

- 擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY
- 擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

圖則名稱 drawing title

工務計劃項目第4414DS號 –
地下污水渠修復工程 (圖三之七)
PWP ITEM NO.4414DS –
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 3 OF 7)

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部門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION	

圖則編號 drawing no. DPM/4414DS/1006

比例 scale 1:50000

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

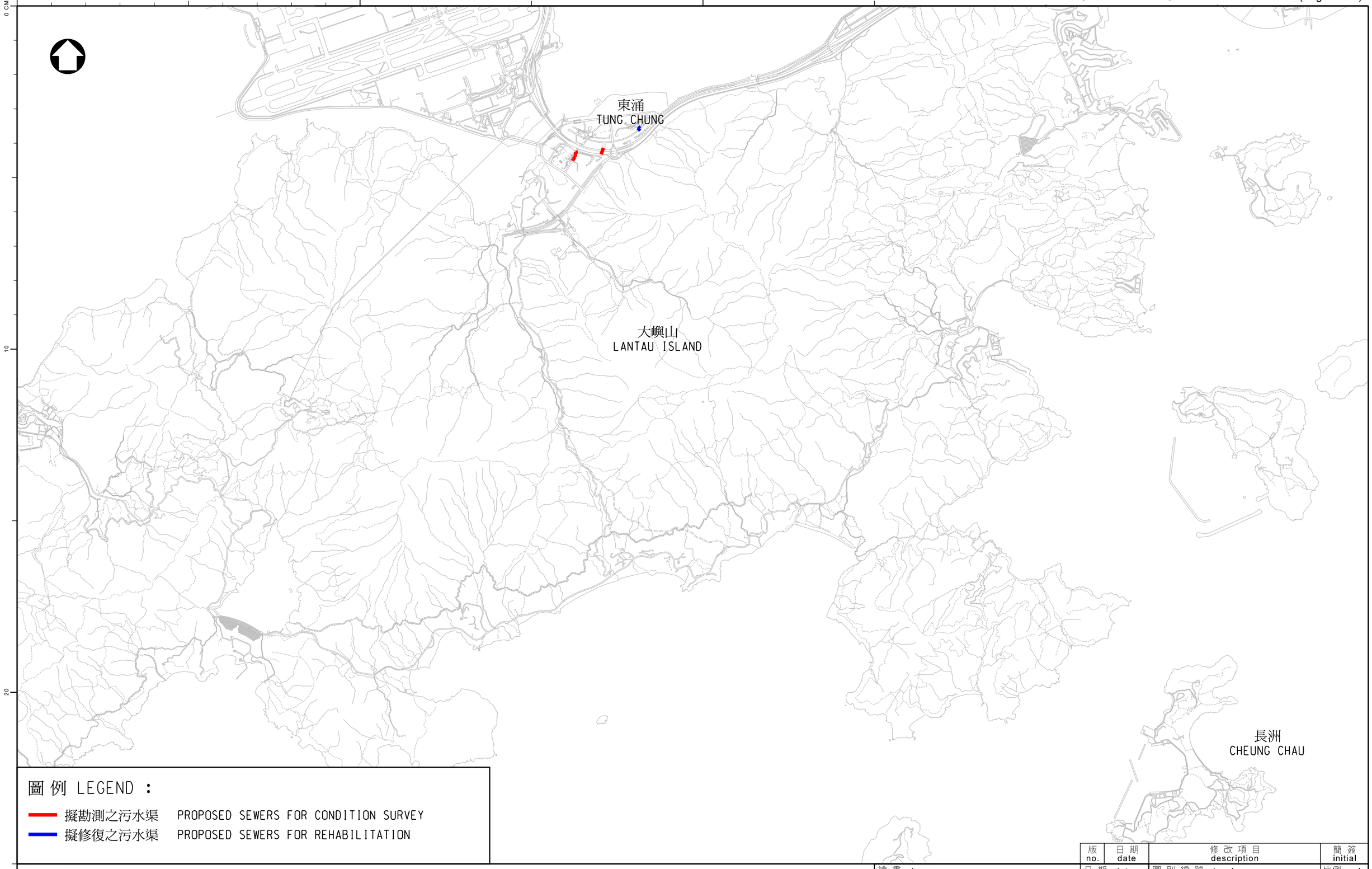

圖 例 LEGEND :

擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY

擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

圖則名稱 drawing title

工務計劃項目第4414DS號 –
地下污水渠修復工程 (圖四之七)
PWP ITEM NO.4414DS –
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 4 OF 7)

版 no.	日期 date	修改項目 description	簡簽 initial

繪畫 drawn	SIGNED H.Y. LEE	日期 date 21 MAR 2018	圖則編號 drawing no. DPM/4414DS/1007
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批核 approved	SIGNED K.W. FUNG	日期 date 21 MAR 2018	
部門 office	工程管理部 PROJECT MANAGEMENT DIVISION		

香港特別行政區政府渠務署
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SPECIAL ADMINISTRATIVE REGION

0 CM 10 20

0 CM 10 20

上水
SHEUNG SHUI

粉嶺
FANLING

大埔
TAI PO

圖 例 LEGEND :

擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY

擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title

工務計劃項目第4414DS號 –
地下污水渠修復工程 (圖五之七)
PWP ITEM NO.4414DS –
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 5 OF 7)

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圖則編號 drawing no. DPM/4414DS/1008

比例 scale 1:50000

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圖 例 LEGEND :

擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY

擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

馬鞍山
MA ON SHAN

沙田
SHA TIN

西貢
SAI KUNG

葵涌
KWAI CHUNG

荃灣
TSUEN WAN

青衣
TSING YI

長沙灣
CHEUNG SHA WAN

九龍塘
KOWLOON TONG

九龍灣
KOWLOON BAY

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

圖 則 名 稱 drawing title

工務計劃項目第4414DS號 －
地下污水渠修復工程 (圖六之七)
PWP ITEM NO.4414DS -
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 6 OF 7)

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批 核 approved	SIGNED K.W. FUNG	日 期 date 21 MAR 2018
部 門 office	工 程 管 理 部 PROJECT MANAGEMENT DIVISION	

圖 則 編 號 drawing no. DPM/4414DS/1009

比例 scale 1:50000

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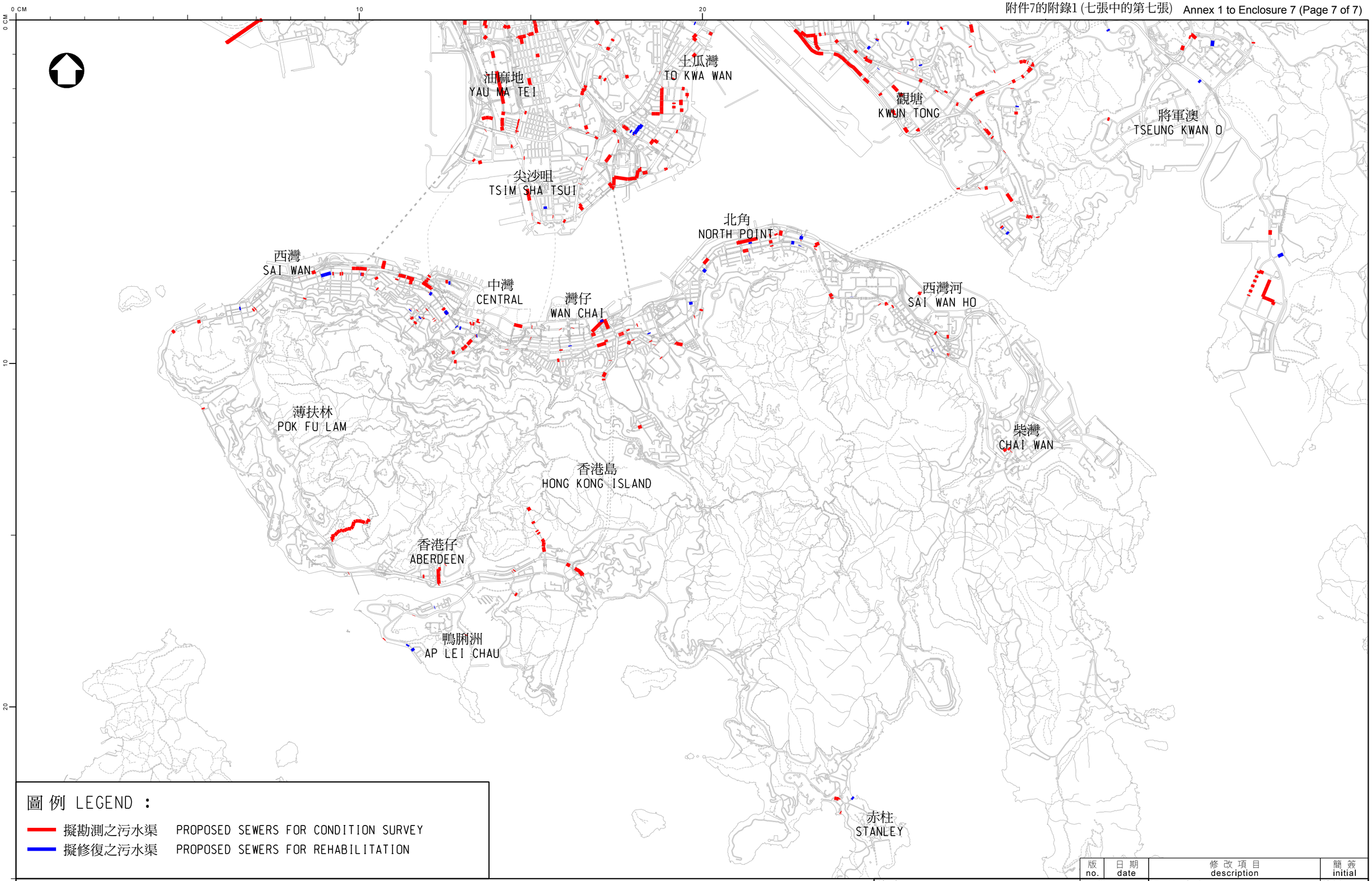

圖 例 LEGEND :

- 擬勘測之污水渠 PROPOSED SEWERS FOR CONDITION SURVEY
- 擬修復之污水渠 PROPOSED SEWERS FOR REHABILITATION

圖則名稱 drawing title

工務計劃項目第4414DS號 –
地下污水渠修復工程 (圖七之七)
PWP ITEM NO.4414DS –
REHABILITATION OF UNDERGROUND SEWERS (DRAWING 7 OF 7)

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圖則編號 drawing no. DPM/4414DS/1010

比例 scale 1:50000

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.: **393DS** (under construction)	● Rehabilitation of about 1.7 kilometres (km) of gravity sewers in Ngau Chi Wan, To Kwa Wan, Sha Tin and Sai Kung
PWP Item No.: **381DS** (under construction)	● Construction of about 6.5 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 1200 mm diameter from Tung Chung to Siu Ho Wan
PWP Item No.: **390DS** (viz. Enclosure 5 to PWSC(2018-19)16)	● 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 1 100 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.: **414DS** (viz. Enclosure 7 to PWSC(2018-19)16)	● Condition surveys of 75 km of gravity sewers in different regions of the territory ● Rehabilitation of 19 km of gravity sewers in different regions of the territory (out of which 12 km of gravity sewers will be rehabilitated later after completion of design and preparatory work and after obtaining Finance Committee's approval.)
PWP Item No.: **344DS** (viz. Enclosure 8 to PWSC(2018-19)16)	● Rehabilitation of about 450 m of a gravity sewer in Tsim Sha Tsui
R&R works to be carried out by the maintenance teams of Drainage Services Department	● Rehabilitation of 40 km of gravity sewers in different regions of the territory ● Condition surveys of 60 km of gravity sewers in different regions of the territory
Other PWP items under planning	● Rehabilitation of about 20 km of rising mains in different regions of the territory ● Rehabilitation of gravity sewers subsequently confirmed by condition surveys to have high risk of structural failure in different regions of the territory

414DS – Rehabilitation of underground sewers

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 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	-	-	-	0.3
					Sub-total	1.3#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	114	38	1.6	14.4
		Technical	603	14	1.6	26.5
					Sub-total	40.9
	Comprising –					
	(i) Consultants' fees for management of RSS				0.7#	
	(ii) Remuneration of RSS				40.2#	
					Total	**42.2**

* 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 = $78,775 per month and MPS salary point 14 = $27,485 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 7.

414DS - Rehabilitation of Underground Sewers

Consultation with District Councils

Date	District Council	Committee
27 November 2017	Southern	District Development and Housing Committee
30 November 2017	Sham Shui Po	Environment and Hygiene Committee
5 December 2017	Eastern	Planning, Works and Housing Committee
12 December 2017	Wan Chai	Development, Planning & Transport Committee
19 December 2017	Wong Tai Sin	Food and Environmental Hygiene Committee
4 January 2018	Tsuen Wan	Environmental and Health Affairs Committee
10 January 2018	Tai Po	Environment, Housing and Works Committee
11 January 2018	Sai Kung	Housing and Environmental Hygiene Committee
11 January 2018	Sha Tin	Health and Environment Committee
15 January 2018	North	District Minor Works and Environmental Improvement Committee
18 January 2018	Yau Tsim Mong	Food, Environmental Hygiene and Public Works Committee
18 January 2018	Kowloon City	Housing and Infrastructure Committee
19 January 2018	Tuen Mun	Environment, Hygiene and District Development Committee
22 January 2018	Yuen Long	Environmental Improvement Committee
29 January 2018	Islands	Tourism, Agriculture, Fisheries and Environmental Hygiene Committee
30 January 2018	Kwun Tong	Environment and Hygiene Committee
20 February 2018	Kwai Tsing	Planning and District Facilities Management Committee
15 March 2018	Central and Western	Food, Environment, Hygiene and Works Committee

344DS – Upgrading of Central and East Kowloon sewerage – phase 3

PROJECT SCOPE AND NATURE

The proposed scope of works under **344DS** comprises –

(a) the construction of about 7 kilometres (km) of gravity sewers with diameters ranging from 300 millimetres (mm) to 1 050 mm in Central and East Kowloon;

(b) the demolition of about 7 km of existing gravity sewers;

(c) the rehabilitation of about 450 metres (m) of a gravity sewer with diameter of 1 200 mm in Tsim Sha Tsui; and

(d) ancillary works[1].

2. A site plan showing the locations of the proposed works is at Annex 1 to Enclosure 8.

3. Subject to funding approval of the Finance Committee, we aim to commence the proposed works in the fourth quarter of 2018 for completion in the first quarter of 2024.

JUSTIFICATION

4. The "Review of Central and East Kowloon Sewerage Master Plans" completed in 2003 recommended that the existing sewerage system in the region should be upgraded to serve the increasing population, the district redevelopment and the planned changes in land use. The overall sewage flow in the region is projected to increase by as much as 30% from 2006 to 2041, having regard to the latest planning data.

/5. …..

[1] Ancillary works include the utilities diversion, road and drainage works required to facilitate the sewerage works.

5. The recommended sewerage upgrading works for Central and East Kowloon are divided into three phases. The first two phases were completed in 2012 and 2016 respectively.

6. We now propose to proceed with phase 3 of the recommended sewerage upgrading works involving the demolition of about 7 km of existing gravity sewers in San Po Kong, Kowloon City, To Kwa Wan, Ma Tau Wai, Hung Hom and Tsim Sha Tsui, and the reprovisioning with larger diameter gravity sewers. The diameters of these new sewers range from 300 mm to 1 050 mm and will serve to provide sufficient capacity to reduce the risk of sewage overflow in Central and East Kowloon. We will also rehabilitate about 450 m of gravity sewer with a diameter of 1 200 mm in Tsim Sha Tsui. Trenchless technologies will be employed, where appropriate, to reduce inconvenience to the public

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be $680.9 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		467.8
(b)	Demolition of existing gravity sewers		5.5
(c)	Rehabilitation of a gravity sewer		48.9
(d)	Ancillary works		3.4
(e)	Environmental mitigation measures		10.4
(f)	Consultants' fees for		3.7
	(i) contract administration	1.0	
	(ii) management of resident site staff (RSS)	2.7	
(g)	Remuneration of RSS		80.4
(h)	Contingencies		60.8
	Total		680.9

/8. …..

8. 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 2 to Enclosure 8.

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

Year	$ million (MOD)
2018 – 2019	11.9
2019 – 2020	73.8
2020 – 2021	138.1
2021 – 2022	147.6
2022 – 2023	93.6
2023 – 2024	78.7
2024 - 2025	76.9
2025 – 2026	41.7
2026 – 2027	18.6
	680.9

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 2018 to 2027. We will deliver the proposed works under a New Engineering Contract (NEC)[2] form of contract with provision for price adjustment.

/11. …..

[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.

11. We estimate the additional annual recurrent expenditure arising from the project to be $900,000. Based on the current level of expenditure on operation and day-to-day maintenance of sewerage facilities, the proposed works will lead to an increase in the recurrent cost of providing sewage services by about 0.04% which will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

12. We consulted the Traffic, Transport and Housing Committee of Yau Tsim Mong District Council (DC), Housing and Infrastructure Committee of Kowloon City DC and Traffic and Transport Committee of Wong Tai Sin DC on 1, 15 and 27 March 2018 respectively. The Committees supported the proposed works.

13. We consulted the Legislative Council Panel on Environmental Affairs on 23 April 2018 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

14. 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 2008 and updated the PER in 2018. The updated 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 7(e) a sum of $10.4 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

15. For short-term environmental impacts during construction, we will control noise, dust and site run-off nuisance to within the established standards and guidelines through the 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.

/16. …..

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 request the contractors to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the disposal of inert construction waste 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.

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

18. We estimate that the proposed works will generate 47 500 tonnes of construction waste. Of these, we will reuse 12 800 tonnes (27%) on site, and deliver 31 200 tonnes (66%) of inert construction waste to PFRF for subsequent reuse and 3 500 tonnes (7%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $2.9 million (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

19. The proposed works will not pose insurmountable impact on any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites and buildings, sites of archaeological interest or known areas of archaeological potential and government historic sites identified by the Antiquities and Monuments Office (AMO). Appropriate mitigation measures, including but not limited to structural monitoring will be carried out to ensure the built heritage

/in …..

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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.

in the vicinity of the proposed works will not be directly or indirectly affected during the course of works. Appropriate mitigation measures will also be recommended if areas of archaeological potential are identified. We will work closely with AMO to formulate and implement the mitigation measures as and when required.

LAND ACQUISITION

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

BACKGROUND INFORMATION

21. The sewerage upgrading works for Central and East Kowloon were originally planned as four packages. In September 2005, we upgraded part of **337DS** "Upgrading of Central and East Kowloon sewerage" Category B as **344DS** "Upgrading of Central and East Kowloon sewerage – package 1"; and in September 2006, the remaining parts of the works were upgraded to Category B as **337DS** "Upgrading of Central and East Kowloon sewerage – packages 2 & 3" and **356DS** "Upgrading of Central and East Kowloon sewerage – package 4".

22. In May 2007, we engaged consultants to undertake site investigation, surveys, traffic impact assessment and detailed design for the sewerage upgrading works under all four packages mentioned in paragraph 21 above at an estimated cost of $5.1 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. In May 2008, **337DS**, **344DS** and **356DS** were combined as **344DS** "Upgrading of Central and East Kowloon sewerage – packages 1 to 4" to facilitate better programming and implementation of works in phases with the developments in the region.

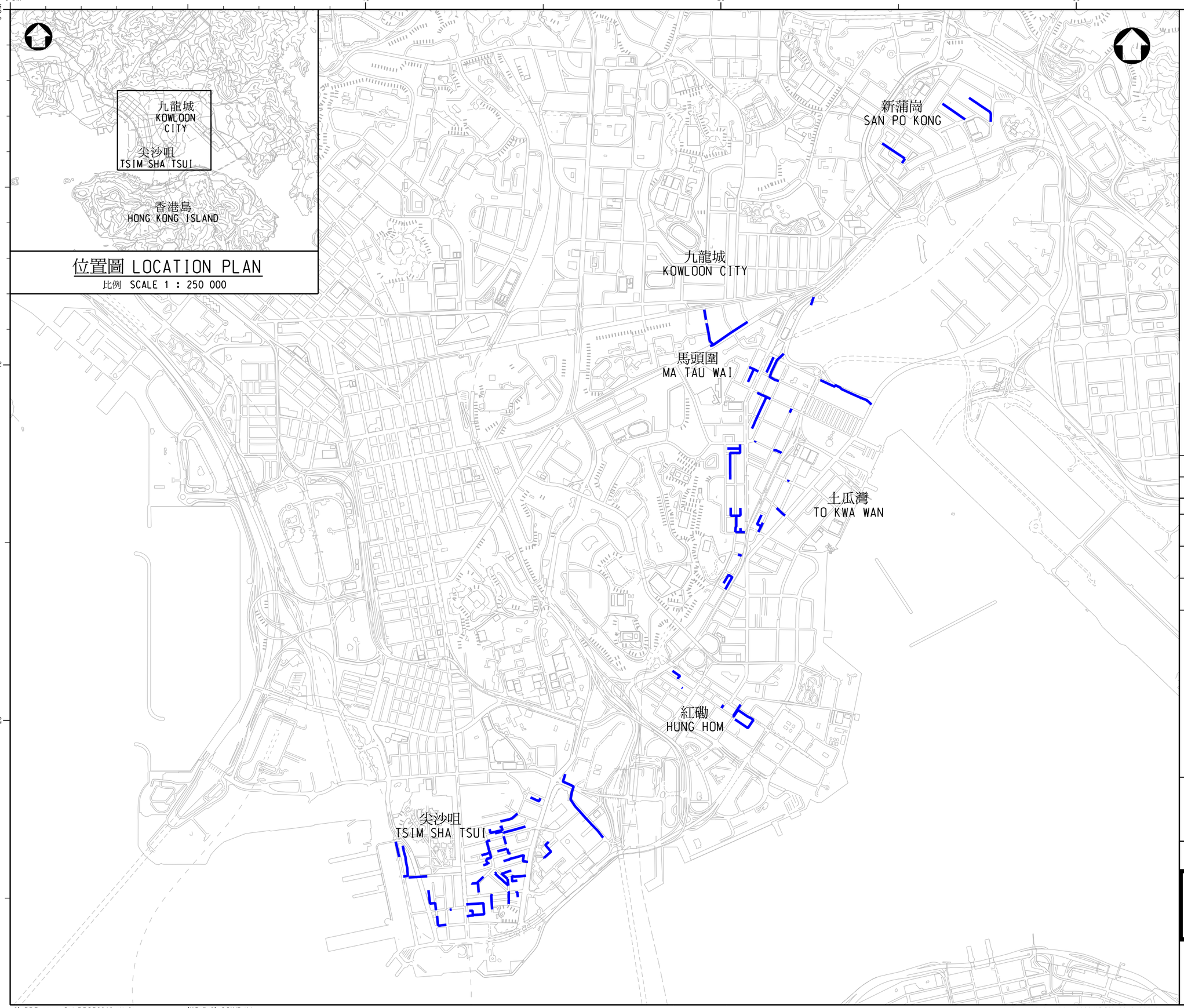
/24. …..

24. In January 2009, we upgraded part of **344DS** to Category A as **367DS** "Upgrading of Central and East Kowloon sewerage – phase 1" at an estimated cost of $304.7 million in MOD prices for the upgrading of existing gravity sewers of about 6.3 km mainly at Wong Tai Sin and Kowloon City and seven existing dry weather flow interceptors (DWFIs) in the hinterland areas. In June 2011, we upgraded another part of **344DS** to Category A as **377DS** "Upgrading of Central and East Kowloon sewerage – phase 2" at an estimated cost of $503.0 million in MOD prices for the upgrading of existing gravity sewers of about 5.7 km, construction of about 1.3 km new sewers mainly at Kowloon Bay and Kwun Tong and upgrading of seven existing DWFIs along the water front areas, with all the remaining part of **344DS** retained as phase 3. The construction works under phases 1 and 2 were completed in 2012 and 2016 respectively.

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

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

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



位置圖 LOCATION PLAN

比例 SCALE 1 : 250 000

圖例
LEGEND :

擬議污水渠
PROPOSED SEWERS

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

修 訂 REVISION

	姓 名 name	日期 date
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核 對 checked	*SIGNED* Ir K. K. LEI	20 MAR 2018
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圖 則 名 稱 drawing title

工務工程計劃編號4344DS
- 九龍中部及東部污水收集系統
改善工程 - 第3期
PWP ITEM NO. 4344DS
- UPGRADING OF CENTRAL AND EAST KOWLOON SEWERAGE - PHASE 3

圖 則 編 號 drawing no.	比例 scale
DCM/2018/008	1 : 20 000

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

344DS – Upgrading of Central and East Kowloon sewerage – phase 3

Breakdown of estimates for consultants' fees and resident site staff costs (in September 2017 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	200	38	1.6	25.2
		Technical	928	14	1.6	40.8
					Sub-total	66.0
	Comprising –					
	(i) Consultants' fees for management of RSS				2.2#	
	(ii) Remuneration of RSS				63.8#	
					Total	**66.8**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $78,775 per month and MPS salary point 14 = $27,485 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 **344DS** 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 8.