

**For discussion
on 27 October 2020**

**Legislative Council
Panel on Development**

Proposed creation of one permanent post of Chief Engineer in the Drainage Services Department for cavern development projects, and PWP Item No. 399DS – Relocation of Sha Tin Sewage Treatment Works to caverns

PURPOSE

This paper briefs Members on the proposals for -

- (a) creating one **permanent post of Chief Engineer (D1) in the Drainage Services Department (DSD)** for leading a dedicated Cavern Projects Division to mainly implement the “Relocation of Sha Tin Sewage Treatment Works to caverns” and planning cavern projects for relocation/accommodation of other suitable sewage treatment facilities; and
- (b) upgrading part of **399DS** to Category A for Relocation of Sha Tin Sewage Treatment Works to caverns – main caverns construction, upstream sewerage works and other related works at an estimated cost of \$14,076.5 million in money-of-the-day prices.

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

WAY FORWARD

3. We propose to create one **permanent post of Chief Engineer (D1) in the DSD** and proceed with the proposed works under **399DS (part)**. After incorporating Members’ comments on the above two proposals, we will seek approval from the Legislative Council. Members are invited to comment on the above proposals.

**Development Bureau
Drainage Services Department
October 2020**

**Proposed Creation of One Permanent Post of Chief Engineer
in the Drainage Services Department**

PROPOSAL

We need additional support at the directorate level in the Drainage Services Department (DSD) for implementing the relocation of Sha Tin Sewage Treatment Works (STSTW) to caverns and planning cavern projects for relocation/accommodation of other suitable sewage treatment facilities. We propose to create one permanent Chief Engineer (CE) post (D1) in DSD with immediate effect upon approval by the Legislative Council (LegCo), to lead a new Cavern Projects Division, focusing on the implementation of relocating STSTW to caverns and planning of cavern projects for relocation/accommodation of other suitable sewage treatment facilities.

JUSTIFICATIONS

Enhancing Land Supply Policy Initiative – Relocation / Accommodation of Suitable Sewage Treatment Facilities in Caverns

2. To support the sustainable development of Hong Kong, it is the established policy of the Government to adopt a multi-pronged approach to enhance land supply. The hilly and hard rock terrain of Hong Kong makes it highly suitable for developing rock caverns, particularly on the urban fringes. The relocation of suitable existing government facilities to caverns can on one hand release above-ground sites for housing and other land uses, and on the other hand can relocate facilities that do not need to be placed on ground and are incompatible with the surrounding environment and land uses nearby. Accordingly, the Government is actively exploring rock cavern development to exploit land resources and as a viable source of long-term land supply. The Development Bureau (DEVB) has promulgated the policy and measures in relation to cavern development projects¹ in December 2017, including a territory-wide Cavern

¹ DEVB issued Development Bureau Technical Circular (Works) No. 8/2017 Rock Cavern Development in December 2017, promulgating the long-term policy in relation to cavern development projects.

Master Plan (CMP)² and associated planning and technical guidelines, as well as according priority to study the feasibility of relocating/accommodating suitable sewage treatment facilities into caverns. In December 2018, the Task Force on Land Supply (Task Force) submitted a report to the Government recommending that cavern development is a priority land supply option worthy of study and implementation. The Government agreed and accepted the recommendations of the Task Force.

Need for a Dedicated Cavern Projects Division in DSD

3. Sewage treatment facilities managed by DSD are important infrastructures and distributed over and serving various districts of Hong Kong. According to the guidelines of CMP, some Strategic Cavern Areas (SCVAs) are potential sites for, subject to studies, accommodating sewage treatment facilities. Since developing sewage treatment facilities in caverns involves substantial development scale, complex technologies, multiple engineering disciplines, lengthy implementation duration and long term commitment, DSD needs to set up a Cavern Projects Division comprising multi-disciplinary professional and technical staff for dedicated planning and implementation of cavern projects to accommodate sewage treatment works. The major duties of this Division are as follows:

- (i) implement the relocation of STSTW to caverns;
- (ii) plan and implement other cavern projects to relocate/accommodate sewage treatment facilities;
- (iii) oversee and supervise design and construction of cavern projects; and
- (iv) build up knowledge, skills and experience of cavern projects to enable their sustainable development.

Implement the relocation of STSTW to caverns

4. DSD is currently implementing the “Relocation of STSTW to caverns”. This project is the largest on-going cavern development project in Hong Kong, involving construction of a main caverns complex of about 14 hectares (total

² Cavern Master Plan delineates Strategic Cavern Areas that are well placed for cavern development and provides planning and technical information and guidelines for reference by project proponents of the public and private sectors to promote development of cavern sites.

volume of 2.3 million cubic metres) for the reprovisioning of the existing STSTW in Nui Po Shan, Sha Tin. The estimated total construction cost is around \$40 to 50 billion. DSD commenced a detailed feasibility study on the project in 2012, and completed it in 2014. The study results confirmed that relocating STSTW to the proposed cavern site at Nui Po Shan of A Kung Kok is technically feasible and financially viable, and can release about 28 hectares of land being occupied by the existing STSTW for more beneficial and suitable land uses. According to the feedbacks of the public engagement exercise, the public generally support relocating suitable government facilities to caverns and releasing the concerned sites for housing and other beneficial uses, as well as improving the environment. In 2014, DSD commenced site investigation, impact assessments and detailed design of the project. The relocation project comprises site preparation and access tunnel construction (i.e. Stage 1 Works), main caverns construction, upstream sewerage works, installation of sewage treatment facilities and decommissioning and demolition of the existing STSTW. The overall construction period of the whole project will span over ten years or more. Upon completion, there will be 28 hectares of land released for housing and other beneficial uses.

Plan and implement other cavern projects to relocate/accommodate sewage treatment facilities

5. In addition to the aforesaid “Relocation of STSTW to caverns” project, DSD is also conducting feasibility studies and associated planning work for another two projects on reprovisioning sewage treatment facilities in caverns, namely “Relocation of Sai Kung Sewage Treatment Works (SKSTW) to Caverns” (the SK cavern project) and “Relocation of Sham Tseng Sewage Treatment Works (SmTSTW) to Caverns” (the SmT cavern project). The technical assessment under the feasibility study of the SK cavern project was substantially completed. Since the existing SKSTW site released from the cavern project has to be planned holistically with adjacent site developments, having regard to the overall planning and development needs of Sai Kung District, DSD will work with relevant departments and conduct the next stage public engagement exercise for the cavern project at an opportune time. As regards the SmT cavern project, its feasibility study was also substantially completed. DSD and relevant departments are now reviewing the public views on this cavern project, the initial development scheme of the released site, relevant findings of technical assessment and the latest planning and development of neighbouring areas, so as to determining the way forward.

6. Apart from the abovementioned two projects, under the Government's established policy on enhancing land supply, DSD will explore other suitable sewage treatment facilities for relocating/ accommodating in SCVAs, e.g. Tsing Lung Tau and Siu Ho Wan, so as to continuously take forward cavern projects on housing sewage treatment facilities.

Oversee and supervise design and construction of cavern projects

7. The design and implementation of cavern projects may vary with their scales, actual site conditions and other technical considerations. Generally, it takes more than ten years to entirely complete a cavern project. If the project involves statutory procedures, such as those under the Town Planning Ordinance (Cap. 131), Country Parks Ordinance (Cap. 208) and Environmental Impact Assessment Ordinance (Cap. 499), it would be even more complicated and take longer time to implement. Taking the project "Relocation of STSTW to caverns" as an example, it would take about 20 years from the start of its feasibility study in 2012 to its full completion upon release of the 28-hectare existing site anticipated in 2031. Besides, cavern sewage treatment facility projects usually involve multiple engineering disciplines and implement in phases through various interfacing contracts with close interfaces and overlapping works sites. Delay in any one contract could have knock-on effects and impacts on other interfacing contracts and affect the project completion. Thus, DSD needs to establish a dedicated Cavern Projects Division comprising multi-disciplinary professional and technical staff to rigorously and continuously oversee and supervise the design and construction of cavern sewage treatment facility projects, so as to ensure construction quality and safety, as well as complying with the design requirements and operational effectiveness.

Build up associated knowledge, skills and experience of cavern projects to enable sustainable development.

8. Cavern sewage treatment facility projects are mega in scale and cover various engineering disciplines, including civil and structural engineering, geotechnical engineering, sewage treatment engineering, environmental engineering, electrical and mechanical engineering, and cavern-related building services and fire services engineering, etc. Therefore, they are far more

complicated than general infrastructure projects and require a lot of cross-professional coordination and project management. Taking the project “Relocation of STSTW to caverns” as an example, it is the largest and most complex cavern construction project in Hong Kong today, and adopts state-of-the-art sewage treatment technology and design of building services and fire services. The proposed Cavern Projects Division will continue to gather and acquire relevant knowledge, technologies and experience from the ongoing cavern sewage treatment facility projects, and will collaborate with and support relevant departments in the formulation and enhancement of guidelines and standards on cavern development, building services and fire services, sewage treatment technology, mechanical and electrical equipment for application in the future cavern projects and enabling sustainable development of this engineering field.

Need to Create One Permanent CE Post (D1) in DSD

9. Currently, DSD has assigned Chief Engineer/Sewerage Projects (CE/SP), which is a permanent CE (D1) post, to lead, on part-time basis, a team of professionals comprising four senior engineers/senior geotechnical engineers, eight engineers/geotechnical engineers/assistant engineers, one senior electrical and mechanical engineer and three electrical and mechanical engineers to oversee the construction of Stage 1 Works of the project “Relocation of STSTW to caverns”, the detailed design for the remaining works of this project, and take forward the feasibility studies on the projects of “Relocation of SKSTW to Caverns” and “Relocation of SmTSTW to Caverns” and the follow up tasks. This team of professionals for cavern projects will be deployed to the Cavern Projects Division upon its creation. We will also create another ten additional permanent posts of technical and general grades to support the daily operation of the Cavern Projects Division.

10. However, the own duties of CE/SP are leading the Sewerage Projects Division and its four other project teams to oversee the construction of Shek Wu Hui Effluent Polishing Plant and Yuen Long Effluent Polishing Plant, the planning of Upgrading of Tai Po Sewage Treatment Works and the planning and construction of other sewerage works. These sewerage projects are all substantial in scale and highly complicated, demanding full time engagement of CE/SP and his project teams. Accordingly, CE/SP is unable to spare long-term effort on

leading the new Cavern Projects Division.

11. In view of the mega project scale and complexity of “Relocation of STSTW to caverns”, we need to implement this \$40 to 50 billion worth project in stages, with a construction period spanning ten years or more. The site preparation and access tunnel construction under Stage 1 Works commenced in February 2019. Subject to the funding approval of the Finance Committee, the proposed main caverns construction and upstream sewerage works under Stage 2 Works are scheduled to commence in the third quarter of 2021. The implementation of the project will be in full swing under a highly compressed implementation programme, targeting to commission the reprovisioned STSTW in caverns by 2029 and release the existing STSTW site by 2031 for housing and other beneficial uses. There is therefore an imminent need to create one permanent CE post (D1) to lead the new dedicated Cavern Projects Division overseeing the smooth delivery of this mega scale and highly complicated cavern project, as well as planning and implementation of other existing and potential cavern sewage treatment facility projects (details referred to paragraphs 5 and 6).

12. As mentioned above, the Cavern Projects Division will be a dedicated project division comprising professional and technical staff from various engineering disciplines. It is responsible for planning and implementation of cavern sewage treatment facility projects, which are of mega scale and involve complex cavern engineering, civil and structural engineering, geotechnical engineering, sewage treatment engineering, environmental engineering, electrical and mechanical engineering, and cavern-related building services and fire services engineering works. Given that professionals in the civil engineering sector are usually equipped with broad engineering knowledge and rich project management experience, they are more suitable for leading the engineering team to manage and implement cavern sewage treatment facility projects. Therefore, we propose to create one permanent CE post (D1) (to be designated as Chief Engineer/Cavern Projects, CE/CP) to lead the new dedicated Cavern Projects Division, to plan and implement cavern sewage treatment facility projects.

13. The proposed job descriptions of the permanent CE post (CE/CP) proposed to be created is at **Annex 1 to Enclosure 1**.

Annex 2 14. The proposed organisation chart of DSD after the creation of the permanent CE post as detailed above is at **Annex 2 to Enclosure 1**.

15. DSD will continue to review the progress and workload of various cavern sewage treatment facility projects³, and review manpower timely to cope with actual needs, so as to continuously plan and implement cavern projects to enhance land supply in the long term.

NON-DIRECTORATE SUPPORT

16. In addition to the above proposed directorate post, there will be 26 non-directorate posts for the Cavern Projects Division, including 14 existing permanent posts of professional grade, two existing time-limited posts of professional grade as well as another ten additional permanent posts of technical and general grades to be created to support the daily operation of the Cavern Projects Division.

ALTERNATIVES CONSIDERED

Annex 3 17. We have critically examined the possibility of redeploying other existing directorate officers within DSD to take on the work of the proposed post. However, the other incumbents are already fully engaged in their respective work schedules, including taking forward a large number of on-going and new drainage, sewage treatment and sewerage projects, overseeing the operation, and maintenance and minor improvement works of the existing drainage and sewerage systems, as well as coordinating district drainage matters, it is operationally impossible for them to take up the new tasks without adversely affecting the discharge of their current duties. It should be emphasised that all these are livelihood-related projects aiming at provisioning of quality drainage and sewage collection, treatment and disposal services to the community. **Annex 3 to Enclosure 1** shows the schedule of responsibilities of all existing CE posts in DSD.

³ Including Relocation of SKSTW and SmtSTW to Caverns mentioned in paragraph 5, and the cavern projects for relocation of existing sewage treatment facilities and accommodation of new sewage treatment facilities in SCVAs under study mentioned in paragraph 6, so as to drive cavern development.

18. If the proposed CE post is not created, DSD will not have adequate resources at directorate level to cope with the operational demands for planning, co-ordination and implementation of the cavern projects.

FINANCIAL IMPLICATIONS

19. The proposed creation of one directorate post will bring about an additional notional annual salary cost at mid-point of \$1,923,600 as follows –

Directorate Post	Notional annual salary cost at mid-point (\$)	No. of Posts
CE (D1)	1,923,600	1
Total	1,923,600	1

The additional full annual average staff cost, including salaries and staff on-cost, is about \$2,687,000.

20. The additional notional annual salary cost at mid-point for the ten non-directorate posts to be created is \$4,926,450 and the full annual average staff cost, including salaries and staff on-cost, is around \$7,148,000.

21. We have earmarked the necessary funding provision to meet the staff cost of the proposal.

ESTABLISHMENT CHANGES

22. In 1996, one permanent Chief Electrical and Mechanical Engineer post (D1) was created to lead the Sewage Treatment Division 2. Upon the cessation of the Sewage Services Trading Fund, a permanent Deputy Director of Accounting Services (D3) post was deleted in 1999. Since then, there is no change to the directorate establishment of DSD.

23. The establishment changes in DSD for the past two years are as follows –

Establishment (Note)	Number of posts			
	Existing (as at 1 Oct 2020)	As at 1 Apr 2020	As at 1 Apr 2019	As at 1 Apr 2018
A	18 [#]	18	18	18
B	433	411	391	369
C	1 581	1 591	1 577	1 553
Total	2 032	2 020	1 986	1 940

Note:

A – ranks in the directorate pay scale or equivalent

B – non-directorate ranks, the maximum pay point of which is above MPS point 33 or equivalent

C – non-directorate ranks, the maximum pay point of which is at or below MPS point 33 or equivalent

– as at 1 October 2020, there was no unfilled directorate post in DSD

CIVIL SERVICE BUREAU COMMENTS

24. The Civil Service Bureau supports the proposed creation of the one permanent directorate post in DSD for implementing the Relocation of STSTW to caverns and planning cavern projects for relocation/accommodation of other suitable sewage treatment facilities. The grading and ranking of the proposed post are considered appropriate having regard to the level and scope of responsibilities and the professional input required.

BACKGROUND

25. About two-thirds of the land in Hong Kong are suitable for rock cavern developments from topographical and geological perspectives, which may be used for relocating suitable public facilities. The 2011-12 Policy Address announced that the Government would adopt a multi-pronged approach, including developing rock caverns to re-provision existing public facilities, for expanding land resources. Relocation of STSTW to caverns was identified as a pilot project. To take forward the initiative, DSD commenced a detailed feasibility study on the relocation of the STSTW to caverns in May 2012, which was completed in May 2014. DSD then commenced the investigation and design of the relocation of STSTW to caverns in September 2014. Stage 1 Works of this project for site preparation and access tunnel construction commenced in February 2019.

26. In July 2011, the Civil Engineering and Development Department commissioned a feasibility study on increasing land supply by reclamation and rock cavern developments. The study has identified the SKSTW and the SmTSTW, amongst others, for relocating to caverns. The 2014 Policy Address also announced the plan to conduct feasibility studies on relocating these two sewage treatment works to caverns. These feasibility studies, undertaken by DSD, were commenced in August 2014.

27. DEVB has promulgated the policy and measures in relation to cavern development projects in December 2017, including a territory-wide CMP and associated planning and technical guidelines, as well as according priority to study the feasibility of relocating/accommodating suitable sewage treatment facilities into caverns.

**Proposed Job Description
Chief Engineer/Cavern Projects**

Rank : Chief Engineer (D1)

Responsible to Assistant Director/Projects and Development

Overall Role and Objectives –

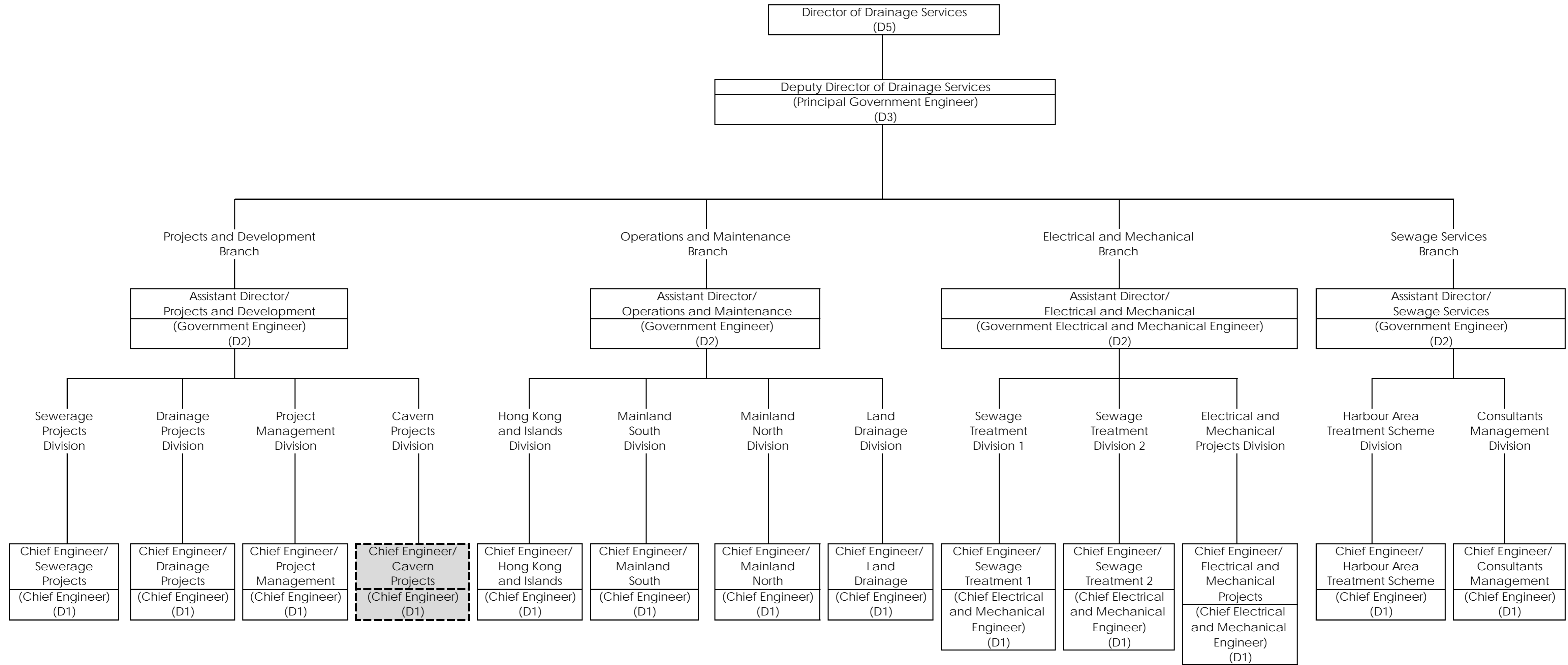
Chief Engineer/Cavern Projects heads a division of the Drainage Services Department (DSD) and is responsible for the overall administration, planning, design and construction supervision of works packages, mainly on the implementation of the Relocation of Sha Tin Sewage Treatment Works (STSTW) to caverns and planning other cavern-related development projects in DSD.

Major Duties and Responsibilities –

1. To oversee the administration, management and coordination of project teams of civil, structural, geotechnical, sewage treatment, environmental and Electrical & Mechanical (E&M) works disciplines in relation to the delivery of Relocation of STSTW to Caverns and other cavern-related development projects in DSD;
2. To oversee the project liaison with other government departments and resolve specialists' comments in relation to building services, fire safety and geotechnical design of the cavern-related development projects in DSD;
3. To oversee the programme and progress of the project implementation, and formulate effective contract procurement strategy to meet the compressed project implementation programme;
4. To oversee the extensive public engagement exercises for delivering cavern projects to cater for the continuous increase in public awareness on environmental protection and living environment;
5. To steer and oversee the in-house project teams, including civil and E&M disciplines, for sustaining the professional development in cavern sewage treatment facilities;
6. To build up knowledge, skills and experience of cavern projects to enable sustainable development; and
7. To oversee the work of senior engineers under his/her purview.

PROPOSED ORGANISATION CHART
Drainage Services Department

Annex 2 to Enclosure 1



Legend :

 Post proposed to be created

**Areas of Responsibilities of the Existing
Chief Engineers in the
Drainage Services Department**

All the existing Chief Engineers in Drainage Services Department (DSD) are fully engaged in their respective duties. It is operationally not possible for them to take up the additional tasks without adversely affecting the discharge of their current duties.

Projects and Development Branch

1. **Chief Engineer/Sewerage Projects** is responsible for upgrading of some existing major sewage treatment works including Shek Wu Hui and Yuen Long Effluent Polishing Plants and Tai Po Sewage Treatment Works, to support the long-term development of Hong Kong; and a number of sewerage projects in various districts. He/She is also responsible for leading his/her team to consult Rural Committees, District Councils and local organisations/committees so as to foster close communication with stakeholders and ensure timely delivery of relevant projects. Currently, he/she is also leading, on part-time basis, a team of professionals to oversee the construction of Stage 1 works of the project “Relocation of Sha Tin Sewage Treatment Works to caverns”, the detailed design for the remaining works of this project, and take forward the feasibility studies of “Relocation of Sai Kung Sewage Treatment Works to caverns” and “Relocation of Sham Tseng Sewage Treatment Works to caverns” and the follow up tasks. Upon the creation of the proposed Chief Engineer post, these cavern projects will be taken up by the proposed post.

2. **Chief Engineer/Drainage Projects** is responsible for the planning, design and construction of the major drainage improvement works for Tai Po, Sha Tin, Sai Kung, North District, Kwun Tong, Mong Kok, Eastern District, Southern District, and Ngong Ping; and the revitalisation works for Tsui Ping River, Tai Wai Nullah, Fo Tan Nullah and Jordan Valley Nullah; and various minor drainage improvement works.

3. **Chief Engineer/Project Management** is responsible for the planning, design and construction of the drainage improvement works in Tsim Sha Tsui, Kowloon City and Wong Tai Sin; reconstruction and rehabilitation of Kai Tak River in Wong Tai Sin district; river improvement and drainage improvement works in Yuen Long rural areas; improvement of Yuen Long Town Nullah and implementation of Yuen Long Barrage Scheme. He/She is also responsible for the strategic planning and implementation of replacement and rehabilitation of drains and sewers over the territory.

Operations and Maintenance Branch

4. **Chief Engineer/Hong Kong and Islands** is responsible for overseeing the operation, maintenance and minor improvement works of the drainage and sewerage systems in Hong Kong and Islands region; coordinating district drainage matters in Hong Kong and Islands region such as vetting drainage proposals of town planning applications and building drainage submissions for developments, providing drainage connections and assessing the impact of Government and other projects on stormwater drains and sewers; overseeing risk assessment of trees managed by DSD, conducting engineer inspection and upgrading of DSD's slopes; and carrying out maintenance for building and civil engineering structures of sewage treatment and flood control facilities.

5. **Chief Engineer/Mainland South** is responsible for overseeing the operation, maintenance and minor improvement works of the drainage and sewerage systems in Kowloon and New Territories South which include Tsuen Wan, Kwai Tsing, Shatin, Ma On Shan, Sai Kung and Tseung Kwan O; coordinating district drainage matters in Kowloon and New Territories South region; development and operation of information systems for drainage asset management; management of the Specialized Services Team of the Drainage Services Department Hotline Services; and development of drainage pipe rehabilitation strategy and technology.

6. **Chief Engineer/Mainland North** is responsible for overseeing the operation, maintenance and minor improvement works of the drainage and sewerage systems in New Territories North which include Yuen Long, Tai Po, Tuen Mun and North districts; coordinating district drainage matters in New Territories North region; management and maintenance of the Shenzhen River (Hong Kong side) and 27 nos. of Village Flood Pumping Schemes in the territory. He/She is also responsible for managing matters related to the Land Drainage Ordinance (Cap 446).

7. **Chief Engineer/Land Drainage** is responsible for the establishment of flood control strategy and flood protection standard; undertaking of drainage system planning and drainage master plan studies as well as the studies and development of the revitalisation of water bodies strategy; overseeing research and development activities; providing technical advice to government departments on drainage, flood control and sewerage planning; and studying climate change impact on drainage and promoting blue-green infrastructure with a view to building city flood resilience.

Electrical and Mechanical Branch

8. **Chief Engineer/Sewage Treatment 1** is responsible for the overall management and coordination of the operation and maintenance activities of all the

sewage collection, treatment and disposal facilities in the New Territories including all sewage pumping stations, treatment, disposal and stormwater facilities.

9. **Chief Engineer/Sewage Treatment 2** is responsible for the overall management and coordination of the operation and maintenance activities of all the sewage collection, treatment and disposal facilities provided under the Harbour Area Treatment Scheme (HATS) including all the sewage pumping stations, treatment, disposal and stormwater facilities in Kowloon, Tseung Kwan O, Kwai Chung, Tsuen Wan, Tsing Yi, Hong Kong Island, Lantau and other outlying islands.

10. **Chief Engineer/Electrical and Mechanical Projects** is responsible for the overall management of the planning, design and construction of electrical and mechanical works for sewage pumping stations, treatment, disposal and stormwater facilities. He/She is also responsible for the research and development of emerging sewage treatment technologies; and planning the utilisation of renewable energy in DSD's facilities.

Sewage Services Branch

11. **Chief Engineer/Harbour Area Treatment Scheme** is responsible for the overall administration, feasibility and engineering studies, planning, design and construction supervision of works projects, mainly involving effect to the water quality of Victoria Harbour, including HATS Stage 2A, Upgrading of San Wai Sewage Treatment Works, Enhancement Works for Kwun Tong Sewage Pumping Station and Kwun Tong Preliminary Treatment Works, Construction and Rehabilitation of Trunk Sewage Rising Mains in Cheung Sha Wan, Construction of dry weather flow interceptor at Cherry Street box culvert and Upgrading of West Kowloon and Tsuen Wan sewerage. In addition to a number of studies relating to the disinfection performance and sewage treatment process in the Stonecutters Island Sewage Treatment Works, he/she is also responsible for liaising with Environmental Protection Department in connection with the development of the HATS Stage 2B scheme.

12. **Chief Engineer/Consultants Management** is responsible for implementing different kinds of sewerage projects including provision of public sewerage systems to unsewered villages and areas as well as upgrading and rehabilitation of existing sewage rising mains, sewage pumping stations and sewage treatment works over the territory. The projects are mainly implemented by engaging consultants to carry out the investigation, planning and design of the proposed works as well as to provide services for contract administration and site supervision for the construction phase.

PWP Item No. 399DS (Part)
Relocation of Sha Tin Sewage Treatment Works to caverns –
main caverns construction and upstream sewerage works

PROJECT SCOPE

The part of **399DS** which we propose to upgrade to Category A, hereinafter collectively referred to as “Stage 2 Works”, comprises –

- (a) main cavern construction
 - (i) construction of a main caverns complex at Nui Po Shan of about 14 hectares in area;
 - (ii) construction of about 260 metres (m) long secondary access tunnel¹ to connect the main caverns complex and Mui Tsz Lam Road;
 - (iii) construction of a ventilation shaft of about 70m deep at the end of A Kung Kok Shan Road;
 - (iv) construction of ventilation ducts in the main cavern complex, including a ventilation adit of about 660 m to connect to the ventilation shaft;
 - (v) construction of about 320 m long effluent discharge tunnels² to connect the relocated Sha Tin Sewage Treatment Works in caverns (the relocated sewage treatment works to be named "Sha Tin Cavern Sewage Treatment Works" and hereinafter referred as “the cavern STSTW”) to existing effluent discharge tunnel; and
 - (vi) site formation works at the secondary access tunnel portal areas, including construction of the relevant retaining structures;

¹ The proposed main access tunnel of about 350 m long is under the scope of the Stage 1 Works, which is under construction.

² The proposed effluent discharge tunnels comprise two discharge pipes of 2.2 metres (m) in diameter.

- (b) upstream sewerage works
 - (i) construction of a new intermediate sewage pumping station (ISPS) at the south-western edge of the existing STSTW;
 - (ii) construction of about 4.6 kilometres (km) of sewage rising mains connecting the existing Sha Tin Main Sewage Pumping Station (STMSPS), the new ISPS and the main access tunnel portal area; and
 - (iii) modification of six existing pumping stations, including STMSPS, A Kung Kok Sewage Pumping Station, Ma On Shan Sewage Pumping Station, Kau To Area 56A Sewage Pumping Station, Chinese University Sewage Pumping Station, Pak Shek Kok No. 3 Sewage Pumping Station and other related upstream sewerage facilities; and
- (c) other related works³.

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

3. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed Stage 2 Works in the third quarter of 2021 for completion in the fourth quarter of 2031.

4. We will retain the remainder of **399DS** in Category B which comprises the construction of sewage treatment facilities, ancillary buildings and associated facilities in the new caverns; decommissioning and demolition of the existing STSTW; and other related works. With a view to pressing ahead for the implementation of the different stages of the Project, we will orderly seek funding for the remainder of **399DS** in a timely manner.

..... 5. A layout plan of the remainder of **399DS** is at **Annex 2 to Enclosure 2**.

³ Works in relation to and to facilitate items (a) & (b) works, including demolition and temporary re-provisioning part of the facilities in the existing STSTW, utilities diversion, road, drainage and pipe laying works, geotechnical works, construction of temporary magazine compound, removal and preservation of trees, provision of temporary traffic arrangement and environmental mitigation measures, etc.

JUSTIFICATION

6. There is a pressing need to optimise the supply of land for various uses by sustainable and innovative approaches to support social and economic development. It is the established policy of the Government to adopt a multi-pronged approach to expand land resources. One practicable approach is rock cavern development, which is a viable source of long-term land supply. In 2011, the Civil Engineering and Development Department completed a study on “Enhanced Use of Underground Space in Hong Kong”. Amongst other findings, the study has demonstrated that relocation of the existing STSTW to caverns is technically feasible and financially viable.

7. Releasing of about 28 hectares of land after relocating the existing STSTW to caverns brings multifold benefits to the communities of Sha Tin and Ma On Shan Districts as a whole. On one hand, the environment of the existing STSTW site and its surroundings will be greatly improved. In comparison with the existing open-plant arrangement, the odour management of the proposed cavern STSTW, with caverns as natural barrier, can be efficiently enhanced so as to minimise the odour impact on the surrounding communities. On the other hand, developing the vacated site for residential and other beneficial uses will bring benefits to the community by meeting the public’s needs⁴.

8. In the October 2017 Policy Agenda, the Government announced that it would strive to complete the site investigation, detailed impact assessments and detailed design for the relocation of STSTW to caverns (“the Project”) as soon as possible for early commencement of cavern construction works, reprovisioning of the facilities inside caverns and onward demolition of the existing STSTW. In February 2019, the Government responded to the report of Task Force on Land Supply that the Government would actively pursue the Project.

9. The future main caverns complex for the cavern STSTW will be the largest of its type ever built in Hong Kong. The Project is being implemented in stages as follows –

- (a) the Stage 1 Works – including mainly site preparation and main access tunnel construction that commenced in February 2019;
- (b) the Stage 2 Works – the proposed works to seek for upgrading in this submission as detailed in the paragraph 1 above;

⁴ The future land uses of the existing STSTW site to be vacated will be separately considered under a planning and engineering study focusing on the planning and development of the vacated site, in which appropriate development and land uses schemes will be formulated for further consultation with the public and stakeholders.

- (c) the remaining works – including mainly construction of sewage treatment facilities in the new cavern, and decommissioning and demolition of the existing STSTW.

10. It is anticipated that the construction period of the Project would be about 13 years. We are implementing the Project stage by stage. Following the commencement of Stage 1 Works in February 2019, we now propose to carry out the Stage 2 Works. We will continue seeking funding approval in an orderly and timely manner and pressing ahead the remaining works.

FINANCIAL IMPLICATIONS

11. We estimate the cost of the proposed Stage 2 Works to be \$14,076.5 million in money-of-the-day (MOD) prices.

PUBLIC CONSULTATION

12. We conducted a three-stage Public Engagement (PE) exercise between 2012 to 2016 for the Project. Views from the public and the relevant stakeholders were gathered through media briefings, roving exhibitions, visits to the Stanley Sewage Treatment Works in caverns, focus group meetings with professional and environmental concern groups, community group meetings, public forum, etc. so as to build consensus on the Project. The public generally agreed that the Project could benefit the community and enhance the environment in Sha Tin as a whole, especially in the aspects of odour control and visual impact.

13. We have continuously consulted and updated the Sha Tin District Council (STDC) on the latest development of the Project since the early stage in 2012. On 10 March 2016, we consulted the Health and Environment Committee (HEC) of STDC on the Environmental Impact Assessment for the Project, the proposed environmental mitigation measures as well as the details of the blasting works for construction of caverns. On 9 May 2017, we consulted the Traffic and Transport Committee (T&TC) of STDC on the proposed road improvement works at Mui Tsz Lam Road and the proposed temporary traffic arrangement during the operation and construction of the Project. To commence the construction works of the Project, we consulted the HEC of STDC on the Project on 11 January 2018. The HEC generally supported the implementation of the Project. We briefed the HEC and the Development and Housing Committee of STDC on the latest Project progress and the plan of commissioning the cavern STSTW

in 2029 on 10 January 2019 and 30 June 2020 respectively.

14. We gazetted the proposed upstream sewerage works under the Water Pollution Control (Sewerage) Regulation (Cap. 358AL) on 8 March 2019. No objection was received during the statutory objection period. The proposed upstream sewerage works were subsequently authorised on 31 May 2019.

15. In response to the suggestions of STDC members during the PE exercise, a community liaison group (CLG) was established in 2017 to enhance and streamline the communication between the project team and the nearby stakeholders. Two CLG meetings to collect the stakeholders' view were held on 11 December 2017 and 24 April 2019 respectively. During the construction phase of Stage 1 Works, we have been keeping a close communication with the relevant stakeholders to listen to their views. We will continue to conduct CLG meetings, update STDC regularly on the Project progress as well as to maintain close communication with the public and relevant stakeholders.

ENVIRONMENTAL IMPLICATIONS

16. The construction and operation of the cavern STSTW is a designated project (DP)⁵ under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap.499) and an environmental permit (EP) is required. The Environmental Protection Department approved the Environmental Impact Assessment (EIA) Report for the above cavern STSTW under EIAO in November 2016, and issued an EP for their construction and operation in March 2017. The EIA Report concludes that the environmental impact of the construction and operation of the cavern STSTW can be controlled to within the criteria under EIAO and the Technical Memorandum on EIA Process. Since the commencement of Stage 1 Works, we have been implementing the environmental mitigation measures and environmental monitoring and audit (EM&A) programme recommended in the approved EIA Report, and comply with the relevant conditions under the EP and other statutory requirements for environmental protection.

17. For short-term environmental impacts during construction of the proposed Stage 2 Works, the recommended mitigation measures mainly

⁵ The proposed upstream sewerage works (as detailed in paragraph 1(b) above) is not a DP under Schedule 2 of the EIAO. The Drainage Services Department completed the Preliminary Environmental Review (PER) for the proposed upstream sewerage works in December 2019. The PER concluded and the Director of Environmental Protection agreed that after implementing the recommended environmental mitigation measures, the proposed upstream sewerage works would not have any long-term adverse environmental impact.

include adoption of quiet powered mechanical equipment and temporary noise barriers to minimise construction noise impact; installation of effective dust collector at the exhaust of enclosed rock crushing plant, use of wheel washing facilities and regular water spraying for dust control; provision of on-site facility for treatment of site run-off to minimise water quality impact; and use of CLGs to maintain close communication with the community and concern groups. All necessary environmental mitigation measures and the implementation of the EM&A programme have been taken into account in the cost estimation for the proposed Stage 2 Works.

18. At the planning and design stages of the proposed Stage 2 Works, we have considered all the proposed works and construction sequences associated with the proposed Stage 2 Works to reduce the 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 in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste to public fill reception facilities (PFRF)⁶. We will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

19. At the construction stage of the proposed Stage 2 Works, 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 also 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 PFRF and landfills respectively through a trip-ticket system.

20. We estimate that the proposed Stage 2 Works will generate about 6.31 million tonnes of construction waste. Of these, we will reuse 0.14 million tonnes (2.2%) on site, reuse 5.02 million tonnes (79.6%) on other construction and/or suitable site(s), deliver 1.04 million tonnes (16.5%) of inert construction waste to PFRF for subsequent reuse, and deliver 0.11 million tonnes (1.7%) of non-inert construction waste to landfill sites for disposal. The total cost for disposal of construction waste at PFRF and landfill sites for the proposed Stage 2 Works is estimated to be about \$95.8 million (based on a unit charge rate of \$71 per tonne for disposal at PFRF and

⁶ PFRF are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap 354N). Disposal of inert construction waste at PFRF requires a license issued by the Director of Civil Engineering and Development.

\$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 Stage 2 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

22. The proposed Stage 2 Works do not involve resumption of private land.

TRAFFIC IMPLICATIONS

23. We have conducted a traffic impact assessment (TIA) for the Project, covering the traffic impact during both construction and operation phases. 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 network in areas concerned. The traffic impact during operation phase, after completion of the Project, has also been assessed and found to be insignificant.

24. We will consult STDC prior to the implementation of any major TTA for the Project. 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 TTA with a view to minimising the traffic impact arising from the construction works.

BACKGROUND

25. In May 2012, FC approved upgrading **379DS** “Feasibility study on relocation of STSTW to caverns” to Category A with an approved project estimate of \$57.9 million in MOD prices for carrying out the feasibility study (FS). The FS commenced in May 2012 and completed in May 2014.

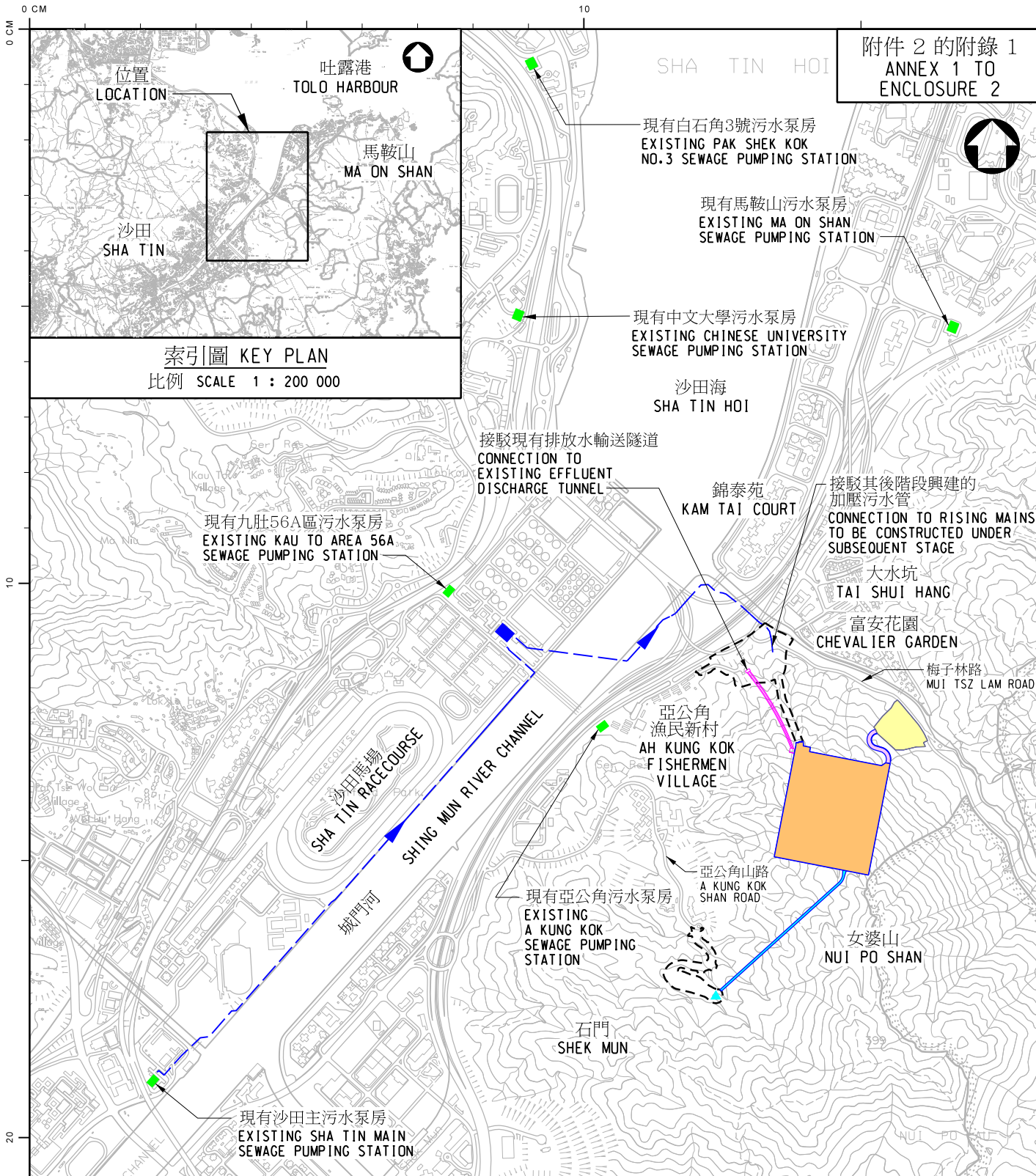
26. We upgraded **399DS** to Category B in September 2013.
27. In July 2014, FC approved the upgrading of part of **399DS** to Category A as **407DS** “Relocation of Sha Tin sewage treatment works to caverns – consultants’ fees and investigation” at an approved project estimate of \$637.7 million in MOD prices for carrying out site investigation, surveys, impact assessments and detailed design for the Project.
28. In September 2014, we engaged consultants to undertake various impact assessments including EIA, TIA, etc. and detailed design for the Project. We also engaged contractors to carry out ground investigation for the Project. The ground investigation works have been completed.
29. In October 2018, FC approved the upgrading of Stage 1 Works of **399DS** to Category A as **425DS** “Relocation of Sha Tin Sewage Treatment Works to Caverns – site preparation and access tunnel construction” at an approved project estimate of \$2,077.5 million in MOD prices for carrying out the Stage 1 Works which were subsequently commenced in February 2019.
30. We have substantially completed the detailed design of the proposed Stage 2 Works.
31. Of the 1 047 no. of trees within the boundary of and affected by the proposed Stage 2 Works, 692 no. of trees will be retained. The proposed works will involve the removal of 355 no. of trees, including 215 no. of trees to be felled and 140 no. of trees to be transplanted. All trees to be removed are common trees that are not important trees⁷. We will incorporate planting proposal under the proposed works as part of the Project, including estimated quantities of 457 no. of trees and 3 214 seedling trees.

⁷ “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 important persons or events;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height or canopy spread equal or exceeding 25 m.

WAY FORWARD

32. We plan to seek funding approval from the FC for upgrading **part of 399DS** to Category A after consulting the Public Works Subcommittee. Members are invited to comment on the above proposals.

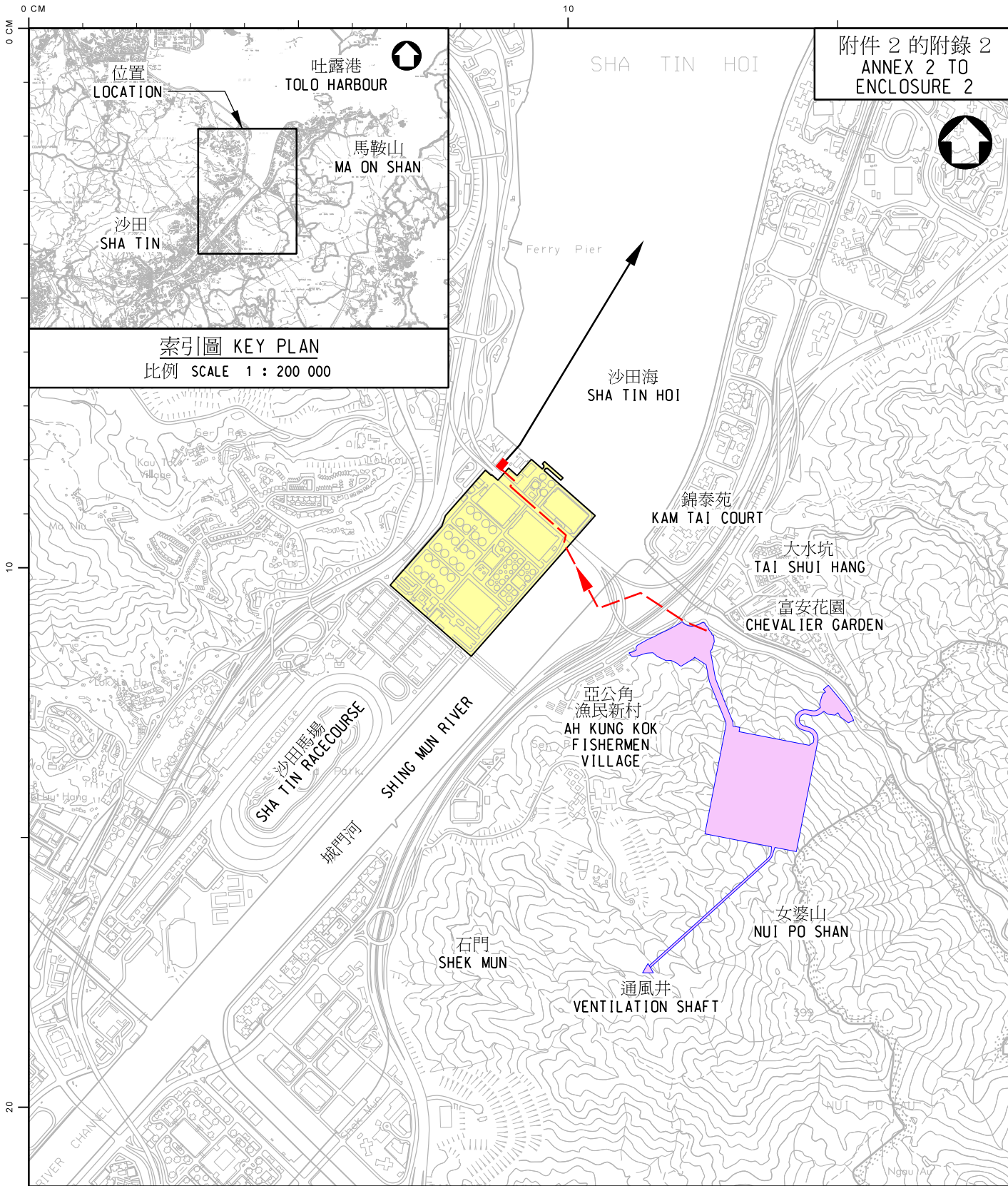


圖例 LEGEND:

- [- - -] 工地開拓、主連接隧道及連接道路工程 (於第一階段工程進行)
- [---] SITE PREPARATION, MAIN ACCESS TUNNEL AND ACCESS ROAD CONSTRUCTION (UNDER STAGE 1 WORKS)
- 主體岩洞建造 (於第二階段工程進行)
- MAIN CAVERNS CONSTRUCTION (UNDER STAGE 2 WORKS)
- 擬建主體岩洞 PROPOSED MAIN CAVERNS COMPLEX
- 擬建通風井 PROPOSED VENTILATION SHAFT
- 擬建副連接隧道 PROPOSED SECONDARY ACCESS TUNNEL
- 擬建排放水輸送隧道 PROPOSED EFFLUENT DISCHARGE TUNNELS
- 擬建通風坑道 PROPOSED VENTILATION ADIT
- 擬建在副連接隧道入口處進行的工地平整工程 PROPOSED SITE FORMATION WORKS AT THE SECONDARY ACCESS TUNNEL PORTAL AREAS
- 上游污水收集系統工程 (於第二階段工程進行)
- UPSTREAM SEWERAGE WORKS (UNDER STAGE 2 WORKS)
- 擬改裝現有污水泵房 EXISTING SEWAGE PUMPING STATIONS TO BE MODIFIED
- 擬建中途污水泵房 PROPOSED INTERMEDIATE SEWAGE PUMPING STATION
- 擬建加壓污水管 PROPOSED SEWAGE RISING MAINS

圖則名稱 drawing title	版 no.	日期 date	修改項目 description	簡簽 initial	
工務工程計劃項目第399DS-2號 搬遷沙田污水處理廠往岩洞 - 主體岩洞建造及上游污水收集系統工程 PWP ITEM NO. 399DS-2 RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - MAIN CAVERNS CONSTRUCTION AND UPSTREAM SEWERAGE WORKS	SIGNED	S. C. NG	16 OCT 2020	DST/399DS/61061	
	核對	checked	日期 date		
	SIGNED	C. C. CHAN	16 OCT 2020	日期 date	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	SIGNED	C. L. LO	

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A4 297x210



附件 2 的附錄 2
ANNEX 2 TO
ENCLOSURE 2

位置
LOCATION

吐露港
TOLO HARBOUR

馬鞍山
MA ON SHAN

沙田
SHA TIN

索引圖 KEY PLAN
比例 SCALE 1 : 200 000

沙田海
SHA TIN HOI

錦泰苑
KAM TAI COURT

大水坑
TAI SHUI HANG

富安花園
CHEVALIER GARDEN

沙田馬場
SHA TIN RACE COURSE

城門河
SHING MUN RIVER





亞公角
漁民新村
AH KUNG KOK
FISHERMEN
VILLAGE


石門
SHEK MUN

女婆山
NUI PO SHAN

通風井
VENTILATION SHAFT

圖例 LEGEND:

-  擬建污水處理設施裝置工程
PROPOSED SEWAGE TREATMENT FACILITIES INSTALLATION
-  現有沙田污水處理廠解除運作及拆卸工程
DECOMMISSIONING AND DEMOLITION OF EXISTING SHA TIN SEWAGE TREATMENT WORKS
-  擬建緊急排放管道及接駁現有排水出口
PROPOSED EMERGENCY DISCHARGE PIPES AND CONNECTION TO EXISTING OUTFALL
-  現有緊急排水出口
EXISTING EMERGENCY OUTFALL

圖則名稱 drawing title	繪畫 drawn	日期 date	修改項目 description	簡簽 initial
工務工程計劃項目第399DS-3號 搬遷沙田污水處理廠往岩洞 - 餘下工程 PWP ITEM NO. 399DS-3 RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS	SIGNED L. Y. CHOW	16 OCT 2020	DST/399DS/61051	比例 scale 1:20000 OR AS SHOWN
	核對 checked	日期 date		
	SIGNED C. C. CHAN	16 OCT 2020	保留版權 COPYRIGHT RESERVED	 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	SIGNED C. L. LO	16 OCT 2020	

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