For discussion
on 15 July 2024

Legislative Council Panel on Development

PWP Item No. 4399DS
Relocation of Sha Tin Sewage Treatment Works to caverns

PURPOSE

This paper briefs Members on the proposal to upgrade the remainder of **4399DS** to Category A for carrying out the remaining works of the relocation of Sha Tin Sewage Treatment Works (STSTW) to caverns project ("the Project"), which mainly comprise the construction and installation of sewage treatment facilities for the relocated STSTW in caverns ("Cavern STSTW"), at an estimated cost of about $15,648.4 million in money-of-the-day (MOD) prices.

PROJECT SCOPE AND NATURE

2. The remainder of **4399DS**, which we propose to upgrade to Category A, hereinafter referred to as "remaining works", comprises –

(a) construction and installation of sewage treatment facilities of the proposed Cavern STSTW with a design treatment capacity of 340 000 cubic metres per day at secondary sewage treatment level;

(b) construction and installation of fire services, building services and related electrical and mechanical (E&M) facilities of the proposed Cavern STSTW;

(c) construction of two workshop buildings at the main access tunnel portal of the proposed Cavern STSTW mainly for the maintenance of sewage treatment facilities;

(d) demolition and land decontamination of the existing STSTW; and

(e) other related works[1].

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[1] Other related works include utilities diversion, road, drainage and landscape works, trees removal and preservation, woodland compensatory planting, implementation of temporary traffic measures, etc. ancillary to the construction of the Cavern STSTW.

3. A layout plan of the proposed remaining works and artistic impression of the buildings at the main access tunnel portal are at **Enclosure 1**. Layout plans and isometric views of the sewage treatment facilities inside caverns are at **Enclosure 2**.

4. The relocation of STSTW to caverns project is mega in scale and complex, covering various professional disciplines and works of different nature. These diverse works components in the Project are interrelated and their implementation has to be in stages, and in proper and timely paces. With a view to shortening the overall delivery period of the Project, we have packaged the diverse works components, according to their implementation sequences, into four stages of construction. There is also a high degree of time overlap among these construction stages, proceeding in a way that the works in the subsequent stages can promptly commence once the site conditions of the preceding construction stage permit.

5. The Project commenced in 2019 to carry out site preparation at the main access tunnel portal and main access tunnel construction (Stage 1 Works). While the aforementioned works were still ongoing, the construction of a main caverns complex of about 2.3 million cubic metres in total volume promptly commenced in 2021 (Stage 2 Works). The caverns constructed by blasting would take several years to complete due to the enormous size. Moreover, the construction of the cavern ventilation system and buildings at the access tunnel portal areas (Stage 3 Works) are in progress, including foundation works for the buildings and design of the cavern ventilation system. According to the programme, the construction of their main structures will commence in 2025 for completion in 2029.

6. Upon obtaining funding approval from the Finance Committee (FC) for the Remaining Works, we will commence the detailed design and procurement of the civil engineering works and electrical and mechanical engineering works of the cavern sewage treatment facilities. After the substantial completion of the main caverns complex in 2026, the works sites inside caverns will be handed over in phases for the immediate commencement of the proposed construction and installation of sewage treatment facilities. We strive to start system testing and commissioning procedures as early as possible with the target to complete the reprovisioning of the STSTW to caverns in 2029. The demolition of the existing STSTW will be carried out subsequently, with the aim of releasing the site in

2031. The project implemention programme is at **Enclosure 3**. In order to achieve this objective smoothly, the multi-disciplinary project team has been working in a collaborative manner from the outset of the Project, carrying out works of different nature inside and outside the caverns according to an implementation programme with a high degree of time overlap. To meet the project programme, we have invited tenders in parallel for part of the remaining works[2] to enable early commencement of the proposed works. The contracts will only be awarded upon obtaining the FC's funding approval.

JUSTIFICATION

7. 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 suitable for development of caverns. The hillside at the urban fringes generally has good road networks, as well as other infrastructure (such as sewerage, water supply and electricity supply), and is suitable for strategic cavern development.

8. Relocating the existing STSTW to caverns brings multifold benefits to Sha Tin and Ma On Shan Districts and the society as a whole. On one hand, the environment of the existing STSTW site and its surroundings will be greatly improved given that sewage treatment facilities of the Cavern STSTW will be installed inside caverns and the existing STSTW will be demolished. The proposed Cavern STSTW will have caverns acting as a natural barrier, together with fully enclosed sewage treatment facilities in addition to deodourising units and a cavern ventilation system designed to operate at negative pressure. Thus, in comparison with the existing STSTW with open-plant arrangements, the proposed Cavern STSTW can efficiently enhance the odour management so as to minimise the impact on the surrounding communities arising from the operation of the sewage treatment works.

9. On the other hand, the STSTW has been in service since 1982, and will have been in operation for nearly 50 years by 2030. If the STSTW is

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[2] The proposed remaining works will be carried out under several works contracts. Tenders for the contract in respect of the civil works for sewage treatment facilities and associated works were invited in March 2024. Tenders for contracts in respect of E&M works for sewage treatment facilities will be invited within 2024, whereas tenders for the contract in respect of the demolition and land decontamination of the existing STSTW will be invited at an opportune time.

not relocated to caverns, substantial refurbishment, reconstruction and upgrading works will have to be implemented for the civil structures, sewage treatment facilities and E&M equipment of the existing STSTW. Carrying out refurbishment works within the limited space of the existing STSTW while maintaining the sewage treatment operation will be highly difficult. By taking the opportunity to relocate the STSTW to caverns, we will adopt more advanced technologies in the proposed Cavern STSTW and have a comprehensive refurbishment of the facilities, with a view to enhancing the operational efficiency and providing better sewage treatment services to the local public, while the existing site can also be released for other more beneficial uses[3]. The proposed Cavern STSTW is a secondary sewage treatment works with a design treatment capacity of 340 000 cubic metres per day, which will be sufficient to meet the long-term development needs.

10. The Project is being implemented in stages as follows –

(a) the Stage 1 Works – mainly include site preparation and main access tunnel construction that commenced in February 2019 and completed in April 2022;

(b) the Stage 2 Works – mainly include main caverns construction and upstream sewerage works that have progressively commenced since July 2021 for completion in 2031[4];

(c) the Stage 3 Works – mainly include buildings, cavern ventilation system and emergency bypass construction that commenced in August 2023 for completion in 2029; and

(d) the remaining works – as detailed in paragraphs 2 and 6 above.

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[3] Following the revival of the Ma Liu Shui reclamation project as announced in the 2021 Policy Address which, together with the land to be vacated by the relocation of STSTW to caverns, can provide new land mainly for innovation and technology development. The Hong Kong Science and Technology Parks Corporation is now conducting a preliminary study in this regard, which is expected to be completed within 2024. Further information about the proposal will be available by then.

[4] The construction of the main caverns complex under the Stage 2 Works is anticipated to substantially complete in 2026, whereas major parts of the upstream sewerage works will complete in stages by 2029 to facilitate the testing and commissioning of the Cavern STSTW. Part of the upstream sewerage works involve re-alignment of the rising mains within the existing STSTW site. These works can only commence after the decommissioning of the existing STSTW in 2029 and are expected to be completed in 2031.

FINANCIAL IMPLICATIONS

11. We estimate the cost of the proposed remaining works to be about $15,648.4 million in MOD prices. The breakdown of the estimated cost in percentage is as follows –

	Remaining works of PWP Item No. **4399DS**
(a) Sewage treatment facilities for the Cavern STSTW	About 65%
(b) Fire services, building services and related E&M facilities for the Cavern STSTW	About 10%
(c) Workshop buildings of the Cavern STSTW	About 4%
(d) Demolition and land decontamination of the existing STSTW	About 5%
(e) Other related works	About 1%
(f) Consultants' fees, remuneration of resident site staff and contingencies of the works project	About 15%

PUBLIC CONSULTATION

12. We conducted a three-stage Public Engagement exercise between 2012 to 2016 for the Project. Views from the public and the relevant stakeholders were gathered through channels including media briefings, roving exhibitions, focus group meetings with professional and environmental concern groups, community group meetings and 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. As regards the implementation arrangements of the overall Project as well as the commencement of the construction works, we consulted the Health and Environment Committee of STDC on 11 January 2018. With a view to providing the latest progress of the Project, we also briefed the relevant Committees of STDC on 10 January 2019, 30 June and 3 November 2020, 29

June 2021, 18 January 2022, 17 January 2023 and 27 February 2024. The STDC generally supported the implementation of the Project and provided comments on the Project.

14. To enhance the communication between the project team and the different stakeholders in the neighbourhood and to exchange views on issues of concern to them, a community liaison group (CLG) was established in 2017. Since then, six CLG meetings have been held, and the latest one was held on 23 February 2024. As the Project proceeds, we will continue to update STDC regularly on the progress of the Project as well as to conduct CLG meetings in order to maintain close communication with the public and relevant stakeholders.

ENVIRONMENTAL IMPLICATIONS

15. The Cavern STSTW is a designated project under Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499) and an environmental permit (EP) is required for its construction and operation. The Environmental Protection Department approved the Environmental Impact Assessment (EIA) Report for the Cavern STSTW under EIAO in November 2016, and issued an EP for its construction and operation in March 2017, which was subsequently amended in August 2022. The EIA Report concludes that the environmental impact of the construction and operation of the Cavern STSTW can be controlled within the criteria under EIAO and the Technical Memorandum on EIA Process. Since the commencement of the Project, we have been complying with the relevant conditions under the EP and other statutory requirements for environmental protection, and implementing the environmental mitigation measures together with environmental monitoring and audit (EM&A) programme.

16. During the construction of the proposed remaining works, the recommended environmental mitigation measures mainly include adoption of quiet powered mechanical equipment and erection of temporary noise barriers to minimise noise impact; water-spraying of the construction site regularly and provision of wheel washing facilities for dust control; and collection and treatment of site runoff through temporary drains before discharge to avoid polluting the surrounding environment. We have allowed part of the project estimate of the proposed remaining works for the implementation of the necessary environmental mitigation measures and EM&A programme.

17. At the planning and design stages of the proposed remaining works, we have considered the construction methods to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil and rock fill) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities (PFRFs)[5]. 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.

18. At the construction stage of the proposed remaining works, we will require the contractor to submit for the Government's approval a plan setting out waste management measures, which will include appropriate mitigation mesures 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 construction waste and non-inert construction waste at PFRFs and landfills respectively through a trip-ticket system.

19. We estimate that the proposed remaining works will generate in total about 1 782 600 tonnes of construction waste. Of these, we will reuse about 762 900 tonnes (42.8%) of inert construction waste on site and deliver about 984 000 tonnes (55.2%) of inert construction waste to PFRFs for subsequent reuse. We will dispose of the remaining 35 700 tonnes (2.0%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRFs and landfills is estimated to be about $77.0 million for the proposed remaining works, based on a unit charge rate of $71 per tonne for disposal at PFRFs 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 remaining works will not affect any heritage sites, i.e. all declared monuments, proposed monuments, graded historic sites / buildings /

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

structures, sites of archaeological interest, all sites / buildings / structures in the new list of proposed grading items; and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

21. The proposed remaining works do not involve resumption of private land.

TRAFFIC IMPLICATIONS

22. We have completed a traffic impact assessment for the Project, covering the traffic impact during both construction and operation phases of the Cavern STSTW. According to the findings of the assessment, with the implementation of appropriate temporary traffic management measures, the construction works will not cause significant impact on the traffic network in the adjacent areas. After completion of the Project, the traffic impact on the surrounding areas during operation phase of the Cavern STSTW is found to be insignificant.

23. During the construction phase, we will establish a traffic management liaison group and closely liaise with relevant departments and other stakeholders to review the proposed temporary traffic management measures with a view to minimising the traffic impact arising from the construction works. In addition, we will set up a telephone hotline for public enquiries.

BACKGROUND

24. In July 2014, the FC approved the upgrading of part of **4399DS** to Category A as **4407DS** "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.

25. In September 2014, we engaged consultants to undertake investigation studies and design for the Project. We also engaged contractors to carry out ground investigation for the Project. The relevant investigation

work and design facilitated finalisation of the project scope and the cost estimate in respect of making a funding application to the Legislative Council.

26. In October 2018, the FC approved the upgrading of Stage 1 Works of **4399DS** to Category A as **4425DS** "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 subsequently commenced in February 2019 and completed in April 2022.

27. In January 2021, the FC approved the upgrading of Stage 2 Works of **4399DS** to Category A as **4445DS** "Relocation of Sha Tin Sewage Treatment Works to Caverns – main caverns construction and upstream sewerage works" at an approved project estimate of $14,076.5 million in MOD prices for carrying out the Stage 2 Works, which have subsequently commenced progressively since July 2021 for completion in 2031.

28. In July 2023, the FC approved the upgrading of Stage 3 Works of **4399DS** to Category A as **4460DS** "Relocation of Sha Tin Sewage Treatment Works to Caverns – buildings, cavern ventilation system and associated works" at an approved project estimate of $3,123.8 million in MOD prices for carrying out the Stage 3 Works, which subsequently commenced in August 2023 for completion in 2029.

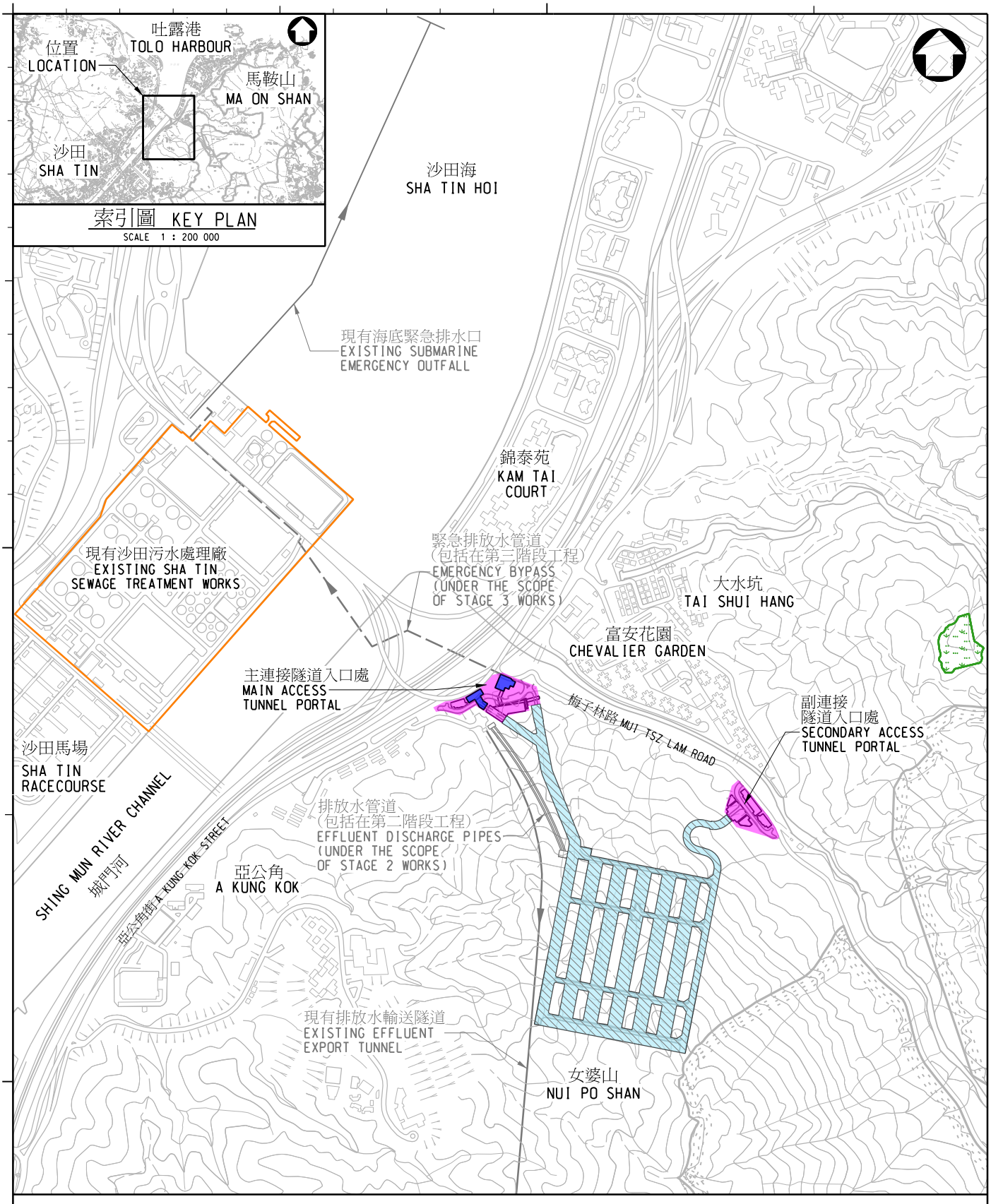
29. Of the 1 556 trees within the boundary of the proposed remaining works, all will be retained.

30. Works in different stages of the Project caused a partial loss of woodland. Woodland compensatory planting will be carried out under the remaining works (about 0.86 hectares in area, comprising approximately 760 seedling trees) in accordance with the recommendations of the EIA report.

WAY FORWARD

31. We plan to seek funding approval from the FC for the proposed remaining works after consulting the Public Works Subcommittee.

Development Bureau
Drainage Services Department
July 2024



圖例 LEGEND:

餘下工程
REMAINING WORKS:

- 擬建岩洞污水處理設施及相關工程
  PROPOSED SEWAGE TREATMENT FACILITIES AND RELATED WORKS IN CAVERNS
- 擬建工場大樓
  PROPOSED WORKSHOP BUILDINGS
- 擬建於主及副連接隧道入口處的相關工程
  PROPOSED RELATED WORKS AT MAIN AND SECONDARY ACCESS TUNNEL PORTAL AREAS
- 在現有沙田污水處理廠進行拆卸工程及在其用地進行土地除污
  DEMOLITION AND LAND DECONTAMINATION OF EXISTING SHA TIN SEWAGE TREATMENT WORKS
- 林地補償種植
  WOODLAND COMPENSATORY PLANTING

4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程（平面圖）

PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS (LAYOUT PLAN)

圖則編號 drawing no. DCP/399DS4/06032

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

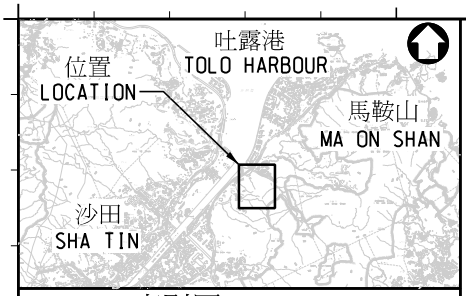
擬建於主連接隧道入口處的建築物（構思圖）
PROPOSED BUILDINGS AT MAIN ACCESS TUNNEL PORTAL (ARTISTIC IMPRESSION)

註釋：只作展述一般佈局之用，設計因實質需要或須作出修改
NOTE: FOR GENERAL ILLUSTRATION PURPOSE ONLY AND DESIGN IS SUBJECT TO CHANGE

4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（構思圖）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(ARTISTIC IMPRESSION)

圖則編號 drawing no. DCP/399DS4/06033

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



索引圖 KEY PLAN
SCALE 1 : 200 000

圖例 LEGEND:

餘下工程
REMAINING WORKS:

1 基本處理設施 PRELIMINARY TREATMENT FACILITIES
2 一級處理設施 PRIMARY TREATMENT FACILITIES
3 生物處理設施 BIOLOGICAL TREATMENT FACILITIES
4 紫外光消毒系統 ULTRAVIOLET DISINFECTION SYSTEM
5 污泥處理設施 SLUDGE TREATMENT FACILITIES
6 電力設施 ELECTRICAL FACILITIES
7 通風設備 VENTILATION EQUIPMENT
行車道及連接隧道 DRIVEWAY AND ACCESS TUNNEL
擬建工場大樓 PROPOSED WORKSHOP BUILDINGS
擬建於主及副連接隧道入口處的相關工程 PROPOSED RELATED WORKS AT MAIN AND SECONDARY ACCESS TUNNEL PORTAL AREAS

主連接隧道入口處
MAIN ACCESS TUNNEL PORTAL

亞公角街 A KUNG KOK STREET

富安花園
CHEVALIER GARDEN

梅子林路 MUI TSZ LAM ROAD

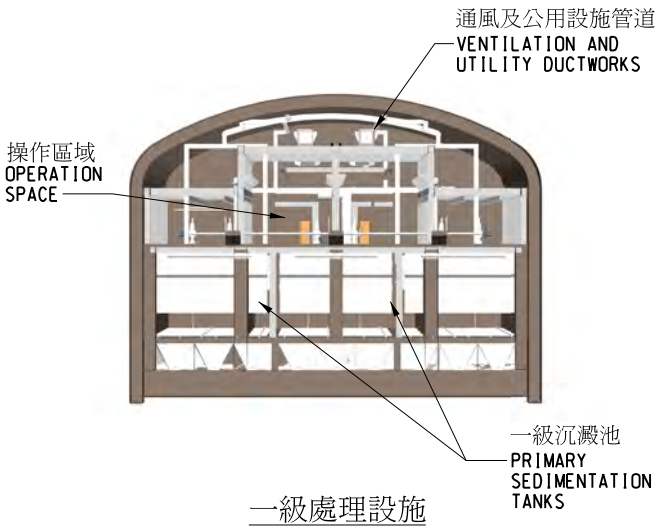
副連接隧道入口處
SECONDARY ACCESS TUNNEL PORTAL

女婆山
NUI PO SHAN

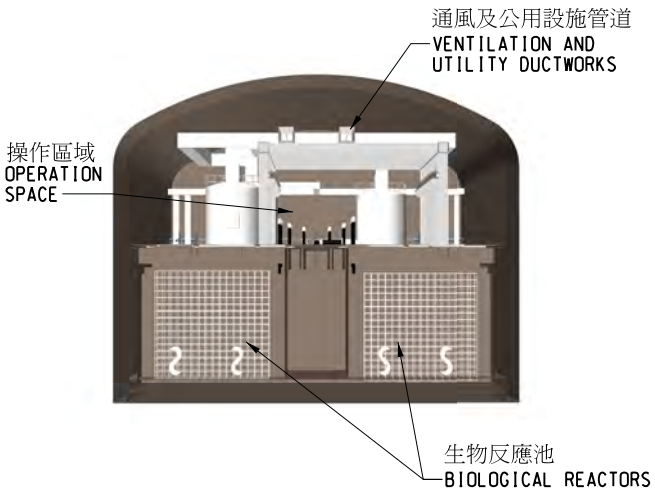
4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（岩洞內擬建污水處理設施的佈局圖）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(LAYOUT PLAN OF THE PROPOSED SEWAGE TREATMENT FACILITIES INSIDE CAVERNS)

圖則編號 drawing no. DCP/399DS4/06034

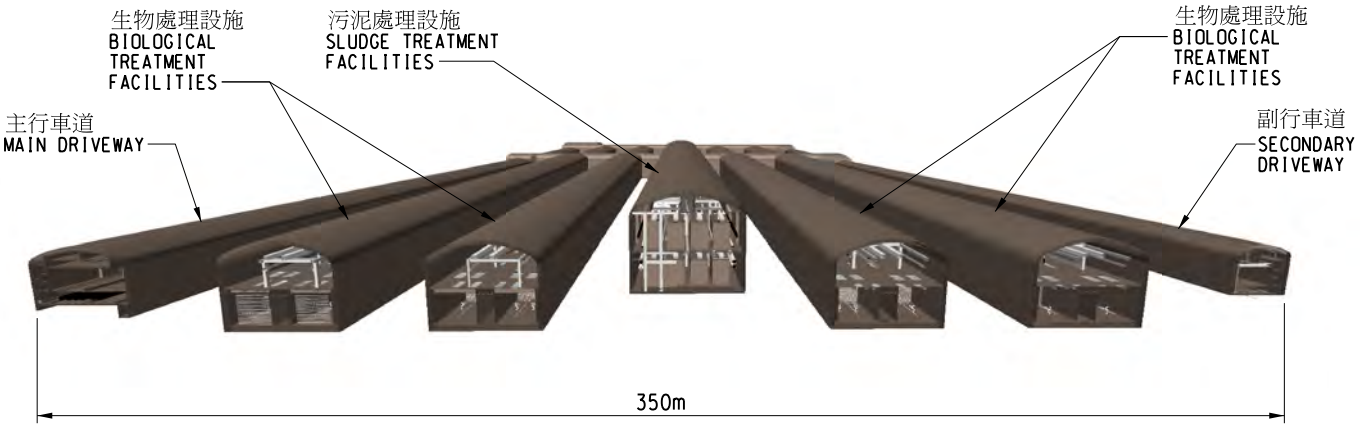
香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



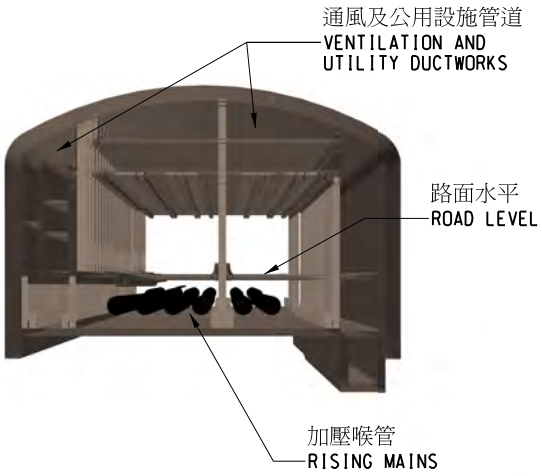
一級處理設施
PRIMARY TREATMENT FACILITIES



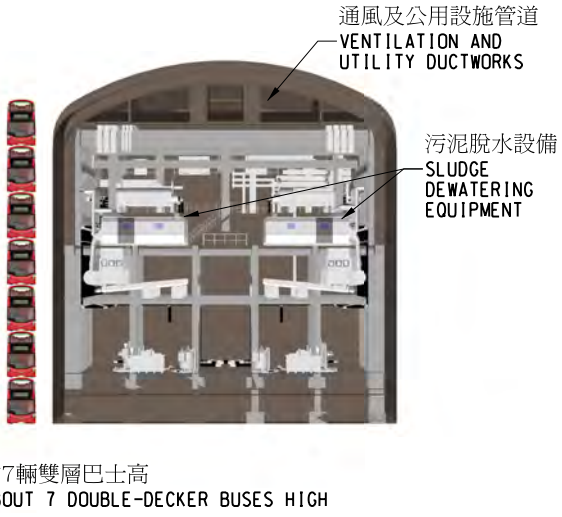
生物處理設施
BIOLOGICAL TREATMENT FACILITIES



主體岩洞建築羣
MAIN CAVERNS COMPLEX



主行車道
MAIN DRIVEWAY



污泥處理設施
SLUDGE TREATMENT FACILITIES

註釋：只作展述一般佈局之用，設計因實質需要或須作出修改
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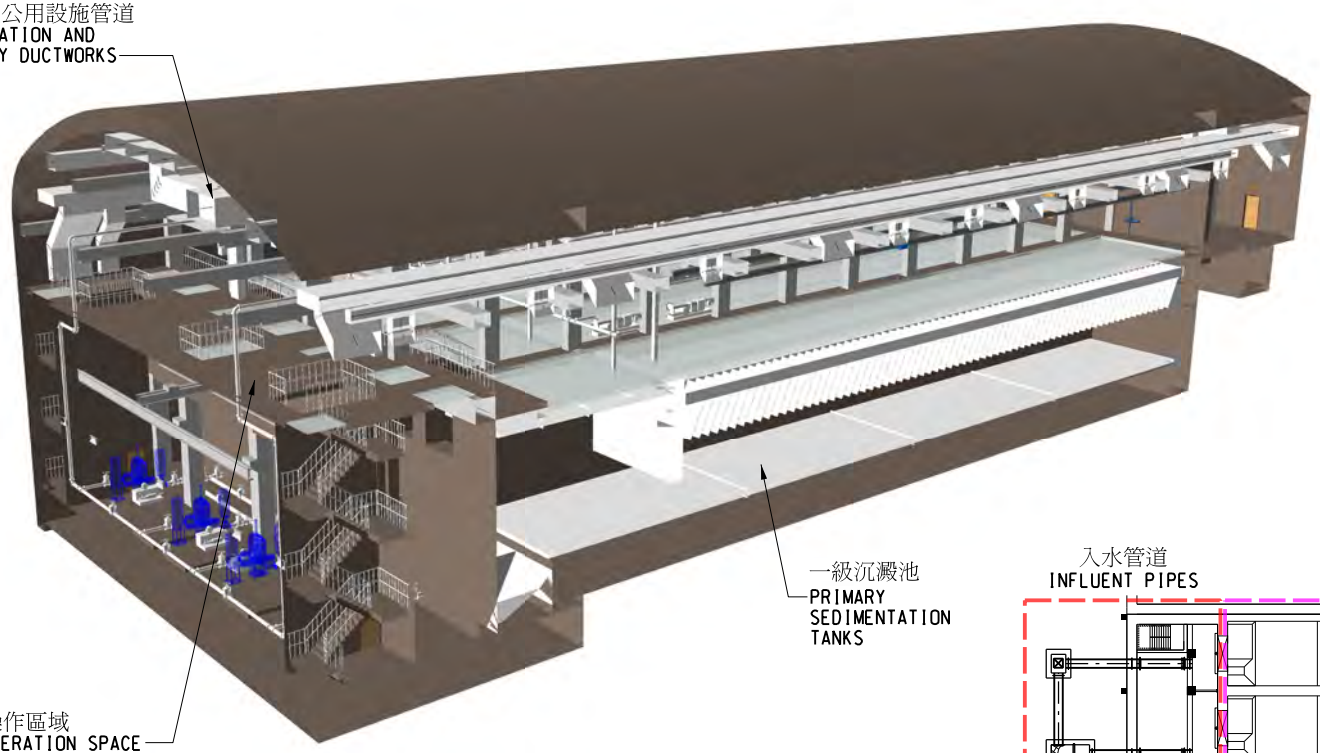
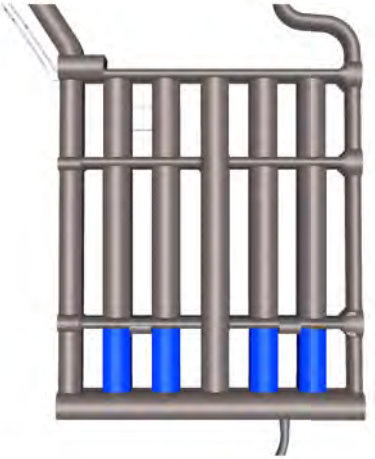
4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（岩洞內擬建污水處理設施的切面圖）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(SECTIONAL VIEWS OF THE PROPOSED SEWAGE TREATMENT FACILITIES INSIDE CAVERNS)

圖則編號 drawing no. DCP/399DS4/06035

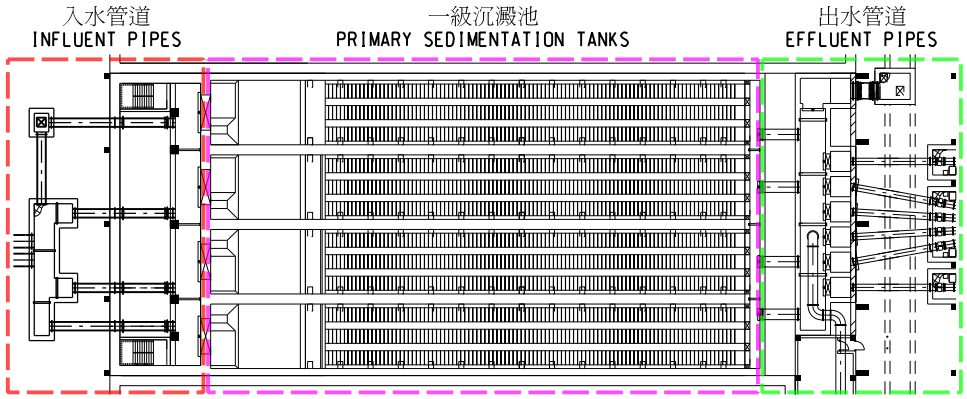
香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION



立體示意圖
ISOMETRIC VIEW



岩洞位置示意圖
LOCATION OF CAVERNS



平面圖
PLAN

註釋：只作展述一般佈局之用，設計因實質需要或須作出修改
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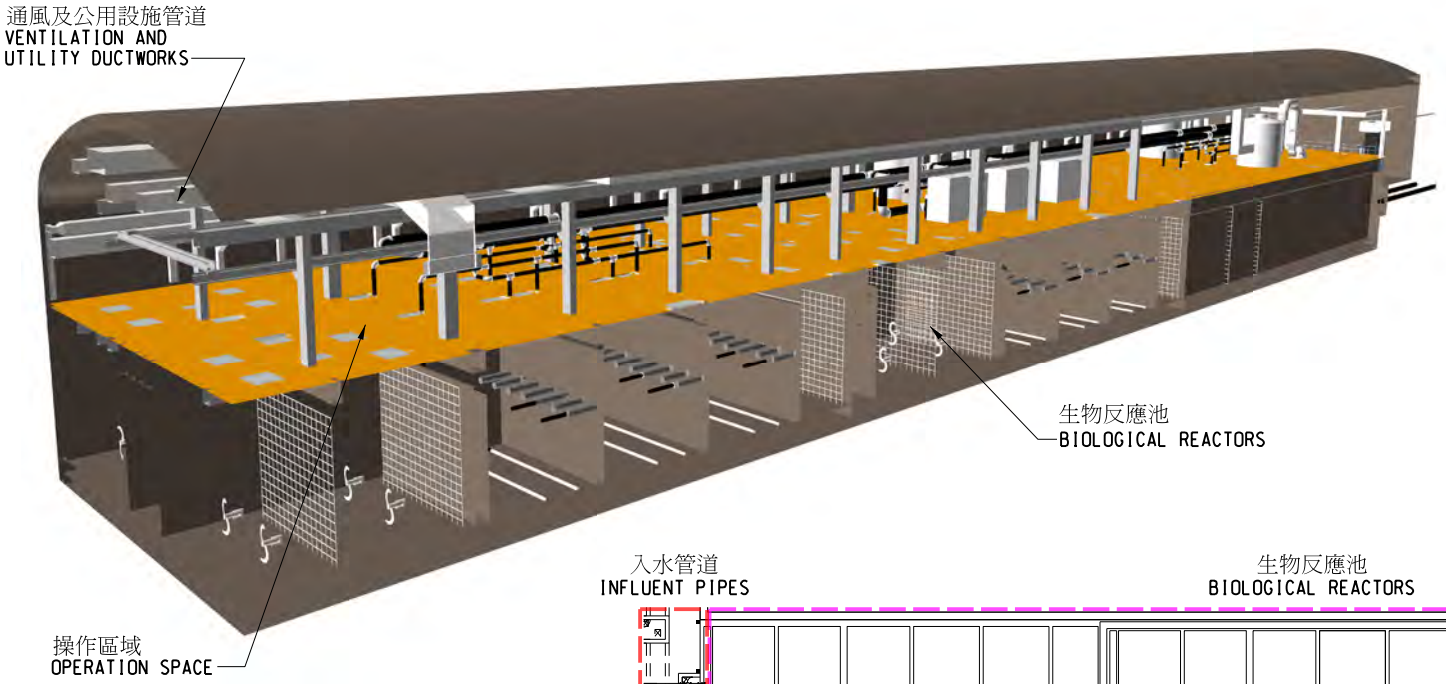
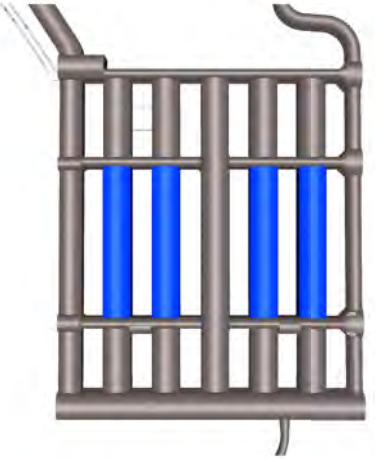
4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（岩洞內的一級處理設施）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(PRIMARY TREATMENT FACILITIES INSIDE CAVERNS)

圖則編號 drawing no. DCP/399DS4/06036

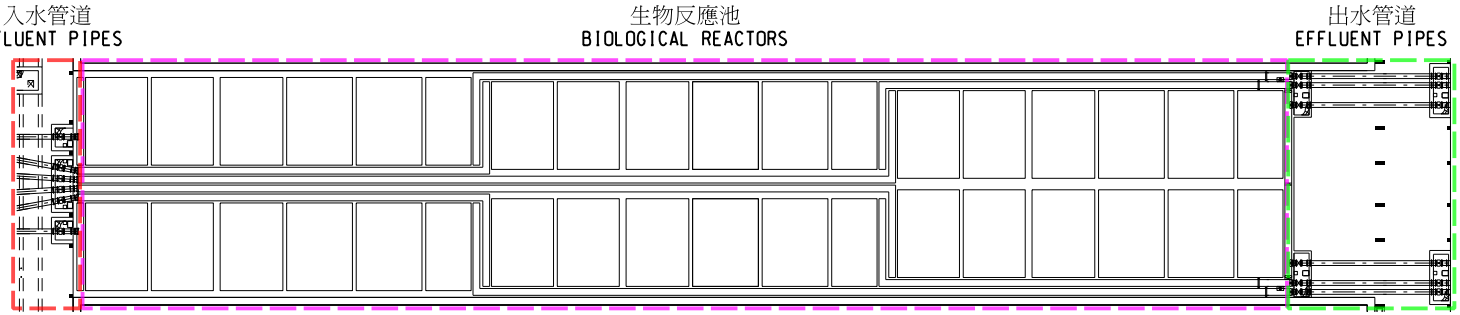
香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION



立體示意圖
ISOMETRIC VIEW



岩洞位置示意圖
LOCATION OF CAVERNS



平面圖
PLAN

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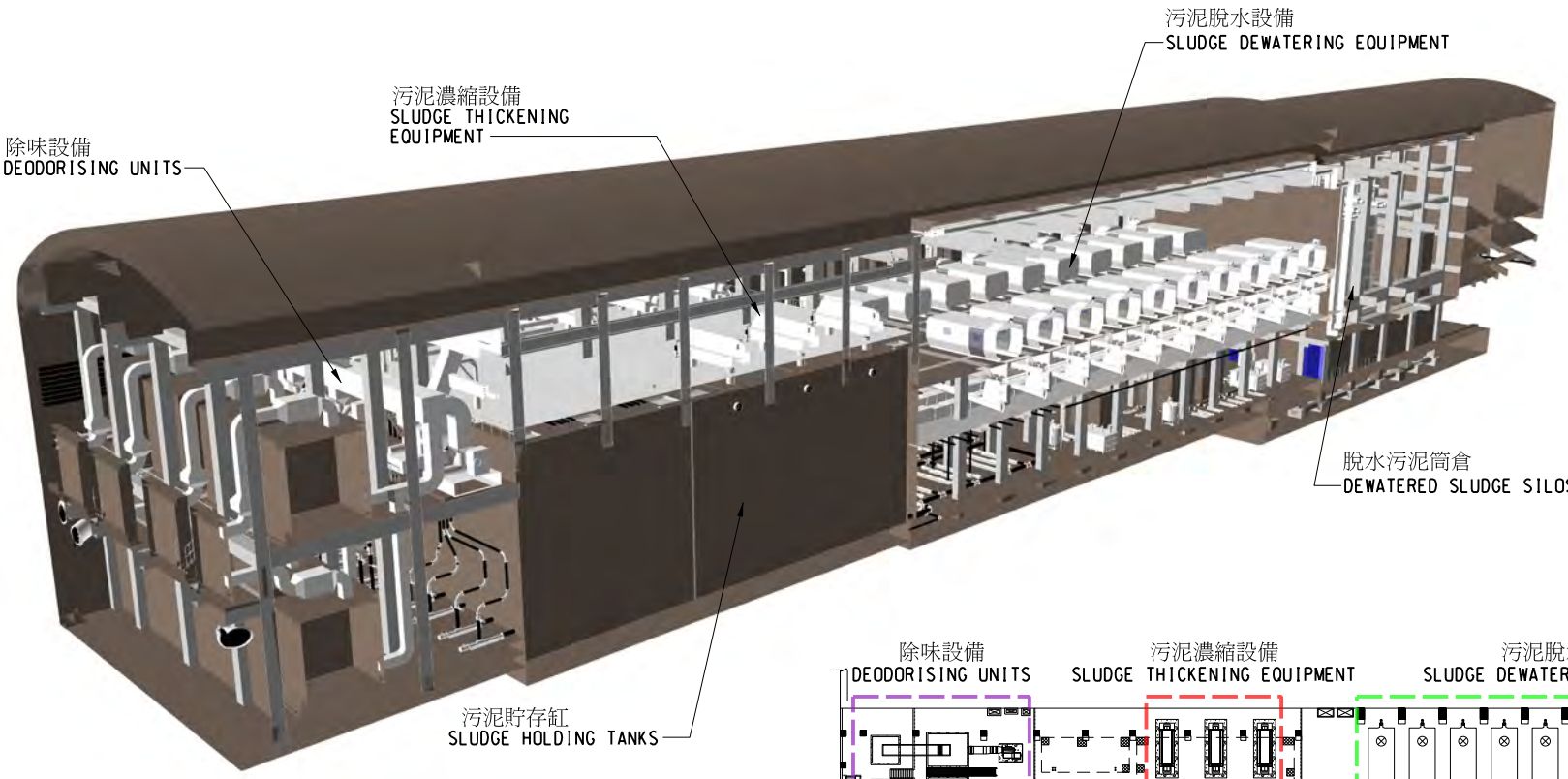
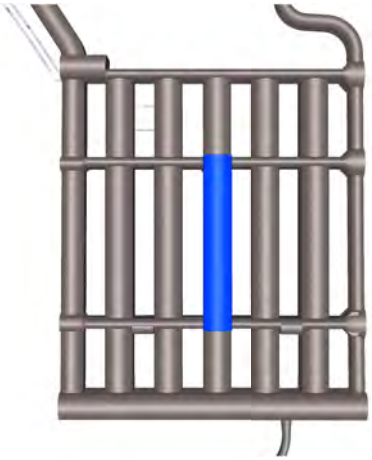
4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（岩洞內的生物處理設施）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(BIOLOGICAL TREATMENT FACILITIES INSIDE CAVERNS)

圖則編號 drawing no. DCP/399DS4/06037

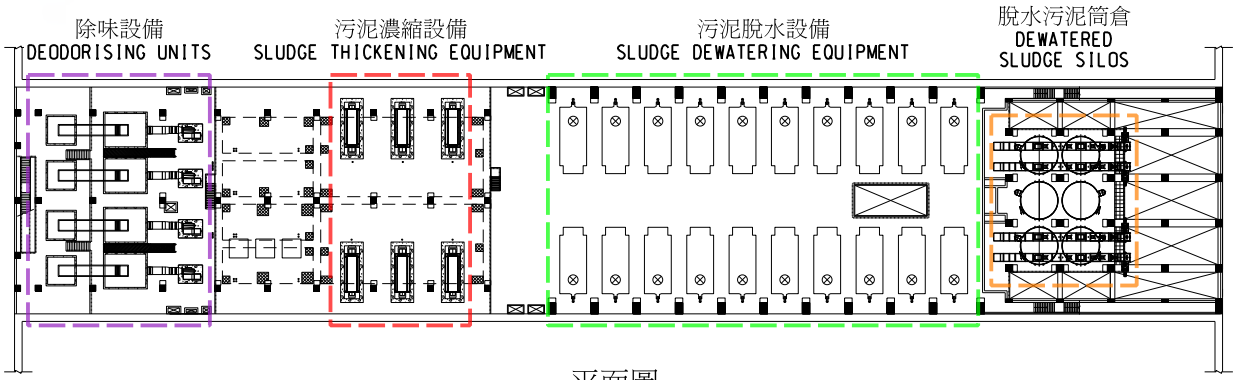
香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION



立體示意圖
ISOMETRIC VIEW



岩洞位置示意圖
LOCATION OF CAVERNS



平面圖
PLAN

註釋：只作展述一般佈局之用，設計因實質需要或須作出修改
NOTE: FOR GENERAL ILLUSTRATION PURPOSE ONLY AND DESIGN IS SUBJECT TO CHANGE

4399DS號工程計劃
搬遷沙田污水處理廠往岩洞 - 餘下工程
（岩洞內的污泥處理設施）
PWP ITEM NO. 4399DS
RELOCATION OF SHA TIN SEWAGE TREATMENT WORKS TO CAVERNS - REMAINING WORKS
(SLUDGE TREATMENT FACILITIES INSIDE CAVERNS)

圖則編號 drawing no. DCP/399DS4/06038

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整體工程推展時間表
Implementation Programme

附件 3 Enclosure 3