For discussion **PWSC(2024-25)15**
on 6 November 2024

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE
Environmental Protection – Sewerage and sewage treatment
272DS – Port Shelter sewerage, stage 2
427DS – Construction and rehabilitation of sewage rising mains in Southern District

Members are invited to recommend to the Finance Committee –

(a) the upgrading of part of **272DS** as **461DS**, entitled "Port Shelter sewerage, stage 2—trunk sewers between Marina Cove and Hong Kin Road" to Category A at an estimated cost of $163.4 million in money-of-the-day (MOD) prices; and

(b) the upgrading of **427DS** to Category A at an estimated cost of $1,057.6 million in MOD prices.

PROBLEM

To cater for the population growth and development needs of Hong Kong and to safeguard public health and protect the environment, we need to provide public sewerage systems for the unsewered areas in Port Shelter, Sai Kung for improvement in the environmental hygiene and further reduction of the amount of pollutants being discharged into the nearby stream courses. In addition, we need to construct and rehabilitate sewage rising mains in Southern District for

/improvement …..

improvement in the stability of the sewerage system and prevention of pollution caused by leakage.

PROPOSAL

2. The Director of Drainage Services proposes to upgrade the following projects to Category A –

(a) part of **272DS** at an estimated cost of $163.4 million in MOD prices for the construction of public sewerage system in Port Shelter, Sai Kung; and

(b) **427DS** at an estimated cost of $1,057.6 million in MOD prices for the construction and rehabilitation of sewage rising mains in Southern District.

The Secretary for Environment and Ecology supports the above proposals.

PROJECT SCOPE AND NATURE

3. The Government has been planning and extending the sewerage infrastructure proactively over the years to strive for continuous improvement in the public hygiene condition and water quality in rivers and marine waters. The sewerage planning strategy focuses on four aspects, including upgrading sewage treatment facilities and extending public sewerage systems to cater for population growth and development needs; providing village sewerage systems to improve the rural environment; conducting proactive and comprehensive pollution source investigations, tracing and rectifying major pollution sources in the stormwater system, so as to intercept discharge of pollutants from entering the harbour, thereby improving the water quality and odour problems of nearshore waters of Victoria Harbour; and rehabilitating ageing sewers progressively.

4. The Government has been committed to implementing the village sewerage programme, which progressively provides public sewerage facilities in village areas to improve rural environmental hygiene conditions and reduce the amount of pollutants being discharged into nearby stream courses. We need to construct public sewerage system for part of the unsewered areas in Port Shelter, Sai Kung, including the proposed item (a) in paragraph 2 above.

5. The Government has also been committed to providing stable and reliable sewage collection and treatment services to the public. At present, there

are about 1 940 kilometres (km) of underground sewers in Hong Kong, of which about 1 730 km are gravity sewers[1] and the remaining approximately 210 km are sewage rising mains[2]. We have been conducting routine inspection and maintenance on these sewers and repairing sewers with defects detected. The sewage rising mains in Southern District have been in service for many years and are ageing and deteriorating at an increasing rate. In order to reduce the risks of bursting of the rising mains, we need to carry out replacement and rehabilitation works for these rising mains, including the proposed item (b) in paragraph 2 above.

6. This paper consists of two consolidated projects covering Sai Kung and Southern District. They are estimated to serve a planned population of about 26 450.

7. Details of the above proposals are provided at **Enclosures 1 and 2** respectively.

Environment and Ecology Bureau
November 2024

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[1] Gravity sewers convey sewage to the downstream sewage collection system by gravity.

[2] Sewage rising mains convey sewage from the sewage pumping station to the downstream sewage collection system by pressure.

272DS – Port Shelter sewerage, stage 2

PROJECT SCOPE AND NATURE

We propose to upgrade part of **272DS** as **461DS** to Category A. The proposed scope of works comprises –

(a) construction of about 2.5 kilometres (km) of twin-pipe trunk sewage rising mains with diameters ranging from 300 millimetres (mm) to 450 mm along Hiram's Highway between Marina Cove and Hong Kin Road;

(b) construction of about 1.4 km of gravity trunk sewers with diameters ranging from 300 mm to 600 mm along Hiram's Highway between Marina Cove and Hong Kin Road; and

(c) ancillary works[1].

2. A layout plan of the proposed works is at **Annex 1 to Enclosure 1.**

3. We plan to commence the proposed works[2] as soon as possible upon obtaining funding approval from the Finance Committee (FC). To meet the works programme, we have invited tenders in parallel to enable early commencement of the proposed works and the returned tender prices have been reflected in the estimated cost of the proposed project. The relevant contract will only be awarded after obtaining funding approval from the FC.

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

[2] Drainage Services Department (DSD) has entrusted the construction of the proposed works to the Highways Department (HyD) for implementation in conjunction with the proposed road works to be constructed under **806TH**. Please refer to paragraph 7 below for the relevant arrangements.

4. For the remaining works of **272DS,** we will seek funding for the relevant works only after the completion of the detailed design.

JUSTIFICATION

5. Currently, the areas between the south of Sai Kung Town and Marina Cove are not covered by public sewerage system. The residents in these areas now rely on individual and simple on-site facilities such as septic tanks and soakaway (STS) systems [3] for sewage treatment and disposal. Extension of public sewerage system to these areas can help improve environmental hygiene and further reduce the amount of pollutants being discharged into the nearby stream courses.

6. The DSD proposes to construct about 6.4 km trunk sewer system along the section of Hiram's Highway between Marina Cove and Hong Kin Road, including about 2.5 km of twin-pipe trunk sewage rising mains (5 km in total) and about 1.4 km of gravity trunk sewers. The proposed trunk sewer system will serve a planned population of about 9 450 in Pak Wai, Pak Kong and Tai Chung Hau areas. This system will connect to a section of twin-pipe rising mains proposed to be constructed by other projects at Hong Kin Road by conveying their sewage to the existing Sai Kung Sewage Treatment Works for proper treatment and disposal. This will minimise the discharge of pollutants into the nearby environment and further improve the water quality of Pak Sha Wan.

7. The proposed works will be carried out within the project boundary of HyD's **806TH** which carries out widening and improvement works on the section of Hiram's Highway between Marina Cove and Hong Kin Road. In order to achieve cost synergy, as well as to avoid repeated road opening and any interfacing problems that may arise from the two contractors working on the same site, DSD has entrusted the construction of the proposed works to HyD for implementation in conjunction with the proposed road works to be constructed under **806TH**. HyD plans to first carry out the advance construction works after awarding the contract, followed by the commencement of road widening works in full swing in 2026. HyD expects to complete the first phase of road section [4] in about four years after the commencement of construction, and complete the Hiram's Highway section in

/the …..

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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 effectively due to reduced percolation ability.

[4] The first phase of road section refers to Tai Mong Tsai Road.

the following two years. The proposed works will also be completed in tandem with the HyD's section of works of Hiram's Highway.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be $163.4 million in money-of-the-day (MOD) prices, broken down as follows –

			$ million (in MOD prices)
(a)	Construction of twin-pipe trunk sewage rising mains[5]		76.9
(b)	Construction of gravity trunk sewers[6]		52.2
(c)	Ancillary works		2.7
(d)	Environmental mitigation measures		0.8
(e)	Consultants' fees for		2.9
	(i) contract administration[7]	1.6	
	(ii) management of resident site staff (RSS)	1.3	
(f)	Remuneration of RSS		13.1

/**$ million** …..

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[5] It includes the construction of about 2.5 km long twin-pipe trunk sewage rising mains with diameters ranging from 300 mm to 450 mm. The unit cost of the proposed twin-pipe trunk sewage rising mains is about $25,700 per metre (m) (in September 2024 prices). This is on par with the range of $22,000 (**431DS** Port Shelter sewerage, stage 2, package 3) to $61,100 (**432DS** Port Shelter sewerage, stage 3, package 2) per m (in September 2024 prices) for construction of twin-pipe trunk sewage rising mains with similar diameter using the same types of construction methods over the past few years.

[6] It includes the construction of about 1.4 km long gravity trunk sewers with diameters ranging from 300 mm to 600 mm. The unit cost of the proposed gravity trunk sewers is about $30,500 per m (in September 2024 prices). This is on par with the range of about $27,200 (**431DS** Port Shelter sewerage, stage 2, package 3) to $43,300 (**389DS** Upgrading of West Kowloon and Tsuen Wan sewerage – phase 2) per m (in September 2024 prices) for construction of the similar gravity trunk sewers with similar diameter using the same types of construction methods over the past few years.

[7] It includes management of works progress, quality and works expenditures, etc.

		$ million (in MOD prices)
(g)	Contingencies	14.8
	Total	163.4

9. As mentioned in paragraph 7 above, DSD has entrusted the proposed works to HyD for implementation in conjunction with **806TH**. DSD proposes engaging HyD's consultants to undertake contract administration and site supervision for the project. A detailed breakdown of the estimates for the consultants' fees and RSS costs by man-months is at **Annex 2 to Enclosure 1**.

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

Year	**$ million (in MOD prices)**
2024 – 25	0.8
2025 – 26	5.0
2026 – 27	23.8
2027 – 28	24.9
2028 – 29	22.3
2029 – 30	21.3
2030 – 31	20.8
2031 – 32	18.1
2032 – 33	12.3
2033 – 34	8.2
2034 – 35	3.4

/**Year** …..

Year	$ million (in MOD prices)
2035 – 36	2.5
	163.4

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 2024 to 2036. HyD will deliver the proposed works under New Engineering Contract (NEC)[8] form with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be about $1.78 million. The additional recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

13. In the design phase of the project, we have considered different construction methods and different alignment for the construction of the twin-pipe trunk sewage rising mains and gravity trunk sewers. In order to optimise the design, we adopted cost effective alignment and depth for construction of trunk sewage rising mains and gravity trunk sewers with consideration on the adjacent topographical profile.

PUBLIC CONSULTATION

14. We consulted the Housing and Environmental Hygiene Committee of Sai Kung District Council (SKDC) in January 2017 and updated the progress of the proposed works in November 2018. Members of the Committee expressed support for the proposed works. We subsequently submitted a document on the latest progress of the proposed works to the SKDC in January 2023.

15. We consulted the Legislative Council Panel on Environmental Affairs (the Panel) on 27 March 2023 and Members expressed support for the proposed works. In response to the queries from Members, we

/provided …..

[8] 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.

provided supplementary information to the Panel on 19 April 2023.

ENVIRONMENTAL IMPLICATIONS

16. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). DSD completed the Environmental Study (ES). The ES concluded and the Director of Environmental Protection agreed that the proposed works would not cause long-term adverse environmental impacts. We have included a sum of $800,000 (in MOD prices) in the project estimate as mentioned in paragraph 8(d) above for implementation of the appropriate environmental mitigation measures to control short-term environmental impacts brought by the works.

17. At the construction stage, we will require the contractors to control the environmental impacts caused by the proposed works to ensure compliance with established standards and guidelines through the implementation of the recommended mitigation measures in the ES. These measures include the use of quality powered mechanical equipment and temporary noise barriers to reduce noise impact, proper arrangement of works sequence to avoid conducting noisy works simultaneously, regular water-spraying to the construction sites 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 that these mitigation measures and good practices will be properly implemented on site.

18. 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[9]). 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. At the construction stage, we will require the contractors to submit for approval by the Government a plan setting out the waste management measures. The plan will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day

/operations …..

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

operations on site comply with the approved plan. We will also require the contractors to separate the inert and non-inert construction waste on site, then deliver to appropriate facilities for disposal. We will monitor 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 251 tonnes of construction waste. Of these, we will reuse about 176 tonnes (about 70%) of inert construction waste on site and deliver about 50 tonnes (about 20%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining about 25 tonnes (about 10%) of non-inert construction waste at landfills. The total cost for delivery and disposal of construction waste at PFRF and landfills is estimated to be about $9,000 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 project will not affect any heritage sites, i.e. all declared monuments, proposed monuments, graded historic sites/buildings/structures, sites of archaeological interest, all sites/buildings/structures on the new list of proposed grading items; and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

22. The proposed works will be implemented within the project boundary of **806TH**. Hence, no land resumption is required under **272DS**.

BACKGROUND INFORMATION

23. In June 2012, we upgraded part of **272DS** and part of **273DS**[10] to Category A as **382DS**[11] at an Approved Project Estimate (APE) of $290.6 million in MOD prices. In January 2013, FC approved the increase in APE of **382DS** by $68.4 million to $359.0 million in MOD prices. The construction works /were …..

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[10] **273DS** – Port Shelter sewerage, stage 3

[11] **382DS** – Sewerage at Clear Water Bay Road, Pik Shui Sun Tsuen and west of Sai Kung town

were completed in May 2018.

24. In July 2015, we upgraded part of **272DS** to Category A as **410DS**[12] at an APE of $68.9 million in MOD prices. The construction works were completed in December 2020.

25. In February 2020, we upgraded part of **272DS** to Category A as **431DS**[13] at an APE of $515.9 million in MOD prices. The construction works commenced in July 2020 and is targeted for completion in 2025.

26. We have completed the detailed design of the proposed works as mentioned in paragraph 1 above, and are working on the design of the remaining works under **272DS**.

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

28. We estimate that the proposed works will create about 20 jobs (15 labourers and five professional or technical staff), providing a total employment of 1 300 man-months.

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[12] **410DS** – Trunk sewers at Hiram's Highway

[13] **431DS** – Port Shelter sewerage, stage 2, package 3

北港
PAK KONG

西貢
SAI KUNG

西貢公路
HIRAM'S HIGHWAY

康樂路
HONG KIN ROAD

連接擬建的雙管污水泵喉
(由其他工程計劃建造)
TO BE CONNECTED TO THE
PROPOSED TWIN-PIPE TRUNK
SEWAGE RISING MAINS
(TO BE CONSTRUCTED
BY OTHER PROJECT)

西貢污水處理廠
SAI KUNG
SEWAGE TREATMENT WORKS

826 000 N

崑徑篤路
CHE KENG TUK ROAD

打蠔墩上圍
TA HO TUN
SHEUNG WAI

打蠔墩下圍
TA HO TUN
HA WAI

大涌口
TAI CHUNG HAU

擬建的污水泵房
(由其他工程計劃建造)
PROPOSED SEWAGE
PUMPING STATION
(TO BE CONSTRUCTED
BY OTHER PROJECT)

滘西新村
KAU SAI
SAN TSUEN

白沙灣
PAK SHA WAN

825 000 N

擬建的污水泵房
(由其他工程計劃建造)
PROPOSED SEWAGE
PUMPING STATION
(TO BE CONSTRUCTED
BY OTHER PROJECT)

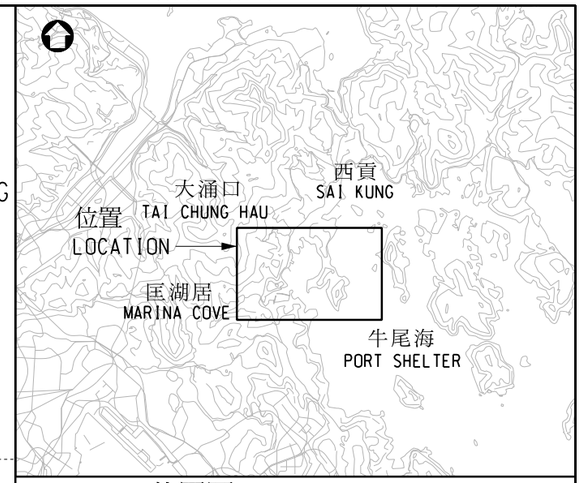
北圍
PAK WAI

匡湖居
MARINA COVE

牛尾海
PORT SHELTER

844 000 E
845 000 E
846 000 E
847 000 E

RM 300
RM 2x450
RM 450
RM 600
RM 450
RM 2x300



位置圖 LOCATION PLAN
比例 SCALE 1 : 200 000

圖例 LEGEND :

擬建的無壓污水幹渠
(直徑300/450/600毫米)
PROPOSED GRAVITY TRUNK
SEWER (DN300/450/600)

擬建的雙管污水主幹泵喉
(直徑300/450毫米)
PROPOSED TWIN-PIPE TRUNK
SEWAGE RISING MAINS
(DN300/450)

工務計劃項目第272DS號(部分) - 牛尾海污水收集系統第2階段工程
PWP ITEM NO. 272DS (PART) - PORT SHELTER SEWERAGE, STAGE 2

渠務署
DRAINAGE SERVICES DEPARTMENT

圖則編號 Drawing no. DSM/2024/017

Annex 2 to Enclosure 1

272DS (Part) – Port Shelter sewerage, stage 2

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2024 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	0.5
		Technical	-	-	-	0.8
					Sub-total	1.3#
(b)	Resident site staff (RSS) costs(Note 3)	Professional	38	38	1.6	5.7
		Technical	114	14	1.6	6.1
					Sub-total	11.8
	Comprising –					
	(i) Consultants' fees for management of RSS				1.1#	
	(ii) Remuneration of RSS				10.7#	
					Total	**13.1**

* 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 = $93,255 per month and MPS salary point 14 = $33,405 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 **272DS**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **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 cost 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**.

427DS – Construction and rehabilitation of sewage rising mains in Southern District

PROJECT SCOPE AND NATURE

We propose to upgrade **427DS** to Category A. The proposed scope of works comprises –

(a) construction of about 1.3 kilometres (km) of twin-pipe sewage rising mains with a diameter of 150 millimetres (mm) connecting Deep Water Bay Golf Club Sewage Pumping Station (SPS) to the sewerage system at Seaview Promenade;

(b) construction of about 0.4 km of single-pipe sewage rising mains with a diameter of 100 mm connecting the Deep Water Bay No. 3 Sewage Pumping Chamber to Deep Water Bay SPS;

(c) construction of about 2.9 km of twin-pipe sewage rising mains with a diameter of 450 mm connecting Repulse Bay Main SPS to the sewerage system at Ap Lei Chau Bridge Road;

(d) construction of a boardwalk of about 450 metres (m) in length and about 3 m in width along the northern bank of Staunton Creek Nullah in Wong Chuk Hang; and

(e) ancillary works[1].

2. A layout plan of the proposed works is at **Annex 1 to Enclosure 2**.

/3. …..

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[1] Ancillary works include utilities diversion, repair and provision of manholes, abandonment or removal of part of existing sewage rising mains, slope works, modification of SPS, temporary closure and reinstatement of carriageways/footpaths/open space and landscaping works that are required for completion of the proposed works.

3. We plan to commence the proposed works as soon as possible upon obtaining funding approval from the Finance Committee (FC) for target completion in stages in around five years, of which the proposed boardwalk works is expected to be completed in around three years. To meet the works programme, we have invited tenders in parallel to enable early commencement of the proposed works and the returned tender prices have been reflected in the estimated cost of the proposed project. The relevant contract will only be awarded after obtaining funding approval from the FC.

JUSTIFICATION

4. To provide a stable and reliable sewerage system, we have adopted a "risk-based" strategy to formulate a territory-wide replacement and rehabilitation programme for the sewers. We also conducted the "Enhanced Management of Underground Sewer and Drain Networks – Feasibility Study" (the Study) in 2015 to evaluate the risks of failure of the existing underground sewers according to factors such as service years, structural condition, likelihood and consequence of collapse, etc. Based on the Study, we have been conducting rehabilitation works for the high-risk gravity sewers and sewage rising mains in phases, and at the same time upgrading the sewage rising mains from the current single-pipe design to twin-pipe system to improve the reliability of the system and to prevent pollution caused by leakage of ageing pipeline. Since the commissioning of the Study, we have completed the replacement and rehabilitation works for about 160 km of gravity sewers and about 9 km of sewage rising mains. Currently, about 140 km of gravity sewers and 40 km of sewage rising mains are under replacement and rehabilitation. We will continue to inspect and monitor the underground sewers for timely planning and implementation of the replacement and rehabilitation works.

5. According to the evaluation results of the Study, the existing sewage rising mains in Southern District connecting the SPS at Island Road to the sewerage system at Ap Lei Chau Bridge Road should be upgraded to twin-pipe system (detailed in paragraph 1 (a) to (c) above), in order to reduce the risks of bursting of the rising mains, improve the stability of the overall sewerage system and reduce the difficulties of maintenance in the future. This sewage rising mains system serves a planned population of about 17 000 of Southern District. As it has been in service for more than 27 years and beyond its design life, it is suffering from ageing and deterioration at an increasing rate. If the sewage rising mains system is damaged or encounters operational failure, the water quality of the beaches along Deep Water Bay, Repulse Bay and South Bay will be adversely affected.

/6. …..

6. We now propose to construct a sewage rising mains system of about 8.8 km long, including 4.2 km of twin-pipe sewage rising mains (8.4 km in total) and 0.4 km of single-pipe sewage rising mains. Trenchless technologies will be employed on the road sections as needed to reduce inconvenience to the public. When the works are completed, the operational efficiency and reliability of the relevant sewage rising mains system will be enhanced significantly.

7. In addition, we propose to construct a boardwalk of about 450 m in length and about 3 m in width along the northern bank in the downstream section of Staunton Creek Nullah in Wong Chuk Hang to facilitate the commuting of residents in the northern bank and enhance the pedestrian connectivity of the nullah area.

FINANCIAL IMPLICATIONS

8. We estimate the cost of the proposed works to be $1,057.6 million in money-of-the-day (MOD) prices, broken down as follows –

		$ million (in MOD prices)
(a)	Construction of sewage rising mains[2]	754.6
(b)	Construction of boardwalk	79.3
(c)	Ancillary works	6.6
(d)	Environmental mitigation measures	8.9
(e)	Consultants' fees for	6.4

/**$ million** …..

[2] It includes the construction of about 8.8 km long of sewage rising mains with diameters ranging from 100 mm to 450 mm which comprise two sections of submarine sewage rising mains of about 3 km long in total. The unit cost of the proposed submarine sewage rising mains is about $188,800 per m (in September 2024 prices). This is lower than the range of about $242,800 (**433DS** Construction of San Shek Wan Sewage Treatment Works and Pui O village sewerage) to $246,400 (**392DS** Expansion of Sha Tau Kok Sewage Treatment Works – phase 1) per m (in September 2024 prices) for construction of pipelines with similar diameter using the same types of construction methods over the past few years due to the relatively lower costs for constructing these pipelines in urban area as compared to remote areas. The unit cost of the remaining proposed twin-pipe sewage rising mains is about $28,600 per m (in September 2024 prices). This is on par with the range of $22,000 (**431DS** Port Shelter sewerage, stage 2, package 3) to $61,100 (**432DS** Port Shelter sewerage, stage 3, package 2) per m (in September 2024 prices) for construction of twin-pipe sewage rising mains with similar diameter using the same types of construction methods over the past few years.

			$ million (in MOD prices)
	(i)	contract administration[3]	4.5
	(ii)	management of resident site staff (RSS)	1.9
(f)	Remuneration of RSS		105.7
(g)	Contingencies		96.1
		Total	1,057.6

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

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

Year	**$ million (in MOD prices)**
2024 – 25	15.0
2025 – 26	80.0
2026 – 27	100.0
2027 – 28	174.0
2028 – 29	296.0
2029 – 30	287.0
2030 – 31	45.0
2031 – 32	31.0

/**Year** …..

[3] It includes management of works progress, quality and works expenditures, etc.

Year	$ million (in MOD prices)
2032 – 33	29.6
	1,057.6

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 2024 to 2033. We will deliver the proposed works under New Engineering Contract (NEC)[4] form with provision for price adjustment.

12. We estimate the additional annual recurrent expenditure arising from this project to be about $4.32 million. The relevant additional recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

13. In the investigation and design phases of the project, we have considered different alignments for the construction of the new sewage rising mains. In order to optimise the design, we adopted cost effective methods for the construction of sewage rising mains with considerations on actual site conditions and traffic constraints.

PUBLIC CONSULTATION

14. We consulted the Economy, Development and Planning Committee of Southern District Council for the proposed sewerage works and the proposed boardwalk works in September 2021 and May 2022 respectively. Members of the Committee expressed support for the proposed works.

15. We gazetted the proposed sewerage works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) in December 2021 and no objection was received within the statutory period. The relevant authorisation notice of the project was gazetted on 14 and 22 April 2022 respectively.

/16. …..

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

16. We gazetted the works of the proposed boardwalk under the Roads (Works, Use and Compensation) Ordinance (Cap. 370) in October 2022. An objection was received during the statutory objection period. The objector was mainly concerned about the alignment of the proposed boardwalk and the impacts on environment due to the proposed works. We subsequently submitted the objection to the Chief Executive in Council (CE-in-C) for consideration. The CE-in-C authorised the proposed boardwalk works on 30 May 2023 without modification. The relevant authorisation notice of the project was gazetted on 16 and 23 June 2023 respectively.

17. We consulted the Legislative Council Panel on Environmental Affairs (the Panel) on 27 March 2023 and Members expressed support for the proposed works. In response to the queries from Members, we provided supplementary information to the Panel on 19 April 2023.

ENVIRONMENTAL IMPLICATIONS

18. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department has completed a Preliminary Environmental Review (PER). The PER concluded and the Director of Environmental Protection agreed that the proposed works would not cause long-term adverse environmental impacts. We have included a sum of $8.9 million (in MOD prices) in the project estimate as mentioned in paragraph 8(d) above for implementation of the appropriate environmental mitigation measures to control short-term environmental impacts brought by the works.

19. At the construction stage, we will require the contractors to control the environmental impacts caused by the proposed works to ensure compliance with established standards and guidelines through the implementation of the recommended mitigation measures in the PER. These measures include the use of quality powered mechanical equipment and temporary noise barriers to reduce noise impact, proper arrangement of works sequence to avoid conducting noisy works simultaneously, regular water-spraying to the construction sites 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 that these mitigation measures and good practices will be properly implemented on site.

/20. …..

20. 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[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.

21. At the construction stage, we will require the contractors to submit for approval by the Government a plan setting out the waste management measures. The plan 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 also require the contractors to separate the inert and non-inert construction waste on site, then deliver to appropriate facilities for disposal. We will monitor the disposal of inert and non-inert construction waste at PFRF and landfills respectively through a trip-ticket system.

22. We estimate that the proposed works will generate in total about 20 500 tonnes of construction waste. Of these, we will reuse about 11 100 tonnes (about 54%) of inert construction waste on site and deliver about 9 100 tonnes (about 44%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining about 300 tonnes (about 2%) of non-inert construction waste at landfills. The total cost for delivery and disposal of construction waste at PFRF and landfills is estimated to be about $710,000 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

23. The proposed works project will not affect any heritage sites, i.e. all declared monuments, proposed monuments, graded historic sites/buildings/structures, sites of archaeological interest, all sites/buildings/structures on the new list of proposed grading items; 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 at PFRF requires a licence issued by the Director of Civil Engineering and Development.

LAND ACQUISITION

24. The proposed works do not require resumption of land.

BACKGROUND INFORMARTION

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

26. There are 194 trees within the proposed works boundary, of which 167 will be retained. The proposed works project will involve removal of 16 trees within the project site, including seven trees that are confirmed to be undesirable species among the invasive species to which compensatory planting will not be carried out[6]. All trees to be removed are not trees of particular interest[7]. Compensatory planting of nine trees and transplantation of 11 trees will be carried out as part of the project. The proposal for tree removal, compensation, and transplantation has been approved by the relevant departments.

/27. …..

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[6] Pursuant to Development Bureau Technical Circular (Works) No. 4/2020, no compensation planting is required for trees of undesirable species.

[7] Trees of particular interest are defined in paragraph 3.3 of the "Guidelines for Tree Risk Assessment and Management Arrangement" promulgated by the Development Bureau. Examples of trees of particular interest are listed as below for reference:

(a) Old and Valuable Trees (OVTs) and trees that are potentially registerable in the Register of OVTs;
(b) Trees of 100 years old or above;
(c) Trees with trunk diameter equal to or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal to or exceeding 25 m;
(d) Stonewall trees or trees of outstanding form (taking account of overall tree sizes, shape and any special features);
(e) Rare tree species listed in "Rare and Precious Plants of Hong Kong" (https://www.herbarium.gov.hk/tc/publications/books/book2/index.html) published by Agriculture, Fisheries and Conservation Department;
(f) Endangered plant species protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap 586);
(g) Tree species listed in the Forestry Regulations (Cap. 96A) under the Forests and Countryside Ordinance (Cap. 96);
(h) Well-known Fung Shui trees;
(i) Landmark trees with evidential records to support the historical or cultural significance of the trees;
(j) Trees which may arouse widespread public concerns; and
(k) Trees which may be subject to strong local objections on removal.

27. We estimate that the proposed works will create about 150 jobs (120 labourers and 30 professional or technical staff), providing a total employment of 8 300 man-months.

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0 CM 10 20 30

813 000 N

812 000 N

811 000 N

835 000 E

836 000 E

837 000 E

838 000 E

黃竹坑
WONG CHUK HANG

連接現有鴨脷洲橋道污水渠
TO BE CONNECTED TO EXISTING SEWER AT AP LEI CHAU BRIDGE ROAD

香葉道
HEUNG YIP ROAD

海洋公園道
OCEAN PARK ROAD

黃竹坑站
WONG CHUK HANG STATION

黃竹坑道
WONG CHUK HANG ROAD

圖示VIEW 1

高爾夫球會污水泵房
GOLF CLUB SEWAGE PUMPING STATION

香島道
ISLAND ROAD

深水灣3號污水中途泵房
DEEP WATER BAY NO.3 SEWAGE PUMPING CHAMBER

深水灣
DEEP WATER BAY

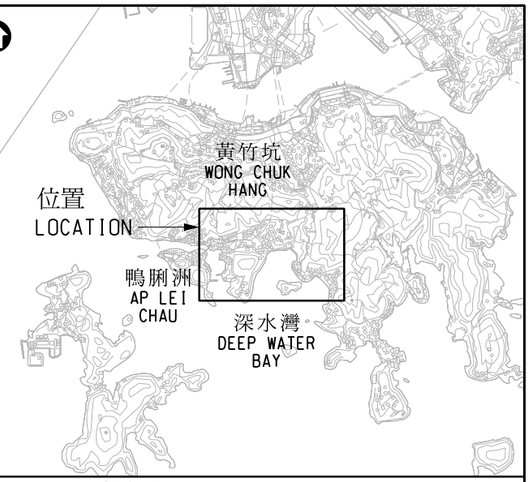
深水灣污水泵房
DEEP WATER BAY SEWAGE PUMPING STATION

觀海堤岸路
SEAVIEW PROMENADE

淺水灣總污水泵房
REPULSE BAY MAIN SEWAGE PUMPING STATION

淺水灣
REPULSE BAY

RM 2x450 RM 2x150 RM 100

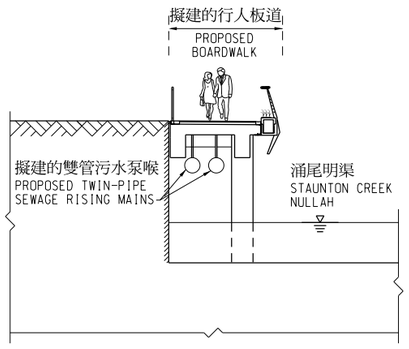


位置圖 LOCATION PLAN
比例 SCALE 1 : 200 000

圖例 LEGEND :

- 現有雙管污水泵喉 EXISTING TWIN-PIPE SEWAGE RISING MAINS
- 擬建的雙管污水泵喉（直徑150/450毫米） PROPOSED TWIN-PIPE SEWAGE RISING MAINS (DN150/450)
- 擬建的單管污水泵喉（直徑100毫米） PROPOSED SINGLE-PIPE SEWAGE RISING MAINS (DN100)
- 擬建的行人板道及擬建的雙管污水泵喉（直徑450毫米） PROPOSED BOARDWALK AND PROPOSED TWIN-PIPE SEWAGE RISING MAINS (DN450)
- 現有無壓污水渠 EXISTING GRAVITY SEWER

圖示 VIEW 1
（構思圖 ARTIST'S IMPRESSION）



典型橫切面A-A TYPICAL SECTION A-A
比例 SCALE 1 : 200

工務計劃項目第427DS號 - 南區污水泵喉建造及修復工程

PWP ITEM NO. 427DS - CONSTRUCTION AND REHABILITATION OF SEWAGE RISING MAINS IN SOUTHERN DISTRICT

渠務署
DRAINAGE SERVICES DEPARTMENT

圖則編號 Drawing no. DCM/2024/002

Annex 2 to Enclosure 2

427DS – Construction and rehabilitation of sewage rising mains in Southern District

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2024 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration (Note 2)	Professional	-	-	-	2.8
		Technical	-	-	-	1.0
					Sub-total	3.8#
(b)	Resident site staff (RSS) costs (Note 3)	Professional	296	38	1.6	44.2
		Technical	888	14	1.6	47.5
					Sub-total	91.7
	Comprising –					
	(i) Consultants' fees for management of RSS				1.6#	
	(ii) Remuneration of RSS				90.1#	
					Total	**95.5**

* 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 = $93,255 per month and MPS salary point 14 = $33,405 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 **427DS**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **427DS** to Category A.

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

Remarks

The cost 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**.