

For discussion
on 12 May 2021

PWSC(2021-22)19

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment

409DS – North East New Territories sewerage system upgrade

355DS – Outlying Islands sewerage stage 2 – Lamma village sewerage phase 2, package 2

353DS – Outlying Islands sewerage, stage 2 – extension of sewerage system to other unsewered villages in Mui Wo

Members are invited to recommend to the Finance Committee –

- (a) the upgrading of **409DS** to Category A at an estimated cost of \$825.8 million in money-of-the-day (MOD) prices;
- (b) the upgrading of **355DS** to Category A at an estimated cost of \$502.9 million in MOD prices; and
- (c) the upgrading of **353DS** to Category A at an estimated cost of \$135.7 million in MOD prices.

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 sewerage system in North District, and provide more village sewerage systems on Lamma Island and in Lantau.

/PROPOSAL

PROPOSAL

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

- (a) **409DS** at an estimated cost of \$825.8 million in MOD prices for the upgrading of sewerage system in North East New Territories;
- (b) **355DS** at an estimated cost of \$502.9 million in MOD prices for the provision of village sewerage in part of Lamma Island; and
- (c) **353DS** at an estimated cost of \$135.7 million in MOD prices for the provision of village sewerage in part of Mui Wo, Lantau.

PROJECT SCOPE AND NATURE

4. 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, harbours and open waters. In recent years, the sewerage planning strategy focuses on four aspects, namely 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; installing dry weather flow interceptors to improve the water quality of nearshore waters of Victoria Harbour; and rehabilitating aging sewers progressively.

5. The construction of village sewerage systems started in the 1990s. The current village sewerage programme covers about 550 villages, of which the sewerage systems for 258 villages have been completed and that of 59 are under construction. Based on the above-mentioned sewerage planning strategy, we now propose to upgrade the sewerage system in the North East New Territories and increase its capacity to cope with the progressive implementation of the village sewerage programme and development of other planned public facilities in the areas. Furthermore, we also propose to provide village sewerage systems on Lamma Island and in Mui Wo, Lantau. For those remaining projects under the programme, in addition to the three proposed items in this paper, we will continue to seek funding for their implementation in the coming years, subject to the progress of the programme and availability of resources.

6. Apart from the above-mentioned plans, we are planning sewerage facilities to support various regional and housing developments and conducting feasibility studies for pollutant interception projects to improve the quality of nearshore waters of Victoria Harbour. We will submit further recommendations on these projects at appropriate time for the Legislative Council's consideration.

7. This paper consists of three sewerage upgrading and provision projects in North District, Lamma Island and Lantau, which will serve an ultimate population of about 30 000.

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

Environment Bureau
May 2021

409DS – North East New Territories sewerage system upgrade

PROJECT SCOPE AND NATURE

The proposed scope of works under **409DS** comprises –

- (a) the construction of two sewage pumping stations (SPSs) with design capacities of about 16 000 and 6 000 cubic metres per day at Sha Ling and Tong Fong respectively;
- (b) the upgrading of seven existing SPSs;
- (c) the construction of about 8.9 kilometres (km) of twin rising mains with diameters ranging from 200 millimetres (mm) to 450 mm and about 5.5 km of single rising main with diameter of 250 mm;
- (d) the construction of about 1.1 km of gravity sewers with diameter of 800 mm;
- (e) the demolition of the existing Sha Ling and Tong Fong SPS; and
- (f) ancillary works¹.

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

3. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for target completion of the works in around six years.

/JUSTIFICATION

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, and local improvement works for the community.

JUSTIFICATION

4. The current sewage flow in the North East New Territories sewerage system is about to reach to its design capacity. To cope with the progressive implementation of village sewerage programme and development of other planned public facilities, it is necessary to upgrade the sewerage system in Ping Che, Ta Kwu Ling, Man Kam To and Sha Ling to increase its handling capacity.

5. The proposed works include the reconstruction of two SPSs at Sha Ling and Tong Fong; upgrading of seven SPSs at Pak Hok Shan, Ng Chow South Road, Ping Yeung, Kat Tin, Lin Ma Hang Road and North East New Territories Landfill; and construction of a total of about 15.5 km of sewers along Ping Che Road, Lin Ma Hang Road, Man Kam To Road and Fu Tei Au Road to convey the sewage in this region to the Shek Wu Hui Effluent Polishing Plant, which is undergoing upgrade, for treatment and polishing. The proposed sewerage system will serve an estimated ultimate population of about 23 000.

FINANCIAL IMPLICATIONS

6. We estimate the cost of the proposed works to be \$825.8 million in money-of-the-day (MOD) prices (please see paragraph 8 below), broken down as follows –

	\$ million (in MOD prices)
(a) Reconstruction and demolition of Sha Ling SPS	111.6
(i) civil works	43.7
(ii) electrical and mechanical (E&M) works	67.9
(b) Reconstruction and demolition of Tong Fong SPS	62.3
(i) civil works	29.3
(ii) E&M works	33.0
(c) Upgrading works at existing SPSs	110.5
(d) Construction of rising mains	307.8
(e) Construction of gravity sewers	21.4

/(f)

		\$ million (in MOD prices)
(f)	Ancillary works	16.8
(g)	Environmental mitigation measures	13.5
(h)	Consultants' fees for	10.7
	(i) contract administration	8.3
	(ii) management of resident site staff (RSS)	2.4
(i)	Remuneration of RSS	96.1
(j)	Contingencies	75.1
Total		<u>825.8</u>

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

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

Year	\$ million (in MOD prices)
2021 – 22	5.5
2022 – 23	74.8
2023 – 24	134.8
2024 – 25	176.3
2025 – 26	131.0
2026 – 27	130.6
2027 – 28	100.0

/Year

Year	\$ million (in MOD prices)
2028 – 29	50.4
2029 – 30	22.4
	<hr style="width: 50%; margin: auto;"/> 825.8 <hr style="width: 50%; margin: auto;"/>

9. 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 2021 to 2030. We will deliver the proposed works under a New Engineering Contract (NEC²) form of contract with provision for price adjustment.

10. We estimate the additional annual recurrent expenditure arising from the proposed project to be \$13.61 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

11. We have consulted the District Minor Works and Environmental Improvement Committee of the North District Council and Ta Kwu Ling District Rural Committee on 21 May 2018 and 5 February 2021 respectively, and they both supported the proposed works.

12. We consulted the Legislative Council Panel on Environmental Affairs on 22 March 2021 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

13. The proposed reconstruction of Sha Ling and Tong Fong SPS and the proposed upgrading works at Kat Tin SPS are designated projects under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) requiring an Environmental Permit (EP) for their construction and operation. Having regard to the Project Profile (PP), the Director of Environmental Protection (DEP) is satisfied that with the implementation of the recommended mitigation measures, the proposed works would not cause adverse environmental impact. An EP for /the

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

the construction and operation of the proposed works was issued on 5 February 2021. The Drainage Services Department (DSD) will implement the mitigation measures set out in the PP and comply with the conditions of the EP.

14. Other than the above mentioned in paragraph 13, the remaining part of the proposed works is not a designated project under the EIAO (Cap. 499). DSD completed a Preliminary Environmental Review (PER) for the remaining part of the proposed works. The PER concluded that and DEP agreed that with the implementation of appropriate mitigation measures, the proposed works would not cause long-term adverse environmental impact. We have included in paragraph 6(g) above a sum of \$13.5 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures to control the short-term environmental impacts during construction.

15. At the construction phase, we will require the contractors to control noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact, regular water-spraying to 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 that these recommended mitigation measures and good practices will be properly implemented on site.

16. For the operation phase, we will implement the measures recommended in the relevant PER, PP and as stipulated in the relevant EP. For the operation of the Sha Ling and Tong Fong SPS, the key measures will include placing most of the equipment in underground enclosed structures, provision of deodourisation units, standby units with dual power supply as well as landscaping works and vertical greening to the structures to minimise potential noise, odour, water quality and visual impacts to nearby sensitive receivers.

17. At the planning and design stages, we have considered ways to reduce the generation of construction waste (e.g. to design the alignment of the sewers in such a manner that excavation and modification of the existing structures will be minimised) 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

construction waste at the public fill reception facilities (PFRF³). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

18. We will also require the contractors to submit for approval a plan setting out the waste management measures during the construction stage, 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 128 000 tonnes of construction waste. Of these, we will reuse about 64 300 tonnes (50%) of inert construction waste on site, and deliver about 57 700 tonnes (45%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 6 000 tonnes (5%) 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 about \$5.3 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

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

LAND ACQUISITION

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

/BACKGROUND

³ 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.

BACKGROUND INFORMATION

22. We upgraded **409DS** to Category B in September 2014.

23. In August 2015, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for the proposed works under **409DS**. The total estimated cost is \$28.8 million in MOD prices. We have charged this amount to block allocation **Subhead 4100DX** “Drainage works, studies and investigations for items in Category D of the Public Works Programme”. We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.

24. The proposed works will involve the felling of 29 trees. All the trees to be removed are not important trees⁴. We will incorporate a planting proposal as part of the project, including an estimated total of 29 trees.

25. We estimate that the proposed works will create about 80 jobs (60 for labourers and 20 for professional or technical staff), providing a total employment of 4 800 man-months.

⁴ “Important trees” refers 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 or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with a trunk diameter equal to or exceeding 1.0 m (measured at 1.3 m above ground level), or with a height or canopy spread equal to or exceeding 25 m.

圖例
LEGEND :

- 現有污水泵喉及無壓污水渠
EXISTING RISING MAINS AND GRAVITY SEWERS
- 擬建的雙管污水泵喉及無壓污水渠
PROPOSED TWIN RISING MAINS AND GRAVITY SEWERS
- 擬建的單管污水泵喉
PROPOSED SINGLE RISING MAIN

重建現有污水泵房
EXISTING SEWAGE PUMPING STATION TO BE RECONSTRUCTED

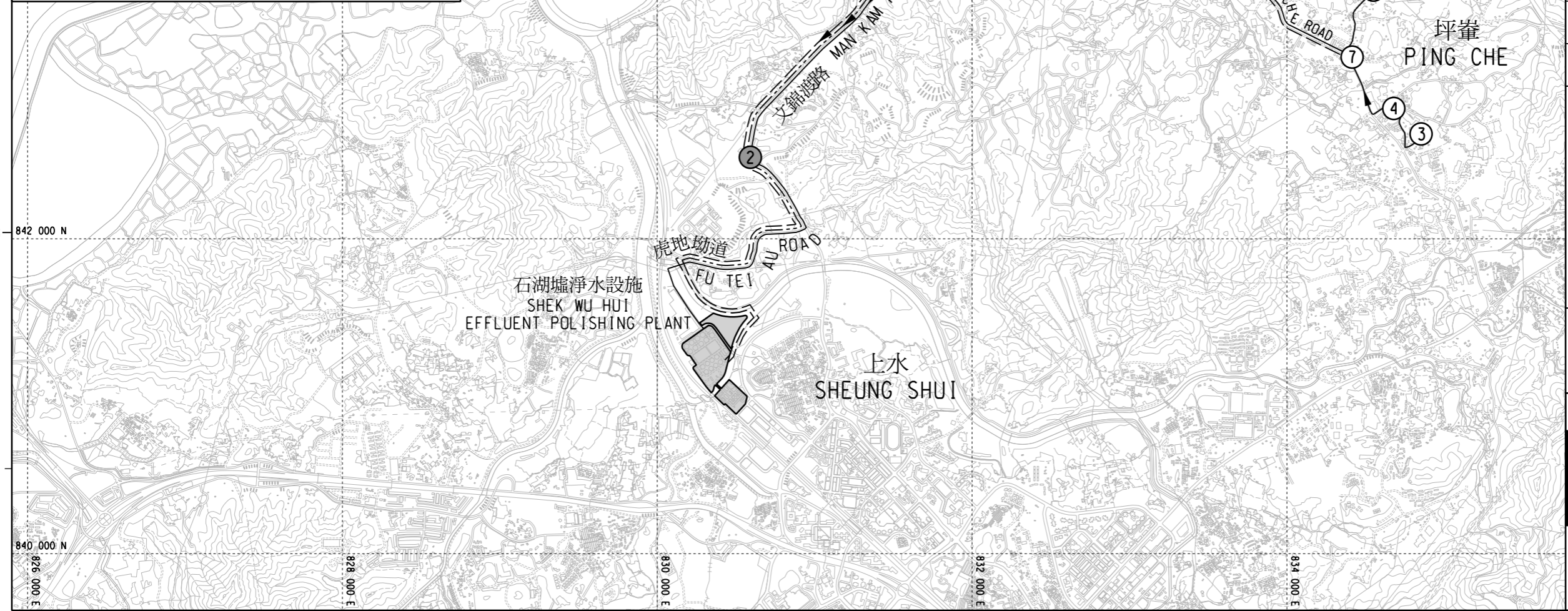
- ① 塘坊污水泵房
TONG FONG SEWAGE PUMPING STATION
- ② 沙嶺污水泵房
SHA LING SEWAGE PUMPING STATION

提升現有污水泵房
EXISTING SEWAGE PUMPING STATION TO BE UPGRADED

- ③ 白鶴山污水泵房
PAK HOK SHAN SEWAGE PUMPING STATION
- ④ 五洲南路污水泵房
NG CHOW SOUTH ROAD SEWAGE PUMPING STATION
- ⑤ 坪洋二號污水泵房
PING YEUNG NO. 2 SEWAGE PUMPING STATION
- ⑥ 坪洋三號污水泵房
PING YEUNG NO. 3 SEWAGE PUMPING STATION
- ⑦ 隔田污水泵房
KAT TIN SEWAGE PUMPING STATION
- ⑧ 蓮麻坑路污水泵房
LIN MA HANG ROAD SEWAGE PUMPING STATION
- ⑨ 新界東北堆填區污水泵房
NORTH EAST NEW TERRITORIES LANDFILL SEWAGE PUMPING STATION



位置圖 LOCATION PLAN
比例 SCALE 1 : 500 000



版 no.	日期 date	修改項目 description	簡簽 initial
修訂 REVISION			
		姓名 name	日期 date
繪畫 drawn		SIGNED L. L. LIU	13 APR 2021
核對 checked		SIGNED C. M. MAK	13 APR 2021
批核 approved		SIGNED P. Y. CHENG	13 APR 2021

圖則名稱 drawing title

工務工程計劃編號409DS
- 提升新界東北污水收集系統
PWP ITEM NO. 409DS
- NORTH EAST NEW TERRITORIES SEWERAGE SYSTEM UPGRADE

圖則編號 drawing no.	比例 scale
DCM/2021/005	1 : 30 000

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部門 office
顧問工程管理部
CONSULTANTS MANAGEMENT DIVISION

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

Annex 2 to Enclosure 1 to PWSC(2021-22)19

409DS – North East New Territories sewerage system upgrade

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2020 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	-	-	-	3.8
					Sub-total	<u>6.6#</u>
(b)	Resident site staff (RSS) costs (Note 3)	Professional	315	38	1.6	43.3
		Technical	730	14	1.6	35.3
					Sub-total	<u>78.6</u>
	Comprising –					
	(i) Consultants' fees for management of RSS				1.9#	
	(ii) Remuneration of RSS				76.7#	
					Total	<u>85.2</u>

* 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 = \$85,870 per month and MPS salary point 14 = \$30,235 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 **409DS**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **409DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 6 of Enclosure 1.

**355DS – Outlying Islands sewerage stage 2 –
Lamma village sewerage phase 2, package 2**

PROJECT SCOPE AND NATURE

The proposed scope of works under **355DS** comprises –

- (a) the construction of two sewage pumping stations (SPSs) with design capacities of about 820 and 300 cubic metres per day at Tai Wan To and Hung Shing Ye respectively;
- (b) the construction of about 1 kilometres (km) of twin rising mains with diameters ranging from 100 millimetres (mm) to 200 mm;
- (c) the construction of about 5 km of gravity sewers with diameters ranging from 150 mm to 225 mm; and
- (d) ancillary works¹.

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

3. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for target completion of the works in around five years.

JUSTIFICATION

4. Currently, the majority of areas between Tai Yuen and Hung Shing Ye of Lamma Island are still unsewered. The villagers in these areas now rely on individual and simple on-site facilities such as septic tanks and soakaway (STS) /systems

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 and provision of temporary sewage treatment facilities at Hung Shing Yeh Beach during the construction of the proposed works.

systems² for sewage treatment and disposal. There is also a sewage trickling filter (STF) in operation for over 20 years at Hung Shing Yeh Beach used for treating sewage generated by visitors before discharge into Hung Shing Ye Bay. Extension of public sewerage system to these areas can help to improve environmental hygiene, reduce the amount of pollutants being discharged into the nearby stream courses and marine waters, and further protect the water quality of the bathing beach.

5. We now propose to provide public sewerage system for seven unsewered village areas, namely Wang Long, Tai Wan Kau Tsuen, Tai Wan San Tsuen, Tai Wan To (part), Ko Long (part), Tai Yuen (part) and Hung Shing Ye, and Hung Shing Yeh Beach through the proposed works.

6. It is estimated that the proposed sewerage system will serve an ultimate population of about 1 830 and a large number of beach-goers by conveying the sewage to the existing Yung Shue Wan Sewage Treatment Works for proper treatment and disposal.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be \$502.9 million in money-of-the-day (MOD) prices (please see paragraph 9 below), broken down as follows –

	\$ million (in MOD prices)
(a) Construction of gravity sewers	153.1
(b) Construction of Tai Wan To SPS	78.0
(i) civil works	46.0
(ii) electrical and mechanical (E&M) works	32.0
(c) Construction of Hung Shing Ye SPS	56.2
(i) civil works	40.0
(ii) E&M works	16.2
	/(d)

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)
(d)	Construction of twin rising mains	55.9
(e)	Ancillary works	38.9
(f)	Environmental mitigation measures	13.7
(g)	Consultants' fees for	3.9
	(i) contract administration	1.5
	(ii) management of resident site staff (RSS)	2.4
(h)	Remuneration of RSS	57.5
(i)	Contingencies	45.7
Total		<hr/> 502.9 <hr/>

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

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

Year	\$ million (in MOD prices)
2021 – 22	3.3
2022 – 23	142.1
2023 – 24	148.4
2024 – 25	102.5
2025 – 26	50.0
2026 – 27	33.1

/Year

Year	\$ million (in MOD prices)
2027 – 28	17.4
2028 – 29	6.1
	<hr/> 502.9 <hr/>

10. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend rate of change in the prices of public sector building and construction output for the period from 2021 to 2029. We will deliver the proposed works under a New Engineering Contract (NEC³) form of contract with provision for price adjustment.

11. We estimate the additional annual recurrent expenditure arising from the proposed project to be \$3.46 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

12. We have consulted the Lamma Island (North) Rural Committee (RC) and the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee of the Islands District Council (IsDC) on the project several times at the early stage of the project. Both Committees have provided continual support to the proposed works. We further consulted the two Committees on the project details and progress on 19 May 2019 and 27 May 2019. Both Committees maintained their support for the proposed works.

13. We gazetted the proposed sewerage works in two packages under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL). The first package for Hung Shing Ye was gazetted on 12 December 2014 with no objection received and the proposed works was authorised on 12 June 2015. The second package for Wang Long, Tai Wan Kau Tsuen, Tai Wan San Tsuen, Tai Wan To (part), Ko Long (part) and Tai Yuen (part) was gazetted on 27 September 2019 and re-gazetted with amendments on 19 June 2020. A total of 15 objections were received for the two /gazettals

³ NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasizes cooperation, mutual trust and collaborative risk management between contracting parties.

gazettals. Ten of the objections were satisfactorily resolved. The remaining five objections could not be resolved ultimately. The Chief Executive in Council reviewed the objections and authorised the proposed works without modification. The notice of authorisation was gazetted on 26 February 2021.

14. We consulted the Legislative Council Panel on Environmental Affairs on 22 March 2021 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

15. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department has completed a Preliminary Environmental Review (PER) for the proposed works which concluded, and the Director of Environmental Protection agreed, that with the implementation of appropriate mitigation measures, the proposed works would not cause long-term adverse environmental impact.

16. At the construction phase, we will require the contractors to control noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact, regular water-spraying to 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 that these recommended mitigation measures and good practices will be properly implemented on site. We have included in paragraph 7(f) a sum of \$13.7 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

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 (PFRF⁴). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

/18.

⁴ 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.

18. We will also require the contractors to submit for approval a plan setting out the waste management measures during the construction stage, 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 33 400 tonnes of construction waste. Of these, we will reuse about 27 050 tonnes (81%) of inert construction waste on site and deliver about 5 680 tonnes (17%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 670 tonnes (2%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfill sites is estimated to be about \$537,000 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

20. The proposed works will not affect any declared monument, proposed monument, graded historic site and building, and Government historic site identified by the Antiquities and Monuments Office (AMO). Since part of the proposed works will be carried out within Tai Wan, Yung Shue Wan and Hung Shing Ye Sites of Archaeological Interest of Lamma Island, we will implement appropriate mitigation measures as recommended by the PER and Supplementary PER in agreement with the AMO.

LAND ACQUISITION

21. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 844 square metres (m²) of private land and clear about 16 952 m² of government land for implementing the proposed works. The land resumption and clearance at Wang Long, Tai Wan Kau Tsuen, Tai Wan San Tsuen, Tai Wan To (part), Ko Long (part), Tai Yuen (part) and Hung Shing Ye will not affect any household but will affect 21 non-domestic structures. The cost of land resumption and clearance, estimated at \$7.0 million, will be charged to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at **Annex 3 to Enclosure 2**.

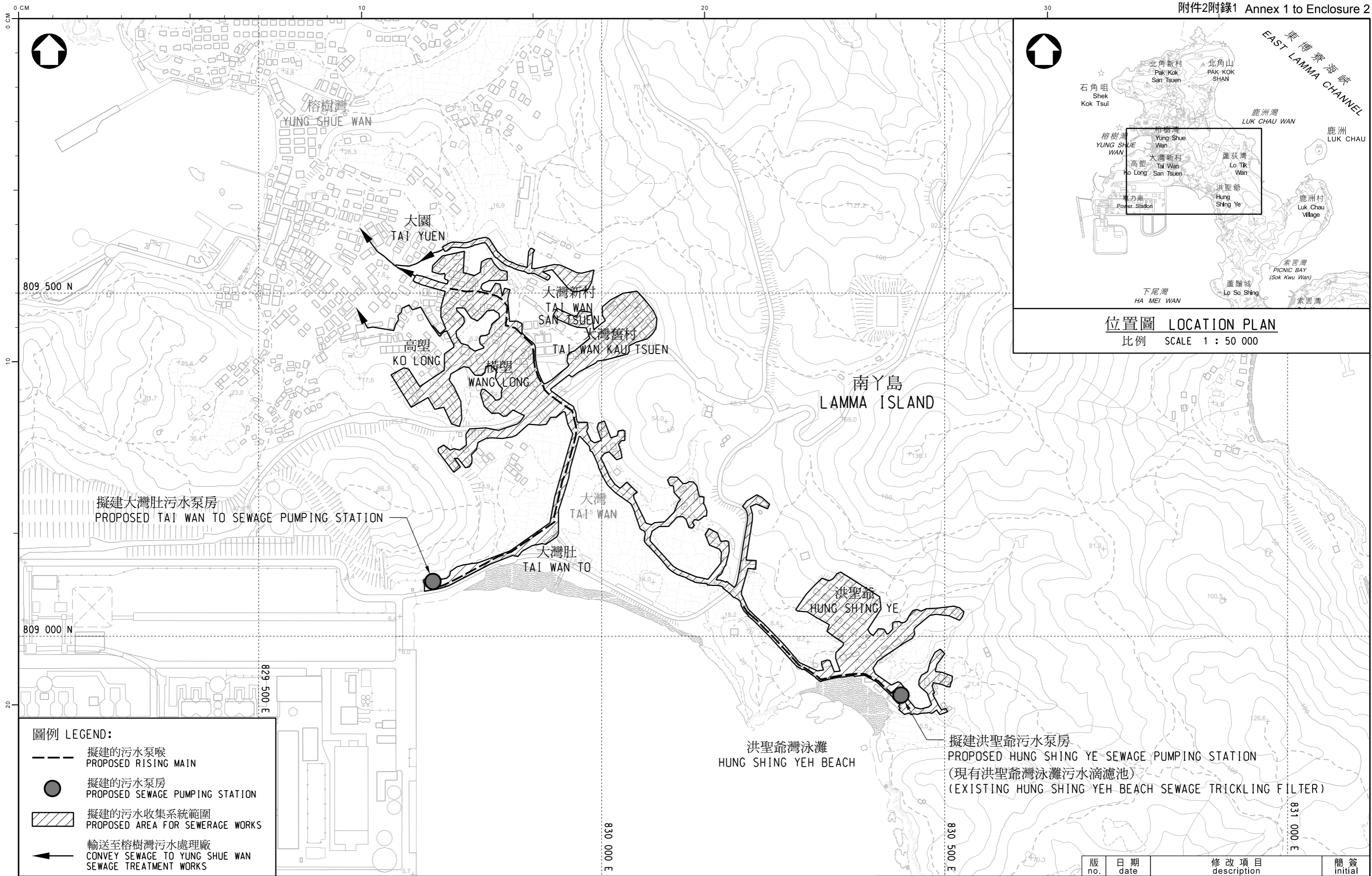
/BACKGROUND

BACKGROUND INFORMATION

22. We upgraded **355DS** to Category B in October 2006.
23. In January 2007, we engaged consultants to undertake site investigation, surveys, impact assessments and detailed design for **355DS**. The total estimated cost was \$8.5 million in MOD prices. We have charged this amount to block allocation Subhead **4100DX** “Drainage works, studies and investigations for items in Category D of the Public Works Programme”.
24. In July 2013, we upgraded part of **355DS** to Category A as **397DS** “Outlying Islands sewerage, stage 2 – Lamma village sewerage phase 2, package 1” at an approved project estimate of \$340.2 million in MOD prices. The construction works were completed in September 2018.
25. We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.
26. The proposed works will involve the felling of 13 trees. All the trees to be removed are not important trees⁵. We will incorporate a planting proposal as part of the project, including an estimated total of 14 trees.
27. We estimate that the proposed works will create about 75 jobs (60 for labourers and 15 for professional or technical staff), providing a total employment of 3 800 man-months.

⁵ “Important trees” refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

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



圖例 LEGEND:

- 擬建的污水泵喉
PROPOSED RISING MAIN
- 擬建的污水泵房
PROPOSED SEWAGE PUMPING STATION
- 擬建的污水收集系統範圍
PROPOSED AREA FOR SEWERAGE WORKS
- 輸送至榕樹灣污水處理廠
CONVEY SEWAGE TO YUNG SHUE WAN SEWAGE TREATMENT WORKS

圖則名稱 drawing title	繪畫 drawn <i>SIGNED</i> K. S. LEUNG	日期 date 13 APR 2021	修改項目 description DVD/2021/017	簡簽 initial AS SHOWN
工務工程計劃編號355DS - 離島污水收集系統第2階段 - 南丫鄉村污水收集系統第2期第2部分 PWP ITEM NO.355DS - OUTLYING ISLANDS SEWERAGE STAGE 2 - LAMMA VILLAGE SEWERAGE PHASE 2, PACKAGE 2	核對 checked <i>SIGNED</i> Ir H. Y. YUEN	日期 date 13 APR 2021	保留版權 COPYRIGHT RESERVED	
	批核 approved <i>SIGNED</i> Ir K.K. LEUNG	日期 date 13 APR 2021	香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	
	部門 office 特別職務部 SPECIAL DUTY DIVISION			

版 no.	日期 date	修改項目 description	簡簽 initial
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核對 checked	日期 date	保留版權 COPYRIGHT RESERVED	
<i>SIGNED</i> Ir H. Y. YUEN	13 APR 2021	香港特別行政區政府渠務署 DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	
批核 approved	日期 date		
<i>SIGNED</i> Ir K.K. LEUNG	13 APR 2021		
部門 office			
特別職務部 SPECIAL DUTY DIVISION			

Annex 2 to Enclosure 2 to PWSC(2021-22)19

**355DS – Outlying Islands sewerage stage 2 –
Lamma village sewerage phase 2, package 2**

**Breakdown of the estimates for consultants’ fees and resident site staff costs
(in September 2020 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	<u>1.3#</u>
(b)	Resident site staff (RSS) costs (Note 3)	Professional	118	38	1.6	16.2
		Technical	718	14	1.6	34.7
					Sub-total	<u>50.9</u>
	Comprising –					
	(i) Consultants’ fees for management of RSS				2.0#	
	(ii) Remuneration of RSS				48.9#	
					Total	<u>52.2</u>

* 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 = \$85,870 per month and MPS salary point 14 = \$30,235 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 **355DS**. The construction phase of the assignment will only be executed subject to Finance Committee’s approval to upgrade **355DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

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

Annex 3 to Enclosure 2 to PWSC(2021-22)19

**355DS - Outlying Islands sewerage stage 2 –
Lamma village sewerage phase 2, package 2**

Breakdown of land acquisition cost

		\$ million
(I)	Estimated cost for resumption of private land	4.95
(II)	Estimated cost for land clearance	1.13
(a)	Ex-gratia allowances (EGAs) (e.g. crop compensation, disturbance allowance for cultivators and EGA for miscellaneous permanent improvements items)	1.13
(III)	Interest and contingency payment	0.91
	Total	<hr/> 6.99 (Say 7.0) <hr/>

Note

The above estimated land acquisition cost is based on the prevailing rates as at April 2021.

**353DS – Outlying Islands sewerage, stage 2 –
extension of sewerage system to other unsewered villages in Mui Wo**

PROJECT SCOPE AND NATURE

The proposed scope of works under **353DS** comprises –

- (a) the construction of a sewage pumping station (SPS) with design capacity of about 365 cubic metres per day at Luk Tei Tong;
- (b) the construction of about 300 metres of twin rising mains with a diameter of 150 millimetres (mm);
- (c) the construction of about 2.9 kilometres of gravity sewers with diameters ranging from 150 mm to 250 mm; and
- (d) ancillary works¹.

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

3. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for target completion of the works in around five years.

JUSTIFICATION

4. Currently, there is no public sewerage in the areas of Ma Po Tsuen and Luk Tei Tong in Mui Wo of Lantau. The villagers in these areas now rely on individual and simple on-site facilities such as septic tanks and soakaway (STS) systems² for sewage disposal. Extension of public sewerage system to these /areas

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

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

areas can help improve environmental hygiene and further reduce the amount of pollutants being discharged into the nearby stream courses and marine waters.

5. We now propose to provide public sewerage system for two unsewered village areas, namely Ma Po Tsuen and Luk Tei Tong through the proposed works. It is estimated that the proposed sewerage system will serve an ultimate population of about 1 100 by conveying the sewage to the existing Mui Wo Sewage Treatment Works for proper treatment and disposal.

FINANCIAL IMPLICATIONS

6. We estimate that the cost of the proposed works to be \$135.7 million in money-of-the-day (MOD) prices (please see paragraph 8 below), broken down as follows –

	\$ million (in MOD prices)
(a) Construction of Luk Tei Tong SPS	42.0
(i) civil works	26.0
(ii) electrical and mechanical works	16.0
(b) Construction of twin rising mains	5.0
(c) Construction of gravity sewers	51.6
(d) Ancillary works	5.0
(e) Environmental mitigation measures	2.2
(f) Consultants' fees for	2.3
(i) contract administration	1.7
(ii) management of resident site staff (RSS)	0.6
(g) Remuneration of RSS	15.3
(h) Contingencies	12.3
	<hr/>
Total	<u>135.7</u>

/7.

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

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

Year	\$ million (in MOD prices)
2021 – 22	3.9
2022 – 23	12.8
2023 – 24	35.3
2024 – 25	36.7
2025 – 26	26.7
2026 – 27	7.7
2027 – 28	7.4
2028 – 29	5.2
	<hr style="width: 50%; margin: auto;"/> 135.7 <hr style="width: 50%; margin: auto;"/>

9. 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 2021 to 2029. We will deliver the proposed works under a New Engineering Contract (NEC³) form of contract with provision for price adjustment.

/10.

³ NEC is a suite of contracts developed by the Institution of Civil Engineers, United Kingdom. It is a contract form that emphasizes cooperation, mutual trust and collaborative risk management between contracting parties.

10. We estimate the additional annual recurrent expenditure arising from the proposed project to be \$1.77 million. The recurrent expenditure will be taken into consideration when determining the sewage charge and trade effluent surcharge rates in future.

PUBLIC CONSULTATION

11. We have consulted the Mui Wo Rural Committee on 6 May 2008. The Committee supported the proposed works. We further consulted the Tourism, Agriculture, Fisheries and Environmental Hygiene Committee of the Islands District Council on 19 January 2009 and 26 November 2018. The Committee also supported the proposed works.

12. We gazetted the proposed sewerage works for Luk Tei Tong under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 3 July 2020. No objection was received and the proposed works at Luk Tei Tong was authorised on 13 November 2020.

13. We gazetted the proposed sewerage works for Ma Po Tsuen under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 3 July 2020 and re-gazetted the works with amendments on 6 November 2020. A total of three objections to the two gazettals were received. Two of the objections were satisfactorily resolved. The remaining one objection cannot be resolved ultimately. The Chief Executive in Council reviewed the objection and authorised the proposed works without modification. The notice of authorisation was gazetted on 30 April 2021.

14. We consulted the Legislative Council Panel on Environmental Affairs on 22 March 2021 and Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

15. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The Drainage Services Department has completed a Preliminary Environmental Review (PER) for the proposed works which concluded, and the Director of Environmental Protection agreed, that with the implementation of appropriate mitigation measures the proposed works would not cause long-term adverse environmental impact.

/16.

16. At the construction phase, we will require the contractors to control noise, dust and site run-off nuisances to within the established standards and guidelines through the implementation of the recommended mitigation measures. These measures include the use of silenced construction equipment and temporary noise barriers to reduce noise impact, regular water-spraying to 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 that these recommended mitigation measures and good practices will be properly implemented on site. We have included in paragraph 6(e) a sum of \$2.2 million (in MOD prices) in the project estimate for implementation of the necessary environmental mitigation measures.

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 (PFRF⁴). We will encourage the contractors to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

18. We will also require the contractors to submit for approval a plan setting out the waste management measures during the construction stage, 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.

⁴ 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.

19. We estimate that the proposed works will generate in total about 21 100 tonnes of construction waste. Of these, we will reuse about 15 600 tonnes (74%) of inert construction waste on site and deliver about 4 300 tonnes (20%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 200 tonnes (6%) 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 about \$545,000 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

20. The proposed works will not affect any declared monument, proposed monument, graded historic site, site of archaeological interest and Government historic site identified by the Antiquities and Monuments Office. The supplementary PER report identified within the boundary of the project a historic building, i.e. Luk Tei Tong Watchtower. We will implement appropriate mitigation measures to protect the Watchtower in accordance with the recommendations of the supplementary PER.

LAND ACQUISITION

21. We have reviewed the design of the proposed works to minimise the extent of land acquisition. We will resume about 3 694 square metres (m²) of private land and clear about 14 893 m² of government land for implementing the proposed works. The land resumption and clearance at Ma Po Tsuen and Luk Tei Tong will not affect any household but will affect 36 non-domestic structures. The cost of land resumption and clearance, estimated at \$25.3 million, will be charged to **Head 701 – Land Acquisition**. A breakdown of the land acquisition cost is at **Annex 3 to Enclosure 3**.

BACKGROUND INFORMATION

22. We upgraded **353DS** to Category B in November 2006.

23. In September 2007, we engaged consultants to undertake site investigation and design for **353DS**. The total estimated cost was \$12 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”.

24. In May 2012, we upgraded part of **353DS** to Category A as **387DS** “Upgrading of Mui Wo sewage treatment works and sewerage at Mui Wo town centre and Wang Tong” at an approved project estimate of \$967.2 million in MOD prices. The construction works were completed in April 2018.

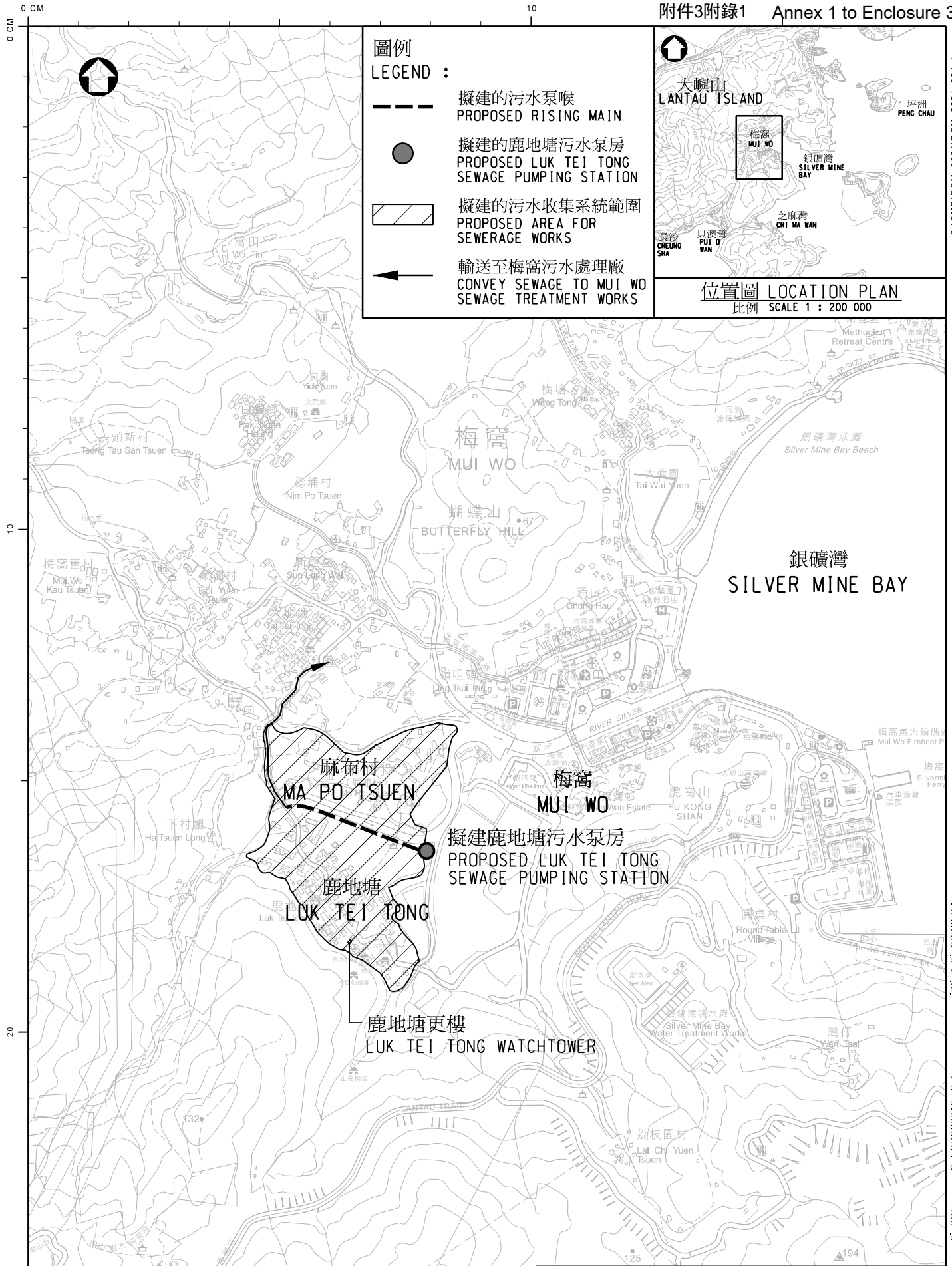
25. We have substantially completed the detailed design of the proposed works mentioned in paragraph 1 above.

26. The proposed works will involve the felling of three trees. All the trees to be removed are not important trees⁵. We will incorporate a planting proposal as part of the project, including an estimated total of four trees.

27. We estimate that the proposed works will create about 20 jobs (15 for labourers and five for professional or technical staff), providing a total employment of 1 000 man-months.

⁵ “Important trees” refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

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



圖例
LEGEND :

- 擬建的污水泵喉
PROPOSED RISING MAIN
- 擬建的鹿地塘污水泵房
PROPOSED LUK TEI TONG SEWAGE PUMPING STATION
- 擬建的污水收集系統範圍
PROPOSED AREA FOR SEWERAGE WORKS
- 輸送至梅窩污水處理廠
CONVEY SEWAGE TO MUI WO SEWAGE TREATMENT WORKS

位置圖 LOCATION PLAN
比例 SCALE 1 : 200 000

	no.	date	description	initial
drawing title 工務項目編號353DS - 離島污水收集系統第2階段 - 擴展污水收集系統至梅窩其他未有污水設施的鄉村 PWP ITEM NO. 353DS - OUTLYING ISLANDS SEWERAGE STAGE 2 - EXTENSION OF SEWERAGE SYSTEM TO OTHER UNSEWERED VILLAGES IN MUI WO	drawn	SIGNED L. S. TSE	date	13 APR 2021
	checked	SIGNED Y. LEE	date	13 APR 2021
	approved	SIGNED M. K. LEE	date	13 APR 2021
	office	CONSULTANTS MANAGEMENT DIVISION		
			drawing no.	DCM/2021/004
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			DRAINAGE SERVICES DEPARTMENT GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION	
			scale	1:10 000

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Annex 2 to Enclosure 3 to PWSC(2021-22)19

353DS – Outlying Islands sewerage, stage 2 – extension of sewerage system to other unsewered villages in Mui Wo

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2020 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	-	-	-	0.4
					Sub-total	<u>1.4#</u>
(b)	Resident site staff (RSS) costs (Note 3)	Professional	55	38	1.6	7.6
		Technical	114	14	1.6	5.5
					Sub-total	<u>13.1</u>
Comprising –						
(a) Consultants' fees for management of RSS					0.5#	
(b) Remuneration of RSS					12.6#	
					Total	<u>14.5</u>

* 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 = \$85,870 per month and MPS salary point 14 = \$30,235 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 **353DS**. The construction phase of the assignment will only be executed subject to Finance Committee's approval to upgrade **353DS** to Category A.
3. The actual man-months and actual costs will only be known after the completion of the construction works.

Remarks

The figures in this Annex are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 6 of Enclosure 3.

Annex 3 to Enclosure 3 to PWSC(2021-22)19

**353DS – Outlying Islands sewerage, stage 2 –
extension of sewerage system to other unsewered villages in Mui Wo**

Breakdown of land acquisition cost

		\$ million
(I) Estimated cost for resumption of private land		21.67
(II) Estimated cost for land clearance		0.31
(a) Ex-gratia allowances (EGAs) (e.g. crop compensation, disturbance allowance for cultivators, EGA for miscellaneous permanent improvements items and “Tun Fu” ceremonial fees)	0.31	
(III) Interest and Contingency payment		3.30
	Total	25.28
		(say 25.3)

Note

The above estimated land acquisition cost is based on the prevailing rates as at April 2021.