For discussion
on 12 June 2019

PWSC(2019-20)15

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
408DS – Yuen Long Effluent Polishing Plant
272DS – Port Shelter sewerage, stage 2
273DS – Port Shelter sewerage, stage 3
125DS – Tolo Harbour sewerage of unsewered areas, stage 2

Members are invited to recommend to the Finance Committee –

(a) the upgrading of part of **408DS**, entitled "Yuen Long Effluent Polishing Plant – stage 1" to Category A at an estimated cost of $6,861.4 million in money-of-the-day (MOD) prices;

(b) the upgrading of part of **272DS**, entitled "Port Shelter sewerage, stage 2, package 3", to Category A at an estimated cost of $515.9 million in MOD prices;

(c) the upgrading of part of **273DS**, entitled "Port Shelter sewerage, stage 3, package 2", to Category A at an estimated cost of $668.2 million in MOD prices;

(d) the upgrading of part of **125DS**, entitled "Tolo Harbour sewerage of unsewered areas, stage 2 – phase 2", to Category A at an estimated cost of $308.1 million in MOD prices, and

(e) the retention of the remainders of **408DS, 272DS**, **273DS** and **125DS** in Category B.

/PROBLEM …..

PROBLEM

2. To cater for population growth and development needs of Hong Kong and to safeguard public health and protect the environment, we need to upgrade the sewage treatment facilities at Yuen Long and build more village sewerage system in Port Shelter and Tolo Harbour.

PROPOSAL

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

(a) part of **408DS** at an estimated cost of $6,861.4 million in MOD prices for the construction of the stage 1 upgrading of the Yuen Long Effluent Polishing Plant;

(b) part of **272DS** and **273DS** at estimated costs of $515.9 million and $668.2 million respectively in MOD prices for the provision of village sewerage in part of Port Shelter; and

(c) part of **125DS** at an estimated cost of $308.1 million in MOD prices for the provision of village sewerage in part of Tolo Harbour.

PROJECT SCOPE AND NATURE

4. We need to enhance the capacity and coverage of the existing sewerage infrastructure in a sustained manner. At present, the public sewerage system of Hong Kong has reached over 93% of the population. Building on this performance, we still need to upgrade the system to improve its performance and extend its coverage to serve expansion areas in developed districts, new development areas and more rural villages.

5. This paper consists of four sewerage projects in Yuen Long, Port Shelter and Tolo Harbour.

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

Environment Bureau
June 2019

408DS – Yuen Long Effluent Polishing Plant

PROJECT SCOPE AND NATURE

The part of **408DS** we propose to upgrade to Category A as stage 1 works comprises –

(a) the demolition and reconstruction of part of the existing Yuen Long sewage treatment works (YLSTW) to increase its treatment capacity from 70 000 cubic metres (m^3) per day to 100 000 m^3 per day and upgrading of sewage treatment level to tertiary effluent polishing standard;

(b) the demolition and reconstruction of sludge treatment facilities;

(c) the demolition and reconstruction of the administration building, storage building, switchgear house and transformer house; and

(d) ancillary works [1] and environmental mitigation measures[2].

2. The location plan and photomontage of the proposed works are shown in Annexes 1 and 2 to Enclosure 1.

/3. …..

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[1] Ancillary works include the utilities diversion, provision of manholes, walkway, necessary building services and landscaping works that are required to complete the proposed works and local improvement works for the community such as provision of river-side walkway, viewing decks, etc.

[2] Environmental mitigation measures include comprehensive odour control/mitigation measures such as fully-enclosing all treatment units and provision of ventilation and deodourisation system.

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence the proposed works in the first quarter of 2020 for completion in 2026.

4. We will retain the remainder of **408DS** in Category B, which comprises the provision of a further treatment capacity 50 000 m^3 per day for the Yuen Long Effluent Polishing Plant to increase its overall treatment capacity to 150 000 m^3 per day. Funding for the remainder of **408DS** will be sought later after completion of the design and preparatory work.

JUSTIFICATION

5. The existing YLSTW serves Yuen Long Town, Yuen Long Industrial Estate and Kam Tin areas with a design capacity of 70 000 m^3 per day. Based on the latest planning data[3], the volume of sewage generation from the YLSTW catchment is estimated to increase to 150 000 m^3 per day[4] after 20 years. We plan to reconstruct the YLSTW within the same footprint to increase its capacity in two stages. The proposed works, as stage 1 of the project, will firstly increase the treatment capacity to 100 000 m^3 per day and reserve space for future construction of co-digestion facilities for sludge and food waste[5]. In the course of stage 1 construction, about half of the existing facilities of the YLSTW would be demolished, while the other half would be kept in operation to maintain the sewage treatment service for Yuen Long area.

6. The YLSTW is a secondary sewage treatment works, located at Yuen Long Industrial Estate within a congested site of only eight hectares in area. It has been operating for over 30 years and most of its facilities are of out-dated design and reaching the end of their design life. We will take this opportunity to upgrade the environmental facilities of the plant and improve the adjacent environment through the following measures –

/(a) …..

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[3] 2014-based Territorial Planning and Employment Database Matrix.

[4] The increase in sewage volume is attributed to natural population growth, further housing developments, village sewerage programme in Yuen Long and Kam Tin areas as well as Yuen Long Industrial Estate's development.

[5] The space reserved is sufficient to construct more digestors and storage tanks for co-digestion of about 200 tonnes of food waste per day. The project for the construction of these additional facilities will be implemented separately and funding will be sought in future.

(a) upgrading the treatment level of the plant to tertiary standard to further reduce the residual organic content of the effluent by 50% (i.e. reducing the biological oxygen demand[6] concentration from 20 milligrams per litre (mg/L) to 10 mg/L) and adding a nutrient removal process, so as to ensure that the water quality of the nearby Shan Pui River and the Deep Bay further downstream would not be affected by the higher volume of effluent discharge;

(b) replacing all existing sewage treatment facilities and sludge treatment facilities with more compact and efficient units so that their capacities and treatment level can be upgraded without the need of additional land;

(c) adopting fully enclosed design to reduce potential odour and noise nuisance to the neighbourhood;

(d) incorporating extensive greening features and provision of public co-use facilities for the benefit of the local community; and

(e) installing "combined heat and power units" to utilise the biogas derived from the digestion of sludge and organic waste (e.g. food waste) as fuel, and using photovoltaic panels to generate renewable energy.

7. At the planning stage, we have considered alternative schemes to meet the increased demand for sewage treatment capacity, including relocation of the YLSTW, construction of an additional effluent polishing plant elsewhere within the district, diversion of the sewage to other sewage treatment facilities and the discharge of treated effluent to other locations. However, it would take considerable time to search for an alternative site for the plant, while cross-district sewage diversion would require extensive sewer re-routing works involving additional capital cost and causing widespread traffic impact. As such, we consider that the proposed scheme of reconstructing the YLSTW on the existing site is most preferable.

/**FINANCIAL** …..

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[6] Biochemical oxygen demand means the amount of oxygen consumed by micro-organism to break down organic matter.

FINANCIAL IMPLICATIONS

8. We estimate the total capital cost of the proposed works to be $6,861.4 million in money-of-the-day (MOD) prices (please see paragraph 10 below), broken down as follows –

		$ million (in MOD prices)	
(a)	Demolition and reconstruction of sewage treatment facilities with increased treatment capacity and upgraded treatment standard at tertiary level		2,918.6
	(i) civil works	1,359.2	
	(ii) electrical and mechanical (E&M) works	1,559.4	
(b)	Demolition and reconstruction of sludge treatment facilities		2,021.3
	(i) civil works	1,056.9	
	(ii) E&M works	964.4	
(c)	Demolition and reconstruction of administration building, storage building, switchgear house and transformer house		251.0
(d)	Ancillary works		141.5
(e)	Environmental mitigation measures		195.7
(f)	Consultants' fees for		56.6
	(i) contract administration	32.8	
	(ii) management of resident site staff (RSS)	23.8	
(g)	Remuneration of RSS		653.0
(h)	Contingencies		623.7
	Total		6,861.4

/9. …..

9. We propose to engage consultants to undertake contract administration and site supervision for the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at Annex 3 to Enclosure 1.

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

Year	**$ million (MOD)**
2019 – 2020	10.0
2020 – 2021	185.9
2021 – 2022	702.0
2022 – 2023	848.9
2023 – 2024	1,060.0
2024 – 2025	1,110.1
2025 – 2026	1,160.0
2026 – 2027	700.0
2027 – 2028	531.7
2028 – 2029	552.8
	6,861.4

/11. …..

11. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2019 to 2029. We will deliver the proposed works under a New Engineering Contract (NEC)[7] form of contract with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be $200.0 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharges rates in future.

PUBLIC CONSULTATION

13. We consulted the Ping Shan Rural Committee (PSRC) on 27 November 2018 and the Environmental Improvement Committee of the Yuen Long District Council on 21 January 2019. Both Committees supported the proposed works.

14. We consulted the Legislative Council Panel on Environmental Affairs on 27 May 2019 and Members supported the proposed works.

/ENVIRONMENTAL …..

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

ENVIRONMENTAL IMPLICATIONS

15. The project is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and an environmental permit (EP) is required for the construction and operation of the project. The Environmental Impact Assessment (EIA) Report for the project was approved with conditions in April 2019 under the EIAO. The EIA Report concluded that the environmental impact of upgrading YLSTW could be controlled to within the criteria under the EIAO and the Technical Memorandum on EIA Process. An EP for the project was issued in April 2019. We will implement the measures recommended in the EIA Report and stipulated in the EP. The key measures include the installing of deodourisation units for odour control, removing sewage sludge off-site in fully enclosed containers, enclosing all process equipment inside building structures, fitting exhaust fans with acoustic louvre/silencer and providing standby units with dual power supply to prevent any emergency discharge due to power interruption during operation. We have included in paragraph 8(e) a sum of $195.7 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 adopt restricted working hours and use quiet powered mechanical equipment and temporary noise barriers to minimise construction noise impact. In order to minimise disturbance to migratory birds, noisy construction activities (i.e. percussive piling works and demolition using mechanical breakers) would not be carried out during the winter period. 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.

/17. …..

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will require the contractors to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the disposal of inert construction waste at the public fill reception facilities (PFRF)[8]. We will encourage the contractors to maximise the use of recycled/recyclable inert construction waste and the use of non-timber formwork to further reduce the generation of construction waste.

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

19. We estimate that the proposed works will generate in total about 546 720 tonnes of construction waste. Of these, we will reuse about 40 800 tonnes (7.5%) inert construction waste on site, and deliver 408 000 tonnes (74.6%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 97 920 tonnes (17.9%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be $48.6 million for the proposed works (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

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[8] 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.

/LAND …..

LAND ACQUISTION

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

BACKGROUND INFORMATION

22. In September 2014, we upgraded **408DS** to Category B.

23. In July 2015, we upgraded part of **408DS** to Category A as **412DS** to engage consultants for carrying out site investigation, surveys, impact assessment and detailed design study for **408DS**.

24. The detailed design of the proposed works has been substantially completed and the latest estimated cost is $30 million in MOD prices.

25. The proposed works will involve the felling of 152 trees and transplanting of ten trees. All the trees to be removed and transplanted are not important trees[9]. We will incorporate planting proposals as part of the project, including some 162 trees.

26. We estimate that the proposed works will create 540 jobs (430 for labourers and 110 for professional or technical staff), providing a total employment of about 36 200 man-months.

Environment Bureau
June 2019

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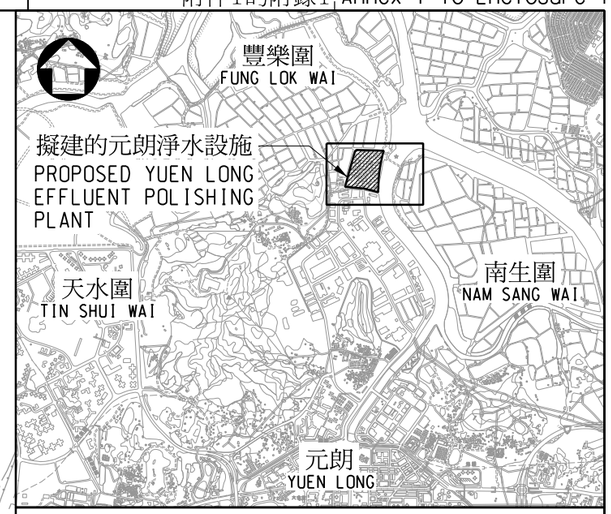
[9] Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –
(a) trees of 100 years old or above;
(b) trees of cultural, historical or memorable significance, e.g. Fung Shui trees, trees as landmark of monastery or 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.



索引圖 KEY PLAN

比例 SCALE 1 : 50 000

圖例 LEGEND :

- 現有元朗污水處理廠的邊界
  EXISTING BOUNDARY OF YUEN LONG SEWAGE TREATMENT WORKS
- 第一階段工程進行期間繼續運作的污水處理組件
  TREATMENT FACILITIES IN OPERATION DURING STAGE 1 CONSTRUCTION WORKS
- 擬建的行人通道
  PROPOSED WALKWAY
- 現有設施在工程完工後停用
  EXISTING FACILITIES TO BE DECOMMISSIONED UPON COMPLETION OF THE WORKS

1	基本處理設施 PRELIMINARY TREATMENT FACILITIES
2	初級處理設施 PRIMARY TREATMENT FACILITIES
3	生物處理設施 BIOLOGICAL TREATMENT FACILITIES
4	三級處理設施 TERTIARY TREATMENT FACILITIES
5	污泥處理設施 SLUDGE TREATMENT FACILITIES
6	行政樓 ADMINISTRATION BUILDING
7	貯存庫 STORAGE BUILDING
8	觀景及園景平台 VIEWING AND LANDSCAPED DECK

圖則名稱 drawing title

工程計劃項目408DS號
元朗淨水設施第一階段
PWP ITEM NO.408DS
YUEN LONG EFFLUENT POLISHING PLANT (STAGE 1)

圖則編號 drawing no. DSP/408DS1/16021

比例 scale 1 : 2000 OR AS SHOWN

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

圖則名稱 drawing title

工程計劃項目408DS號
元朗淨水設施第一階段
PWP ITEM NO.408DS
YUEN LONG EFFLUENT POLISHING PLANT (STAGE 1)

圖則編號 drawing no. DSP/408DS1/16022

比例 scale N.T.S.

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

408DS – Yuen Long Effluent Polishing Plant

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

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	16.5
		Technical	-	-	-	8.2
					Sub-total	24.7#
(b)	Resident site staff costs (Note 3)	Professional	2 138	38	1.6	280.4
		Technical	4 991	14	1.6	229.4
					Sub-total	509.8
	Comprising –					
	(i) Consultants' fees for management of resident site staff				17.9#	
	(ii) Remuneration of resident site staff				491.9#	
					Total	**534.5**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $81,975 per month and MPS salary point 14 = $28,725 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **408DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 8 of Enclosure 1.

272DS – Port Shelter sewerage, stage 2

PROJECT SCOPE AND NATURE

The part of **272DS** that we propose to upgrade to Category A comprises –

(a) the construction of a secondary sewage treatment works (STW) with a design capacity of about 2 050 cubic metres per day (m^3/day) at Wo Mei;

(b) the construction of a sewage pumping station (SPS) with a design capacity of about 1 350 m^3/day at Wong Chuk Wan;

(c) the construction of about 1.2 kilometre (km) of sewage rising mains with a diameter of 200 millimetres (mm) along Tai Mong Tsai Road at Wong Chuk Wan;

(d) the construction of about 4.2 km of gravity sewers with diameters ranging from 225 mm to 450 mm in Wong Chuk Wan, Wo Mei and Heung Chung; and

(e) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee (FC), we aim to commence construction of the proposed works in the fourth quarter of 2019 for completion in the fourth quarter of 2024.

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

4. We will retain the remainder of **272DS** in Category B for the provision of public sewerage system for the other 17 unsewered areas in the Port Shelter catchment. Funding for the remainder of **272DS** will be sought later after completion of the design and preparatory work.

JUSTIFICATIONS

5. Currently, many parts of Sai Kung are covered by public sewerage system, but some of the village areas in the district within the Port Shelter catchment are unsewered, with their sewage disposed of by individual and simple on-site facilities such as septic tanks and soakaway (STS) systems[2]. Extension of the public sewerage system to these areas can help improve environmental hygiene and further reduce the amount of pollutants being discharged into the nearby water bodies.

6. We propose to provide public sewerage system for three unsewered areas within the Port Shelter catchment, namely Wong Chuk Wan, Wo Mei and Heung Chung through the proposed works. The proposed sewerage system will serve an estimated population of about 4 000.

7. Upon completion of the proposed works, sewage from Wong Chuk Wan will be pumped by the proposed SPS and be conveyed to the Sai Kung STW for proper treatment and disposal. Sewage from Wo Mei and Heung Chung will be treated by the proposed STW to be constructed at Wo Mei, and the treated effluent will be discharged into the nearshore waters of Hebe Haven.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be $515.9 million in money-of-the-day (MOD) prices (please see paragraph 10 below), broken down as follows –

/$ million …..

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[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.

			$ million (in MOD prices)
(a)	Construction of Wo Mei STW		237.1
	(i) civil works	122.5	
	(ii) electrical and mechanical works (E&M works)	114.6	
(b)	Construction of Wong Chuk Wan SPS		29.5
	(i) civil works	18.6	
	(ii) E&M works	10.9	
(c)	Construction of gravity sewers		121.3
(d)	Construction of sewage rising mains		14.0
(e)	Ancillary works		6.6
(f)	Environmental mitigation measures		6.1
(g)	Consultants' fees for		3.1
	(i) contract administration	1.1	
	(ii) management of residential site staff (RSS)	2.0	
(h)	Remuneration of RSS		52.9
(i)	Contingencies		45.3
	Total		515.9

9. 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.

/10. …..

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

Year	$ million (MOD)
2019 – 2020	2.8
2020 – 2021	56.1
2021 – 2022	105.7
2022 – 2023	98.8
2023 – 2024	82.0
2024 – 2025	73.4
2025 – 2026	52.1
2026 – 2027	29.4
2027 – 2028	15.6
	515.9

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

12. We estimate the additional annual recurrent expenditure arising from this project to be $2.92 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

/**PUBLIC** …..

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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.

PUBLIC CONSULTATION

13. We have been consulting relevant members of Sai Kung Rural Committee (SKRC) and Sai Kung District Council (SKDC) about the proposed works since September 2001, and have provided updates at the Housing and Environmental Hygiene Committee (HEHC) of the SKDC and the SKRC in March 2013 and March 2016 respectively. The proposed works were supported. We further consulted the HEHC on 15 November 2018. The Committee maintained their support for the proposed works.

14. We gazetted the proposed sewerage works in two packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL). The first package for Wong Chuk Wan was gazetted in May 2013 and authorised in July 2013. The second package for Wo Mei and Heung Chung was gazetted in December 2018 and authorised in March 2019.

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

ENVIRONMENTAL IMPLICATIONS

16. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). Drainage Services Department (DSD) completed Preliminary Environmental Reviews (PER) for the proposed works in December 2010 and proposed STW at Wo Mei in September 2016. DSD then updated the PER of December 2010 for the proposed SPS in Wong Chuk Wan in January 2019. The PERs have concluded and the Director of Environmental Protection agreed, with the implementation of appropriate mitigation measures as mentioned in the following paragraphs, that the proposed works would not cause long-term adverse environmental impacts. We have included in paragraph 8(f) a sum of $6.1 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures.

/17. …..

17. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisance to within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact, regular water-spraying of the construction site to minimise emission of fugitive dust, and on-site treatment of site run-off to minimise potential water quality impact. We will also carry out regular site inspections to ensure proper implementation of these recommended mitigation measures and good site practices.

18. For the operation phase of the proposed SPS in Wong Chuk Wan and the proposed STW in Wo Mei, we will implement the measures recommended in the PERs. The key measures include placing most of the equipment in underground enclosed structures, provision of deodourisation units, as well as landscaping works and vertical greening to the structures to minimise the potential noise, odour and visual impact to nearby sensitive receivers.

19. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the disposal of inert construction waste at the public fill reception facilities (PFRF)[4]. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

20. We will require the contractor 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 require 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.

/21. …..

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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.

21. We estimate that the proposed works will generate in total about 68 000 tonnes of construction waste. Of these, we will reuse about 38 000 tonnes (56%) of inert construction waste on site and deliver about 29 000 tonnes (43%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 000 tonnes (1%) of non-inert construction waste at landfills. The total cost for disposal of the construction waste at PFRF and landfill sites is estimated to be $2.3 million for the proposed works (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

23. The proposed works will only involve government land. No land resumption is required. We will charge the cost of land clearance for government land, estimated at $130 000, to **Head 701 – Land Acquisition**. A breakdown of the land clearance cost is at Annex 3 to Enclosure 2.

BACKGROUND INFORMATION

24. We upgraded **272DS** to Category B in September 2006.

25. In August 2007, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works. The total estimated cost was $17.3 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".

26. In June 2012, we upgraded part of **272DS** and part of **273DS** to Category A as **382DS** at an Approved Project Estimate (APE) of $290.6 million in MOD prices. In January 2013, the FC approved the increase in APE of **382DS** by $68.4 million to $359 million in MOD prices. The construction works commenced in January 2013 and were substantially completed in 2018.

/27. …..

27. In July 2015, we upgraded part of **272DS** to Category A as **410DS** at an APE of $68.9 million in MOD prices. The construction works commenced in March 2016 for completion in the fourth quarter of 2020.

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

29. The proposed works will involve the felling of one tree. The tree to be removed is not an important tree[5]. We will incorporate a planting proposal as part of the project, including an estimated total of 13 trees.

30. We estimate that the proposed works will create about 85 jobs (65 labourers and 20 professional or technical staff), providing a total employment of 4 300 man-months.

Environment Bureau
June 2019

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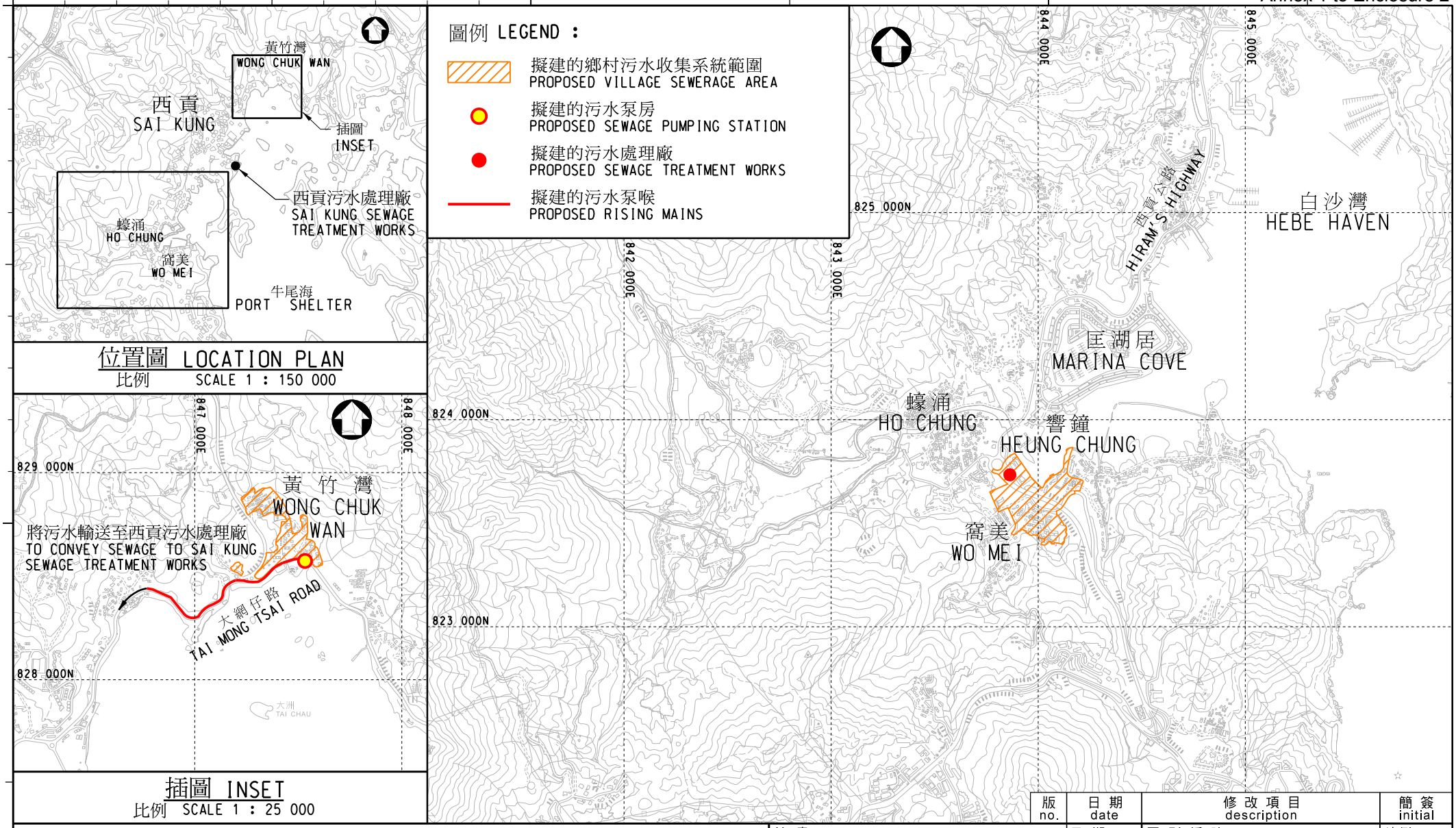
[5] "Important trees" refer to tree in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –
(a) trees of 100 years old or above;
(b) trees of cultural, historical or memorable significance, e.g. Fung Shui trees, trees as landmark of monastery or 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.



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

圖 則 名 稱 drawing title

工務工程計劃編號272DS - 牛尾海污水收集系統第2階段
PWP ITEM NO.272DS - PORT SHELTER SEWERAGE, STAGE 2

繪 畫 drawn *SIGNED* W. H. CHAN	日 期 date 29 MAY 2019	圖 則 編 號 drawing no. DCM/2019/041
核 對 checked *SIGNED* Ir C. F. WAN	日 期 date 29 MAY 2019	比例 scale 1 : 25 000 OR AS SHOWN
批 核 approved *SIGNED* Ir C. K. CHAN	日 期 date 29 MAY 2019	
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

272DS – Port Shelter sewerage, stage 2

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

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.7
		Technical	-	-	-	0.2
					Sub-total	0.9#
(b)	Resident site staff costs (Note 3)	Professional	184	38	1.6	24.1
		Technical	435	14	1.6	20.0
					Sub-total	44.1
	Comprising –					
	(i) Consultants' fees for management of resident site staff				1.6#	
	(ii) Remuneration of resident site staff				42.5#	
					Total	**45.0**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $81,975 per month and MPS salary point 14 = $28,725 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade this part of **272DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 8 of Enclosure 2.

272DS – Port Shelter sewerage, stage 2

Breakdown of land acquisition cost

			($)	$ million
(I)	**Estimated cost for land clearance**			0.12
	(a)	Ex-gratia allowances (EGAs) e.g. crops compensation, disturbance allowance for cultivators, and "Tun Fu" ceremonial fees, etc.	0.12	
(II)	**Interest and contingency payment**			0.01
			Total	**0.13**

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

273DS – Port Shelter sewerage, stage 3

PROJECT SCOPE AND NATURE

The part of **273DS** that we propose to upgrade to Category A comprises –

(a) the construction of a secondary sewage treatment works (STW) with a design capacity of about 140 cubic metres per day (m^3/day) at Po Toi O;

(b) the construction of a sewage pumping station (SPS) with a design capacity of about 3 400 m^3/day at Tseng Lan Shue;

(c) the construction of about 390 metres (m) of submarine outfall with a diameter of 280 millimetres (mm) for the disposal of treated effluent from the proposed STW at Po Toi O;

(d) the construction of about 800 m of rising mains with a diameter of 250 mm in Tseng Lan Shue and Po Toi O;

(e) the construction of about 13.3 kilometres of gravity sewers with diameters ranging from 225 mm to 450 mm in Tseng Lan Shue, Sam Long, Tai Po Tsai and Po Toi O; and

(f) ancillary works[1].

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

/3. …..

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

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 2019 for completion in the fourth quarter of 2024.

4. We will retain the remainder of **273DS** in Category B for the provision of public sewerage system for the other five unsewered areas in Port Shelter catchment. Funding for the remainder of **273DS** will be sought later after completion of the design and preparatory work.

JUSTIFICATIONS

5. Currently, many parts of Sai Kung are covered by public sewerage system, but some of the village areas in the district within the Port Shelter catchment are unsewered, with their sewage disposed of by individual and simple on-site facilities such as septic tanks and soakaway (STS) systems[2]. Extension of the public sewerage system to these areas can help improve environmental hygiene and further reduce the amount of pollutants being discharged into the nearby water bodies.

6. We propose to provide public sewerage system for the four unsewered areas, namely Tseng Lan Shue, Sam Long, Tai Po Tsai and Po Toi O through the proposed works. The proposed sewerage system will serve an estimated population of about 9 500.

7. Upon completion of the proposed works, sewage from Tseng Lan Shue and Sam Long will be pumped by the proposed SPS and be conveyed to the Kwun Tong Preliminary Treatment Works (PTW) while the sewage from Tai Po Tsai will be conveyed to the Tseung Kwan O PTW for proper treatment and disposal. Sewage from Po Toi O will be treated by the proposed STW and the treated effluent will be discharged through the proposed submarine outfall into the Clear Water Bay away from the existing mariculture area.

/FINANCIAL …..

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[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.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works as detailed in paragraph 1 above to be $668.2 million in money-of-the-day (MOD) prices (please see paragraph 10 below), broken down as follows –

				$ million (in MOD prices)
(a)	Construction of Po Toi O STW			50.8
	(i)	civil works	35.4	
	(ii)	electrical and mechanical works (E&M works)	15.4	
(b)	Construction of Tseng Lan Shue SPS			40.8
	(i)	civil works	27.1	
	(ii)	E&M works	13.7	
(c)	Construction of gravity sewers			286.9
(d)	Construction of rising mains			25.9
(e)	Construction of submarine outfall at Po Toi O			112.2
(f)	Ancillary works			7.7
(g)	Environmental mitigation measures			12.9
(h)	Consultants' fees for			4.1
	(i)	contract administration	1.6	
	(ii)	management of residential site staff (RSS)	2.5	
(i)	Remuneration of RSS			68.4
(j)	Contingencies			58.5
		Total		668.2

/9. …..

9. 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.

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

Year	$ million (MOD)
2019 – 2020	5.8
2020 – 2021	71.1
2021 – 2022	144.0
2022 – 2023	124.3
2023 – 2024	103.3
2024 – 2025	95.0
2025 – 2026	67.5
2026 – 2027	37.7
2027 – 2028	19.5
	668.2

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

/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 estimate the additional annual recurrent expenditure arising from this project to be $5.79 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

13. We have been consulting relevant members of Hang Hau Rural Committee (HHRC) and Sai Kung District Council (SKDC) about the proposed works since October 2001, and have provided updates at the Housing and Environmental Hygiene Committee (HEHC) of the SKDC in March 2013. The proposed works were supported. We further consulted the HEHC on 15 November 2018. The Committee maintained their support for the proposed works.

14. We gazetted the proposed sewerage works in three packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL). The first package for Tai Po Tsai was gazetted in December 2012. It was authorised by The Chief Executive in Council in January 2014 after considering the unresolved objections submitted by the members of the public. The second package for Tseng Lan Shue and Sam Long was gazetted in March 2014 and authorised in June 2014. The third package for Po Toi O was gazetted in August 2017 and authorised in November 2017.

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

ENVIRONMENTAL IMPLICATIONS

16. The proposed STW and submarine outfall at Po Toi O are designated projects under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) requiring an environmental permit (EP) for construction and operation. The Director of Environmental Protection (DEP) approved the EIA report and issued an EP for the construction and operation of the proposed works in January 2017. The approved EIA report has concluded that with implementation of the recommended mitigation measures, the proposed works would not cause adverse environmental impact. Drainage Services Department (DSD) will implement the mitigation measures recommended in the approved EIA report and comply with the conditions of the EP.

/17. …..

17. The proposed SPS at Tseng Lan Shue is a designated project under Schedule 2 of the EIAO (Cap. 499) requiring an EP for its construction and operation. Having regard to the project profile (PP), the DEP is satisfied that with implementation of the recommended measures, the proposed works would not cause adverse environmental impact. With the consent of the Secretary for the Environment, the permission to apply directly for an EP was granted in December 2018. An EP for the construction and operation of the proposed works was issued in February 2019. DSD will implement the measures set out in the PP and comply with the conditions of the EP.

18. The remaining part of **273DS** we propose to upgrade to Category A is not a designated project under the EIAO (Cap. 499). DSD completed a Preliminary Environmental Review (PER) for the remaining proposed works in December 2010 and updated the PER in January 2019. The PER concluded and the DEP agreed that, with the implementation of appropriate mitigation measures, the proposed works would not cause long-term adverse environmental impacts.

19. We have included in paragraph 8(g) a sum of $12.9 million (in MOD prices) in the project estimate for implementation of the environmental mitigation measures and the environmental monitoring and audit (EM&A) programme.

20. During the construction phase of the proposed works under 273DS, DSD will adopt the non-dredge trenchless construction method and water-tight cofferdam during submarine outfall construction, and will require the contractors to control noise, dust and site run-off nuisance to within the established standards and guidelines, as well as the EM&A programme. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact, regular water-spraying of the construction site to minimise emission of fugitive dust, and on-site treatment of site run-off to minimise potential water quality impact.

21. For the operation phase, we will implement the measures recommended in the relevant PER, PP, EIA Report and stipulated in the relevant EPs. For the operation of the proposed STW in Po Toi O and the proposed SPS in Tseng Lan Shue, the key measures will include placing most of the equipment in underground enclosed structures, provision of deodourisation units as well as landscaping works and vertical greening to the structures to minimise potential noise, odour and visual impact to nearby sensitive receivers.

/22. …..

22. At the planning and design stages, we have considered ways to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise the disposal of inert construction waste to the public fill reception facilities (PFRF[4]). 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.

23. We will require the contractor 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 require 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.

24. We estimate that the proposed works will generate in total about 150 000 tonnes of construction waste. Of these, we will reuse about 97 300 tonnes (65%) of inert construction waste on site and deliver about 51 600 tonnes (34%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 100 tonnes (1%) of non-inert construction waste at landfills. The total cost for disposal of the construction waste at PFRF and landfill sites is estimated to be $3.9 million for the proposed works (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap 354N)).

HERITAGE IMPLICATIONS

25. 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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[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.

LAND ACQUISITION

26. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 1 496 square metres (m^2) of private land and clear about 56 460 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 $14.0 million to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at Annex 3 to Enclosure 3.

BACKGROUND INFORMATION

27. We upgraded **273DS** to Category B in September 2006.

28. In August 2007, we engaged consultants to undertake site investigation, survey, impact assessments and detailed design for the proposed works. The total estimated cost was $10.8 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".

29. In June 2012, we upgraded part of **272DS** and part of **273DS** to Category A as **382DS** at an Approved Project Estimate (APE) of $290.6 million in MOD prices. In January 2013, the FC approved the increase in APE of **382DS** by $68.4 million to $359 million in MOD prices. The construction works commenced in January 2013 and were substantially completed in 2018.

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

31. The proposed works will involve the felling of ten trees. All the trees to be removed are not important trees[5]. We will incorporate a planting proposal as part of the project, including an estimated total of 12 trees.

32. We estimate that the proposed works will create about 140 jobs (110 labourers and 30 professional or technical staff), providing a total employment of 7 200 man-months.

Environment Bureau
June 2019

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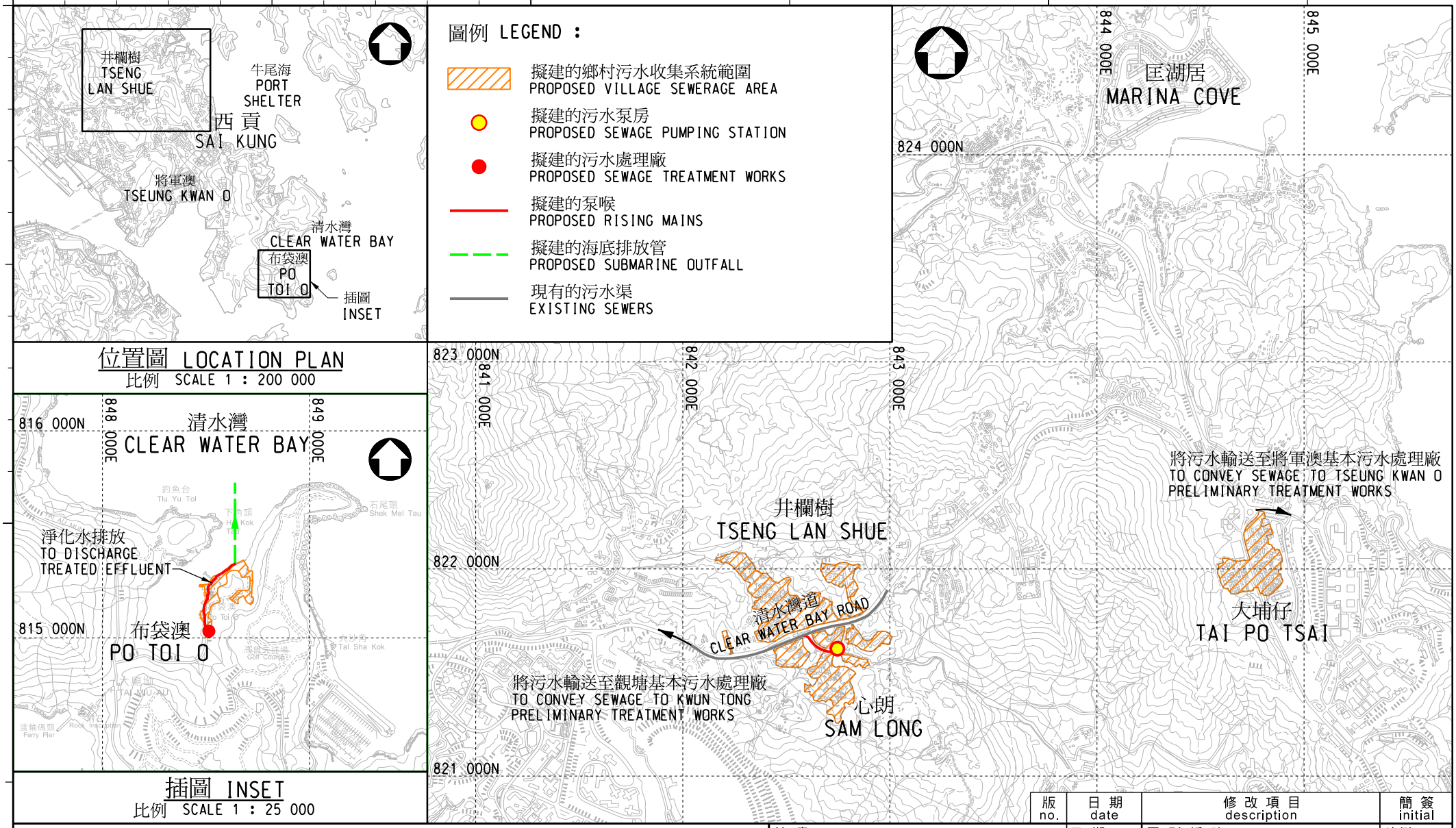
[5] "Important trees" refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

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



位置圖 LOCATION PLAN
比例 SCALE 1 : 200 000

插圖 INSET
比例 SCALE 1 : 25 000

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

圖 則 名 稱 drawing title

工務工程計劃編號273DS - 牛尾海污水收集系統第3階段
PWP ITEM NO.273DS - PORT SHELTER SEWERAGE, STAGE 3

繪 畫 drawn *SIGNED* W. H. CHAN	日 期 date 29 MAY 2019	圖 則 編 號 drawing no. DCM/2019/042
核 對 checked *SIGNED* Ir C. F. WAN	日 期 date 29 MAY 2019	比例 scale 1 : 25 000 OR AS SHOWN
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香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

273DS – Port Shelter sewerage, stage 3

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

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.0
		Technical	-	-	-	0.3
					Sub-total	1.3#
(b)	Resident site staff costs (Note 3)	Professional	248	38	1.6	32.5
		Technical	532	14	1.6	24.5
					Sub-total	57.0
	Comprising –					
	(i) Consultants' fees for management of resident site staff				2.0#	
	(ii) Remuneration of resident site staff				55.0#	
					Total	**58.3**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $81,975 per month and MPS salary point 14 = $28,725 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade this part of **273DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

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

273DS – Port Shelter sewerage, stage 3

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land acquisition (resumption of private land)**		12.4
(II)	**Estimated cost for land clearance**		0.36
	(a) Ex-gratia allowances (EGAs) e.g. crops compensation, disturbance allowance for cultivators, and "Tun Fu" ceremonial fees, etc.	0.36	
(III)	**Interest and contingency payment**		1.28
		Total	**14.04 (Say 14.0)**

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

125DS — Tolo Harbour sewerage of unsewered areas, stage 2

PROJECT SCOPE AND NATURE

The part of **125DS** that we propose to upgrade to Category A comprises –

(a) the construction of a sewage pumping station (SPS) with a design capacity of about 120 cubic metres (m^3) per day at Cheung Kang;

(b) the modification of a sewage pumping station at Tai Po Kau;

(c) the construction of about 300 metres (m) of twin rising mains with a diameter of 150 millimetres (mm);

(d) the construction of about 5.6 kilometres (km) of gravity sewers with diameters ranging from 200 mm to 450 mm in Cheung Kang, Ma Niu, Ha Wong Yi Au and Care Village; and

(e) ancillary works[1].

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

3. Subject to the funding approval of the Finance Committee, we aim to commence the construction of the proposed works in the fourth quarter of 2019 for completion in the first quarter of 2024.

4. We will retain the remainder of **125DS** in Category B for the provision of public sewerage system for another 26 unsewered areas in Sha Tin and Tai Po. Funding for the remainder of **125DS** will be sought at a later stage after completion of the design and preparatory work.

/**JUSTIFICATION** …..

[1] Ancillary works include the utilities diversions, 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.

JUSTIFICATION

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

6. We propose to construct public sewerage system for the four unsewered village areas within the Tolo Harbour catchment, namely Cheung Kang, Ma Niu, Ha Wong Yi Au and Care Village. The proposed sewerage system will serve an estimated population of about 3 300.

7. Upon completion of the proposed works, sewage from Cheung Kang will be pumped by the proposed SPS and be conveyed to Sha Tin Sewage Treatment Works together with sewage from Ma Niu, while sewage from Ha Wong Yi Au and Care Village will be pumped by the modified Tai Po Kau SPS to Tai Po Sewage Treatment Works for proper treatment and disposal.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be $308.1 million in money-of-the-day (MOD) prices (please see paragraph 10 below), broken down as follows –

		$ million (in MOD prices)
(a)	Construction of Cheung Kang SPS	34.4
	(i) civil works	25.7
	(ii) electrical and mechanical works (E&M works)	8.7
(b)	Modification of Tai Po Kau SPS	28.1
	(i) civil works	19.4
	(ii) E&M works	8.7

/(c) …..

[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.

(c)	Construction of gravity sewers		162.2
(d)	Construction of twin rising mains		5.6
(e)	Ancillary works		4.6
(f)	Environmental mitigation measures		5.4
(g)	Consultants' fees for		3.8
	(i) contract administration	2.2	
	(ii) management of resident site staff (RSS)	1.6	
(h)	Remuneration of RSS		36.0
(i)	Contingencies		28.0
	Total		308.1

9. 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 4.

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

Year	**$ million (MOD)**
2019 – 2020	3.1
2020 – 2021	22.0
2021 – 2022	55.4
2022 – 2023	82.5
2023 – 2024	84.5

/**Year** …..

Year	$ million (MOD)
2025 – 2026	21.6
2026 – 2027	16.6
	308.1

11. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2019 to 2027. We will deliver the proposed works under a New Engineering Contract (NEC)[3] form of contract with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be $2.77 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

13. We have been consulting relevant members of Sha Tin Rural Committee (STRC), Tai Po Rural Committee (TPRC), the Development and Housing Committee of the Sha Tin District Council (STDC DHC) and the Environment, Housing and Works Committee of the Tai Po District Council (TPDC EHWC) since March 2009, in which the proposed works were supported. We further consulted the Health and Environment Committee of the Sha Tin District Council (STDC HEC) and TPDC EHWC on 7 March 2019 and on 9 January 2019 respectively. The Committees maintained their support for the proposed works.

14. We gazetted the proposed sewerage works for three villages in two packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL). The first package for Ma Niu was gazetted in March 2015 and authorised in January 2016, after the two objections received against the proposal were resolved. The second package for Ha Wong Yi Au and Care Village was gazetted in May 2017 and

/amended …..

[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.

amended by further gazette in November 2018. It was authorised in January 2019 after the two objections received against the proposal were resolved. The proposed sewerage works for Cheung Kang, which will not affect any private land, was authorised in April 2019 to be executed as minor works under Cap. 358AL.

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

ENVIRONMENTAL IMPLICATIONS

16. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). Drainage Services Department (DSD) completed a Preliminary Environmental Review (PER) in December 2009. DSD also completed a Supplementary Preliminary Environmental Review (SPER) for the proposed modification of Tai Po Kau Sewage Pumping Station in March 2017. The two Reviews concluded and the Director of Environmental Protection agreed, with the implementation of appropriate mitigation measures as mentioned in the following paragraphs, that the proposed works would not cause long-term adverse environmental impacts. These measures include equipping the new and modified sewage pumping stations with deodourisation units and acoustic louvres/ silencers. We have included in paragraph 8(f) a sum of $5.4 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

17. For the construction phase, we will require the contractors to control noise, dust and site run-off nuisances within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact. In addition, water-spraying to the construction site will be applied regularly to minimise emission of fugitive dust, and on-site treatment of site run-off will be carried out to minimise potential water quality impact. We will also carry out regular site inspections to ensure that these recommended mitigation measures and good site practices.

18. At the planning and design stages, we have considered ways to reduce generation of construction waste where possible. In addition, we will require the contractors to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible in order to minimise disposal of inert

/construction …..

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

20. We estimate that the proposed works will generate in total about 11 500 tonnes of construction waste. Of these, we will reuse about 7 600 tonnes (66%) of the inert construction waste on site and deliver another 2 900 tonnes (25%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 000 tonnes (9%) of non-inert construction waste to landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be about $406,000 for the proposed works (based on a unit charge rate of $71 per tonne for disposal at PFRF and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

/LAND …..

[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.

LAND ACQUISITION

22. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 1 559 square metres (m^2) of private land and clear about 21 548 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 $25.7 million, to **Head 701 – Land Acquisition**. A breakdown of the land acquisition and clearance cost is at the Annex 3 to Enclosure 4.

BACKGROUND INFORMATION

23. We upgraded **125DS** to Category B in 1990.

Stage 1 phase 1 works

24. In February 1991, we upgraded part of **125DS** to Category A as **137DS** at an Approved Project Estimate (APE) of $11.9 million in MOD prices to engage consultants to carry out site investigation, surveys, impact assessment and detailed design study for **125DS** stage 1 phase 1 works.

25. In January 1993, June 1994, January 1997 and April 2001, **125DS** stage 1 phases 1A, 1B, 1C and 1D works were respectively upgraded to Category A as **163DS**, **177DS**, **284DS** and **328DS** at a total APEs of about $251.7 million in MOD prices. The above phases of construction works were completed.

Stage 1 phase 2 works

26. In July 1994, we upgraded part of **125DS** to Category A as **179DS** at an APE of $19.0 million in MOD prices to engage consultants to carry out site investigation, surveys, impact assessment and detailed design study for **125DS** stage 1 phase 2 works.

27. In May 1997, April 2001 and November 2008, **125DS** stage 1 phases 2A, 2B and 2C works respectively upgraded to Category A as **213DS**, **328DS** and **365DS** at a total APEs of about $640.4 million in MOD prices. The above phases of construction works were completed.

/**Stage** …..

Stage 2 works

28. In January 2007, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for **125DS** stage 2 works at the total estimated cost of $14.3 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".

29. In June 2013, **125DS** stage 2 phase 1 works were upgraded to Category A as **395DS** at an APE of $364.7 million in MOD prices. The construction works was completed in 2018.

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

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

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

Environment Bureau
June 2019

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

(a) tree of 100 years old or above;
(b) trees of cultural, historical or memorable significance e.g. Fung Shui 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 1.0m (measured at 1.3m above ground level), or with height/canopy spread equal or exceeding 25m.

0 CM 10 20 30

0 CM 10 20

大埔
TAI PO

將污水輸送至大埔污水處理廠
TO CONVEY SEWAGE TO TAI PO
SEWAGE TREATMENT WORKS

下黃宜坳
HA WONG
YI AU

美援新村
CARE VILLAGE

元洲仔
YUEN CHAU TSAI

吐露港
TOLO HARBOUR

TAI PO KAU

EAST RAIL LINE

LEAD MINE PASS

GRASSY HILL

COVE HILL

SHAU KEI WAN

馬尿
MA NIU

將污水輸送至沙田污水處理廠
TO CONVEY SEWAGE TO SHA TIN
SEWAGE TREATMENT WORKS

沙田
SHA TIN

沙田海
SHA TIN HOI

The Chinese University of Hong Kong

渡輪碼頭
Ferry Pier

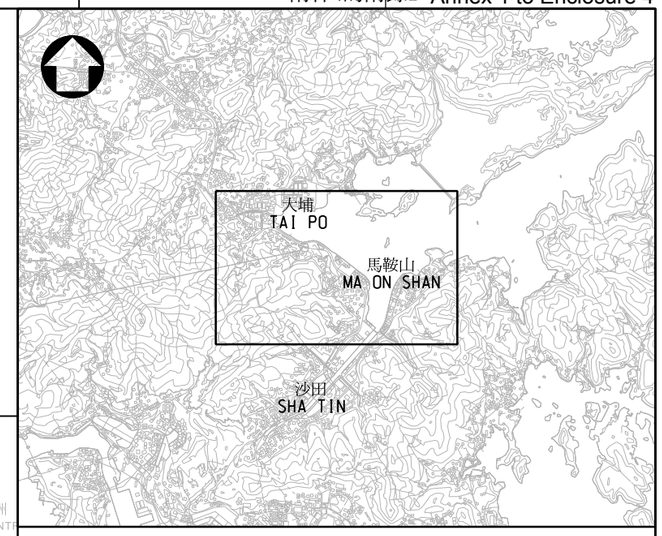
長庚
CHEUNG KANG

將污水輸送至沙田污水處理廠
TO CONVEY SEWAGE TO SHA TIN
SEWAGE TREATMENT WORKS

馬鞍山
MA ON SHAN

圖例 LEGEND:

- 擬建的鄉村污水收集系統範圍
  PROPOSED AREA FOR IMPLEMENTATION OF VILLAGE SEWERAGE WORKS
- 擬建的污水泵房
  PROPOSED SEWAGE PUMPING STATION
- 擬改建的污水泵房
  PROPOSED MODIFICATION OF SEWAGE PUMPING STATION
- 現有的污水渠
  EXISTING SEWERS
- 擬建的雙管污水泵喉
  PROPOSED TWIN RISING MAINS



位置圖 LOCATION PLAN
比例 SCALE 1 : 250 000

版 no.	日期 date	修改項目 description	簡簽 initial

圖則名稱 drawing title

工務工程計劃編號125DS - 吐露港未敷設污水設施地區的污水收集系統，第2階段
PWP ITEM NO.125DS - TOLO HARBOUR SEWERAGE OF UNSEWERED AREAS, STAGE 2

繪畫 drawn	SIGNED W. H. CHAN	日期 date 29 MAY 2019
核對 checked	SIGNED Ir W. K. CHAN	日期 date 29 MAY 2019
批核 approved	SIGNED Ir W. F. WONG	日期 date 29 MAY 2019
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

圖則編號 drawing no. DCM/2019/029
比例 scale 1 : 25 000 OR AS SHOWN

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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125DS – Tolo Harbour sewerage of unsewered areas stage 2

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

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	1.3
		Technical	-	-	-	0.5
					Sub-total	1.8#
(b)	Resident site staff costs (Note 3)	Professional	78	38	1.6	10.2
		Technical	439	14	1.6	20.2
					Sub-total	30.4
	Comprising –					
	(i) Consultants' fees for management of resident site staff				1.3#	
	(ii) Remuneration of resident site staff				29.1#	
					Total	**32.2**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 38 = $81,975 per month and MPS salary point 14 = $28,725 per month).
2. The consultants' staff cost for contract administration is calculated in accordance with the existing consultancy agreement for the design and construction of the project. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade this part of **125DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 8 of Enclosure 4.

125DS – Tolo Harbour sewerage of unsewered areas stage 2

Breakdown of land acquisition cost

			$ million
(I)	**Estimated cost for land acquisition (resumption of private land)**		22.65
(II)	**Estimated cost for land clearance**		0.70
	(a) Ex-gratia allowances (EGAs) [e.g. crop compensation, disturbance allowance for cultivators, miscellaneous permanent improvements to farms, open-air/ outdoor business undertakings, clearance of graves, urns ("Kam Taps') and shrines and "Tun Fu" ceremonial fees, etc.]	0.70	
(III)	**Interest and Contingency payment**		2.34
	Total		**25.69 (say 25.7)**

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