

**For discussion
on 23 February 2021**

Legislative Council Panel on Development

Extension of Siu Ho Wan Water Treatment Works and improvement of water supply to Sha Tin, Sheung Shui and Fanling

PURPOSE

This paper briefs Members on our proposals to –

- (a) upgrade part of **365WF**, entitled “**Siu Ho Wan water treatment works extension – main works**”, to Category A at an estimated cost of \$3,694.9 million in money-of-the-day (MOD) prices for the main works of Siu Ho Wan water treatment works extension;
- (b) upgrade **54WS**, entitled “**Salt water supply to Sha Tin Area 52, Shui Chuen O**”, to Category A at an estimated cost of \$136.0 million in MOD prices for the construction of To Shek salt water pumping station and Shui Chuen O salt water service reservoir and laying of the associated water mains; and
- (c) upgrade **55WS**, entitled “**Reclaimed water supply to Sheung Shui and Fanling**”, to Category A at an estimated cost of \$1,255.5 million in MOD prices for the construction of Shek Wu Hui Water Reclamation Plant and laying of the associated water mains.

— 2. Details of the above three proposals are provided at **Enclosures 1 to 3** respectively.

WAY FORWARD

3. We will seek support of the Public Works Subcommittee for the approval by the Finance Committee (FC) to upgrade part of **365WF**, **54WS** and **55WS** to Category A. We will invite tenders in parallel to enable early commencement of the proposed works, and will only award the contracts after obtaining FC's funding approval.

Development Bureau
Water Supplies Department
February 2021

365WF - Siu Ho Wan water treatment works extension – main works

PROJECT SCOPE

The part of **365WF** which we propose to upgrade to Category A comprises –

- (a) increasing the water treatment capacity of Siu Ho Wan water treatment works (SHW WTW) from 150 000 cubic metres (m³) per day to 300 000 m³ per day within the existing water treatment works compound, by constructing new water treatment facilities and a new laboratory building and modifying the existing chemical building, dewatering building and sludge thickener;
- (b) constructing a new raw water booster pumping station at Siu Ho Wan to increase the raw water transfer capacity from Tai Lam Chung Reservoir to SHW WTW;
- (c) improving and upgrading the existing Pui O raw water pumping station and Pui O No. 2 raw water pumping station to a combined raw water transfer capacity of 460 000¹ m³ per day; and
- (d) laying approximately 1.2 kilometres of water mains with diameter ranging from 1 200 millimetres (mm) to 1 400 mm along South Lantau Road (SLR) to increase the raw water transfer capacity from Shek Pik Reservoir to SHW WTW.

— The location of the proposed works is shown on the plan at **Annex 1 to Enclosure 1**.

2. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for completion in around six and a half years.

3. We will retain the remainder of **365WF** in Category B which mainly comprises the upgrading of the pre-treatment, clarification and filtration processes and treatment technologies of the existing SHW WTW and laying of remaining water mains along SLR. We will seek funding for

¹ In addition to conveying 300 000 m³ of raw water per day to the extended SHW WTW, Pui O raw water pumping station and Pui O No. 2 raw water pumping station also transfer 160 000 m³ per day to the existing Silvermine Bay WTW.

the remainder of **365WF** at a later stage.

JUSTIFICATION

4. The SHW WTW was commissioned in 1996 with a design water treatment capacity of 150 000 m³ per day to provide reliable fresh water supply to developments in North Lantau including the Hong Kong International Airport and the Tung Chung New Town.

5. There are currently two sources of raw water supply to the SHW WTW, one from Shek Pik Reservoir and the other from Tai Lam Chung Reservoir. At present, raw water from Shek Pik Reservoir is transferred to SHW WTW via pumping at Pui O No. 2 raw water pumping station whereas raw water from Tai Lam Chung Reservoir is supplied to SHW WTW by gravity.

6. Subsequent to the launching of various development proposals in North Lantau including the Hong Kong International Airport Three-Runway System and the Tung Chung New Town Extension, the SHW WTW would not be able to cope with the increase in water demand by 2028. Therefore, we propose to expand the water treatment capacity of SHW WTW from 150 000 m³ per day to 300 000 m³ per day and increase correspondingly the transfer capacity of the two raw water supply systems.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be \$3,694.9 million in MOD prices.

PUBLIC CONSULTATION

8. We consulted the Tourism, Agriculture, Fisheries, Environmental Hygiene and Climate Change Committee of the Islands District Council on 23 November 2020 on the project. Members recognised the importance of the Project to cope with the developments in North Lantau and their main concern and suggestion was that the relevant part of SLR should be widened and improved in conjunction with the proposed mainlaying works. As it takes time to liaise with other departments on ways to address Members' suggestion, the project scope has been refined such that the water mains section in concern would be dealt with separately.

ENVIRONMENTAL IMPLICATIONS

9. The proposed SHW WTW extension is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and an environmental permit is required for the construction and operation of the project. In December 2004, the EIA report for the project was approved under EIA Ordinance (EIAO) with an Environmental Permit issued in January 2005. The EIA report concluded that the environmental impact of the project can be controlled to within the criteria under EIAO and the Technical Memorandum on EIA Process. We also conducted an Environmental Review in December 2020, which concluded that the evaluation and recommendations presented in the approved EIA report are still valid.

10. We shall implement the measures recommended in the approved EIA report. The key measures include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities to prevent noise, dust and site run off impact during construction stage. We have included in the project estimate the cost to implement environmental mitigation measures.

11. At the planning and design stages, we have optimized the size of the process facilities and adopted advanced compact treatment system to minimise building footprint and excavation volume to reduce generation of construction waste wherever practicable. In addition, we will reuse inert construction waste (e.g. demolished concrete and excavated soil and rock) on site or at other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities (PFRF)². We will maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce generation of construction waste.

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

² Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

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.

13. We estimate that the project will generate in total about 202 000 tonnes of construction waste. We will reuse about 15 660 tonnes (8%) of inert construction waste on site and deliver 180 790 tonnes (89%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 5 550 tonnes (3%) 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 \$13.95 million for the project (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

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

LAND ACQUISITION

15. The proposed works do not involve resumption of private land.

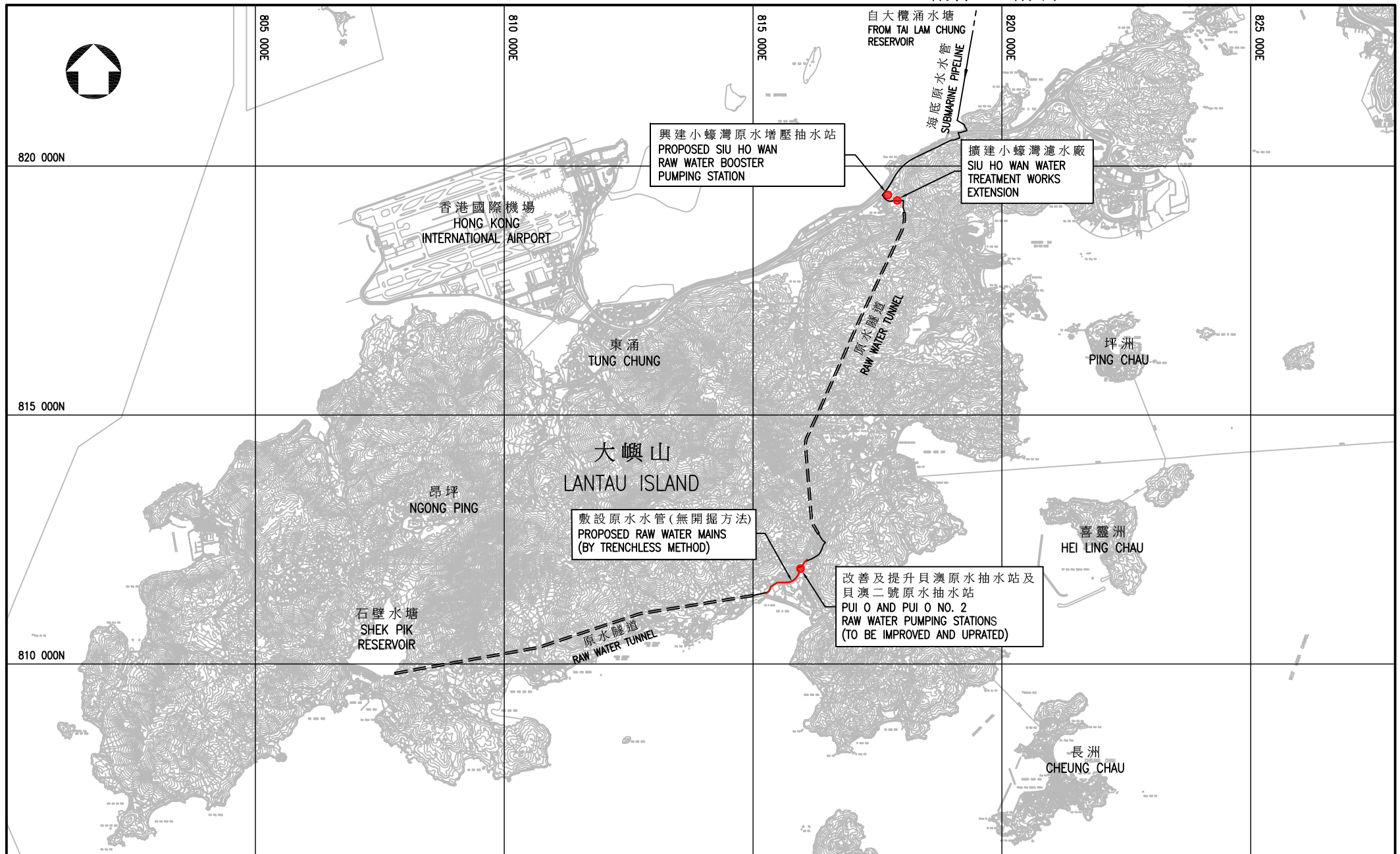
TRAFFIC IMPLICATIONS

16. To minimize possible disruption to traffic during construction, we have conducted a traffic impact assessment for the proposed works. During the construction phase, we will establish a traffic management liaison group and closely liaise with the Hong Kong Police Force, the Transport Department and other concerned government departments to discuss, scrutinize and review the proposed temporary traffic arrangement with a view to minimising the traffic impact arising from the construction works. In addition, we will set up a telephone hotline to respond to public enquiries or complaints.

BACKGROUND

17. We upgraded **365WF** to Category B in October 2017.

18. On 1 June 2018, we upgraded part of **365WF** to Category A as **366WF** “Siu Ho Wan water treatment works extension – detailed study, design and site investigation” at an approved project estimate of \$111.5 million in MOD price. We engaged a consultant in August 2018 to undertake the detailed design and site investigation works. We have substantially completed the detailed design of the proposed works.



365WF - 小蠔灣濾水廠擴展工程 - 主項工程
 365WF - SIU HO WAN WATER TREATMENT WORKS EXTENSION - MAIN WORKS
 建議擴展工程項目
 PROPOSED WORKS ITEMS

 **水務署**
 Water Supplies Department

草圖編號 SK 52016/3
 SKETCH NO.

54WS – Salt water supply to Sha Tin Area 52, Shui Chuen O

PROJECT SCOPE

The **54WS** which we propose to upgrade to Category A comprises –

- (a) construction of To Shek salt water pumping station with a pumping capacity of approximately 4 000 cubic metres (m³) per day;
- (b) construction of Shui Chuen O salt water service reservoir with a capacity of around 820 m³; and
- (c) laying of about 2.0 kilometres (km) of associated water mains with diameters ranging from 100 millimetres (mm) to 300 mm.

2. A location plan showing 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 completion in around four years.

JUSTIFICATION

4. At present, fresh water is provided to the Shui Chuen O area for flushing. The mean daily demand of fresh water for flushing is about 3 300 m³ per day.

5. Owing to increase in fresh water demand arising from new housing developments in Sha Tin area, we anticipate that the mean daily fresh water demand in the area will exceed the capacity of the related fresh water supply system by year 2025.

6. In order to conserve precious fresh water resources and to relieve the burden of the fresh water supply system in meeting the future demand, we propose to provide salt water supply to the Shui Chuen O area, including constructing a new salt water pumping station of a pumping capacity of 4 000

m³ per day (namely To Shek salt water pumping station), constructing a new salt water service reservoir of a storage capacity of 820 m³ (namely Shui Chuen O salt water service reservoir), and laying about 2.0 km of associated water mains.

FINANCIAL IMPLICATIONS

7. We estimate the cost of the proposed works to be \$136.0 million in MOD prices.

PUBLIC CONSULTATION

8. We sought views from the Development and Housing Committee of Sha Tin District Council on 27 October 2020. Members of the committee noted that the initiative would help save fresh water and we agreed to adjust the proposed water main alignment to minimise its traffic impact.

ENVIRONMENTAL IMPLICATIONS

9. The proposed works are not regarded as a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (Cap. 499). We have carried out a Preliminary Environmental Review (PER) for the proposed works. The PER concluded that the project would not have any long-term environmental impacts. We will incorporate the mitigation measures recommended in the PER into the relevant works contract to control the environmental impacts arising from the construction works to within established standards and guidelines. These measures include frequent watering of the site, provision of wheel-washing facilities, covering of materials on trucks and use of silenced construction plant. We have included in the project estimate the cost for the implementation of the environmental mitigation measures.

10. At the planning and design stages, we have considered design and layout optimisation to reduce generation of construction waste. In addition, we will require the contractor to reuse inert construction waste (e.g. demolished concrete and excavated soil and rock) on site or at other suitable construction sites as far as possible, in order to minimise the disposal of inert

construction waste at public fill reception facilities (PFRF)¹. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce generation of construction waste where possible.

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

12. We estimate that the proposed works will generate in total about 24 500 tonnes of construction waste. Of these, we will reuse about 4 750 tonnes (19%) of inert construction waste on site and deliver 18 250 tonnes (75%) of inert construction waste to PFRF for subsequent reuse. We will dispose of the remaining 1 500 tonnes (6%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRF and landfills is estimated to be about \$1.6 million for the project (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

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

¹ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

LAND ACQUISITION

14. The proposed works do not involve resumption of private land.

TRAFFIC IMPLICATIONS

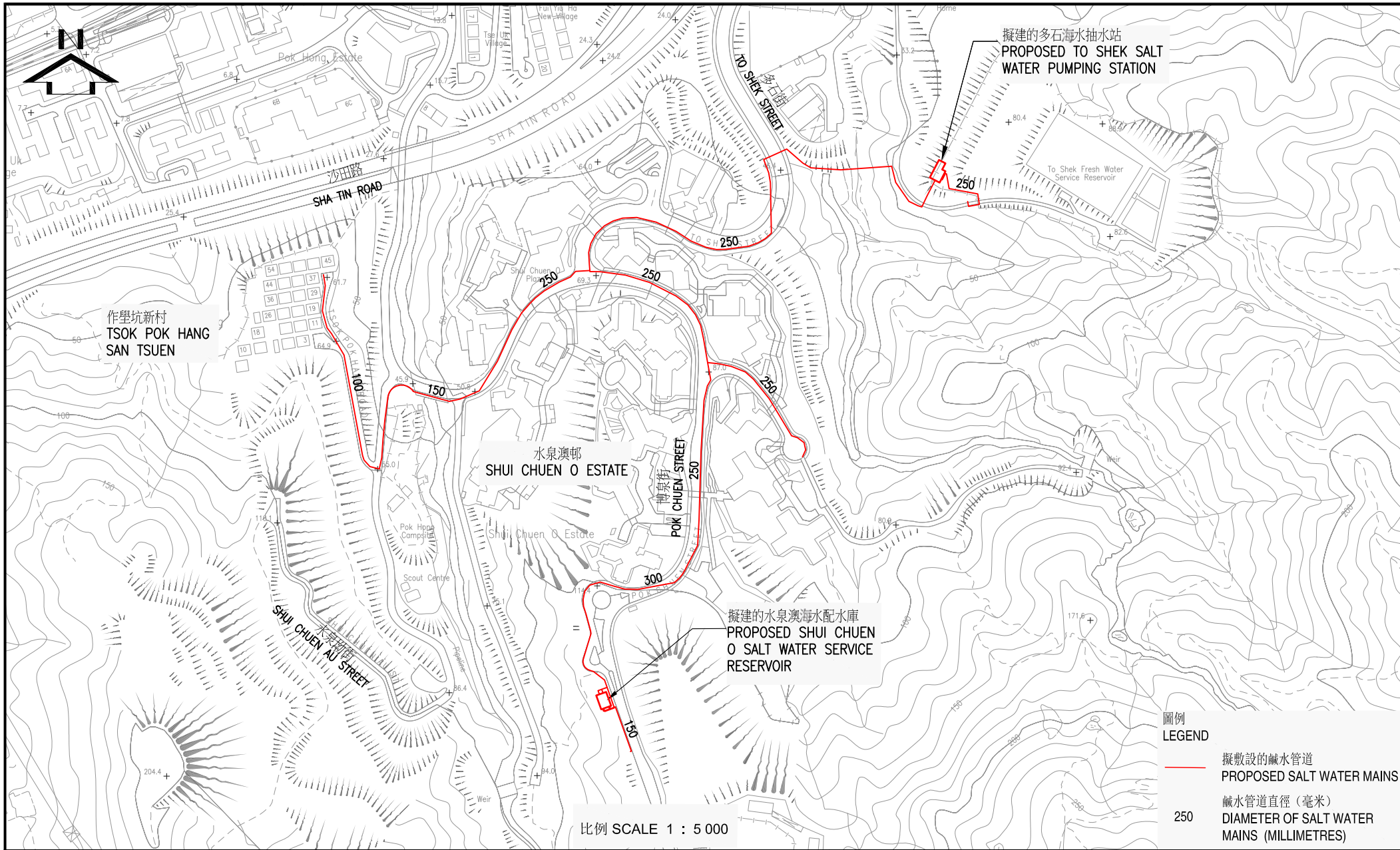
15. We have carried out a Traffic Impact Assessment (TIA) for the proposed works. According to the findings of the assessment, with the implementation of appropriate temporary traffic arrangement (TTA), the construction works will not cause significant impact on the traffic in the areas concerned.

16. At the construction stage, we will establish a traffic management liaison group and closely liaise with the Hong Kong Police Force, the Transport Department and other relevant departments to discuss, scrutinise and review the proposed TTA with a view to minimising the traffic impact arising from the construction works.

BACKGROUND

17. We upgraded **54WS** to Category B in August 2014.

18. Between 2018 and 2019, we engaged contractors to carry out site investigations and consultants to undertake the TIA, tree survey and landscape design for the proposed works at a total cost of \$4.75 million in MOD prices. We charged the amount to block allocation **Subhead 9100WX** “Waterworks, studies and investigations for items in Category D of the Public Works Programme”.



圖例 LEGEND	
	擬敷設的鹹水管道 PROPOSED SALT WATER MAINS
250	鹹水管道直徑 (毫米) DIAMETER OF SALT WATER MAINS (MILLIMETRES)

工務工程編號 54WS --- 沙田52區水泉澳鹹水供應系統
 P.W.P. Item No. 54WS --- Salt Water Supply to Sha Tin Area 52, Shui Chuen O


 水務署
 WATER SUPPLIES DEPARTMENT

草圖編號 SKETCH NO. SK 62020 / 107

55WS – Reclaimed water supply to Sheung Shui and Fanling

PROJECT SCOPE

We propose to upgrade **55WS** to Category A, the scope of which comprises –

- (a) construction of Shek Wu Hui Water Reclamation Plant (SWHWRP)¹ with a production capacity of up to 73 000 cubic metres (m³) per day;
- (b) laying of about 1.2 kilometres (km) of pumping mains with a diameter of 600 millimetres (mm) connecting the proposed SWHWRP and the Table Hill Reclaimed Water Service Reservoir²;
- (c) laying of about 24.1 km of distribution mains with diameters ranging from 150 mm to 450 mm in the north-eastern part of Sheung Shui and Fanling (SSF) areas and associated water main connection works; and
- (d) associated works including environmental mitigation works, landscaping works and other engineering works.

—— A location plan showing the proposed works is at **Annex 1 to Enclosure 3**.

2. We plan to commence the proposed works upon obtaining funding approval from the Finance Committee for completion in phases in around five and a half years, targeting to make reclaimed water supply first available in 2024.

JUSTIFICATION

3. Expansion of the use of lower grade water (i.e. seawater and

¹ The reclamation plant comprises mainly hypo-chlorination facilities and a pumping station.

² The existing Table Hill No. 2 Fresh Water Service Reservoir will be converted into the Table Hill Reclaimed Water Service Reservoir.

recycled water³) for non-potable purposes is one of the demand management measures in the updated Total Water Management Strategy, which aims at sustainable use of fresh water to ensure water security and support the development of Hong Kong. The public consultation on the supply of recycled water in Hong Kong in 2018 revealed that majority of the views received are positive and supportive of the Water Supplies Department's proposed supply of recycled water for non-potable uses, such as toilet flushing.

4. SSF areas are located inland and are currently supplied with fresh water for flushing. Taking the opportunity arising from the Drainage Services Department's upgrading of Shek Wu Hui Sewage Treatment Works to tertiary treatment, we will process the treated sewage effluent therefrom to produce reclaimed water for supply to the northeast New Territories areas for non-potable uses. We will implement reclaimed water supply in phases and start the supply to SSF areas in 2024. The supply will be extended to Kwu Tung North and Fanling North New Development Areas (NDAs) in pace with their development programmes. It is estimated that about 22 million m³ of fresh water can be saved each year ultimately.

5. For providing reclaimed water supply to SSF areas with allowance to cater for the NDAs' demand, the facilities mentioned in paragraph 1 above are required to be put in place.

FINANCIAL IMPLICATIONS

6. We estimate the cost of the proposed works to be \$1,255.5 million in MOD prices.

PUBLIC CONSULTATION

7. We consulted the Committee on Land Development, Housing and Works of North District Council on 16 March 2020 and 18 May 2020 respectively. Members supported the proposed works.

ENVIRONMENTAL IMPLICATIONS

³ Recycled water comprises reclaimed water (from the processing of treated effluent from sewage treatment works), treated grey water (from the treatment of used water collected from baths, wash basins, kitchen sinks or similar fittings) and harvested rainwater.

8. The proposed SWHWRP will reuse treated sewage effluent to produce reclaimed water. The reuse of treated sewage effluent is a designated project under Schedule 2 of the Environmental Impact Assessment (EIA) Ordinance (Cap. 499) and an environmental permit is required for its construction and operation. It formed part of the “North East New Territories New Development Areas” of which the EIA report was approved in October 2013. The EIA report concluded that the environmental impact of the designated project can be controlled to within the criteria under the EIA Ordinance (EIAO) and the Technical Memorandum on EIA Process. An Environmental Permit was issued in November 2013. We shall implement mitigation measures recommended in the approved EIA report and the Environmental Monitoring and Audit Manual, such as pollution control measures including frequent watering of site, provision of wheel washing facilities, covering of materials on trucks, use of silenced construction plant, temporary noise barriers and acoustic enclosures for noisy construction activities.

9. While the mitigation measures are applicable to the construction of SWHWRP, the laying of pumping mains and distribution mains is not a designated project under the EIAO. We have carried out a Preliminary Environmental Review (“PER”) for the mainlaying works. The PER concluded and the Director of Environmental Protection agreed in November 2020 that the works would not have any long-term environmental impacts. We will incorporate the mitigation measures recommended in the PER, similar to those described in paragraph 8 above, into the works contract to control the environmental impacts arising from the construction works to within established standards and guidelines. We have included in the project estimate the cost for implementing the environmental mitigation measures referred to in paragraphs 8 and 9.

10. At the planning and design stages, we have considered optimising the design and layouts of the proposed works to reduce generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. demolished concrete and excavated soil and rock) on site or at other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities⁴. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timer formwork to further reduce generation of construction waste.

⁴ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

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

12. We estimate that the proposed works will generate in total about 37 520 tonnes of construction waste. Of these, we will reuse about 21 730 tonnes (58%) of inert construction waste on site and deliver 14 930 tonnes (40%) of inert construction waste to public fill reception facilities for subsequent reuse. We will dispose of the remaining 860 tonnes (2%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at public fill reception facilities and landfills is estimated to be about \$1.23 million for the project (based on a unit charge rate of \$71 per tonne for disposal at public fill reception facilities and \$200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

14. The proposed works do not involve resumption of private land.

TRAFFIC IMPLICATIONS

15. We have carried out a Traffic Impact Assessment (TIA) for the proposed works. The TIA concludes that with the implementation of appropriate traffic management measures, the proposed works would not cause significant impact on the traffic. Prior to commencement of works on site, we will carry out a traffic review at the construction stage to revisit the

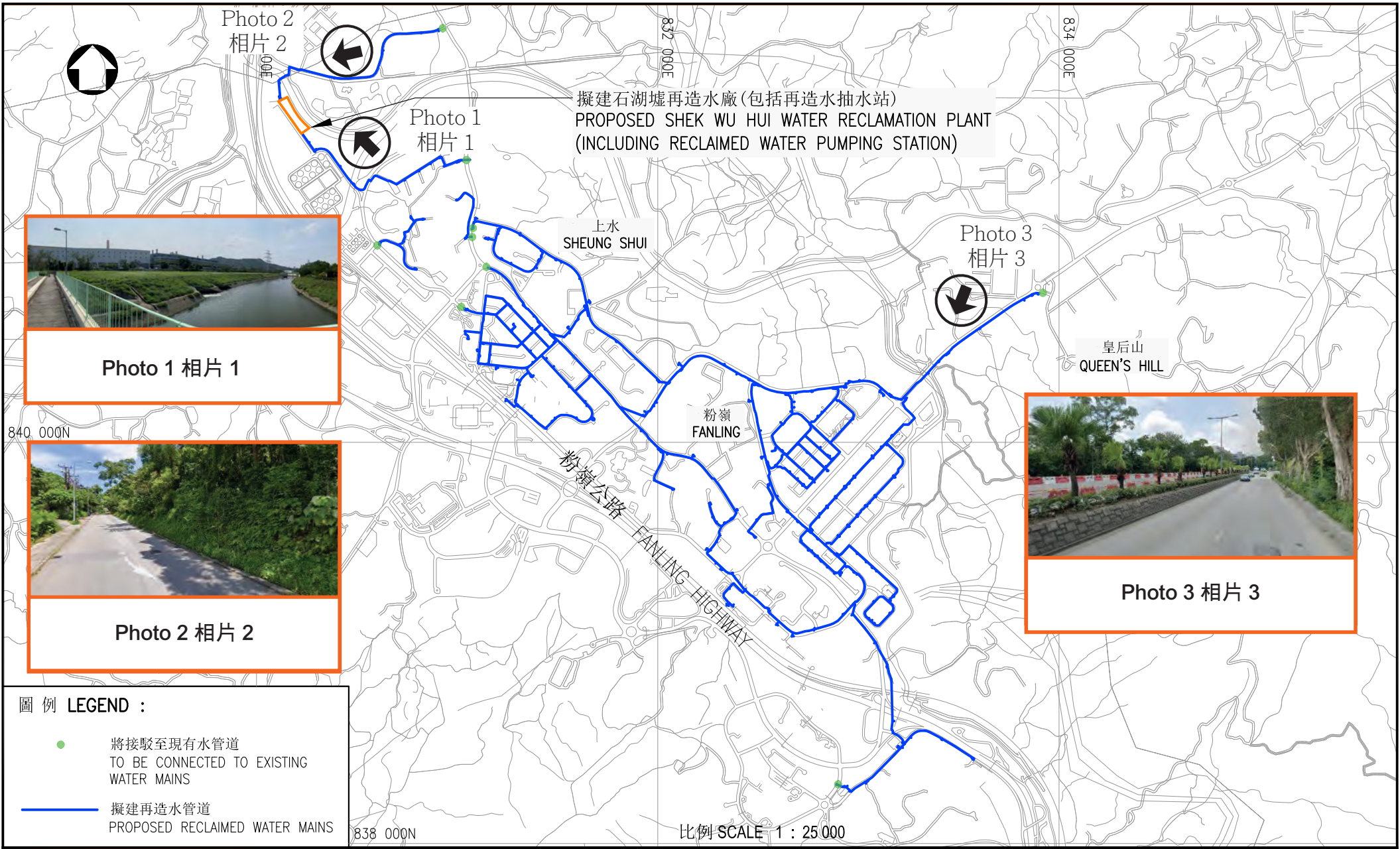
temporary traffic management measures with reference to the latest traffic condition.

BACKGROUND

16. We upgraded **55WS** to Category B in August 2016.

17. In February 2019, we engaged consultants to undertake the investigation and detailed design and engaged contractors to carry out site investigation works for the proposed works at a cost of about \$23.48 million in MOD prices. We have charged this amount to block allocation **Subhead 9100WX** “Waterworks, studies and investigations for items in Category D of the Public Works Programme”. The investigation and detailed design of the proposed works have been substantially completed.

18. We have been implementing infrastructure works which allow for the supply of reclaimed water to SSF areas, including the construction of a service reservoir, laying of trunk water mains and the local distribution mains at south-western part of SSF areas. The Table Hill No. 2 fresh water service reservoir and trunk water mains (implemented under PWP Item No. **350WF**), as well as the distribution mains at south-western part of SSF areas (being implemented under PWP Item No. **355WF**) had been designed with flexibility for conversion in phases to a flushing water system using reclaimed water. These facilities will be progressively deployed to supply reclaimed water following the completion of the first phase of the proposed works in 2024, which includes the SWHWRP and associated reclaimed water mains.



擬建石湖墟再造水廠 (包括再造水抽水站)
 PROPOSED SHEK WU HUI WATER RECLAMATION PLANT
 (INCLUDING RECLAIMED WATER PUMPING STATION)



Photo 1 相片 1



Photo 2 相片 2



Photo 3 相片 3

圖例 LEGEND :

- 將接駁至現有水管道
TO BE CONNECTED TO EXISTING WATER MAINS
- 擬建再造水管道
PROPOSED RECLAIMED WATER MAINS

838 000N

比例 SCALE 1 : 25 000

工程計劃編號第55WS號 --- 上水及粉嶺再造水供應工程
 P.W.P. Item No.55WS --- Reclaimed water supply to Sheung Shui and Fanling

水務署
 WATER SUPPLIES DEPARTMENT

草圖編號 SKETCH NO. SK 62020/019