FORM
5

Application No. :
Reference No. :
(For official use)

FORM 5
ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE
(CHAPTER 499)
SECTION 13(1)

Application for Variation of an Environmental Permit

PART A PREVIOUS APPLICATIONS

☑ No previous application for variation of an environmental permit.

☐ The environmental permit was previously amended.

Application No. : .....

PART B DETAILS OF APPLICANT

B1. Name : (person or company)

Civil Engineering and Development Department

[Note : In accordance with section 13(1) of the Ordinance, the person holding an environmental permit or a person who assumes responsibility for the designated project may apply for variation of the environmental permit.]

B2. Business Registration No. : (if applicable) [redacted]

B3. Correspondence Address : [redacted]

B4. Name of Contact Person : [redacted]

B5. Position of Contact Person : [redacted]

B6. Telephone No. : [redacted]

B7. Fax No. : [redacted]

B8. E-mail Address : (if any) [redacted]

PART C DETAILS OF CURRENT ENVIRONMENTAL PERMIT

C1. Name of the Current Environmental Permit Holder :

Civil Engineering and Development Department

C2. Application No. of the Current Environmental Permit : AEP-591/2021

C3. The Current Environmental Permit was Issued in : month / year

0 5 / 2 0 2 1

Important Notes : Please submit the application together with

(a) 3 copies of this completed form; and

(b) appropriate fee as stipulated in the Environmental Impact Assessment (Fees) Regulation

to the Environmental Protection Department at the following address :

The EIA Ordinance Register Office,
27th floor, Southorn Centre,130 Hennessy Road,
Wan Chai, Hong Kong.

RECEIVED
- 6 JUL 2022
EIAO Register Office, E.P.D.

☐ Tick (✓) the appropriate box

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
Conditions 1.6, 1.7, 2.3, 2.8 and Figure 1 of current EP (EP-591/2021)	Environmental Review Report (ERR) •Proposed design changes for integrating the committed rock cavern development into a joint cavern complex to accommodate both the Reprovisioned Public Works Central Laboratory building (PWCL Portion) and the New Government Records Service's (GRS) Archives Centre (AC) building (AC Portion) (refers to Figure 2.1 of ERR): 1) Change of rock cavern dimensions for the PWCL Portion from approximately 2 × 25m(W) × 28m(H) × 100m(D) to approximately 2 x 36m(W) x 29m(H) x 80m(D)	The design of PWCL Portion is proposed to be integrated with the AC Portion into a joint cavern complex and development to maximize the synergy effect of these caverns in close vicinity with similar works nature and project programme. Under the integrated design and construction, construction adits/common provisions could be shared such that construction period could be minimised. This not only maximises the synergy effect of the caverns, but also minimises the duration of environmental nuisances through integrating the design and construction of committed Rock Cavern Development into a joint cavern complex. In addition, the layout design of the caverns of PWCL Portion has also been optimised in order to cater for the operational requirements and to enhance the connectivity within the cavern.	The proposed variations would not result in material change to environmental impacts with the mitigation measures in place and the Project still complies with the requirements described in the EIAO-TM.	The proposed variations would not result in adverse impacts on the environment and community. Detailed description of the potential impacts on environment and community is discussed in the enclosed ERR.	The environmental performance requirements as stated in the approved Project Profile submitted for Applications for Permission to Apply Directly for an Environmental Permit (PP for DIR) (Register No. DIR-283/2021) will not be violated due to the proposed variation.	No additional mitigation measures is required. Updated maximum allowable sound power levels for the fixed noise sources of the Project is presented in the enclosed ERR.

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

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	2) Expansion of works area southward by approximately 110m to cover construction and operation of a total of four caverns [dimensions of which are approximately 4 x 36m(W) x 29m(H) x 110m(D)], connecting with shared construction adits and separate building structures within cavern and at portal; 3) Addition of a building structure for the AC Portion of the cavern development adjacent to the portal area and building structure proposed for the PWCL Portion. •The construction programme is required to be extended to cater for the AC portion construction. Nevertheless, cavern formation works will be carried out under a fully enclosed condition after population intake of the Anderson Road Quarry Development					

PART D PROPOSED VARIATIONS TO THE CONDITIONS IN CURRENT ENVIRONMENTAL PERMIT

D1. Condition(s) in the Current Environmental Permit :	D2. Proposed Variation(s) :	D3. Reason for Variation(s) :	D4. Describe the environmental changes arising from the proposed variation(s) :	D5. Describe how the environment and the community might be affected by the proposed variation(s) :	D6. Describe how and to what extent the environmental performance requirements set out in the EIA report previously approved or project profile previously submitted for this project may be affected :	D7. Describe any additional measures proposed to eliminate, reduce or control any adverse environmental impact arising from the proposed variation(s) and to meet the requirements in the Technical Memorandum on Environmental Impact Assessment Process :
	•Provision of activated carbon or scrubber system to treat the exhaust gases from the fume hood of the new AC Building prior to discharge to avoid causing air pollution					

PART E DECLARATION BY APPLICANT

E1. I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental permit may be suspended, varied or cancelled if any information given above is false, misleading, wrong or incomplete.

[redacted] [redacted] [redacted]

Signature of Applicant | Full Name in Block Letters | Position

on behalf of Geotechnical Engineering Office, Civil Engineering and Development Department

Company Name and Chop (as appropriate)

6 July 2022

Date

NOTES :

1. A person who constructs or operates a designated project in Part I of Schedule 2 of the Ordinance or decommissions a designated project listed in Part II of Schedule 2 of the Ordinance without an environmental permit or contrary to the permit conditions commits an offence under the Ordinance and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

2. A person for whom a designated project is constructed, operated or decommissioned and who permits the carrying out of the designated project in contravention of the Ordinance commits an offence and is liable to a maximum fine of $5,000,000 and to a maximum imprisonment for 2 years.

The Government of the Hong Kong Special Administrative Region

Civil Engineering and Development Department

Joint Cavern Development at Anderson Road Quarry Site – Reprovisioning of Public Works Central Laboratory and Building of Government Records Services' Archives Centre

Environmental Review Report for Rock Cavern Development for Relocation of Public Works Central Laboratory Building and New Archives Centre

July 2022

Geotechnical Projects Division
Geotechnical Engineering Office
Civil Engineering and Development Department

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1 INTRODUCTION

1.1 Background

1.1.1 In 2015, the Civil Engineering and Development Department (CEDD) completed an Engineering Feasibility Study (EFS) under Agreement No. CE 12/2012 (GE) "Long-term Strategy for Cavern Development – Feasibility Study", which ascertained the technical feasibility of provisioning of various public facilities within caverns on the rock slopes at the Anderson Road Quarry (ARQ) site that is within the Strategic Cavern Area (SCVA) No. 28 – Tai Sheung Tok of the Cavern Master Plan (CMP).

1.1.2 The rock slopes at Tai Sheung Tok overlooking ARQ Development was selected as the most suitable location and committed for rock cavern development to accommodate the Reprovisioned Public Works Central Laboratory (PWCL) Building, which currently houses the PWCL of the CEDD, the Force Laboratory of the Innovation and Technology Commission (ITC) and the Product Testing & Dutiable Commodities (PTDC) Section of the Government Laboratory in Kowloon Bay, under Agreement No. CE13/2018 (GE) "Relocation of Public Works Central Laboratory to Caverns - Feasibility Study" (FS).

1.1.3 The committed rock cavern development covers construction and operation of two caverns, each with dimensions of 25 m(W) × 28 m(H) × 100 m(D), connecting with adits and a portal building on the north-eastern rock slopes at platform of around +195mPD adjoining the planned internal road at ARQ site and is targeted to be completed/commissioned in year 2026. As it involves construction of rock caverns and is classified as a designated project (DP) by virtue of Item Q.2 of Part 1, Schedule 2 of the *Environmental Impact Assessment Ordinance* (*EIAO*) — "Underground rock caverns". A Project Profile (PP) was submitted for Applications for Permission to Apply Directly for an Environmental Permit (DIR) (Register No. DIR-283/2021) and was approved on 27 April 2021 under the *Environmental Impact Assessment Ordinance* (EIAO). Following the approval of the DIR, the Environmental Permit (EP) (EP No: EP-591/2021), covering the construction and operation of the rock cavern development, was granted on 20 May 2021.

1.1.4 Subsequent to the completion of the FS, the design of the committed rock cavern development at ARQ site has been proceeded and reviewed under Agreement No. CE 54/2021 (GE) "Joint Cavern Development at Anderson Road Quarry Site – Reprovisioning of Public Works Central Laboratory and Building of Government Records Service's Archives Centre – Investigation, Design and Construction", with a view to minimising project interfaces and achieving better coordination in design and construction by taking advantages of the synergy prospect in shared use of space and/or common provisions. Changes in cavern sizes of the committed rock cavern development and schedule of construction programme have been identified.

1.1.5 These changes would require a variation of condition of the current EP (EP-591/2021) and the CEDD, the Project Proponent of the Project, therefore seeks approval from the Director of Environmental Protection (DEP) to vary the conditions of the current EP. AECOM Asia Co. Ltd (AECOM) has been commissioned by the CEDD to provide a supplementary review/assessment of potential environmental impacts arising from the proposed design changes.

1.2 Purpose of This Report

1.2.1 This Environmental Review Report (ERR) has been prepared to identify and assess the likely environmental issues pertinent to the proposed design changes of rock cavern development and to identify any additional environmental mitigation measures that may be required for compliance with environmental standards. The purpose of this ERR is to demonstrate that no material change to the environmental impact of the Project would be resulted from the proposed changes with the mitigation measures in place and the Project still complies with the requirements described in the EIAO-TM, such that a Variation of Environmental Permit (VEP) can be granted by the DEP without calling for an EIA report by virtue of Section 13(5) of the EIAO.

1.2.2 This report will form part of the submission to the Environmental Protection Department (EPD) for the application of a Variation to Conditions 1.6, 1.7 and 2.3, and Figure 1 of the current EP (EP-591/2021).

1.3 Report Structure

1.3.1 The remainder of the report is organised as follows:

- Section 2 presents the details and justification of the proposed variations and identifies the potential environmental aspects of concern associated with such variations.
- Sections 3 to 5 present the evaluation of potential impacts on the environment due to the proposed design changes, and proposed additional mitigation measures (if required) for compliance with the requirements in the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).
- Section 6 summarises the findings of environmental review/assessment associated with the proposed variations.
- Section 7 identifies any additional environmental monitoring and audit (EM&A) requirements.
- Section 8 presents the conclusions of this ERR.

2 PROPOSED VARIATIONS

2.1 Proposed Variations

2.1.1 The design of the committed rock cavern development on the north-eastern rock slopes at platform of around +195mPD adjoining the planned internal road at ARQ site has been refined and integrated into a joint cavern complex to accommodate both the Reprovisioned PWCL building housing the PWCL of CEDD and the PTDC of the Government Laboratory (PWCL Portion), as well as the New Government Records Service's (GRS) Archives Centre (AC) (AC Portion) building, with a view to maximising the synergy effects from shared use of space and/or common provisions and to minimising project interfaces. It is also confirmed that the Force Laboratory of the Innovation and Technology Commission (ITC) will not co-locate with the Reprovisioned PWCL Building. The following changes have been identified compared to the design adopted in the approved PP for DIR (Register No. DIR-283/2021):

- Change of rock cavern dimensions for the PWCL Portion – Taking into account the updated future tenants of the Reprovision PWCL Building, in order to cater for the operational requirements and to enhance the connectivity within the cavern, the dimensions for the caverns of the PWCL Portion have been optimised from approximately 2 × 25m(W) × 28m(H) × 100m(D) to approximately 2 x 33-36m(W) x 27-29m(H) x 80m(D) (**Figure 2.1** refers).
- Expansion of works area and rock cavern sizes - The works area is proposed to be expanded southward by approximately 110m to cover construction and operation of a total of four caverns [dimensions of which are approximately 4 x 33-36m(W) x 27-29m(H) x 80-110m(D)], connecting with shared construction adits and separate building structures within cavern and at portal (**Figure 2.1** refers). General layout plan and sections of the caverns are provided in **Appendix A.**
- Addition of a building structure for the AC Portion of the cavern development adjacent to the portal area and building structure proposed for the PWCL Portion (**Figure 2.1** refers).

2.1.2 According to the latest engineering information, volume of the caverns of the PWCL Portion (approximately 190,000 m^3) would be less than that adopted in the approved PP for DIR (approximately 230,500 m^3). Approximately 0.3 ha extended aboveground works area for additional portal building, and approximately 0.83 ha underground works area are required.

2.1.3 The majority of building structure for the PWCL Portion is proposed to be constructed by using Modular Integrated Construction (MiC) / Design for Manufacture and Assembly (DfMA) instead of the cast in-place construction method assumed in the approved PP for DIR, while the new building structure for the AC Portion would be partially constructed by MiC/DfMA due to strict operation requirement and control on environmental conditions for different repositories.

2.2 Reasons for Proposed Variations

2.2.1 The technical feasibility of the provisioning of suitable public facilities (e.g. laboratory and archives) on the north-eastern rock slopes at the ARQ site was established in the EFS conducted under Agreement No. CE 12/2012 (GE). Technical study to ascertain the suitability and technical feasibility of accommodating the AC to caverns on the north-eastern rock slopes at the ARQ site, which adjoin the site boundary of the PWCL Portion, was substantially completed by the GRS. The New AC in caverns and the associated facilities would cater for GRS' storage needs for archival records for 15-20 years after commissioning.

2.2.2 Considering the relative tentative implementation programmes as well as the synergy prospect, the Government considered it beneficial to bundle the developments of the Reprovisioned PWCL Building and New AC with a view to minimising project interfaces and achieving better coordination in design and construction.

2.2.3 The design of PWCL Portion is proposed to be integrated with the AC Portion into a joint cavern complex and development to maximize the synergy effect of these caverns in close vicinity with similar works nature and project programme. Under the integrated design and construction, construction adits/common provisions could be shared such that construction period could be minimised. This not only maximises the synergy effect of the caverns, but also minimises the

duration of environmental nuisances through integrating the design and construction of committed Rock Cavern Development into a joint cavern complex.

2.2.4 In addition to integrating the design of the PWCL Portion with the AC Portion into a joint cavern complex, the layout design of the caverns of PWCL Portion has also been optimised in order to cater for the operational requirements and to enhance the connectivity within the cavern.

2.3 Construction Works

2.3.1 As confirmed by the Engineer, the proposed design changes of the rock cavern development would not affect the construction method as adopted in the approved PP for DIR, except for the adoption of MiC/DfMA for the building structural works. While approximately 0.3 ha extended aboveground works area will be required (**Section 2.1.1** refers), same as the original works area, the additional aboveground works area within ARQ site would have also been properly formed, with bare rock face exposed after site formation works and access haul road paved, prior to the commencement of construction phase such that no major site formation works would be required.

2.3.2 Same as the construction method adopted in the approved PP for DIR, the cavern formation will commence immediately without major site formation works and the overall active works area of the cavern construction would not be greater than 2,500 m^2 at any time. The cavern construction works would be mainly carried out underground/inside rock mass or enclosed condition except for the building construction and landscaping works at the portal area. Construction adits will be initially excavated by mechanical breaking for about 20 m, followed by drill and blast method in the remaining section of construction adits and caverns. Rock plugs will be left at the portal of caverns for breaking through by mechanical method. The drill-and-blast operation will be carried out in frequency up to once a day with shelters acted as blast doors installed at all the construction adit/cavern portals to ensure that the drill-and-blast activities are undertaken underground/inside rock mass in a fully enclosed condition. The design of the shelters remains the same as that proposed in the PP for DIR that they will be installed with ventilation system equipped with dust collector (in the form of dust extraction and collection system] with at least 85% dust removal efficiency (e.g. fabric filter) for treatment before discharging into the atmosphere. Due to the relatively small scale of the underground excavations, provision of a project magazine and storage of explosives on site is not anticipated. The maximum explosives charge weight per delay will be limited according to the separation distance between the face of blasting and the sensitive receivers, and also the vibration limit of the sensitive receivers. Blasting should be carried out outside sensitive hours as far as practicable and the blasting schedule should be submitted to the concerned authority for approval prior for its implementation. The administrative and procedural control of all blasting operations in Hong Kong are vested in the Superintendent of Mines. The DGO also stipulates that no person shall carry out blasting unless he/she possesses a valid Mine Blasting Certificate to be issued by the Superintendent of Mines, who will review applications on a case–by–case basis before issuing a Mine Blasting Certificate.

2.3.3 The majority of building structure for the PWCL Portion will be constructed by MiC/DfMA instead of the cast in-place construction method as assumed in the approved PP for DIR, while the new building structure for the AC Portion would be constructed by MiC/DfMA and cast-in-place construction method due to strict operation requirement and control on environmental conditions for different repositories and associated on-site modification required. Compared to the cast-in-place construction method, MiC/DfMA would result in less construction waste generation and shorter construction period. Hence, with the adoption of MiC/DfMA, comparatively less environmental disturbance and shorter duration of nuisance to nearby sensitive receivers would be expected.

2.4 Construction Programme

2.4.1 With the integrated design and construction of PWCL Portion and AC Portion, the construction programme would be slightly extended. Construction of the Project is scheduled to commence in year 2023 for completion/commissioning in year 2026 (PWCL Portion) and year 2028 (GRS'

AC Portion) (**Appendix C** refers). The overall duration for cavern formation would be about 2 years from mid-2023 to mid-2025.

2.5 Environmental Aspects of Concern

2.5.1 A preliminary review of potential environmental impacts associated with the proposed variations has been conducted and the potential environmental impacts that require further review/assessment in this ERR have been identified as detailed below and summarised in **Table 2.1**.

2.5.2 For the proposed change to the rock cavern dimension of the PWCL Portion, given that there is no significant change to the cavern volume, location and construction method as adopted in the approved PP for DIR, no adverse environmental impacts would be envisaged and hence no material change to environmental impact would be resulted from this change. No further review of the potential environmental impacts associated with this change is therefore considered necessary.

2.5.3 Given that there are no major changes in the existing / planned land uses (currently as bare rock slope surface, refer to the site photos in **Figure 2.1**) upon completion of Schedule 3 EIA study for Development of Anderson Road Quarry (EIAO Register No. AEIAR–183/2014 approved without conditions on 28 Jul 2014) ("ARQ Development Sch.3 EIA) and no ecological or cultural heritage / archaeological resources (such as Site of Archaeological Interest (SAI), Declared Monuments and archaeological potential areas) identified within or in the vicinity of the proposed enlarged works area, no ecological impacts, cultural heritage impacts or land contamination issues would be envisaged. No further review of these potential environmental impacts is considered necessary. Nevertheless, if there are any buildings / structures both at grade level and underground which were built in or before 1969, or discovery of antiquities or supposed antiquities in the course of works, the Antiquities and Monuments Office (AMO) should be alerted in an early stage or once identified.

2.5.4 Potential environmental implications on air quality, noise, water quality, waste management implication, landscape and visual, and hazard to life associated with the proposed variations concerning the enlarged works area / cavern sizes and addition of a building structure during construction and operational phases are described below.

Construction Phase

2.5.5 As confirmed by the Engineer, there is no change to the location and construction method (except for the adoption of MiC/DfMA for building structural works) as adopted in the approved PP for DIR. The expanded works area within ARQ site would have also been properly formed and remains on existing cut slopes (currently as bare rock slope surface) parallel to the internal road at ARQ site. No major site formation works would be required under this Project and the cavern construction works would be mainly carried out underground/inside rock mass in a fully enclosed condition. As such, potential water quality impacts and landscape and visual impacts due to the proposed changes would be similar to those assessed in the approved PP for DIR. With the adoption of standard good site practices and recommended mitigation measures as presented in the approved PP for DIR, no adverse water quality, landscape and visual impacts would be anticipated and hence no material change to these impacts would be resulted from this change. No further review of these potential environmental impacts is therefore considered necessary.

2.5.6 While the cavern formation works would overlap with the population intakes at Sites R2-1 to R2-3, R2-5, R2-7, R2-8 and RS-1 (at about 77 m to 360 m from the proposed rock caverns and construction adit) based on the latest construction programme (**Section 2.4** refers) and the tentative programme of population intakes of ARQ Development (**Section 2.6** refers), there is no change to the cavern construction method as adopted in the approved PP for DIR. Drill-and-blast operation would be undertaken underground/inside rock mass fully enclosed by shelters in frequency up to once a day and the procedures (e.g. maximum explosives charge weight per delay, operation hour) is controlled by rigorous application requirement for the blasting operation (as detailed in **Section 2.3.2**) that it would effectively minimise the air overpressure and ground vibration as well as confine any possible flyrock hazard within the

blast area. Rock plugs will also be left at the portal of caverns for breaking through by mechanical method that there will be sufficient clearance between the blasting site that is fully enclosed inside rock mass and the Sites. Given such vigorous design and arrangement to control the blasting operation, adverse impact from blasting operation to the areas adjacent to the proposed caverns would not be anticipated. As such, potential noise impacts and hazard to life from blasting due to the proposed changes would be similar to those assessed in the approved PP for DIR. With the adoption of recommended mitigation measures and rigorous application requirement for the blasting operation as presented in the approved PP for DIR, no adverse impacts would be anticipated and hence no material change to potential noise impacts and hazard to life issue from blasting, would be resulted. No further review of these potential environmental impacts is therefore considered necessary.

2.5.7 The volume of the caverns of the PWCL Portion would be less than that adopted in the approved PP for DIR due to optimisation of the cavern dimension for the PWCL Portion (**Section 2.1.2** refers) and the C&D materials generated from building structural works could be reduced due to the adoption of MiC/DfMA method as compared to the cast in-place construction method assumed in the approved PP for DIR (**Section 2.1.3** refers). While additional C&D materials [approximately 187,000 m^3 inert C&D materials (mainly granite rocks) and 1,500 m^3 of non-inert C&D materials] and general refuse (approximately 29.5 kg / day) would be generated from the expansion of works area and rock cavern sizes for the construction of the AC Portion, the chemical wastes to be generated from plant and equipment maintenance is anticipated to be in the similar order of a few cubic meters per month. Similar to that in the approved PP for DIR, about 80% of the additional excavated rock would be sent to quarry and 20% would be sent to public fills reception facilities (PFRF) for recycle / beneficial reuse. A Construction and Demolition Material Management Plan (C&DMMP) following requirements as stipulated in Section 4.1.3 of Chapter 4 of the Project Administration Handbook (PAH) for Civil Engineering Works "Management of Construction and Demolition Material Including Rock" published by CEDD would be prepared based on the latest design described in **Section 2.1** of for CEDD's vetting. With the implementation of standard good site practice and recommended appropriate mitigation measures in the approved PP for DIR, no adverse impact on waste management would be anticipated and hence no material change to waste management would be resulted from this change. No further review of waste management is considered necessary.

2.5.8 While the construction method and the overall active works area of the cavern construction as assessed in the approved PP for DIR remain unchanged, the proposed design change would result in larger aboveground construction area and changes in the construction programme that overlap of the construction works with the tentative population intakes of ARQ Development is expected. Hence, further review on the potential impacts on air quality and noise during construction phase would be necessary.

Operational Phase

2.5.9 There is no change in the operation nature of the PWCL Portion or the exhaust locations for the treated and extracted gases from fumehood as assessed in the approved PP for DIR due to the proposed variations in cavern dimensions of PWCL Portion.

2.5.10 For the AC Portion, it will accommodate the archival storage facilities for government archival records with public inspection service to be managed by the GRS. Based on the operation of the existing Hong Kong Public Records Building, the AC Portion would also include house records conservation and preservation facilities (e.g. laboratory, conservation wet treatment room, dark room, fumigation chamber etc.) for the preservation, conservation treatment and maintenance of archival records (e.g. papers, photographic films, microfilms etc.), which would be similar nature as general laboratory works. Nonetheless, fumehood and / or separate ventilation system would be provided at the records conservation and preservation facilities for optimised environmental control (i.e. climatic conditions) for the treatment / maintenance of records. Provided that the activated carbon or scrubber will be equipped to treat the exhaust gases from fumehood / separate ventilation system of the records conservation and preservation facilities prior to discharge to minimise any potential nuisance from its operation, the operation of the AC facilities would not constitute a significant air pollution source and no

adverse operational air quality impact would be anticipated. Likewise, while small quantities of Dangerous Goods (DGs) such as chemicals, organic solvents, etc. would be used and stored in the AC Portion for records conservation and preservation. Given that any DG store for the operation of AC Portion will apply for a DG license under the *Dangerous Goods Ordinance (Cap. 295)* and will provide adequate safety precautionary measures as per FSD's requirements, no significant off-site hazard to life impacts would be anticipated. No further review of these potential environmental impacts is considered necessary.

2.5.11 Given the archival nature of the facility, limited amount domestic sewage (approx. 10 m^3 per day) and general refuse (approx. 300 kg per day) would be generated by workers of the AC Portion. Provided that adequate sewerage and sewage treatment facilities are properly implemented under the Development of Anderson Road Quarry Site (ARQ Development) to accommodate all the sewage effluents, and that the general refuse generated would be handled, transported and disposed of using the methods and good site practices and any chemical wastes from the records conservation and preservation facilities would handled, stored and disposed of at the CWTC at Tsing Yi or other licensed facility properly and in accordance with the Waste Disposal (Chemical Waste) (General) Regulation as adopted in the approved PP for DIR, adverse impacts on water quality or waste management would not be envisaged and hence no material change to water quality impact or waste management would be resulted from this change. No further review of these potential environmental impacts is considered necessary.

2.5.12 In view of the addition of a building structure for the AC Portion, potential fixed plant noise impacts, and landscape and visual impacts associated with the change would be further assessed.

Table 2.1 Summary of Potential Environmental Impact Associated with the Proposed Variations

Potential Environmental Impact	Construction Phase*	Operational Phase*
Air Quality	√	x
Noise	√ (1)	√
Water Quality	x	x
Waste Management Implication	x	x
Ecology	x	x
Landscape and Visual	x	√
Land Contamination	x	x
Cultural Heritage	x	x
Hazard to Life	x	x

Notes:
* – No adverse environmental impacts from the change of the rock cavern dimension.
√ – Potential impact to be further reviewed in this ERR
X – Potential change of impact associated with the proposed variations is not expected
(1) – Construction noise impact from use of powered mechanical equipment (PME) only

2.6 Concurrent Projects and Cumulative Impacts

2.6.1 Based on the latest available information, the tentative programme of population intakes of ARQ Development would be similar to that in the approved PP for DIR, with some adjustments to the population intake schedule of Sites R2-2 to R2-7. As shown in **Appendix D**, the tentative population intakes of ARQ Development would start at Site R2-1 (at about 125 m from the Project site) in 2023, then Sites RS-1 and R2-8 (at about 230 m to 360 m from the Project site) in 2024, then Sites R2-2, R2-3, R2-5 and R2-7 (at about 70 m to 250 m from the Project site) in Q1/Q2 2025, and finally Sites R2-6 and R2-4 (at about 40 m from the Project site) in Q3 2025 and Q4 2026 respectively. Since no major site formation works would be required for both the PWCL and AC cavern developments, the major construction works (i.e. cavern formation works) would be mainly carried out underground/inside rock mass as that in the approved PP. Furthermore, the same as the design adopted in the approved PP for DIR, shelters with ventilation system equipped with dust collector with at least 85% dust removal efficiency would

be installed to fully enclose all the construction adit/cavern portals to ensure confinement of the construction dust and noise within the cavern. Furthermore, MiC/DfMA will be adopted for building structure construction, which could minimise the construction nuisance (e.g. noise impacts) from aboveground works to the nearby sensitive receivers. Hence, similar to the approved PP for DIR, no significant cumulative environmental impacts from the Project and the staged ARQ development would be anticipated and no material change to the cumulative environmental impacts would be envisaged.

3 CONSTRUCTION AIR QUALITY IMPACT ASSESSMENT

3.1 Introduction

3.1.1 This section presents a further review on the findings and recommendations of construction phase air quality assessment in the approved PP for DIR, taking into account the proposed design changes.

3.2 Representative Air Sensitive Receivers

3.2.1 Representative existing and planned Air Sensitive Receivers (ASRs) within 500m of the Project site were identified in the approved PP for DIR. A review of the ASRs with regard to the proposed expanded works areas was conducted based on the latest available information. No additional ASR was identified. The representative ASRs as identified in the approved PP for DIR are summarized in **Table 3.1** and are illustrated in **Figure 3.1**.

Table 3.1 Representative Air Sensitive Receivers (ASRs)

ID	Description	Land Use	Existing / Planned* ASR
ASR1	Sam Long Village	Residential	Existing
ASR2	Siu To Yuen Village	Residential	Existing
ASR3	Wo Fat Hing Distillery	Industrial	Existing
ASR4	Chi Yum Ching She	Place of Public Worship	Existing
ASR5	Planned Residential development	Residential	Planned (2026 Q4)
ASR6	Planned Residential development	Residential	Planned (2026 Q4)
ASR7	Planned Residential development	Residential	Planned (2025 Q3)
ASR8	Planned Residential development	Residential	Planned (2025 Q3)
ASR9	Planned Residential development (Mount Anderson)	Residential	Planned (2023)

Note:
* Year in brackets refers to the anticipated completion year of construction of the respective ARQ development site as presented in **Appendix D**.

3.3 Construction Dust Source

3.3.1 As discussed in **Section 2.3**, the proposed design changes of the rock cavern development would not affect the construction method as adopted in the approved PP for DIR and the cavern formation would be carried out without the need of major site formation works. Based on the updated construction programme, the overall duration for cavern formation works would last for 2 years from mid-2023 to mid-2025, overlapping with the staged intake of the ARQ Development. Further review of the potential construction dust impact associated with the cavern construction, i.e. major dusty / heavy construction activities, has been conducted and is presented in **Section 3.4** below.

3.4 Evaluation of Construction Dust Impact

3.4.1 The new set of Air Quality Objectives (AQOs) came into effect on 1 January 2022. A transitional period is provided under the *Air Pollution Control (Amendment) Bill* to the effect that, for a project in respect of which an EP has been issued under the *EIAO* before 1 January 2022, the new AQOs will not apply to an application for variation of an EP submitted within 36 months from 1 January 2022. As such, the previous AQO adopted in the approved PP for DIR, which was put in force since 1 January 2014, remains valid for this ERR.

3.4.2 As addressed in the approved PP for DIR with reference to the assessment in the Schedule 2 EIA Report for Development of Anderson Road Quarry site – Rock Cavern Developments (EIAO Register No. AEIAR-194/2016 approved without conditions on 15 Mar 2016) (ARQ Rock Cavern Sch.2 EIA), provided that the overall active construction active work areas of the Project

limited to 2,500 m^2 and following the recommendation of hourly watering on the active construction works area to achieve a dust removal efficiency of 87.5%, adverse construction dust impact, due to the exceedance of annual average RSP concentration, would only be anticipated for area within 40m from the works area of heavy construction activities. The prediction in the ARQ Rock Cavern Sch.2 EIA was based on EPD's previous PATH modelling results for annual average RSP concentration in Year 2015, i.e. 41 $\mu g/m^3$ (about 18% buffer compared to the respective AQO).

3.4.3 In addition to the limitation of active works area and hourly watering in hourly watering on the active work area as adopted in the assessment in the ARQ Rock Cavern Sch.2 EIA, as per EP (EP-591/2021) Conditions 2.4 and 2.6, shelters with ventilation system equipped with dust collector [in the form of dust extraction and collection system with at least 85% dust removal efficiency (e.g. fabric filter) for treatment before discharging into the atmosphere] would be installed to fully enclose all the construction adits/cavern portals to ensure confinement of the construction dust within the cavern. Vehicle wheel washing facilities inside the shelters installed at the portal entrance and hourly watering of exposed areas and paved haul roads will also be adopted. With the implementation of the dust control measures adopted in the approved PP for DIR in addition to the recommended dust suppression measures in the ARQ Rock Cavern Sch.2 EIA, the particulates contributions from the cavern construction would be further reduced. Furthermore, based on EPD's latest PATH model results (Year 2025), the background annual average RSP concentration is predicted to be 26 $\mu g/m^3$, which is well below the respective AQO of 50 $\mu g/m^3$ by about 48% margins. In view of the lower background pollutant levels and the implementation of the additional dust control measures as recommended in the approved PP for DIR, dust emissions from the cavern construction works would be well controlled and the exceedance zone would be anticipated to be reduced and well confined within 40m from the cavern portal/adits.

3.4.4 Based on the current design, the closest air sensitive receivers (ASRs) to the Project site are ASR 5, 6, 7 and 8 (at Site R2-4 / Site R2-6) which are located at about 49 m to 65 m from the ventilation exhaust of the construction adits/cavern portals (**Figure 3.1** refers) and would tentatively be occupied in Q3 2025 (Site R2-6) and Q4 2026 (Site R2-4) (**Appendix B** refers). While the cavern formation works would overlap with the tentative population intakes at Sites R2-1 to R2-3, R2-5, R2-7, R2-8 and RS-1, these sites are situated at about 77 m to 360 m from the proposed rock caverns and construction adit that all the ASRs within these sites are located outside the exceedance zone, adverse air quality impact would not be anticipated and hence no material change to air quality impact would be resulted from the proposed changes.

3.5 Air Quality Mitigation Measures

3.5.1 The following mitigation measures in Section 6.2 of the approved PP for DIR and EP (EP-591/2021) Conditions 2.4 and 2.6 should be adopted:

- Install the enclosures (acting as blasting doors) with ventilation system equipped with dust collectors with at least 85% dust removal efficiency for treatment of exhaust air before discharging to the atmosphere at all portals before the commencement of any construction works conducted underground / inside rock mass and during drill and blast works;
- Provision of vehicle wheel washing facilities inside the shelters installed at the portal entrance;
- Watering once every working hour at active works areas, exposed areas and paved haul roads to achieve a dust removal efficiency of 87.5%; and
- Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be incorporated to control dust emission from the site and be included in relevant contract documents.

3.6 Environmental Monitoring and Audit

3.6.1 Since there is no material change to air quality impacts anticipated, no additional monitoring and audit requirements for the proposed variations are required.

4 NOISE IMPACT ASSESSMENT

4.1 Introduction

4.1.1 This section presents a further review on the findings and recommendations of construction and operational noise impacts in the approved PP for DIR, taking into account the proposed design changes.

4.2 Representative Noise Sensitive Receivers

4.2.1 Representative existing and planned Noise Sensitive Receivers (NSRs) within 300m of the Project site were identified in the approved PP for DIR. A review of NSRs in the vicinity of the proposed changes was conducted based on the latest available information. No additional NSR was identified. The representative NSRs as identified in the approved PP for DIR are summarised in **Table 4.1** and are illustrated in **Figure 4.1**. As the expanded works area remains located parallel to the internal road at ARQ site and the development sites, there is no change in horizontal distance between Project site and the representative NSRs.

Table 4.1 Representative Noise Sensitive Receivers (NSRs)

ID	Description	Land Use	Existing / Planned NSR	Approx. Distance to Project Site (m)
NSR1	Siu To Yuen Village	Residential	Existing	185
NSR2	Planned Residential development	Residential	Planned	45
NSR3	Planned Residential development	Residential	Planned	40
NSR4	Planned Residential development	Residential	Planned	40
NSR5	Planned Residential development	Residential	Planned	50
NSR6	Planned Primary School	Educational Institute	Planned	140
NSR7	Planned Residential development (Mount Anderson)	Residential	Planned	125

4.3 Identification and Evaluation of Noise Impact

Construction Noise

4.3.1 The potential construction noise arising from the expanded works areas would be the use of PME. As discussed in **Sections 2.3 and 4.2**, there is no change in construction method (except for the adoption of MiC/DfMA for building structure construction) as adopted in the approved PP for DIR and no change in the distance between expanded Project site and the representative NSRs. The adoption of MiC/DfMA for building structure construction could shorten the construction period and miminise construction noise impacts from building structural works to the nearby sensitive receivers. The findings and recommendations of construction noise impact assessment in the approved PP for DIR would remain valid. Same as the approved PP for DIR, shelter/enclosure would be installed at all portals of cavern and construction adits as part of the set-up works to protect the nearby existing and planned NSRs against the potential noise impacts from works undertaken underground/inside rock mass. With the provision of shelter/enclosure to fully enclose the portal areas and the adoption of standard good site practice and recommended mitigation measures as presented in the approved PP for DIR, no adverse construction noise impact arising from the variations is anticipated and hence no material change to construction noise impact would be resulted from the proposed changes.

Operational Fixed Plant Noise

4.3.2 The same as the design adopted in the PP for DIR and as per EP (EP-591/2021) Condition 2.7, all the fixed noise sources (except fixed plant involving the air exchange, e.g. mechanical ventilation and air-conditioning system, and fire safety) shall be installed inside the cavern or reinforced concrete structure with a soundproof door. The building structures of the Reprovisioned PWCL Building and the New AC at portal area would be the key fixed plant noise sources as illustrated in **Figure 4.1**.

4.3.3 The approach for fixed plant noise assessment follows the same methodology and assumption as used in the approved PP for DIR. The maximum allowable sound power levels (SWLs) of the identified fixed noise sources were updated by adopting standard acoustics principles, taking into account cumulative noise levels from all operation exhausts to ensure that it would comply with the noise criterion stipulated in the *Technical Memorandum on Noise from Places other than Domestic Premises, Public Places or Construction Sites* (IND-TM). The maximum allowable sound power level in **Appendix E** should be included in the contract documents of the Project to ensure being strictly followed by the Contractor. Given that the proposed fixed plants are properly designed to meet the maximum allowable sound power level in **Appendix E**, no adverse fixed plant noise impact would be anticipated and hence no material change to fixed noise impact would be resulted from the proposed changes.

4.4 Noise Impact Mitigation Measures

Construction Phase

4.4.1 Noise mitigation measures stated in Section 6.3 of the approved PP for DIR should be followed by contractor and incorporated into contract documents of the Project, including implementation of noise requirements set out under the "Recommended Pollution Control Clauses for Construction Contracts" published by EPD and good site practices for minimise construction noise impacts on the surrounding NSRs, standard noise control measures including the use of quiet PME, movable / temporary noise barriers.

Operational Phase

4.4.2 Given that the proposed fixed plants are properly designed to meet the maximum allowable sound power level in **Appendix E**, no adverse fixed plant noise impact would be anticipated. Notwithstanding this, the same as the design described in Section 5.2.2 in the approved PP for DIR, the portal buildings would be designed with an aim to avoid direct line of sight from the nearby sensitive receivers to the fixed plants, such as assigning the fixed plants at the side and at the back of the portal building away from sensitive receivers where technical feasible, or adopting proper facade design.

4.5 Environmental Monitoring and Audit

4.5.1 Since there is no material change to noise impacts anticipated, no additional monitoring and audit requirements for the proposed variations are required. Following recommendations in the approved PP for DIR, which was referenced to the ARQ Rock Cavern Sch. 2 EIA, to ensure compliance with the fixed plant noise criteria, a commissioning test for the fixed plant of the ventilation exhaust should be conducted.

5 OPERATIONAL LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.1 Introduction

5.1.1 The proposed variations as discussed in **Section 2** of this ERR have been reviewed. As detailed in **Section 2.5**, for the change of the rock cavern dimension of the PWCL Portion, given that there is no change to the cavern location and construction method as adopted in the approved PP for DIR, no adverse environmental impacts would be envisaged from the change. Likewise, since there is no change to the construction method and location as adopted in the approved PP for DIR, potential landscape and visual impacts due to the proposed changes would be similar to those assessed in the approved PP for DIR and no further review of these potential landscape and visual impacts during construction phase is therefore considered necessary.

5.1.2 During operational phase, in view of the addition of a building structure for the AC Portion at the portal area, potential landscape and visual impacts associated with the change have been further assessed. This section presents a further review on the findings and recommendations of operational landscape and visual impact in the approved PP for DIR, taking into account the additional building structure for the AC Portion at the portal area. This review also takes into account on any changes in circumstances, including the changes of existing and planned developments.

5.2 Environmental Legislation, Standards and Guidelines

5.2.1 Legislation and standards that are relevant to the consideration of the landscape and visual impact under this ERR include the following:

- Chapters 4, 10 and 11 of Hong Kong Planning Standards and Guidelines;
- DEVB TC(W) No. 4/2020 – Tree Preservation;
- DEVB TC(W) No. 5/2020 – Registration and Preservation of Old and Valuable Trees;
- EIAO, Cap.499 Guidance Note No. 8/2010 - Preparation of Landscape and Visual Impact Assessment Under the Environmental Impact Assessment Ordinance;
- ETWB TC(W) No. 5/2005 - Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works;
- GEO Publication No. 1/2011 - Technical Guidelines on Landscape Treatment for Slopes;
- TPB PG-No. 41 - Town Planning Board Guidelines on Submission of Visual Impact Assessment for Planning Applications to the Town Planning Board;
- Tree Management Practice Note No. 1 – Tree Preservation during Construction; and
- Study on Landscape Value Mapping of Hong Kong.

5.3 Review of Changes to Baseline Findings Presented in Approved PP for DIR

5.3.1 Representative landscape resource (LR) and landscape character area (LCA) within 500m of the Project site were identified in the approved PP for DIR. A review of LRs and LCAs in the vicinity of the proposed changes was conducted based on the latest available information. As the expanded works area remains located parallel to the internal road at ARQ site and the development sites, the assessment area is slightly enlarged in the eastern boundary with no additional LRs and LCAs were identified. No Old and Valuable Trees (OVTs) are identified within the assessment area. The representative LRs and LCAs as identified in the approved PP for DIR are summarised in **Table 5.1** and **Table 5.2**, and are illustrated in **Figure 5.1** and **Figure 5.2** respectively.

Table 5.1 Representative Landscape Resources (LRs)

ID	Description	Sensitivity
LR1	Plantation on Rock Berms above or near the Proposed Portal	Medium
LR2	Hillside Woodland	High

ID	Description	Sensitivity
LR3	Quarry	Medium
LR4	Development Area	Low
LR5	Rural Development Area	Medium

Table 5.2 Representative Landscape Character Resources (LCAs)

ID	Description	Sensitivity
LCA1	Quarry LCA (Planned Comprehensive Residential Area LCA)	Low
LCA2	Peaks, Uplands and Hillsides LCA	High
LCA3	Rural Fringe LCA	Medium
LCA4	Development Area LCA	Low

5.3.2 Representative existing and planned Visually Sensitive Receivers (VSRs) within the visual envelope of the Project site were identified in the approved PP for DIR. A review of VSRs in the vicinity of the proposed changes was conducted based on the latest available information. As the expanded works area remains located parallel to the internal road at ARQ site and the development sites, they shared the same visual envelope and no additional VSRs were identified. There is no change in horizontal distance between Project site and the representative NSRs. The representative VSRs as identified in the approved PP for DIR are summarized in **Table 5.3** and are illustrated in **Figure 5.3**.

Table 5.3 Representative Visually Sensitive Receivers (VSRs)

ID	Description	VSR Group	Approx. Distance to Project Site (m)	Sensitivity
O1	Recreation users of the planned open space	Recreational	30-200	Medium
R1	Planned residential development immediately adjacent to the Project	Residential	30-100	High
R2	Newly completed residential development at On Tai Estate	Residential	550-600	Medium
R3	Planned residential development in the Anderson Road Quarry Site	Residential	100-300	Low
T1	Planned road users along the road in front of the proposed development	Travelling	10-100	Low

5.4 Operational Landscape and Visual Impact Assessment

5.4.1 During operational phase, in view of the addition of a building structure [dimension of which is approximately 90m (L) x 20m (D) x 28m(H)] for the AC Portion at the portal area, potential landscape and visual impacts associated with the change would be further assessed below. The approach for landscape and visual assessment follows the same methodology and assumption as used in the approved PP for DIR.

5.4.2 For landscape impacts during operation phase, the expanded works area within ARQ site would have been properly formed and remains on existing cut slopes (currently as bare rock slope surface) parallel to the internal road at ARQ site. No additional tree removal is involved. As such, potential landscape impacts due to the proposed changes would be similar to those assessed in the approved PP for DIR that no material change to the operational landscape impacts would be envisaged.

5.4.3 For visual impacts during operation phase, the portal areas proposed to be expanded southward by approximately 110m for the additional building structure for the AC Portion. The additional building structure for the AC Portion at the portal area is not visible for VSRs in medium to long distance (i.e. R2 and R3). Although the AC Portion is proposed as separate

building, its building mass and height are similar to those of the adjacent PWCL Portion, the magnitude of visual change is considered as intermediate for VSRs in close distance (i.e. O1, R1 and T1), which is similar to the original magnitude of visual change in the approved PP for DIR. As such, potential visual impacts during operational phase due to the proposed changes would be no significant changes to those assessed in the approved PP for DIR that no material change to the operational visual impacts would be envisaged as summarised in **Table 5.4** below.

Table 5.4 Magnitude of Visual Change During Operational Phase as compared to Approved PP for DIR

ID	Description	Original Magnitude of Visual Change	Description of Change	Magnitude of Visual Change in this ERR
O1	Recreation users of the planned open space	Intermediate	The portal areas proposed to be expanded southward by approximately 110m for the additional building structure for the AC Portion at the portal area.	Intermediate
R1	Planned residential development immediately adjacent to the Project	Intermediate	The portal areas proposed to be expanded southward by approximately 110m for the additional building structure for the AC Portion at the portal area.	Intermediate
R2	Newly completed residential development at On Tai Estate	Small	The additional building structure for the AC Portion at the portal area is not visible for VSRs in medium to long distance.	Small
R3	Planned residential development in the Anderson Road Quarry Site	Small	The additional building structure for the AC Portion at the portal area is not visible for VSRs in medium to long distance.	Small
T1	Planned road users along the road in front of the proposed development	Intermediate	The portal areas proposed to be expanded southward by approximately 110m for the additional building structure for the AC Portion at the portal area.	Intermediate

5.5 Landscape and Visual Mitigation Measures

5.5.1 With the implementation of the landscape and visual mitigation measures recommended in the approved PP for DIR, no significant adverse landscape and visual impact arising from the proposed variations is anticipated. The landscape and visual mitigation measures as recommended in the approved PP for DIR are summarised in **Table 5.5** and are illustrated in **Figure 5.4**. The photomontage is illustrated in **Figure 5.5** and **5.6**.

Table 5.5 Operational Phase Landscape and Visual Mitigation Measures Recommended in Approved PP for DIR

ID	Mitigation Measures	Description	Construction / Operational Phase
OM1	Sensitive and aesthetically pleasing design	Sensitive and aesthetically pleasing design as regard to the form, material and finishes shall be incorporated to the proposed tunnel portals and entrance area in order to blend in the structures to the adjacent landscape and visual context. Environmentally friendly design with green initiatives such as green roof and vertical greening shall be considered in the detailed design stage.	Operational
OM2	Landscape treatments on slope	Landscape treatments such as planting on soil slope, provision of berm planter on rock cut slope and provide vertical greening with climbers at toe planter shall be provided in accordance with GEO Publication No. 1/2011 - Technical Guidelines on Landscape Treatment for Slopes and the Guiding Principles on Use of Native Plant Species in Public Works Projects issued by DEVB. The greening on slope and structure shall enhance the environment and the visual amenity value of the area.	Operational
OM3	Proposed tree planting	Proposed tree planting and shrub planting shall be incorporated to enhance the landscape and visual amenity value of proposed building structure for the AC Portion at the portal area and the entrance area. New trees will be provided on the roof of proposed building structure for the AC Portion at the portal area and the adjoining entrance areas including native species to enhance the environment value of the area. The planting design shall be with reference to the Guiding Principles on Use of Native Plant Species in Public Works Projects issued by DEVB where possible.	Operational

5.6 Environmental Monitoring and Audit

5.6.1 With no significant adverse impacts anticipated and no material change to the operational landscape and visual impacts would be resulted from the proposed changes, no additional monitoring and audit requirements for the proposed variations are required.

6 SUMMARY OF ENVIRONMENTAL FINDINGS

6.1 Construction Dust Impact

6.1.1 With the implementation of the dust control measures adopted in the approved PP for DIR in addition to the recommended dust suppression measures in the ARQ Rock Cavern Sch.2 EIA and considering the existing lower background pollutant levels, dust emission from the cavern construction would be well controlled and the exceedance zone would be anticipated to be reduced and well confined within 40m from the cavern portal/adits. Given that no ASRs would fall within the exceedance zone, no adverse air quality impact would be anticipated and hence no material change to air quality impact would be resulted from the proposed changes. Since there is no material change to air quality impacts anticipated, no additional monitoring and audit requirements for the proposed variations are required.

6.2 Noise Impact

6.2.1 Potential noise impacts associated with the proposed design changes were reviewed. With the provision of shelter/enclosure to fully enclose the portal areas and the adoption of standard good site practice and recommended mitigation measures as presented in the approved PP for DIR, no adverse construction noise impact arising from the variations is anticipated and hence no material change to construction noise impact would be resulted from the proposed changes.

6.2.2 Maximum allowable sound power levels for the fixed noise sources of the Project have been reviewed and updated based on the proposed design changes. Given the maximum allowable sound power levels could be achieved with the fixed plant properly designed, no adverse fixed noise impact would be anticipated and hence no material change to fixed noise impact would be resulted from the proposed changes.

6.3 Operational Landscape and Visual Impact

6.3.1 With the impacts anticipated have no significant changes, no material change to the operational landscape and visual impacts would be resulted from the proposed changes, no additional monitoring and audit requirements for the proposed variations are required.

7 ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

7.1 Objectives and Requirements

7.1.1 The objectives and requirements of EM&A for the construction of the Project described in the approved PP for DIR follows the ARQ Rock Cavern Sch. 2 EIA.

7.2 Change in EM&A Requirements Associated with Proposed Variations

7.2.1 Based on the findings of environmental review conducted above, the EM&A requirements adopted in the approved PP for DIR would remain applicable to the proposed changes.

8 CONCLUSION

8.1.1 An environmental review/assessment has been conducted for the proposed variations of designs to integrate the committed rock cavern development into a joint cavern complex covering the following changes compared to the design adopted in the approved PP for DIR (DIR-283/2021):

(i) Change of cavern dimensions for PWCL Portion;

(ii) Expansion of works area and rock cavern sizes; and

(iii) Addition of a building structure with fixed plants.

8.1.2 The potential environmental issues pertinent to the proposed changes have been assessed and the required mitigation requirements have also been identified.

8.1.3 It is concluded that the proposed variations of the Project would not result in material change to the environmental impacts leading to adverse residual environmental impact with the implementation of the recommended mitigation measures and the project still complies with the requirements described in the EIAO-TM. The EM&A requirements adopted in the approved PP for DIR remain valid.

FIGURES

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

842000 E

842400 E

821200 N

820800 N

TAN SHAN

SITE R2-1

SITE R2-2

SITE R2-3

SITE R2-4

SITE R2-5

SITE R2-6

SITE R2-7

SITE R2-8

PWCL PORTION

AC PORTION

ON SAU ROAD

1001

1002

1003

1004

N

NOTE:

1. INDICATIVE BLOCK PLANS AT ARQ DEVELOPMENT SITE ADOPTED ARE BASED ON THE ARQ DEVELOPMENT SCHEDULE 3 EIA (EIAO REGISTER NO. AEIAR-183/2014).

LEGEND:

- PPROJECT BOUNDARY
- PROPOSED CAVERN AND ADITS
- PROPOSED CONSTRUCTION ADITS
- PROPOSED BUILDING STRUCTURE AT PORTAL AREA
- ORIGINAL CAVERN AND ADITS
- ORIGINAL CONSTRUCTION ADITS
- ORIGINAL PORTAL BUILDING
- 1001 LOCATION & DIRECTION OF PHOTOGRAPH TAKEN / PHOTO ID

PHOTO 1001: NORTHERN ROCK SLOPE AT ARQ SITE
DATE TAKEN: 21 MARCH 2018

PHOTO 1002: NORTHERN ROCK SLOPE AT ARQ SITE
DATE TAKEN: 29 MARCH 2019

PHOTO1004: NORTHERN ROCK SLOPE AT ARQ SITE
DATE TAKEN: 19 JANUARY 2022

PHOTO 1003: NORTHERN ROCK SLOPE AT ARQ SITE
DATE TAKEN: 13 NOVEMBER 2020

AECOM

PROJECT
項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE - INVESTIGATION, DESIGN AND CONSTRUCTION

CLIENT
委主

CEDD 土木工程拓展署 Civil Engineering and Development Department

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ISSUE/REVISION
修訂

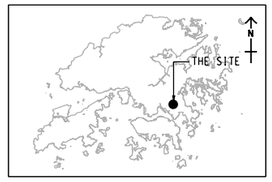
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
階段

SCALE 比例 — **DIMENSION UNIT** 尺寸單位

A3 1 : 4000 — METRES

KEY PLAN N.T.S
索引圖



PROJECT NO. 項目編號 — **AGREEMENT NO.** 協議編號

60672072 — CE 54/2021(GE)

SHEET TITLE
圖紙名稱

PROPOSED DESIGN CHANGE

SHEET NUMBER
圖紙編號

60672072/PP/FIGURE 2.1

Plot File by: LaiWR 3/1/2022
PATH P:\PROJECTS\60672072\DRAWING\REPORT\ERRIERR_721.dgn

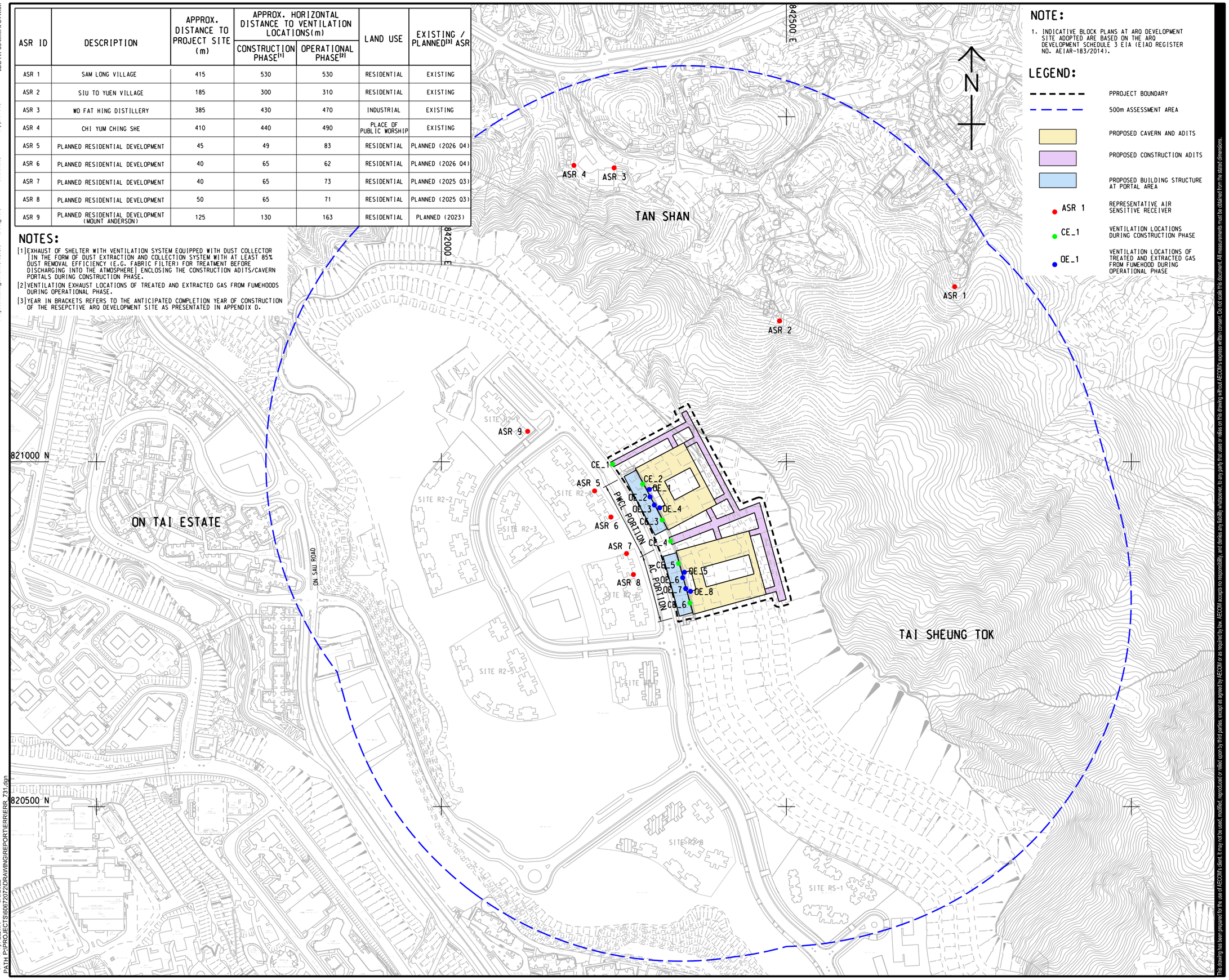
ASR ID	DESCRIPTION	APPROX. DISTANCE TO PROJECT SITE (m)	APPROX. HORIZONTAL DISTANCE TO VENTILATION LOCATIONS(m)		LAND USE	EXISTING / PLANNED[3] ASR
			CONSTRUCTION PHASE[1]	OPERATIONAL PHASE[2]		
ASR 1	SAM LONG VILLAGE	415	530	530	RESIDENTIAL	EXISTING
ASR 2	SIU TO YUEN VILLAGE	185	300	310	RESIDENTIAL	EXISTING
ASR 3	WO FAT HING DISTILLERY	385	430	470	INDUSTRIAL	EXISTING
ASR 4	CHI YUM CHING SHE	410	440	490	PLACE OF PUBLIC WORSHIP	EXISTING
ASR 5	PLANNED RESIDENTIAL DEVELOPMENT	45	49	83	RESIDENTIAL	PLANNED (2026 Q4)
ASR 6	PLANNED RESIDENTIAL DEVELOPMENT	40	65	62	RESIDENTIAL	PLANNED (2026 Q4)
ASR 7	PLANNED RESIDENTIAL DEVELOPMENT	40	65	73	RESIDENTIAL	PLANNED (2025 Q3)
ASR 8	PLANNED RESIDENTIAL DEVELOPMENT	50	65	71	RESIDENTIAL	PLANNED (2025 Q3)
ASR 9	PLANNED RESIDENTIAL DEVELOPMENT (MOUNT ANDERSON)	125	130	163	RESIDENTIAL	PLANNED (2023)

NOTES:

[1] EXHAUST OF SHELTER WITH VENTILATION SYSTEM EQUIPPED WITH DUST COLLECTOR [IN THE FORM OF DUST EXTRACTION AND COLLECTION SYSTEM WITH AT LEAST 85% DUST REMOVAL EFFICIENCY (E.G. FABRIC FILTER) FOR TREATMENT BEFORE DISCHARGING INTO THE ATMOSPHERE] ENCLOSING THE CONSTRUCTION ADITS/CAVERN PORTALS DURING CONSTRUCTION PHASE.

[2] VENTILATION EXHAUST LOCATIONS OF TREATED AND EXTRACTED GAS FROM FUMEHOODS DURING OPERATIONAL PHASE.

[3] YEAR IN BRACKETS REFERS TO THE ANTICIPATED COMPLETION YEAR OF CONSTRUCTION OF THE RESEPCTIVE ARQ DEVELOPMENT SITE AS PRESENTATED IN APPENDIX D.



NOTE:

1. INDICATIVE BLOCK PLANS AT ARQ DEVELOPMENT SITE ADOPTED ARE BASED ON THE ARQ DEVELOPMENT SCHEDULE 3 EIA (EIAO REGISTER NO. AEIAR-183/2014).

LEGEND:

- PPROJECT BOUNDARY
- 500m ASSESSMENT AREA
- PROPOSED CAVERN AND ADITS
- PROPOSED CONSTRUCTION ADITS
- PROPOSED BUILDING STRUCTURE AT PORTAL AREA
- ASR 1 — REPRESENTATIVE AIR SENSITIVE RECEIVER
- CE_1 — VENTILATION LOCATIONS DURING CONSTRUCTION PHASE
- OE_1 — VENTILATION LOCATIONS OF TREATED AND EXTRACTED GAS FROM FUMEHOOD DURING OPERATIONAL PHASE

AECOM

PROJECT 項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE

CLIENT 客戶

CEDD 土木工程拓展署 Civil Engineering and Development Department

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STATUS 狀況

SCALE 比例 A3 1 : 5000

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN 索引圖 N.T.S

PROJECT NO. 項目編號 60672072

AGREEMENT NO. 協議編號 CE 54/2021(GE)

SHEET TITLE 圖紙名稱

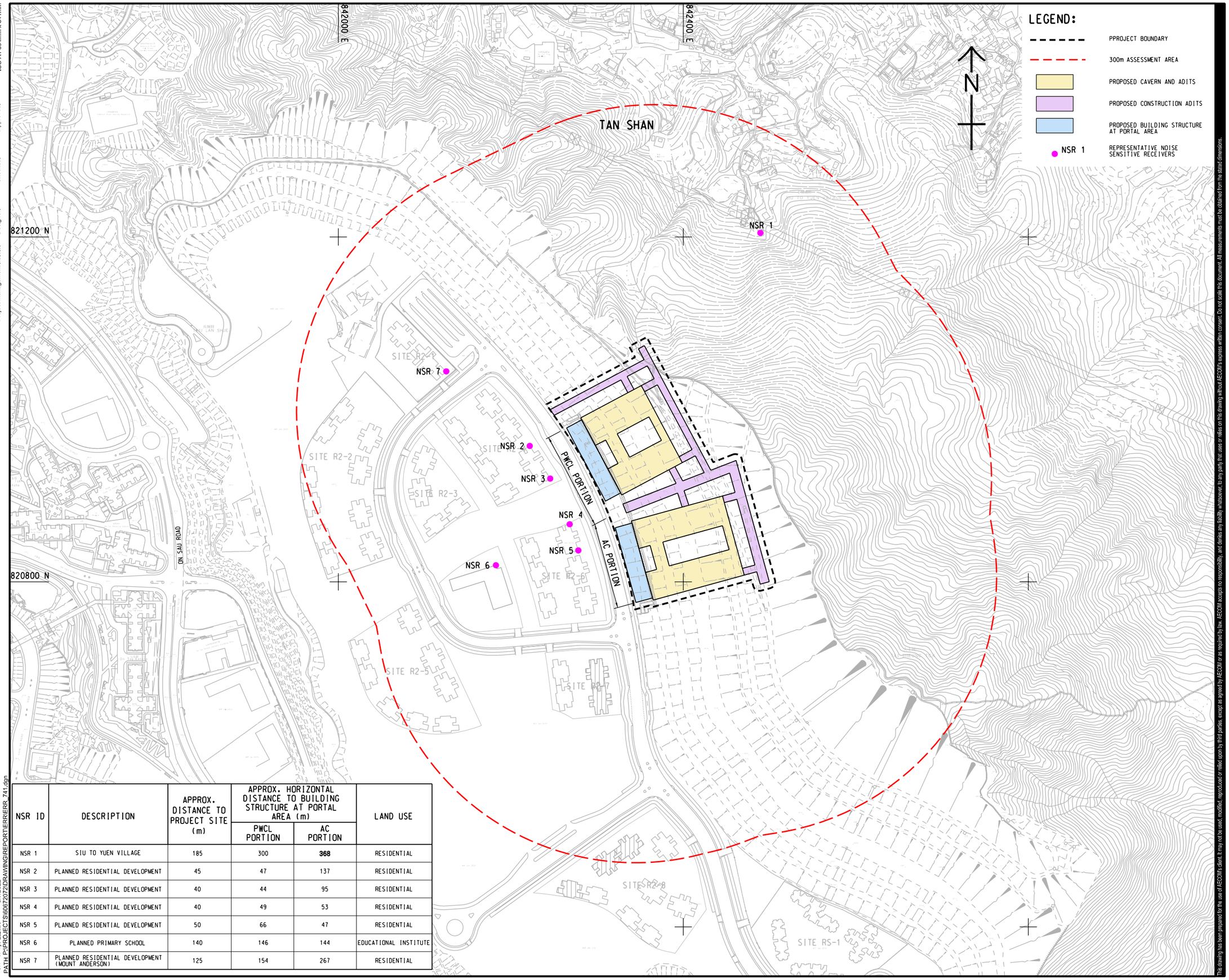
LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS

SHEET NUMBER 圖紙編號

60672072/ERR/FIGURE 3.1

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:

Plot File by: LaiMR
PATH: P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_731.dgn
5/6/2022



NSR ID	DESCRIPTION	APPROX. DISTANCE TO PROJECT SITE (m)	APPROX. HORIZONTAL DISTANCE TO BUILDING STRUCTURE AT PORTAL AREA (m)		LAND USE
			PWCL PORTION	AC PORTION	
NSR 1	SIU TO YUEN VILLAGE	185	300	**368**	RESIDENTIAL
NSR 2	PLANNED RESIDENTIAL DEVELOPMENT	45	47	137	RESIDENTIAL
NSR 3	PLANNED RESIDENTIAL DEVELOPMENT	40	44	95	RESIDENTIAL
NSR 4	PLANNED RESIDENTIAL DEVELOPMENT	40	49	53	RESIDENTIAL
NSR 5	PLANNED RESIDENTIAL DEVELOPMENT	50	66	47	RESIDENTIAL
NSR 6	PLANNED PRIMARY SCHOOL	140	146	144	EDUCATIONAL INSTITUTE
NSR 7	PLANNED RESIDENTIAL DEVELOPMENT (MOUNT ANDERSON)	125	154	267	RESIDENTIAL

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:

Plot File by: LatMR
PATH P:\PROJECTS\60672072\DRAWING\REPORT\ERRIERR_741.dgn
5/7/2022

AECOM

PROJECT
項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE

CLIENT
業主

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STATUS
狀況

SCALE 比例
A3 1 : 4000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號
60672072

AGREEMENT NO. 協議編號
CE 54/2021(GE)

SHEET TITLE
圖紙名稱

LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE 4.1

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

842000 E

842500 E

N

LEGEND:

— — —	500m ASSESSMENT AREA
———	PLANNED ROAD
LR1	PLANTATION ON ROCK BERMS ABOVE OR NEAR THE PROPOSED PORTAL
LR2	HILLSIDE WOODLAND
LR3	QUARRY
LR4	DEVELOPMENT AREA
LR5	RURAL DEVELOPMENT AREA

TAN SHAN

LR5

LR2

LR1

LR3

LR4

ON SAU ROAD

SITE R2-1

SITE R2-2

SITE R2-3

SITE R2-4

SITE R2-5

SITE R2-7

SITE R2-8

SITE RS-1

821000 N

820500 N

Plot File by: LaiMR 2/16/2022
PATH: P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_701.dgn

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STATUS
階段

SCALE 比例
A3 1 : 5000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號
60672072

AGREEMENT NO. 協議編號
CE 54/2021(GE)

SHEET TITLE
圖紙名稱

LOCATIONS OF LANDSCAPE RESOURCES

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE 5.01

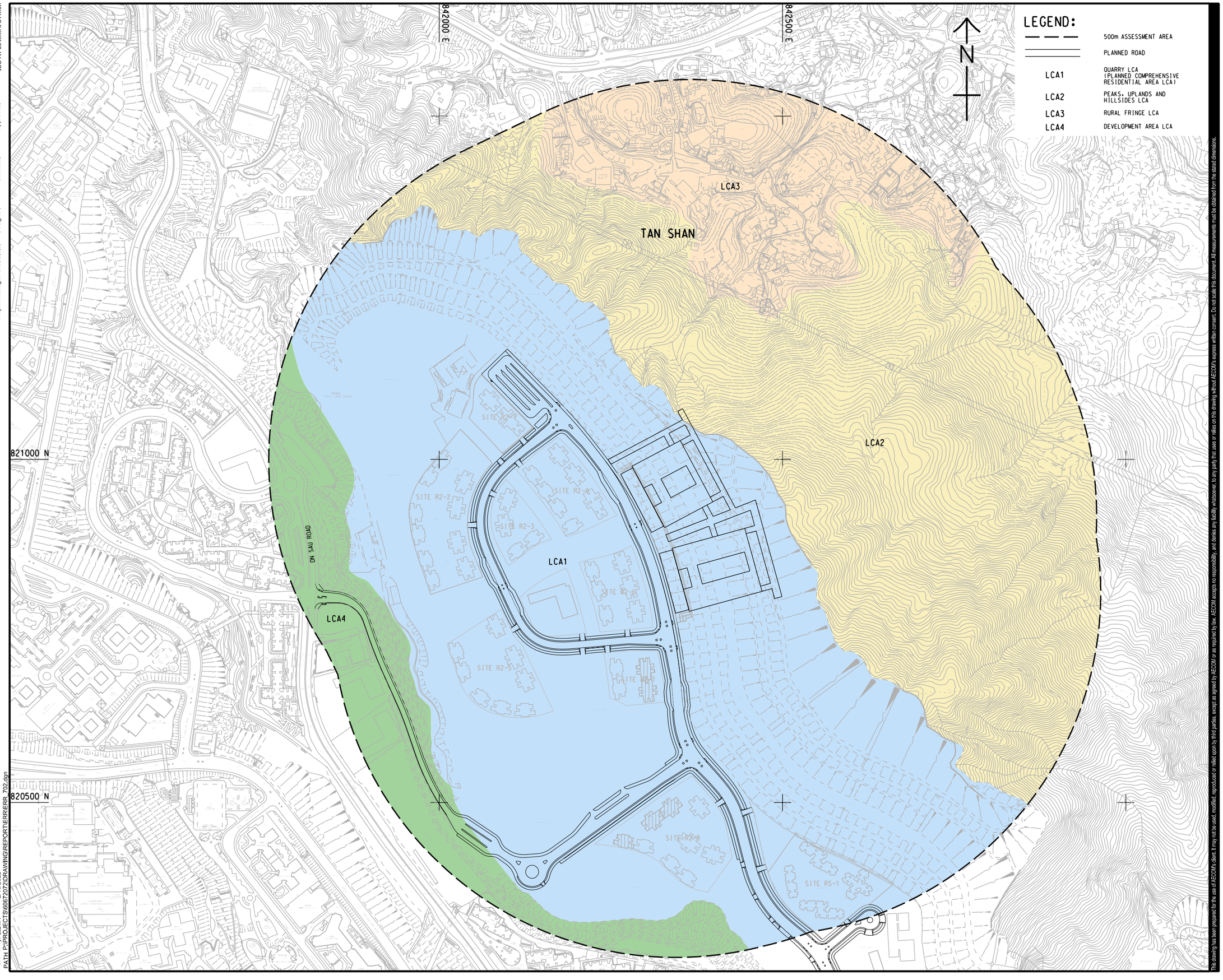
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by: LaiNR 2/16/2022
PATH: P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_702.dgn

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STATUS
階段

SCALE 比例
A3 1 : 5000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號
60672072

AGREEMENT NO. 協議編號
CE 54/2021(GE)

SHEET TITLE
圖紙名稱

LOCATIONS OF LANDSCAPE CHARACTER AREAS

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE 5.02

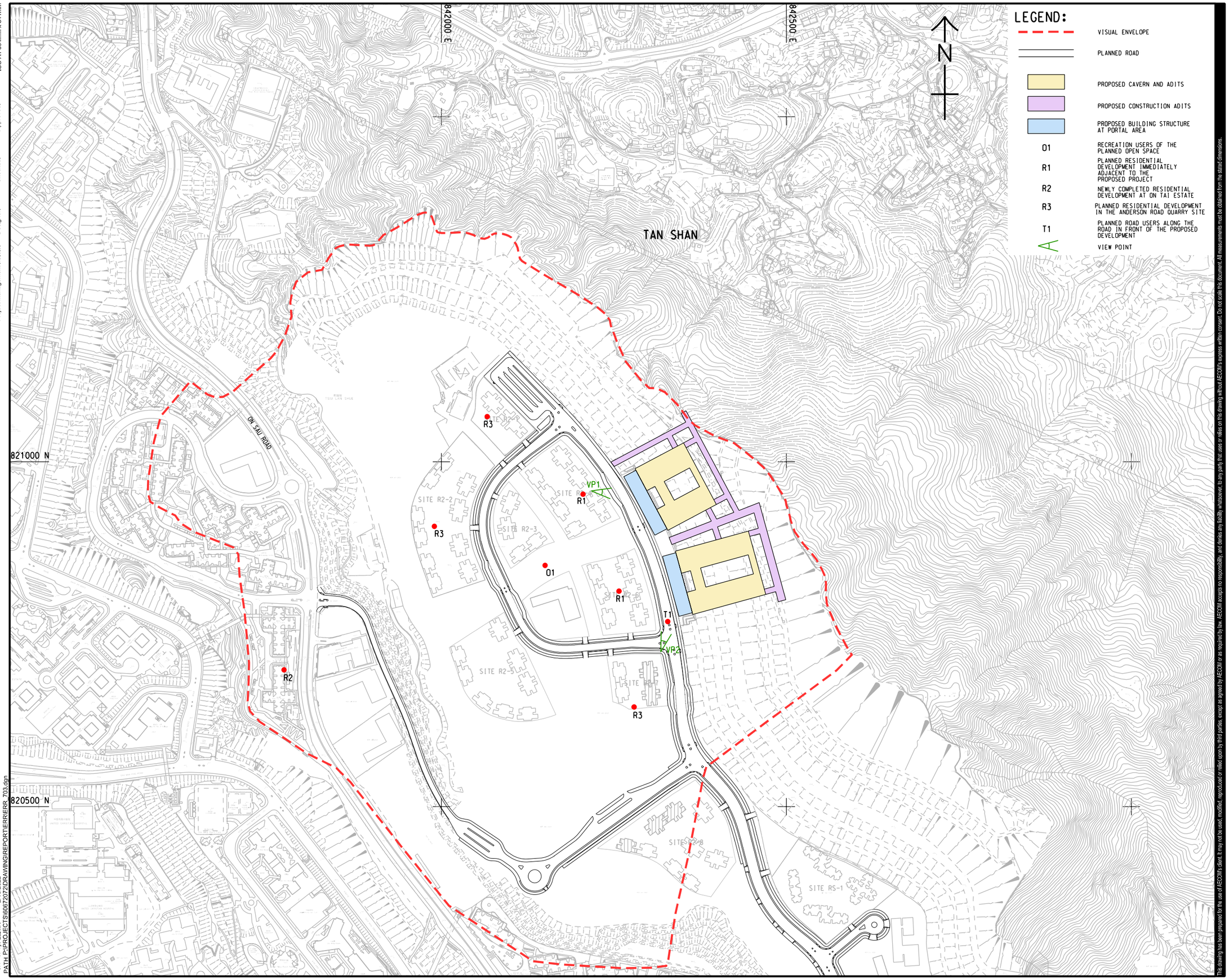
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by:- LaMR 2/16/2022
PATH P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_703.dgn

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PROJECT
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STATUS
階段

SCALE 比例 — A3 1 : 5000

DIMENSION UNIT 尺寸單位 — METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號 — 60672072

AGREEMENT NO. 協議編號 — CE 54/2021(GE)

SHEET TITLE
頁紙名稱

LOCATIONS OF KEY VISUALLY SENSITIVE RECEIVER GROUPS

SHEET NUMBER
頁紙編號

60672072/ERR/FIGURE 5.03

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

NOTE:

1. MAINTENANCE AUTHORITIES FOR SOFT LANDSCAPE WORKS ARE IDENTIFIED IN ACCORDANCE WITH THE DEVB TC(W) NO. 6/2015.

LEGEND:

- ROOF OF PROPOSED PORTAL BUILDING
- PROPOSED ERECTION OF DECORATIVE SCREEN HOARDING (CM2)
- PROPOSED LANDSCAPE TREATMENT ON SLOPE TO PROVIDE GREENING (OM2)
- ROCK SLOPE TO BE RETAINED
- EXISTING VEGETATION TO BE RETAINED
- PROPOSED SENSITIVE DESIGN OF PORTAL BUILDING AND ASSOCIATED ENTRANCE AREA (OM1)
- PROPOSED TREE PLANTING IN LANDSCAPE AREA (ON ROOF) (OM3)
- PROPOSED TREE PLANTING IN LANDSCAPE AREA (AT GRADE) (OM3)
- EXISTING TREES NEAR THE WORKS AREA ARE PROPOSED TO BE RETAINED (CM1)

821000 N

820900 N

842300 E

842200 E

OM2

CM1

OM3

ROOF OF PROPOSED PORTAL BUILDING

CYCLE TRACK UNDER CONSTRUCTION 施工中的單車徑

WALKWAY UNDER CONSTRUCTION 施工中的行人路

PUBLIC ROAD UNDER CONSTUCTION 施工中的公用道路

WIP Jan 2021

Plot File by: LaMR 2/16/2022
PATH P:\PROJECTS\60672072\DRAWING\REPORT\ERRIERR_704.dgn

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PROJECT 項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE

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STATUS 階段

SCALE 比例 — A3 1 : 1000

DIMENSION UNIT 尺寸單位 — METRES

KEY PLAN N.T.S 索引圖

PROJECT NO. 項目編號 — 60672072

AGREEMENT NO. 協議編號 — CE 54/2021(GE)

SHEET TITLE 圖紙名稱

LANDSCAPE AND VISUAL MITIGATION MEASURES

SHEET NUMBER 圖紙編號

60672072/ERR/FIGURE 5.04

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

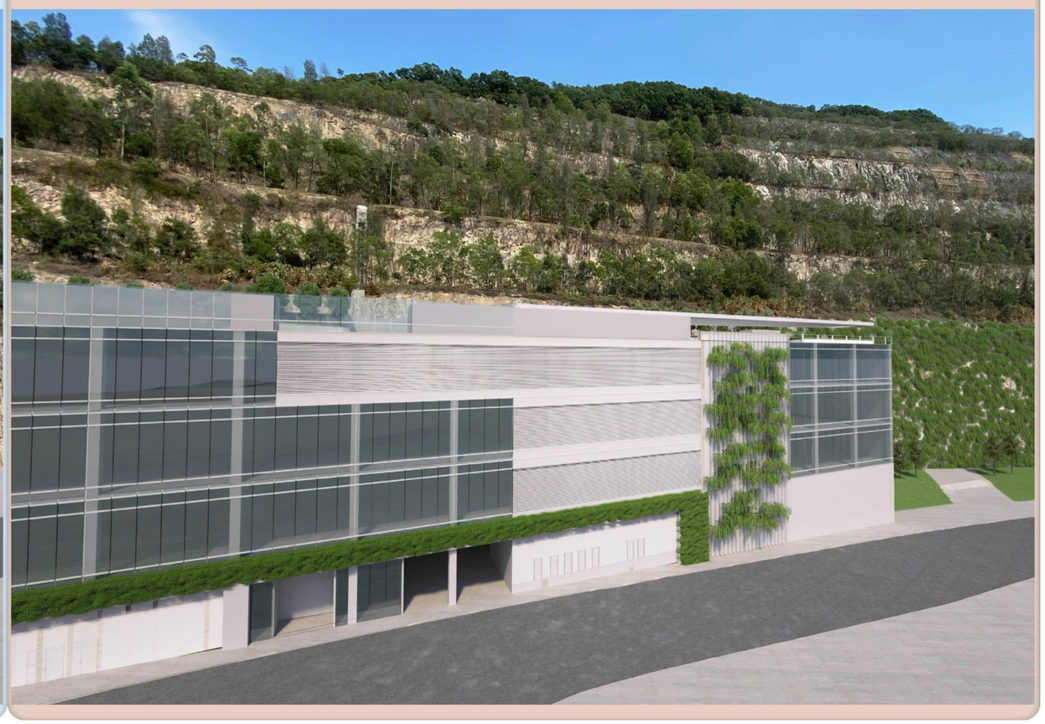
Project Management Initials:

Existing Condition of View Point 1

Condition of View Point 1 after Site Formation by Others

Day 1 without Mitigation Measures

10 Years with Mitigation Measures



Plot File by: FENGWF 2022/4/28
PATH: P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_705.dgn

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STATUS
階段

SCALE 比例: N.T.S

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖 N.T.S

PROJECT NO. 項目編號: 60672072

AGREEMENT NO. 協議編號: CE 54/2021(GE)

SHEET TITLE
圖紙名稱

PHOTOMONTAGE OF VIEW POINT 1

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE 5.05

Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm

Existing Condition of View Point 2

Condition of View Point 2 after Site Formation by Others

Day 1 without Mitigation Measures

10 Years with Mitigation Measures

Plot File by: FENGWF 2022/4/28
PATH: P:\PROJECTS\60672072\DRAWING\REPORT\ERR\ERR_706.dgn

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PROJECT
項目

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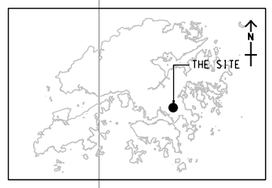
STATUS
階段

SCALE 比例: N.T.S

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖 N.T.S



PROJECT NO. 項目編號: 60672072

AGREEMENT NO. 協議編號: CE 54/2021(GE)

SHEET TITLE
圖紙名稱

PHOTOMONTAGE OF VIEW POINT 2

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE 5.06

Appendix A
General Layout and Section Plan of the Development

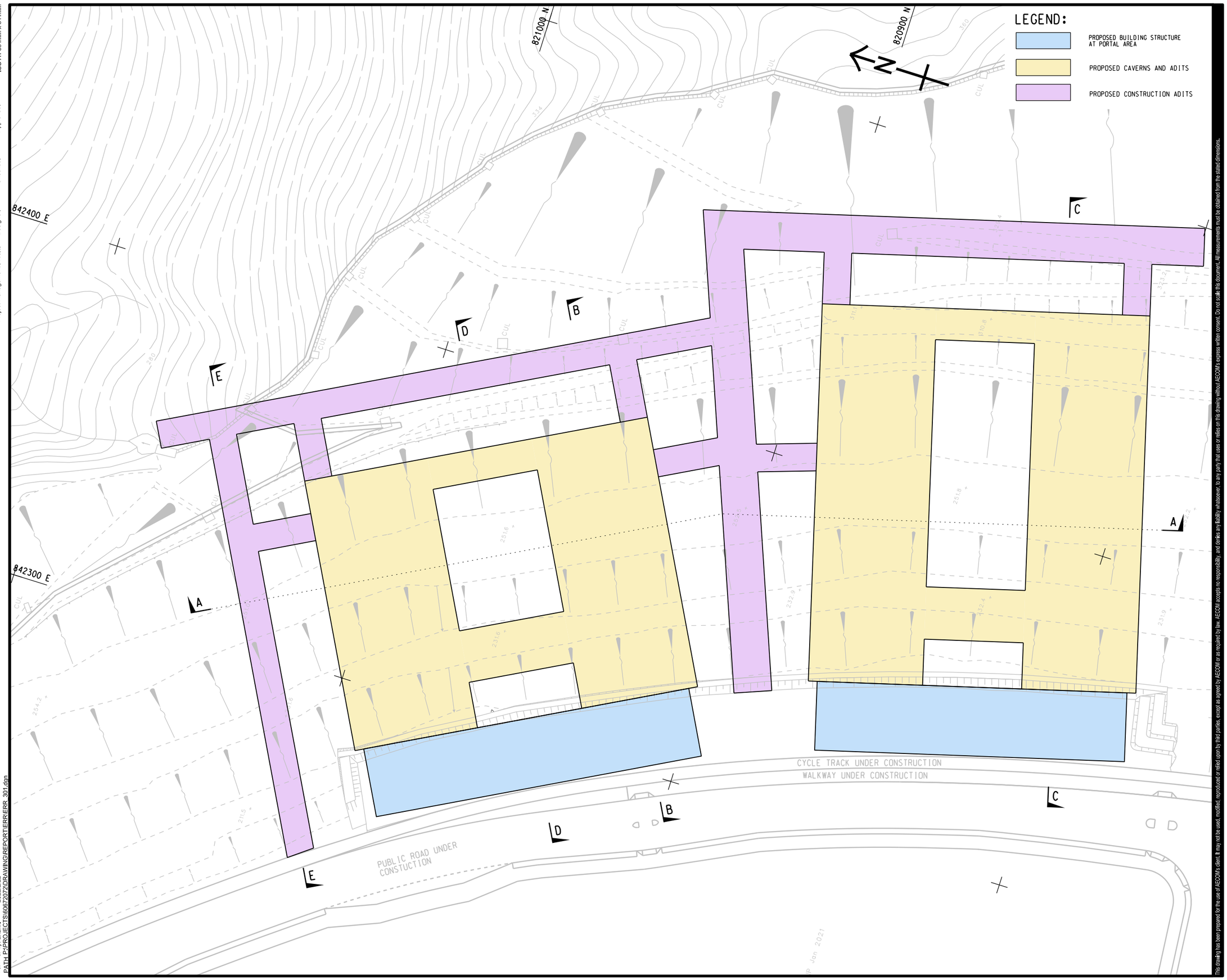
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by: zhanxl 2022/2/22
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AECOM

PROJECT
項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
階段

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號
60672072

AGREEMENT NO. 協議編號
CE 54/2021(GE)

SHEET TITLE
圖紙名稱

LAYOUT PLAN OF THE DEVELOPMENT

SHEET NUMBER
圖紙編號

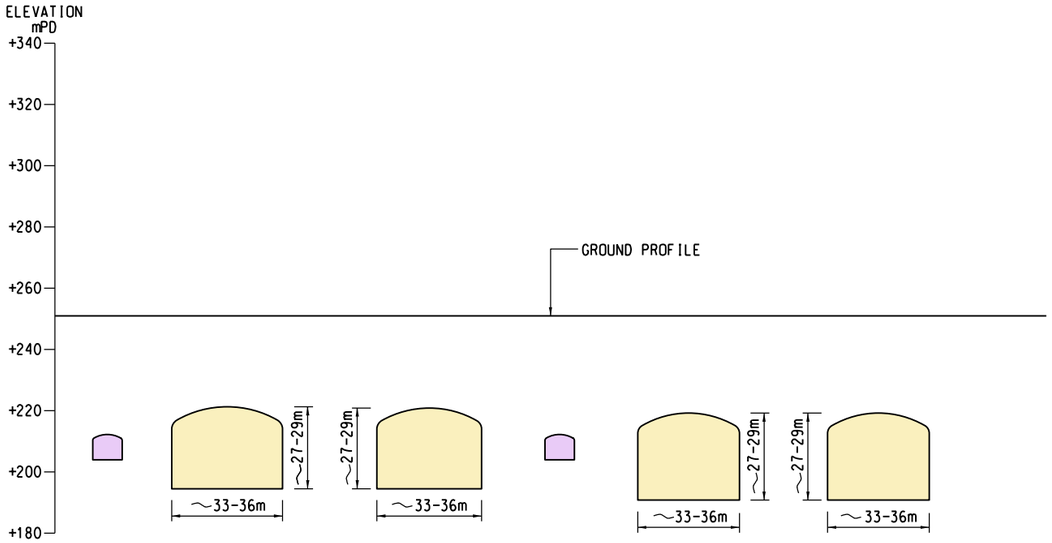
60672072/ERR/FIGURE A01

LEGEND:

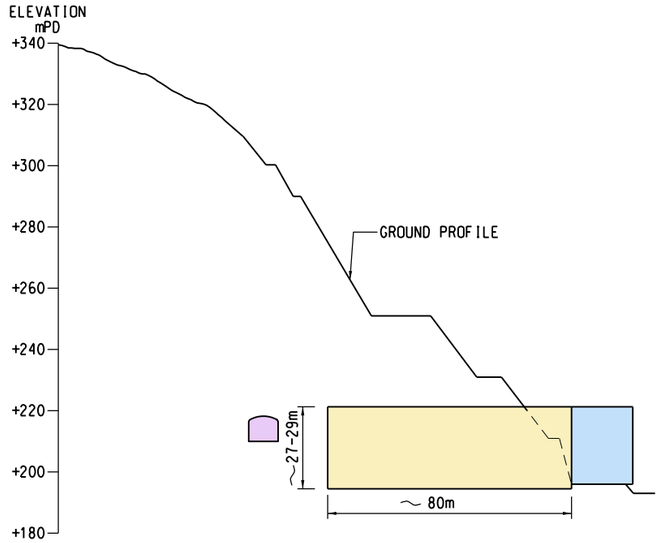
PROPOSED PORTAL BUILDING

EXCAVATION WORKS FOR PROPOSED CAVERNS AND ADITS

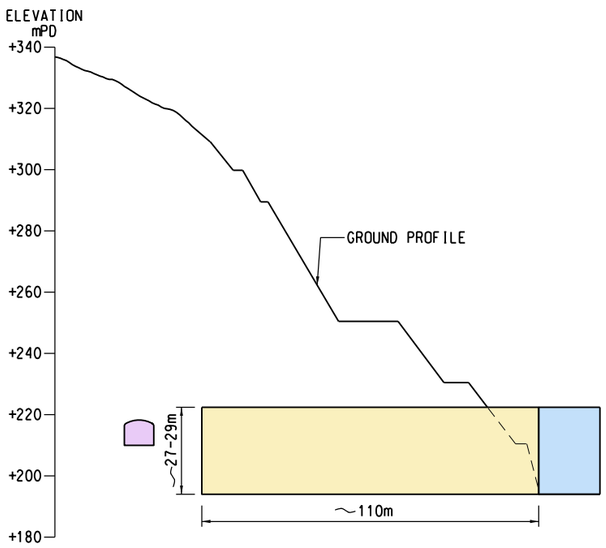
EXCAVATION WORKS FOR PROPOSED CONSTRUCTION ADITS



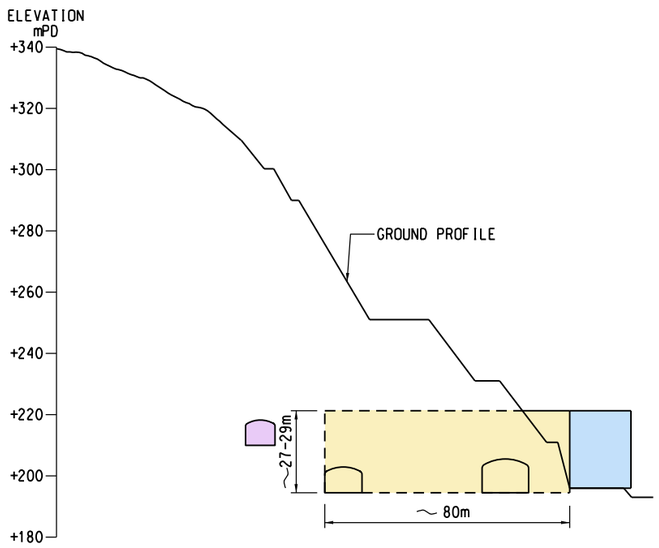
SECTION A - A



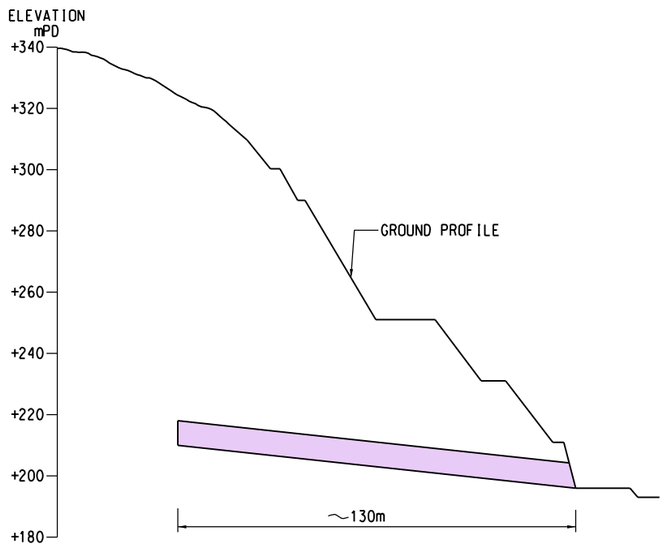
SECTION B - B



SECTION C - C



SECTION D - D



SECTION E - E

AECOM

PROJECT
項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICE' S ARCHIVES CENTRE - INVESTIGATION, DESIGN AND CONSTRUCTION

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STATUS
現況

SCALE 比例 — A3 1 : 2000

DIMENSION UNIT 尺寸單位 — METRES

KEY PLAN 索引圖 N.T.S

PROJECT NO. 項目編號 — 60672072

AGREEMENT NO. 協議編號 — CE 54/2021(GE)

SHEET TITLE
圖紙名稱

SECTIONS OF
THE DEVELOPMENT

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE A02

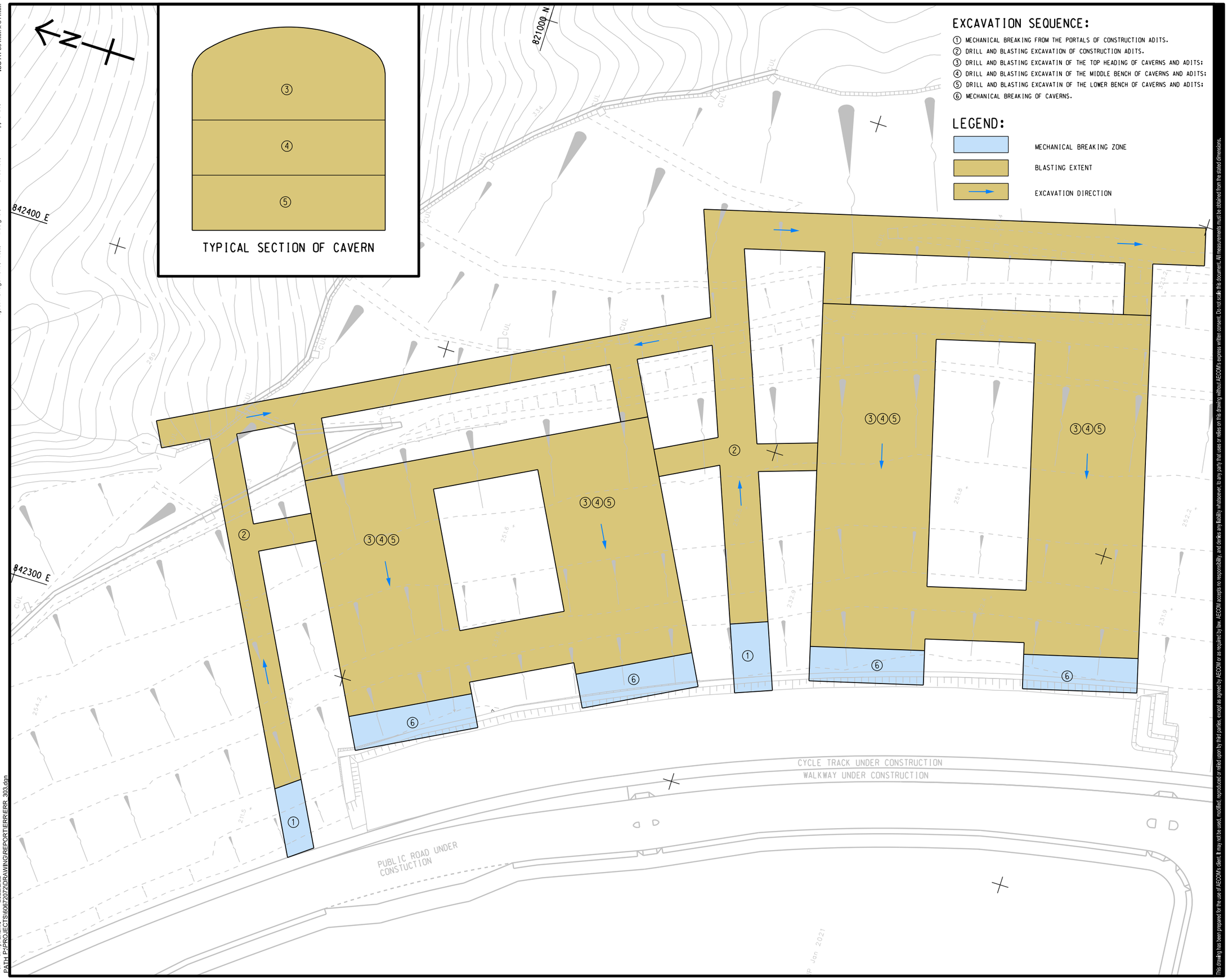
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



Plot File by: zhanxt 2022/2/22
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AECOM

PROJECT
項目

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STATUS
狀況

SCALE 比例
A3 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN N.T.S
索引圖

PROJECT NO. 項目編號
60672072

AGREEMENT NO. 協議編號
CE 54/2021(GE)

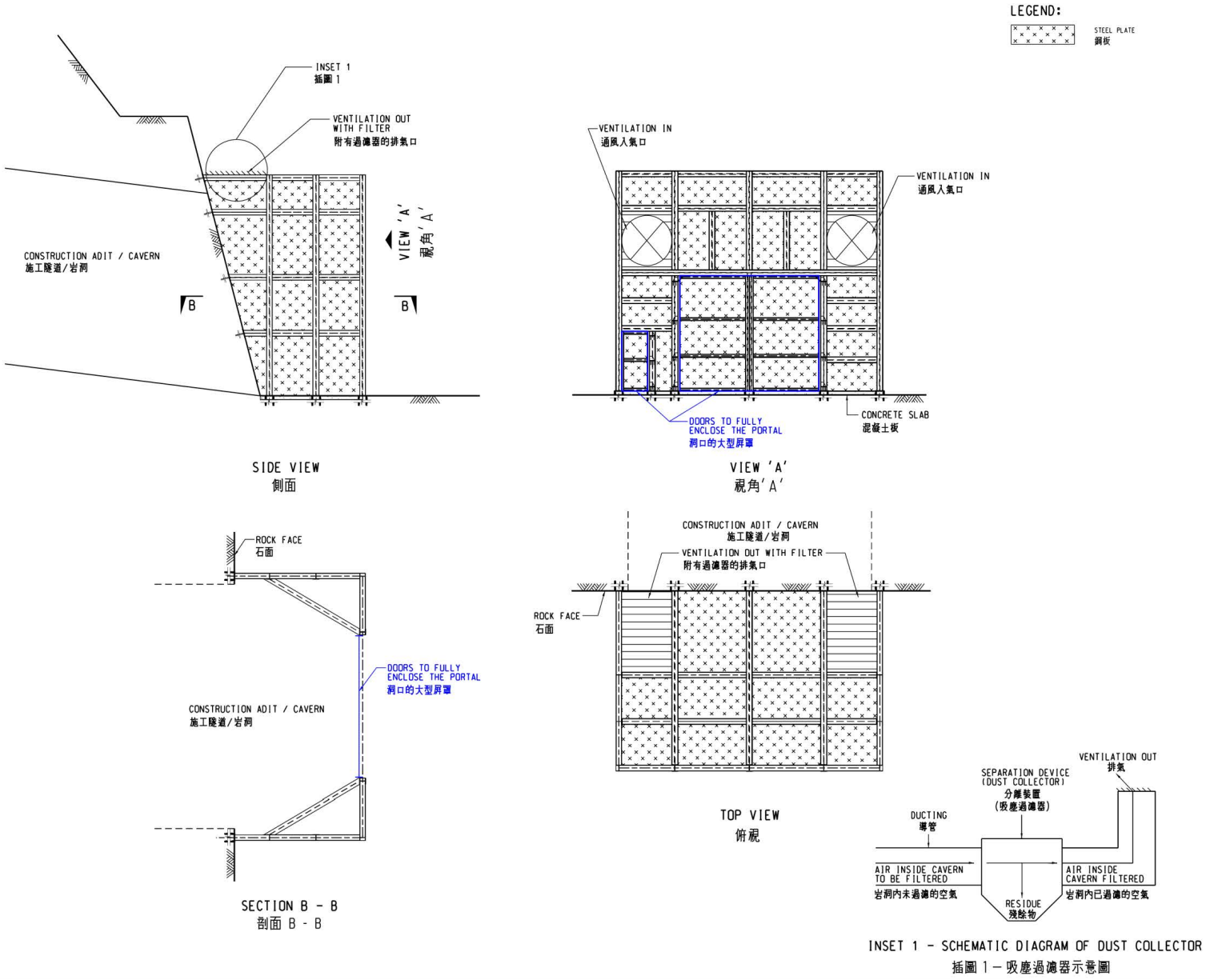
SHEET TITLE
圖紙名稱

EXCAVATION METHOD

SHEET NUMBER
圖紙編號

60672072/ERR/FIGURE A03

Appendix B
Enclosure with Ventilation Arrangement at Portal



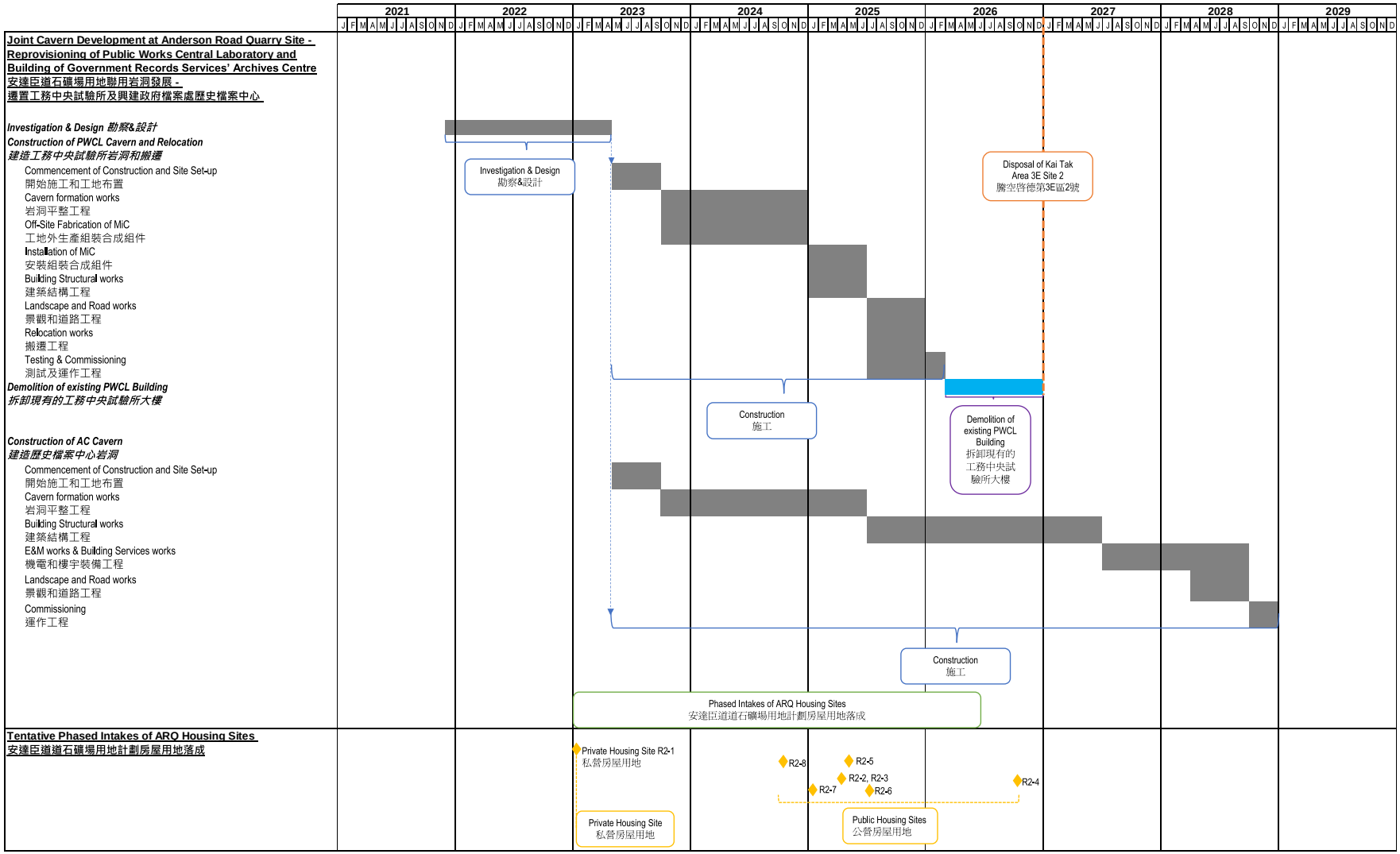
Project Title – Rock Cavern Development for Relocation of Public Works Central Laboratory Building
工程項目名稱 - 搬遷工務中央試驗所大樓的岩洞發展
[This figure was prepared based on Appendix F of Project Profile (Register No.: PP-619/2021)]
[本圖是根據工程項目簡介(登記冊編號:PP-619/2021) 附件 F 製作]

Environmental Permit No. :
環境許可證編號：
EP- 591/2021

Figure 2 – Enclosure with Ventilation Arrangement at Portal
圖二 – 在洞口附有通風系統的典型大型屏障

Appendix C
Tentative Programme of the Project

Appendix C Tentative Programme of the Project



Appendix D
Tentative Schedule of Population Intakes of ARQ Development

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

842000 E

842500 E

821500 N

821000 N

820500 N

TAN SHAN

TAI SHEUNG TOK

SITE R2-1

SITE R2-2

SITE R2-3

SITE R2-4

SITE R2-5

SITE R2-7

SITE R2-8

SITE RS-1

ON SAU ROAD

N

NOTE:

1. INDICATIVE BLOCK PLANS AT ARQ DEVELOPMENT SITE ADOPTED ARE BASED ON THE ARQ DEVELOPMENT SCHEDULE 3 EIA (EIAO REGISTER NO. AEIAR-183/2014).

LEGEND:

- PPROJECT BOUNDARY
- 500m ASSESSMENT AREA
- PROPOSED CAVERN AND ADITS
- PROPOSED CONSTRUCTION ADITS
- PROPOSED BUILDING STRUCTURE AT PORTAL AREA

ARQ HOUSING SITE	TENTATIVE YEAR OF POPULATION INTAKES
RS-1	2024
R2-1	2023
R2-2	2025 Q2
R2-3	2025 Q2
R2-4	2026 Q4
R2-5	2025 Q2
R2-6	2025 Q3
R2-7	2025 Q1
R2-8	2024 Q4

AECOM

PROJECT
項目

JOINT CAVERN DEVELOPMENT AT ANDERSON ROAD QUARRY SITE – REPROVISIONING OF PUBLIC WORKS CENTRAL LABORATORY AND BUILDING OF GOVERNMENT RECORDS SERVICES' ARCHIVES CENTRE

CLIENT
客戶

CEDD 土木工程拓展署 Civil Engineering and Development Department

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

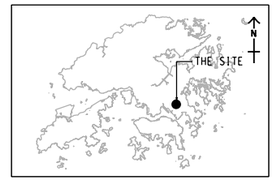
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
狀態

SCALE 比例: A3 1 : 5000

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN N.T.S
索引圖



PROJECT NO. 項目編號: 60672072

AGREEMENT NO. 協議編號: CE 54/2021(GE)

SHEET TITLE
圖紙名稱

TENTATIVE POPULATION INTAKES OF ARQ DEVELOPMENT

SHEET NUMBER
圖紙編號

60672072/ERR/APPENDIX D

Plot File by: LaMR
PATH P:\PROJECTS\60672072\DRAWINGS\REPORTS\ERR\ERR_707.dgn
5/6/2022

Appendix E
Maximum Allowable Sound Power Levels for Fixed Plant

Appendix E Maximum Allowable Sound Power Levels for Fixed Plant

Representative Noise Sensitive Receiver (NSR)		Area Sensitive Rating [1]	Noise Criteria[2][3], dB(A)	Fixed Noise Sources [4][5]	Appointed Criteria, dB(A)	Distance from NSR to Noise Source, m	Correction, dB(A)			Maximum Allowable SWL, dB(A)
							Distance	Tonality	Façade	
NSR1	Siu To Yuen Village	A	45	Building Structure of PWCL Portion at Portal Area	42	300	-58	6	3	91
				Building Structure of AC Portion at Portal Area	42	368	-59	6	3	92
NSR2	Planned Residential Development	B	49	Building Structure of PWCL Portion at Portal Area	46	47	-41	6	3	78
				Building Structure of AC Portion at Portal Area	46	137	-51	6	3	88
NSR3	Planned Residential Development	B	49	Building Structure of PWCL Portion at Portal Area	46	44	-41	6	3	78
				Building Structure of AC Portion at Portal Area	46	95	-48	6	3	85
NSR4	Planned Residential Development	B	49	Building Structure of PWCL Portion at Portal Area	46	49	-42	6	3	79
				Building Structure of AC Portion at Portal Area	46	53	-42	6	3	79
NSR5	Planned Residential Development	B	49	Building Structure of PWCL Portion at Portal Area	46	66	-44	6	3	81
				Building Structure of AC Portion at Portal Area	46	47	-41	6	3	78
NSR6	Planned Primary School	B	53	Building Structure of PWCL Portion at Portal Area	50	146	-51	6	3	92
				Building Structure of AC Portion at Portal Area	50	144	-51	6	3	92
NSR7	Planned Residential Development (Mount Anderson)	B	49	Building Structure of PWCL Portion at Portal Area	46	154	-52	6	3	89
				Building Structure of AC Portion at Portal Area	46	267	-57	6	3	94
									Allowable SWL for Building Structure of PWCL Portion at Portal Area	=78
									Allowable SWL for Building Structure of AC Portion at Portal Area	=78

Notes:

[1] Assignment of Area Sensitive Ratings (ASR) follows IND-TM.
- Area Sensitive Rating of "A" is assigned for NSR contained in (i) Rural area, including country parks or village type developments, and not affected by an IF.
- Area Sensitive Rating of "B" is assigned for NSR contained in (iii) Urban Area, and not affected by an IF.

[2] Noise Criteria is the minimum of the 5 dB(A) below the Acceptable Noise Level (ANL-5) stated in the IND-TM and Prevailing Background Noise level suggested in the assessment of Schedule 3 EIA Report for Development of Anderson Road Quarry (EIAO Register No. AEIAR–183/2014).

[3] The testing and office hour of the Reprovisioned PWCL Building and new GRS' AC would be in daytime (0700 – 1900) only, whereas some fixed plants may require to be in operation/standby for 24 hours to meet the operation requirement of some instruments that evening and night-time operation of the fixed noise sources have been assumed. Night-time noise criteria has been adopted for residential uses and evening-time noise criteria for educational uses.

[4] All the fixed noise sources (except fixed plant involving the air exchange, e.g. mechanical ventilation and air-conditioning system, and fire safety) shall be installed inside the cavern or reinforced concrete structure with a soundproof door.

[5] The sound power levels of the two building structures of PWCL Portion and AC Portion at portal have been assumed the same.