

Lam Tei Quarry (Development of Lam Tei Underground Quarry)

藍地石礦場(藍地地下採石場發展)

Project Profile (English Version)

工程項目簡介 (英文版)

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1 BASIC INFORMATION

1.1 Project Title

- 1.1.1.1 Lam Tei Quarry (Development of Lam Tei Underground Quarry) (hereinafter referred to as “the Project” or “LTUQ”).

1.2 Project Description

1.2.1 Purpose and Nature of the Project

- 1.2.1.1 Currently, the existing Lam Tei Quarry (LTQ) located in Tuen Mun is the only active quarry in Hong Kong, which operates under a contract set to expire in 2025. To ensure a consistent supply of construction materials for buildings and infrastructure development in Hong Kong, it is important to strategically optimise the local rock supply to the construction industry, for example through quarries operation. In addition to virgin rock extraction, surplus excavated rock from local construction projects (e.g. Route 11 and Tuen Mun Bypass) can be received and processed at quarries for beneficial reuse. Moreover, quarries can also serve as ideal locations for manufacturing plants that produce rock-derived construction materials such as ready-mixed concrete and asphalt.
- 1.2.1.2 To cope with the local demand of rock-derived construction materials for buildings and infrastructures development, and serve as a receiving point for the surplus excavated rock from construction projects, it is proposed to extend the existing quarrying activities at LTQ through underground quarry-cum-cavern development.
- 1.2.1.3 In Policy Address 2022, the Government set out the intention to implement underground quarry-cum-cavern development with the aims of enhancing long-term efficient land supply and local source of rock material supply. The Project aligns with this dual-benefit policy, contributing to the sustainable provision of local rock resources and enhancing land supply.

1.2.2 Location of the Project and History of the Project Site

- 1.2.2.1 The Project site is situated at the centre of Tuen Mun District and covers the LTQ. It is bounded by Yuen Long Highway at the north, the Permitted Village Burial Ground no. 22 at the northwest and Tai Lam Country Park (TLCP) at the south to southeast. To the east and west of the Project site are the Hung Shui Hang Irrigation Reservoir (HSHIR) and Lam Tei Irrigation Reservoir (LTIR) respectively and their connecting watercourses. **Figure 1.1** illustrates the location and footprint of the Project. The LTQ is surrounded by rock cutting slopes, whereas scattered village houses and graves in Fu Tei Ha Tsuen (FTHT) and Fuk Hang Tsuen (FHT) were found at its west and north. Currently, LTQ can be accessed via Chui Fuk Road or Fuk Hang Tsuen Path.
- 1.2.2.2 Quarrying activities at LTQ have been commenced since 1960, when the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) had not yet come into effect. The LTQ was initially operated under a permit contract before 1993, followed by a rehabilitation contract which required the contractor to complete rock excavation based on an approved landform and landscaping within a definite time. Section 9(2) of the EIAO specifies that Designated Projects (DPs) in Part I of Schedule 2 which have commenced construction or been in operation before the Ordinance had come into operation are exempted from provisions of the EIAO, and no Environmental Permit (EP) is required. As such, LTQ is an exempted DP under Schedule 2, Part I, Item J.3 – “A surface quarry (being a quarry as defined by section 2(1) of the Factories and Industrial Undertakings Ordinance (Cap. 59)) at which ground surface excavation is carried out”.
- 1.2.2.3 The LTQ is currently operated under an extended revenue-earning quarrying and rehabilitation contract (i.e. Contract no. GE/2014/01) covering a surface area of approximately 30ha. The existing LTQ ancillary operation possesses a rock processing plant, asphalt production plant, and concrete batching plants.

1.2.3 **Previous Proposal for Applying EIA SB**

1.2.3.1 The previous proposal for applying Environmental Impact Assessment Study Brief (EIA SB) (which was issued in June 2022) was initially planned to encompass the entire site of the existing LTQ (~30ha) for ancillary operations. Moreover, two independent underground quarry complexes (total extent of ~46ha) with six access tunnels were proposed under the previous proposal (**Figure 1.2** refers).

1.2.4 **Updated Proposal after the Issuance of EIA SB**

1.2.4.1 With the development of strategic highways Route 11 and Tuen Mun Bypass (TMB) as confirmed in 2023, the western part of the LTQ site will be handed over to the project proponent of Route 11 and TMB for site formation works of the proposed LTQ Interchange at LTQ site. As such, an updated proposal with smaller Project extent (including both aboveground and underground areas) was developed to exclude the works area of Route 11 and TMB.

1.2.4.2 The extent of aboveground works areas and underground complex are significantly reduced from ~30ha to ~9ha and from ~46ha to ~27ha, respectively. The number of proposed access tunnels is also reduced to two from six. Besides, access through Chui Fuk Road will no longer be used as the existing LTQ operation and previous proposal. A comparison between the previous and updated proposals is presented in **Figure 1.2**.

1.2.5 **Proposed Addition, Modification or Alteration to the Existing LTQ**

1.2.5.1 As mentioned in **Section 1.2.1**, underground quarry-cum-cavern development is proposed to extend the quarrying activities at LTQ, at the same time enhance the land supply. The proposed underground development will be located at immediate south to the LTQ and beneath the TLCP (**Figure 1.1** refers). The Project operation consists of two major elements as detailed below:

- *Quarrying Activities*

1.2.5.2 The quarrying activities of the Project will be relocated from the surface land of LTQ (i.e. current practices) to the underground strata of TLCP to minimise the environmental impacts on nearby sensitive receivers from the extension of quarrying activities.

1.2.5.3 The proposed underground development consists of main access tunnels (MATs) and production caverns, with depths generally more than 50m – 150m below ground. The tentative dimension of the production caverns is approximately 26m span x 16m height (**Figure 1.3** refers), which is designed with the consideration of underground support requirements and the spatial requirements of potential after-uses. MATs will be constructed around the production caverns as a primary access and an evacuation route. According to the latest design, MATs will be formed with an excavated span and a height of ~16m and ~18m, respectively (**Figure 1.3** refers).

1.2.5.4 Considering the cost effectiveness and the hardness of the rock in the Project site, drill-and-blast method (D&B), being adopted under the current LTQ operation, is the most suitable and appropriate method for the quarrying activities, i.e. formation of the production caverns and major parts of MATs. Besides, the operation frequency of D&B under the Project would remain unchanged as the existing LTQ operation, which will be conducted once per day during daytime.

- *Ancillary Operation*

1.2.5.5 Regarding the nature and purposes of the Project as detailed in **Section 1.2.1**, the type of ancillary operations, including stockpiling, rock processing and other associated activities (e.g. concrete batching and asphalt production), will remain unchanged from the existing quarrying operation at LTQ. The operational mode, in term of the operation period of the facilities related to the quarry operation, of the Project will also remain the same as that of

the existing LTQ operation (i.e. during non-restricted hours)¹. Furthermore, under the updated proposal, the aboveground works area of the Project will be limited to the eastern part of the LTQ due to the construction of the proposed LTQ Interchange under Route 11 and TMB. Consequently, the Project is expected to cause less noise nuisance to the sensitive receivers along Chui Fuk Road compared to that from the existing LTQ, despite having similar scale of ancillary operations and associated operations. All aboveground facilities related to the quarry operation will be removed after the completion of the Project in 2044. Any environmental impacts related to the decommissioning of quarry will be assessed by the relevant project proponent separately.

- 1.2.5.6 Under the updated proposal, the surface area of the Project will be limited to the eastern portion of the LTQ with a single entrance via Fuk Hang Tsuen Path. Nuisance to sensitive receivers at the west of LTQ (e.g. Fu Tei Ha Tsuen) can be reduced from that of the existing operation. The significant reduced scale of the Project in term of footprint, coupled with the proposed underground quarrying activities, will result in diminished environmental impacts from the Project on nearby sensitive receivers compared to both the previous proposal and existing LTQ operation. Given that the Project site is situated at a valley area surrounded by man-made rock slopes serving as screening barriers for the nearby sensitive receiver, with the implementation of appropriate mitigation measures (both of the currently adopted and additional measures as detailed in **Section 4**), general good site practices, and additional emission monitoring (detailed in **Section 4.3**), no adverse residual environmental impacts from the proposed addition, modification or alteration to the existing LTQ would be anticipated.
- 1.2.5.7 Regarding the encroachment into the underground area of TLCP, the project proponent will seek consent from the Country and Marine Parks Authority under the Country Park Ordinance (Cap. 208) and approval from Lands Department separately.

1.2.6 **Consideration of Alternative Locations**

- 1.2.6.1 The hillside area, located immediately south of the existing LTQ and within TLCP, has been identified as a highly suitable site for this Project due to its favourable geological condition and topographic settings. It possesses sufficient reserves of high quality rock that can serve as good raw materials for concrete and asphalt production. There are also site constraints that limit the possibility of extending quarry operations towards the east, west and north of LTQ. These constraints include HSHIR at the east, while the planned Route 11 and TMB at the west and north. Therefore, the extension of the quarry could only be situated immediately south of the existing LTQ in the underground strata of TLCP. Furthermore, this area is compatible with the quarrying industry due to the many years of operation of LTQ, making it the most suitable location for the first underground quarry-cum-cavern development in Hong Kong.

1.3 **Material Change to an Exempted Designated Project**

- 1.3.1.1 As explained in **Section 1.2.2.2**, LTQ is an exempted DP under Schedule 2, Part I, Item J.3 – “A surface quarry (being a quarry as defined by section 2(1) of the Factories and Industrial Undertakings Ordinance (Cap. 59)) at which ground surface excavation is carried out”.
- 1.3.1.2 Section 9(4) of the EIAO specifies that material change to an exempted project requires an EP under the Ordinance unless it is subsequently exempted. Material change as defined in Schedule 1 of the EIAO means a physical addition or alteration to a designated project which results in an adverse environmental impact as defined in the technical memorandum. Section 6.1 of the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM) issued under the EIAO has listed out the circumstances without additional mitigation measures in place that are considered as material change.

¹ All ancillary operation and other associated activities will take place from hours 0700 to 1900 on working days (non-restricted hours). During the night-time period, all ancillary operation and other associated activities will not operate, except the asphalt production plant when there are night-time road works that require asphalt (**Section 3.3.2.11** refers).

- 1.3.1.3 The proposed quarry extent of the Project will be at the underground area of TLCP, which is a site of conservation importance that may raise concerns on the potential ecological impacts. Hence, the Project is considered to constitute material changes to the exempted DP, i.e. the existing LTQ, where the following circumstances under Section 6.1 of the EIAO-TM are considered applicable:
- 6.1 (a) a change to physical alignment, layout or design of the project causing an environmental impact likely to affect existing or planned community, ecologically important areas or sites of cultural heritage; and
 - 6.1 (e) a change resulting in physical works that are likely to affect a rare, endangered or protected species, or an important ecological habitat, or a site of cultural heritage.
- 1.3.1.4 This Project Profile (PP) has been prepared to seek permission from the Director of Environmental Protection under Section 5(10) of the EIAO to apply directly for an Environmental Permit for the material changes to the exempted DP, i.e. the existing LTQ.
- 1.3.1.5 This PP only covers the construction and operational phases of the Project, not covering the after-uses of the produced caverns. Separate studies will be carried out by the concerned project proponent for the future use of the produced cavern.

1.4 Project Proponent

- 1.4.1.1 The project proponent is Civil Engineering and Development Department.

1.5 Name and Telephone Number of Contact Person(s)

Contact Person:	Ms. LAU Nga Yan, Phoebe
Post Title:	Sr Geo Engr / Mines 3
Branch:	Quarry Studies, Mines Section 3, Mines Division
Group:	Geotechnical Engineering Office (GEO)
Department:	Civil Engineering and Development Department
Office Address:	6/F, South Tower, West Kowloon Government Offices, 11 Hoi Ting Road, Kowloon
Telephone:	3842 7222
Facsimile:	2714 0193

1.6 Implementation Programme

- 1.6.1.1 The Project will be constructed and operated by a new quarry operator under a new quarry contract to be effective in Q1 2025. Tender invitation will be proceeded immediately after obtaining EP, in order to meet the tight target schedule. Major construction activities are expected in 2025 to involve site clearance (e.g. vegetation removal and erection of fence), platform formation, construction of portals and the front sections (legeoss than 10m) of the MATs by mechanical excavation, installation of blasting door, minor slope stabilisation works associated with the portals' formation, as well as installation of ancillary facilities / plants. Given that the LTQ site is already a flat platform with a general elevation of around +25mPD, large scale site formation works at aboveground works area of the Project will not be required. No D&B and ancillary operations of the Project will be carried out during the construction phase. Remaining ancillary operations under the existing LTQ will be continuously operated within the proposed aboveground works area for the approximate half year of the construction phase. The construction phase will take approximately 1 year, including the time required for procurement, delivery, installation and license(s) application for ancillary facilities / plants. The tentative construction programme is presented in **Appendix 1.1**.
- 1.6.1.2 Once the initial set up is ready in Q1 2026, D&B method will be adopted for the formation of production caverns and MATs. Same as the current practices at the LTQ, the as-blasted rock fragments will be crushed on-site to suitable sizes for use as aggregates by rock crushers, and will go through further processing in concrete batching or asphalt production plants within the aboveground works area of the Project for export. Depending on the scale of operation, the operational phase is likely to be completed in Q4 2044.

1.7 Interactions with Other Projects

1.7.1.1 Based on the best available information at the time of writing this PP, four other projects that would likely interface with the Project are identified. Relevant details were summarised in **Table 1.1**, with the locations shown in **Figure 1.4**.

Table 1.1 Summary of Other Potential Projects Identified within 500m of the Project Site

Project	Tentative Construction Programme	Possible Cumulative Impacts
Development at Lam Tei North East	Not available	The implementation schedule of this project is uncertain. No detailed information and implementation programme of this project is available at the time of preparing this PP.
Route 11 (Section between Yuen Long and North Lantau) (Route 11)	Q1 2026 – Q4 2033	The explosive magazine (same explosive magazine as Tuen Mun Bypass), slope works, operation and maintenance facilities, Lam Tei Quarry (LTQ) Interchange and tunnel section at Lam Tei will be located near the Project site. The construction and operation of Route 11 will overlap with the operational phase of this Project from Q1 2026 to Q4 2044. Potential cumulative impacts during the operational phase in terms of air quality, noise, water quality, hazard to life, ecology, and landscape and visual will be taken into account in this PP.
Site Formation and Infrastructure Works for Public Housing Developments at Lam Tei North, Tuen Mun – IDC (under Agreement No. CE5/2022 (CE))	Under Review	Based on the best available information, the boundary of the proposed public housing development at Lam Tei North would partly fall within the 500m area of the Project. The programme for Lam Tei North public housing development is under review, relevant construction will overlap with the operational phase of this Project only in Q1 2026 at the earliest. However, in view of the large separation of more than 450m between these two projects, the temporary and localised nature of the construction activities involved, no potential cumulative environmental impacts during the overlapping period would be anticipated.
Tuen Mun Bypass (TMB)	Q2 2025 – Q3 2033	The explosive magazine (same explosive magazine as Route 11), slope works, operation and maintenance facilities, LTQ Interchange and tunnel section at Lam Tei will be located near to the Project. The construction and operation of TMB will overlap with those of this Project from Q2 2025 to Q4 2025 and Q4 2033 to Q3 2044, respectively. Potential cumulative impacts during the construction and operational phases in terms of air quality, noise, water quality, hazard to life, ecology, and landscape and visual will be taken into account in this PP.

2 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

2.1 General

2.1.1.1 The Project is located in Lam Tei, Tuen Mun. The current zonings of the northern part of the Project site under the Approved Lam Tei and Yick Yuen Outline Zoning Plan (OZP) No. S/TM-LTY/12 include “Other Specified Uses” (“OU”) annotated “Quarry”, “Green Belt” (“GB”), and “Conservation Area” (“CA”); while the southern part of the Project site is TLCP. Major elements of surrounding environment of the Project site include low-rise residential development, scattered village houses / squatter houses, temporary structures, HSHIR and LTIR as described in **Sections 2.2 to 2.9**. Similar to the existing environment, the past land uses of the Project site were mainly quarry, vegetated / vacant land and irrigation reservoirs and no major changes to these land uses were observed.

2.2 Air Quality

2.2.1.1 Apart from the existing LTQ operation, the closest major source of air pollutants in the study area would be heavy traffic along the existing Yuen Long Highway, Kong Sham Western Highway and Castle Peak Road, which are located more than 200m from the Project boundary. According to best available information from Centralised Environmental Database by EPD and the observations from the site survey in May 2024, no existing or planned industrial chimney is identified within the study area.

2.2.1.2 To identify the air sensitive receivers (ASRs) within the study area that would likely be affected by the potential impacts from the construction and operation of the Project, site survey was conducted in May 2024, and relevant available information including topographic maps, Outline Zoning Plans (OZPs), such as OZP No. S/TM-LTY/12 and OZP No. S/TM/38, and other published plans in the vicinity of the Project Site were reviewed. The details and locations of the identified ASRs within the study area are presented in **Table 2.1** and **Figure 2.2**, respectively.

Table 2.1 Summary of Identified Air Sensitive Receivers

ASR ID	Description	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Nearest Project Boundary (m)
<i>Existing ⁽²⁾</i>			
A01	Temple	W	440
A02	Temple	W	495
A03	Lo Fu Hang	V	405
A04	Fu Tei Ha Tsuen	V	390
A05	Church of Christian Faith Lam Tei Gospel Church	W	495
A06	Fuk Hang Tsuen	V	410
A07	Fuk Hang Tsuen	V	145
A10	Fuk Hang Tsuen Houses 59 - 61	V	470
A11	Fuk Hang Tsuen Village House	V	440
A12	Fuk Hang Tsuen Village House	V	455
A13	Fuk Hang Tsuen Village House	V	325
A14	Fuk Hang Tsuen Village House	V	340
A15	Tsoi Yuen Tsuen House 159	V	490
A16	Tsoi Yuen Tsuen Village House	V	450
A17	Fuk Hang Tsuen House 152	V	425
A18	Tsoi Yuen Tsuen House 74	V	435

ASR ID	Description	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Nearest Project Boundary (m)
A19	Tsoi Yuen Tsuen House 282	V	440
A20	Tsoi Yuen Tsuen House 283	V	450
A21	Fuk Hang Tsuen Village House	V	190
A22	Fuk Hang Tsuen Village House	V	145
A23	Tin Hau Temple at Fuk Hang Tsuen Path	W	120
A24	Fuk Hang Tsuen House 178	V	195
A25	Fuk Hang Tsuen Village House	V	185
A26	Tung Fuk Road Village House	V	280
A27	Tung Fuk Road Village House	V	335
A28	Tung Fuk Road Village House	V	390
A29	Tung Fuk Road Village House	V	445
A30	Tung Fuk Road Village House	V	485
A31	Fuk Hang Tsuen Village House	V	18
A32	Fu Tei Ha Tsuen Village House	V	365
A33	Fu Tei Ha Tsuen Village House	V	435
A34	Chui Fuk Road Village House	V	265
A35	Fu Fuk Road Village House	V	305
A36	Chui Fuk Road Village House	V	235
A37	Chui Fuk Road Village House	V	225
A38	Fu Tei Ha Tsuen Village House	V	370
A39	Nam On Buddhist Monastery	W	445
<i>Planned</i>			
A40	Route 11 Administration Building	O	185
A41	Route 11 Administration Building	O	170
A44	Tuen Mun Bypass Satellite Control Building	O	180
A45	Tuen Mun Bypass Satellite Control Building	O	175
P01	Comprehensive Development in D.D. 130 and Adjoining Government Land	G/IC	395
P02	Comprehensive Development in D.D. 130 and Adjoining Government Land	G/IC	435
P03	Comprehensive Development in D.D. 130 and Adjoining Government Land	G/IC	490
P04	Temporary Place of Recreation, Sports or Culture (Indoor Recreation Centre)	G/IC	445
P05	Public Housing Development at Lam Tei North	G/IC	455
P06	Public Housing Development at Lam Tei North	G/IC	480
P07	Temporary Place of Recreation, Sports or Culture (Sports Training Ground)	Re	175

Notes:

- (1) G/IC – Government, Institution and Community; O – Office; Re – Recreational; V – Village; W – Place of Public Worship.
- (2) All the existing ASRs are also affected by the existing LTQ operation.

2.2.1.3 The air quality monitoring station at Tuen Mun Public Library is the nearest monitoring station of the Environmental Protection Department (EPD) to the Project site. The latest five-year (2018 - 2022) average concentrations of air pollutant relevant to the Project are summarised in **Table 2.2**.

Table 2.2 Concentrations of Pollutants at Tuen Mun EPD Air Quality Monitoring Station (2018 – 2022)

Air Pollutant (AP)	Averaging Time	AQO [1]	Concentration ($\mu\text{g}/\text{m}^3$)				
			2018	2019	2020	2021	2022
Respirable Suspended Particulates (RSP)	10 th Highest 24-hour	100 (9)	87	89	84	87	65
	Annual	50	42	41	34	36	32
Fine Suspended Particulates (FSP)	19 th Highest 24-hour	50 (18)	47	46	41	42	39
	Annual	25	26	24	20	19	18
Nitrogen Dioxide (NO ₂)	19 th Highest 1-hour	200 (18)	177	166	166	172	128
	Annual	40	47	47	40	44	39
Sulphur Dioxide (SO ₂)	4 th Highest 10-min	500 (3)	94	45	98	22	29
	4 th Highest 24-hour	50 (3)	20	12	10	9	11

Notes:

[1] Value in () refers the number of exceedances allowed per year.

[2] Bolded value indicates exceedance of Air Quality Objective (AQO) limit value.

2.2.1.4 Apart from the air quality monitoring data, EPD has released a set of background levels from “Pollutants in the Atmosphere and their Transport over Hong Kong”, PATH model. The air pollutant concentrations in the study area, with reference to the PATH data in Year 2025 (PATH v3.0), Year 2030 (PATH v3.0) and Year 2040 (PATH v3.0), are summarised in **Table 2.3** to **Table 2.5**.

Table 2.3 Background Air Pollutants in Year 2025 Extracted from the PATH v3.0 Model

AP	Avg. Time	AQO [1]	Data Summary	PATH v3.0 Grid in Year 2025 [2]							
				21,43	21,44	22,42	22,43	22,44	23,42	23,43	23,44
FSP [3][4]	24-hr	50 (18)[4]	19 th Max.	33	34	35	34	34	35	34	34
			No. of Exceedance(s)	0	0	2	0	0	2	2	0
	Annual	25	-	13	14	13	13	13	13	13	13
RSP [4]	24-hr	100 (9)	10 th Max.	57	57	60	58	57	60	59	58
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	50	-	21	21	21	21	21	21	21	21
NO ₂	1-hr	200 (18)	19 th Max.	86	87	77	76	80	76	71	73
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	40	-	19	21	16	16	18	16	16	16
SO ₂	10-min	500 (3)	4 th Max.	28	29	26	26	28	28	26	28
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	24-hr	50 (3)	4 th Max.	8	8	8	8	8	8	8	8
No. of Exceedance(s)			0	0	0	0	0	0	0	0	

Notes:

[1] Values in () mean the number of exceedances allowed per year.

[2] Bolded value indicates exceedance of the AQO.

[3] All concentrations are in microgram per cubic metre ($\mu\text{g}/\text{m}^3$)

[4] The new AQO allows 35 days of exceedance per calendar year for daily FSP. Instead, government and related projects shall adopt a more stringent standard with the number of allowable exceedance of 18 days per calendar year

Table 2.4 Background Air Pollutants in Year 2030 Extracted from the PATH v3.0 Model

AP	Avg. Time	AQO [1]	Data Summary	PATH v3.0 Grid in Year 2030 [2]							
				21,43	21,44	22,42	22,43	22,44	23,42	23,43	23,44
FSP [3][4]	24-hr	50 (18)[4]	19 th Max.	30	31	29	30	31	30	30	31
			No. of Exceedance(s)	0	0	0	0	0	0	0	0

AP	Avg. Time	AQO [1]	Data Summary	PATH v3.0 Grid in Year 2030 [2]							
				21,43	21,44	22,42	22,43	22,44	23,42	23,43	23,44
	Annual	25	-	12	12	12	12	12	12	12	12
RSP [4]	24-hr	100 (9)	10th Max.	50	51	53	51	51	53	53	53
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	50	-	19	20	19	19	20	19	20	20
NO ₂	1-hr	200 (18)	19th Max.	79	79	70	70	72	69	66	65
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	40	-	17	18	14	14	16	15	14	14
SO ₂	10-min	500 (3)	4th Max.	25	26	22	24	25	25	24	25
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	24-hr	50 (3)	4th Max.	7	7	7	7	7	7	7	7
			No. of Exceedance(s)	0	0	0	0	0	0	0	0

Notes:

[1] Values in () mean the number of exceedances allowed per year.

[2] Bolded value indicates exceedance of the AQO.

[3] All concentrations are in microgram per cubic metre ($\mu\text{g}/\text{m}^3$)

[4] The new AQO allows 35 days of exceedance per calendar year for daily FSP. Instead, government and related projects shall adopt a more stringent standard with the number of allowable exceedance of 18 days per calendar year

Table 2.5 Background Air Pollutants in Year 2040 Extracted from the PATH v3.0 Model

AP	Avg. Time	AQO [1]	Data Summary	PATH v3.0 Grid in Year 2040 [2]							
				21,43	21,44	22,42	22,43	22,44	23,42	23,43	23,44
FSP [3][4]	24-hr	50 (18) [4]	19th Max.	29	29	29	29	29	29	29	30
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	25	-	12	12	12	12	12	12	12	12
RSP [4]	24-hr	100 (9)	10th Max.	50	50	53	51	50	53	52	52
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	50	-	19	19	19	19	19	19	19	19
NO ₂	1-hr	200 (18)	19th Max.	68	68	59	58	63	60	57	58
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	Annual	40	-	14	15	12	12	13	12	12	12
SO ₂	10-min	500 (3)	4th Max.	25	26	22	24	25	25	24	25
			No. of Exceedance(s)	0	0	0	0	0	0	0	0
	24-hr	50 (3)	4th Max.	7	7	7	7	7	6	6	6
			No. of Exceedance(s)	0	0	0	0	0	0	0	0

Notes:

[1] Values in () mean the number of exceedances allowed per year.

[2] Bolded value indicates exceedance of the AQO.

[3] All concentrations are in microgram per cubic metre ($\mu\text{g}/\text{m}^3$)

[4] The new AQO allows 35 days of exceedance per calendar year for daily FSP. Instead, government and related projects shall adopt a more stringent standard with the number of allowable exceedances of 18 days per calendar year.

2.3 Noise

2.3.1.1 The existing noise climate of the Project site is dominated by the industrial noise from the existing LTQ and traffic noise from Yuen Long Highway and Kong Sham Western Highway.

2.3.1.2 The existing and planned Noise Sensitive Receivers (NSRs) within 300m study area from the Project boundary have been identified based on site observation and review of the latest information including topographic maps, relevant Development Permission Area Plans, Outline Development Plans, OZPs (i.e. Approved OZP No. S/TM-LTTY/12), Layout Plans and other published land use plans, including plans and drawings published by the Lands Department, and land use and planning applications approved by the Town Planning Board in the vicinity of the Project site. These identified NSRs were mainly residential dwellings including village houses and squatter houses. NSRs located closest to the subject noise

sources, i.e. first layer of NSRs, are considered the most affected locations. The first layer of NSRs represents the worst-case scenario were selected as representative Noise Assessment Point (NAPs) for this noise impact review. The details of NAPs are summarised in **Table 2.6** below, with locations and photographs presented in **Figure 2.3** and **Appendix 2.3.1** respectively.

Table 2.6 Representative Noise Sensitive Receivers

NAP ID ⁽²⁾ ⁽³⁾ ⁽⁴⁾	Description	Land Use ⁽¹⁾	No. of Storey	Approximate Horizontal Distance to the Nearest Project Boundary (m)	Noise Impact Review [Y/N]			
					Construction Phase	Operational Phase		
					Construction Noise	Quarry Noise	Fixed Noise Sources	Road Traffic Noise
FHT1	Squatter House out of the Northwestern Entrance of the Existing Lam Tei Quarry	R	1	228	Y	Y	Y	N
FHT2	Squatter House at the Northeast of the Project boundary	R	1	18	Y	Y	Y	Y
FHT3	Squatter House at the West of 173 Fuk Hang Tsuen	R	1	109	N	N	N	Y
FHT4	Village House at 175 Fuk Hang Tsuen	R	1	149	N	N	N	Y
FHT5	Tin Hau Temple	W	2	122	Y	Y	Y	Y

Note:

- (1) R – Residential; W – Place of Public Worship.
- (2) The Yuen Long Water Treatment Works cum staff quarter located at the northeast of the Project boundary and the squatter houses to the immediate northeast of the Project boundary were confirmed to be abandoned according to the observation from site survey (**Figure 2.3** refers). Thus, they were not considered in this review. Besides, the Project's site office to be set up within the aboveground works area will be provided with mechanical ventilation and thus, will not rely on opened window / door for ventilation.
- (3) For the "G/IC" site currently occupied by "Yuen Long Fresh Water Service Reservoir" and "H.K.W.W. Yuen Long R.G. Filter", there will be planned noise sensitive uses if there are other development projects. Relevant authorities (e.g. Lands Department / Planning Department) will impose the appropriate planning requirement(s) for the future developer(s), if any, to incorporate the necessary noise mitigation measures to address the noise impacts from the Project.
- (4) According to Annex 13 of EIAO-TM, and with reference to the approved EIA Report of Route 11 and TMB, TLCP would not be considered as an NSR due to the transient nature of the visitor to TLCP.

2.3.1.3 All selected NSRs for the fixed noise sources impact review are either village houses or squatter houses and located at hillside areas considered as "rural area". Yuen Long Highway, a major road with an annual average daily traffic flow in excess of 30,000 located at the north to the selected NSRs, is considered as an Influencing Factor (IF). Nonetheless, given that all of the selected NSRs are low rise structures and facing away from Yuen Long Highway at a considerable separation of more than 80m, they are not affected by this IF. Besides, according to the observation from site surveys conducted in December 2022 and November 2023, the noise generated by this IF is not noticeable at the selected NSRs. Since they are not affected by IF, the Area Sensitive Ratings (ASRs) for these NSRs is considered as "A".

2.3.1.4 Background noise measurements were conducted in April 2023 at various locations in the vicinity of the Project to obtain prevailing background noise levels. Reference of prevailing noise measurement results from the concurrent projects (i.e. Route 11 and TMB) were also made, and the lowest measured background noise levels from the three concurrent projects were adopted for determining the appropriate fixed noise criteria for the nearby NSRs. Locations of noise measurement points, measurement procedures & parameters, measured background noise levels, and the review criteria for the proposed fixed noise sources of the Project, as adopted in this PP, are presented in **Appendix 2.3.2**.

2.3.1.5 In any event, the ASRs and Acceptable Noise Levels (ANLs) assumed in this PP are for indicative review only. It should be noted that noise from fixed noise sources is controlled under Section 13 of the Noise Control Ordinance (NCO) (Cap. 400). Therefore, the Noise Control Authority (NCA) shall determine the noise impact from the concerned fixed noise sources based on the prevailing legislation and practices being in force, and taking account of contemporary conditions / situations of adjoining land uses. Nothing in this PP shall bind the NCA in the context of law enforcement against any of the fixed noise sources being assessed.

2.4 Water Quality

2.4.1.1 Major water sensitive receivers (WSRs) identified within 500m from the Project boundary are listed below, with the locations presented in **Figure 2.4**.

- Tai Lam Country Park (TLCP);
- Water gathering grounds (WGGs);
- Hung Shui Hang Irrigation Reservoir (HSHIR);
- Lam Tei Irrigation Reservoir (LTIR);
- Upstream and downstream watercourses of LTIR;
- Upstream and downstream watercourses of HSHIR;
- Modified watercourses near Fu Hang Tsuen Path and Chung Wong Toi; and
- Modified watercourse near Fu Tei Ha Tsuen connecting to Tuen Mun River.

2.5 Land Contamination

2.5.1.1 A review of historical aerial photographs was undertaken to evaluate the likelihood of potential contamination associated with past land uses within the Project site. Review findings are summarised in **Table 2.7** below and the historical aerial photographs reviewed are provided in **Appendix 2.5.1**.

Table 2.7 Summary of Historical Land Uses

Year	Reference of Aerial Photos in Appendix 2.5.1 (Photo Reference Number ^a)	Description of Land-Uses and Site Operation / Activities
1963	60671716/PP/APP2.5.1/101 & 102 (#1963-7814)	The Project site was mainly occupied by natural terrain. Quarries were observed in the west to and at the north of the Project site. Temporary structures were observed in the east of the Project site.
1993	60671716/PP/APP2.5.1/103 & 104 (#A34582)	The northern portion of the Project site was largely occupied by quarries. Transmission towers were observed in the centre of the Project site. An agricultural station was observed in the east of the Project site. No other significant land use changes were observed within the Project site.
2003	60671716/PP/APP2.5.1/105 & 106 (#CW46497, CW53426)	Footprint of the existing LTQ was observed in the north of the Project site. Ancillary facilities were observed in the centre of LTQ. No other significant land use changes were observed within the Project site.
2022	60671716/PP/APP2.5.1/107 & 108 (#E147928C, E147931C, E147934C, E148890C, E148893C)	The ancillary facilities in the north of the existing LTQ were no longer observed and the area was vacated. Ancillary facilities were observed in the southwest of the existing LTQ. The agricultural station at the east of the Project site was no longer present. No other significant land use changes were observed within the Project site.

Note:

^a Source of aerial photographs: Survey and Mapping Office, Lands Department.

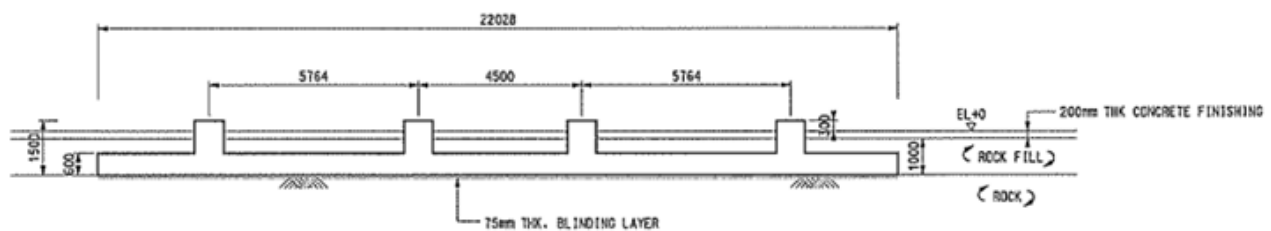
2.5.1.2 Based on the review of aerial photographs, the Project site has been mainly occupied by quarry and vegetation since 1960s. It should be noted that for the former temporary structures and agricultural station observed in the east of the Project site, based on the review of aerial photographs and topographic maps, there was no evidence to suggest that the former temporary structures and agricultural station were of industrial uses. It is further confirmed in the recent site surveys that the area was vacant / vegetated land with no site

activities observed. Therefore, potential land contamination issues associated with former temporary structures and agricultural station are not anticipated.

- 2.5.1.3 Although potentially contaminating land uses / activities identified within the Project site may include the operation of ancillary facilities associated with quarry operation (e.g. asphalt production and concrete batching plants) within the existing LTQ which has been observed since 2003, potential land contamination impact associated with the Project is anticipated to be insignificant due to the following:

No Soil Excavation or Potential Exposure of Contaminated Soil

- 2.5.1.4 Quarrying activities have been commenced in LTQ since 1960. During the quarrying, all soils near the original ground surface had already been removed at the early stage. Good quality granitic rock underneath was exposed and then quarried. In recent years, the surface quarry at LTQ has reached the final formation level at ~+25mPD. All naturally occurring soils in LTQ have already been completely removed and no longer exist.
- 2.5.1.5 As part of the quarry operation, ancillary plants, such as concrete batching and asphalt production plants, were built inside LTQ. However, the natural rock surface is always undulating, thus, a completely flat platform could hardly be formed during quarrying. To facilitate the construction of ancillary plants, a very thin layer of rock fill (not in-situ) was sometimes laid on the natural rock surface manually by workers, if necessary, to form a flat platform before constructing the concrete foundation of the ancillary plants. The rock fill is typically made of sandy gravel with cobble-sized fragments.
- 2.5.1.6 As a general practice of the existing LTQ operation, the ancillary plants were relocated from time to time so that the rock within the surface land of LTQ could be quarried to facilitate the surface quarrying operation. Whenever the plants were relocated, all underneath rock fill and rock within or in the vicinity of the footprint of the former ancillary facilities would then be excavated.
- 2.5.1.7 According to the available foundation design report of the existing ancillary plants at LTQ provided by CEDD, each existing ancillary plant was constructed on top of a concrete slab with concrete blinding (Concrete Footing Foundation). A typical cross-section showing the footing foundation design extracted from the foundation design report is presented below.



- 2.5.1.8 Although concrete batching and asphalt production plants are considered as potentially contaminating land uses, the potential of land contamination caused by operation of the existing plants is considered unlikely due to the presence of concrete slabs. Besides, throughout the construction and operation of the Project, the existing concrete blinding at LTQ will not be disturbed or removed as there will be no surface quarrying activities during the construction phase and all quarrying will be conducted underground during the operational phase of the Project.
- 2.5.1.9 Given that the concrete blinding will remain in place throughout the construction and operational phases of the Project, no soil excavation or potential exposure of contaminated soil is anticipated. No potential land contamination impact is therefore anticipated for the Project.

No Change in Land Use

- 2.5.1.10 The LTQ, with both quarrying activity and aboveground ancillary operations, has been operated since 1960. The LTQ site is currently zoned as "Other Specified Uses" ("OU")

annotated “Quarry” on the Approved OZP No. S/TM-LTY/12. There is no change in land use within the aboveground works area of the Project and the ancillary operation will continue throughout the Project until Q4 2044. Detailed land contamination assessment and decontamination works, if required, are expected to be separately carried out at the time of decommissioning of the quarry site.

2.5.1.11 In view of the above, no potential land contamination impacts are anticipated for the Project.

2.6 Hazard to Life

2.6.1.1 The use, transport and overnight storage of explosives could have potential risk implications to the nearby surrounding population. Same as the quarrying activities conducted under the current LTQ operation, D&B method with same operation frequency of one blast per day during the non-restricted hours will be adopted in the underground quarrying activities of the Project. Since no explosives will be handled during the construction phase and no storage of explosives (same explosives arrangement of the current LTQ operation) will be expected during the operational phase of the Project, the review of hazard to life impact only focused on the on-site transport and use of explosives during the operational phase.

2.6.1.2 Following the operation of the Project, the quarry activities by D&B method will be relocated from the surface area of LTQ to the underground strata of TLCP, moving away from the residential sensitive receivers along Chui Fuk Road and Fuk Hang Tsuen Path. At the same time, with the future tunnel users of the planned Route 11 and TMB in the vicinity from 2033. Having considered the separation distances between all the potential sensitive receivers and the Project, and also the consequences of accidental detonation of explosives and blasting operation, the road users of the planned Route 11 and TMB are the only off-site population further considered in the hazard to life risk review.

2.7 Ecology

2.7.1.1 The study area for the purpose of terrestrial and aquatic ecological impact review includes areas within 500m from the Project boundary (**Figure 2.7.1** refers). The ecological baseline of the Project site was established from literature review and a six-month site survey between June 2022 and November 2022 covering both dry and wet seasons. The schedule of ecological survey is presented in **Table 2.8** below and the survey transects / locations are mapped in **Figure 2.7.1**.

Table 2.8 Schedule of Ecological Surveys

Ecological Survey	2022					
	Wet Season					Dry Season
	Jun	Jul	Aug	Sep	Oct ⁽¹⁾	Nov
Habitat survey		✓		✓		✓
Vegetation survey		✓		✓		✓
Avifauna survey (Day & Night)	✓		✓		✓	✓
Terrestrial mammal survey (Day & Night)	✓		✓		✓	✓
Odonate survey	✓		✓		✓	
Butterfly survey	✓		✓		✓	✓
Amphibian survey (Day & Night)	✓		✓		✓	
Reptile survey (Day & Night)	✓		✓		✓	
Aquatic communities survey		✓		✓	✓	

Note:

(1) Transitional month

2.7.1.2 Relevant literature reviewed for ecological resources in the study area is listed below:

- Highways Department (HyD) (2023a). Route 11 (Section between Yuen Long and North Lantau) – Environmental Impact Assessment Report (Register No.: AEIAR-255/2023);
- Highways Department (HyD) (2023b). Tuen Mun Bypass - Environmental Impact Assessment Report (Register No.: AEIAR-258/2024);
- Agriculture, Fisheries and Conservation Department (AFCD) (2023). Tai Lam Country Park;

- Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub;
- Highways Department (HyD) (2022). Ground Investigation Works within Tai Lam Country Park for Route 11 (Section between Yuen Long and North Lantau) – Project Profile;
- Civil Engineering and Development Department (CEDD) (2022). Underground Quarrying at Lam Tei, Tuen Mun – Investigation, Design and Construction – Ecological Review Report;
- Civil Engineering and Development Department (CEDD) (2021a). Study on River Revitalisation and Flood Attenuation Facilities for Hung Shui Kiu New Development Area – Feasibility Study – Preliminary Environmental Review;
- Civil Engineering and Development Department (CEDD) (2021b). Site Formation and Infrastructure Works for Proposed Public Housing Developments at Ping Shan South, Yuen Long, Lam Tei North and Nai Wai, Tuen Mun – Feasibility Study – Preliminary Environmental Review;
- Civil Engineering and Development Department (CEDD) (2020a). Technical Study on Underground Quarrying in Hong Kong – Investigation – Additional Services No. 3 – Draft Ecological Baseline Survey Report (EBSR);
- Civil Engineering and Development Department (CEDD) (2020b). Underground Quarrying in Hong Kong – Investigation – Additional Services No. 2 – Final Preliminary Environmental Review Report (PERR);
- Civil Engineering and Development Department (CEDD) (2020c). Development at San Hing Road and Hong Po Road, Tuen Mun – EIA Report (AEIAR-227/2020); and
- Civil Engineering and Development Department (CEDD) (2017). Technical Study on Underground Quarrying in Hong Kong – Investigation – Inception Report.

Recognised Sites of Conservation Importance

- 2.7.1.3 Tai Lam Country Park (TLCP) is located at the south of the study area and within the Project boundary (**Figure 2.7.1** refers). Designated in 1979, TLCP covers 5,412ha of sylvan grounds in the Western New Territories, extending from Tsuen Wan to Tuen Mun (AFCD, 2023). Under the afforestation of TLCP, the country park is dominated by species such as Taiwan Acacia (*Acacia confusa*), *Eucalyptus* spp. and Brisbane Box (*Lophostemon confertus*). The forest of Tai Lam also provides habitat for various bird species and other mammal species such as Small Indian Civet (*Viverricula indica*), East Asian Porcupine (*Hystrix brachyura*) and Red Muntjac (*Muntiacus muntjak*). A diversity of amphibian and reptile species such as Hong Kong Cascade Frog (*Amolops hongkongensis*), Lesser Spiny Frog (*Quasipaa exilispinosa*) and Indo-Chinese Rat Snake (*Ptyas korros*) can also be found in TLCP.
- 2.7.1.4 An area zoned “Conservation Area” (“CA”) under the Approved OZP No. S/TM-LTYYY/12 is located at the northeast of the study area (**Figure 2.7.1** refers). The planning intention of this CA zone is to protect and retain the existing natural landscape, ecological or topographical features of the area for conservation, educational and research purposes and to separate sensitive natural environment such as Country Park from the adverse effects of development.

Habitat Characteristics and Wildlife Recorded

- 2.7.1.5 Based on the literature review and 6-month ecological survey, a total of 9 habitats were recorded within the 500m study area, namely watercourse, modified watercourse, irrigation reservoir, mixed woodland, plantation, shrubland, dry agricultural land, village / orchard and developed area / wasteland (**Figures 2.7.2.1 & 2.7.2.2** refer). Among these habitats, 5 of them including plantation, shrubland, developed area / wasteland, mixed woodland and watercourses (i.e. W1 and W2a) were recorded within the Project boundary. Vegetations recorded at the plantation habitat within the proposed aboveground works area was with sparse cover of exotic plantation tree species e.g. Horsetail Tree (*Casuarina equisetifolia*), *Acacia* spp., Brisbane Box (*Lophostemon confertus*), while pioneer native shrubs and herbs e.g. Dichotomy Forked Fern (*Dicranopteris pedate*), Pond Spice (*Litsea glutinosa*) and Greenbrier (*Smilax china*) were recorded in the understory. Evaluation of the ecological value of each habitat is presented in **Appendix 2.7.1A**. Representative photographs of habitats are provided in **Appendix 2.7.1B**, with area of each habitat within the study area provided in **Table 2.9** below.

Table 2.9 Habitats Recorded within the 500m Study Area

Habitat Type	Approx. Area (ha) within Study Area (Percentage of Area)	Approx. Area (ha) within Project Boundary	
		Above the Area of the Proposed Underground Works	Within the Proposed Aboveground Works Area
Watercourse	4.21 (approx. 2.61km) (1.41%)	0.26	-
Modified Watercourse	0.29 (approx. 0.16km) (0.10%)	-	-
Irrigation Reservoir	3.02 (1.01%)	-	-
Mixed Woodland	42.72 (14.33%)	0.15	-
Plantation	46.35 (15.55%)	7.13	0.70
Shrubland	150.72 (50.56%)	19.89	-
Dry Agricultural Land	0.72 (0.24%)	-	-
Village / Orchard	23.12 (7.75%)	-	-
Developed Area / Wasteland	26.98 (9.05%)	-	8.35
Total	298.13 (100%)⁽¹⁾	27.43	9.05

Note:

- (1) The size and percentage presented in this table is subject to rounding adjustments. Any discrepancies between total and sums of individual numbers listed therein are due to rounding.

- 2.7.1.6 During the recent ecological survey, a total of 41 avifauna species, 10 bat species, 6 mammal species, 48 butterfly species, 30 odonate species, 9 amphibian species, 10 reptile species and 24 aquatic community species were recorded within the 500m study area. Among these recorded species, 8 avifauna species, all of the 10 recorded bat species, 4 non-flying mammal species, 1 butterfly species, 4 odonate species, 4 herpetofauna species, and 7 aquatic community species are of conservation importance. The recorded habitats for each species of conservation importance are presented in **Appendix 2.7.4A**.
- 2.7.1.7 A total of 8 floral species of conservation importance were recorded within the study area during the surveys. Two of them, namely Cycad-fern (*Brainea insignis*) and Pale Purple Eulophia (*Eulophia graminea*) were not recorded in previous studies. Besides, 3 floral species of conservation importance, namely Silver-back Artocarpus (*Artocarpus hypargyreus*), Walking-stick Orchid (*Geodorum densiflorum*) and Lesser Platanthera (*Platanthera minor*), were recorded in previous studies but could not be found in the recent ecological surveys. As presented **Figures 2.7.2.1 & 2.7.2.2**, all of the recorded Pitcher Plants and orchid species (i.e. Bamboo Orchid and Pale Purple Eulophia) during the surveys were recorded outside the aboveground works area; while Emarginate-leaved Ormosia (*Ormosia emarginata*) was recorded within the Project boundary but outside the proposed aboveground works area and underground quarry extent.
- 2.7.1.8 No breeding and roosting grounds / activities were recorded within the 500m study area from literature and current surveys. Tadpoles of Hong Kong Cascade Frog and Lesser Spiny Frog were recorded in the natural watercourses (i.e. W1 inside the Project boundary and W3a outside the Project boundary) during current surveys. Hence, the watercourses are recognised as nursery ground for these frog species. Representative photographs of floral and fauna species of conservation importance are provided in **Appendix 2.7.4B**. The corresponding habitats where the floral and fauna species of conservation importance recorded are presented in **Appendices 2.7.2 & 2.7.3** and **Figures 2.7.2.1 & 2.7.2.2**.
- 2.7.1.9 The species of conservation importance recorded within the 500m study area from literature and current surveys are presented in **Appendix 2.7.4A**. Indicative locations of the flora and fauna species of conservation importance recorded in recent ecological surveys and previous studies are presented on **Figures 2.7.2.1 & 2.7.2.2** and **Figures 2.7.3.1 & 2.7.3.2**, respectively. The comprehensive lists of floral and fauna species recorded within the study area are presented in **Appendices 2.7.2 & 2.7.3** respectively.

2.8 Landscape and Visual

- 2.8.1.1 The Project site is situated on existing rock cutting slopes with angles ranging from 60° to 70°. The study area covers the woodland surrounds HSHIR, part of the TLCP, and a small portion of Fuk Hang Tsuen at the north of the Project site. TLCP is located at the southern part of the study area. The extent and location of the Project, and the 100m study area are illustrated in **Figure 2.8.1**. According to the Approved OZP No. S/TM-LTY/12, the existing zonings within the 100m study area are “Other Specified Uses annotated Quarry”, “Green Belt” and “CA” (**Figure 2.8.1** refers). No Old and Valuable Tree (OVT), potential OVTs or Tree of Particular Interest (TPI) is identified within the study area.
- 2.8.1.2 As presented in **Figure 2.8.2**, 6 key landscape resources (LRs), namely Lam Tei Quarry Site (LR1), Vegetation of Settled Valley (LR2), Watercourses / Reservoirs (LR3), Hillside Woodland (LR4), Rural Land (LR5), and G/IC facilities (LR6) are identified within the 100m study area. Representative photos of the identified LR are shown in **Figure 2.8.3**. According to **Figure 2.8.4**, 4 key landscape character area (LCA), namely Lam Tei Quarry Landscape (LCA1), Tai Lam Settled Valley Landscape (LCA2), Lam Tei Miscellaneous Rural Fringe Landscape (LCA3), and Tai Lam Upland and Hillside Landscape (LCA4) are identified within the study area, with representative photos of the LCAs presented in **Figure 2.8.5**. All these LR and LCAs are considered as visual characters and resources as well. Distinctive character / resources (i.e. TLCP, CA and watercourses (W1 & W3c)) are identified in LCA2. The surrounding natural topography and landscape scenery are the key visual characters and resources within the study area. The vegetation of settled valley, reservoir and hillside woodland are visual characters to provide the public viewers, including visitors at Yuen Tau Shan, Leung Tin Au, at Fu Tei Country Trail / Lam Tei Irrigation Reservoir and Hung Shui Hang Irrigation Reservoir, and travellers along Fu Hang Road and along the Yuen Long Highway a visual attraction.
- 2.8.1.3 The details of key LR, LCAs, public viewing points (PVPs) which will be potentially affected by the Project, with their sensitivity are presented in **Table 2.10** below.

Table 2.10 Key LR, LCA, Public Viewing Points and their Sensitivity

ID	Description	LRs & LCAs: Approximate Area (ha) within the 100m Study Area; PVPs: Approximate Horizontal Distance (m) from the Nearest Project Boundary	Sensitivity
<i>Landscape Resources (Figures 2.8.2 & 2.8.3 refer)</i>			
LR1	<u>Lam Tei Quarry Site</u> The quality of the landscape resources is low. This LR is tolerant to change and considered to have low sensitivity. Based on the tree survey under separate submission, the slope area of this LR is dominated by self-seeding plants, wild grass and weed, or vegetation in fair to poor condition. The total numbers of surveyed vegetation (including shrubs and trees) in LR1 are 639. Dominant species including <i>Eucalyptus</i> spp., <i>Melia azedarach</i> , and <i>Casuarina equisetifolia</i> . 7 numbers of <i>Eucalyptus</i> spp., 1 <i>Casuarina equisetifolia</i> and 3 <i>Melia azedarach</i> identified within this LR will be directly affected by the construction.	24.78	Low
LR2	<u>Vegetation of Settled Valley</u> Valleys are in lower hill slopes within and to the south of the Project Site. Valley sides are generally thickly wooded, whilst valley floors contain Hung Shui Hang. This LR falls within TLCP and CA, a key protected area with little tolerance to change and substantial importance to the landscape setting of the nearby areas. The quality of this LR is high and has low ability to accommodate	54.3	High

ID	Description	LRs & LCAs: Approximate Area (ha) within the 100m Study Area; PVPs: Approximate Horizontal Distance (m) from the Nearest Project Boundary	Sensitivity
	change due to the maturity of the existing vegetation. The landscape sensitivity is considered as high.		
LR3	<u>Watercourses / Reservoir</u> Hung Shui Hang Irrigation Reservoir and watercourses (distinctive character / resources) are identified in this LR. All the way along downstream are covered by the plantation and shrubland. The quality of this LR is high and has low ability to accommodate change due to the maturity of the existing vegetation. The landscape sensitivity is considered as high.	2.15	High
LR4	<u>Hillside Woodland</u> It is an upland landscape to the east side of the Project. The hillsides generally covered in scrub vegetation with rocky outcrops and boulders. Woodland is found on valleys or along the seasonal streams. The quality of this LR is high and has low ability to accommodate change due to the maturity of the existing vegetation. The landscape sensitivity is considered as high.	2.24	High
LR5	<u>Rural Land</u> Patterns of uncultivated agricultural fields, patches of woodland, open storage, parking lots, industrial land uses and scattered village. The quality of this LR is considered as fair and the ability to accommodate change is considered as medium. The landscape sensitivity is considered as medium.	3.08	Medium
LR6	<u>G/IC Facilities</u> Service reservoirs are located on engineered platforms cut from the lower hillsides, predominantly covered with scrubby vegetation. The quality of this LR is low and has a high ability to accommodate change. The landscape sensitivity is considered as low.	1.48	Low
<i>Landscape Character Areas (Figures 2.8.4 & 2.8.5 refer)</i>			
LCA1	<u>Lam Tei Quarry Landscape</u> This LCA is the existing Lam Tei Quarry site. Given that this LCA is already with quarrying operation and associated activities, it is tolerant to change and the sensitivity of the LCA is low.	24.76	Low
LCA2	<u>Tai Lam Settled Valley Landscape</u> This LCA is the settled valley landscape at Tai Lam and is identified as a distinctive character. Distinctive character / resources, i.e. TLCP and watercourses, are identified within this LCA. Trees were planted as rehabilitation measure for the existing surface quarry, while self-seeding weeds and grass were grown along the quarry benches. This LCA is intolerant to change and the sensitivity of this LCA is high.	58.31	High
LCA3	<u>Lam Tei Miscellaneous Rural Fringe Landscape</u> This LCA is located at the north of the existing Lam Tei Quarry site with a few of squatters adjacent to Fuk Hang Tsuen Path. This LCA is relatively tolerant to change and the sensitivity is medium.	2.74	Medium
LCA4	<u>Tai Lam Upland and Hillside Landscape</u> This LCA is the upland and hillside landscape at Tam Lam Country Park. A number of Species of Conservation Importance were recorded at these LRs, e.g. Pitcher Plant and Crested Goshawk. This LCA is intolerant to change and the sensitivity of this LCA is high.	2.26	High

ID	Description	LRs & LCAs: Approximate Area (ha) within the 100m Study Area; PVPs: Approximate Horizontal Distance (m) from the Nearest Project Boundary	Sensitivity
<i>Public Viewers / Public Viewing Points (Figure 2.8.6 refers)</i>			
RE1	<u>Visitors at Yuen Tau Shan</u> This RE1 is a recreational public VP at the far northwest to the Project site. The visitors at Yuen Tau Shan can look to the surrounding natural topography and landscape scenery, at the same time with alternative views available. The sensitivity of this public viewing point is considered as medium.	2,879	Medium
RE2	<u>Visitors at Leung Tin Au</u> This RE2 is a recreational public VP at the far northwest to the Project site. The visitors at Leung Tin Au can look to the open view to the surrounding natural topography and landscape scenery, at the same time with alternative views available. The value of existing views is high. The sensitivity of this public viewing point is considered as medium.	3,223	Medium
RE3	<u>Visitors at Fu Tei Country Trail / Lam Tei Irrigation Reservoir and Hung Shui Hang Irrigation Reservoir</u> This RE3 is a recreational public VP at Fu Tei Country Tail and the nearby reservoirs. The visitors at Fu Tei Country Trail can look to the open view to the surrounding natural topography and landscape scenery, at the same time with alternative views available. The value of existing views is high. Subject to the site condition, where the site is partially blocked by shrubland and plantation, this public viewing point has only partial degree of visibility. In view of the partial degree of visibility to the proposed works, the sensitivity of this public viewing point is considered as medium.	335	Medium
T1	<u>Travellers along Fu Hang Road</u> This T1 is a traveller public VP from Fu Hang Road. The travellers along Fu Hang Road can look to the open view to the surrounding natural topography and landscape scenery, at the same time with alternative views available. The sensitivity of this public viewing point is considered as low.	506	Low
T2	<u>Travellers along Yuen Long Highway</u> This T2 is a traveller public VP from Yuen Long Highway. The travellers along Yuen Long Highway can look to the open view to the surrounding natural topography and landscape scenery, at the same time with alternative views available. The value of existing views is high. The sensitivity of this public viewing point is considered as low.	370	Low

2.9 Cultural Heritage

Historical Background

- Waterworks

2.9.1.1 The development in New Territories, especially on agricultural development and social welfare planning, had been concerned after World War II². However, due to rapid growth of population³, there were insufficient infrastructures in the New Territories, and the quality of

² 許舒。(2016)《新界百年史》。中華書局(香港)有限公司。

³ 劉智鵬, 劉蜀永。(2012).《香港地區史研究之四:屯門》。香港,三聯書店(香港)有限公司。

life for the farmers were extremely low⁴. The situation was worsened by the rapid industrialisation in the New Territories, which caused demand over water sources and lands⁵.

2.9.1.2 In the light of these issues, largescale waterworks for the north-western New Territories have been planned in the 1950s, such as Tai Lam Chung (大欖涌) Reservoir Scheme commenced in 1952⁶. However, local farmers, especially those in Yuen Long, strongly opposed to the scheme due to worries of diminishing water supply for agriculture use resulted from it. In order to show government goodwill and benefit to the primary economy, irrigation schemes were added “on a somewhat ad hoc basis and partly as a by-product of waterworks schemes”⁷. Hung Shui Hang Irrigation Reservoirs were completed in 1957 then.

2.9.1.3 The exceptionally low rainfall in 1963 led to water shortage in Hong Kong⁸. As a result, a service reservoir at Lam Tei was completed in 1963 as part of the reaction to the drought.

- Quarry

2.9.1.4 Lam Tei Quarry was first operated since the 1960s by *Asia Stone Company Limited*^{9,10}. The Quarry has changed management and operated by the Government since 1982¹¹. It is currently the only active local quarry in Hong Kong.

Cultural Heritage Resources

2.9.1.5 No declared monuments proposed monuments, graded historic sites / buildings / structures; all sites, buildings / structures in the new list of proposed grading items; Government historic sites; and Site of Archaeological Interest (SAI) is identified within the Project boundary and the 300m study area.

2.9.1.6 Other identified items located within 300m study area are described in **Table 2.11** below, with the locations mapped in **Figure 2.9**.

Table 2.11 Other identified items within 300m Study Area

ID	Cultural Heritage Resources	Status	Approximate Horizontal Distance from, m		
			Project Boundary	Aboveground Works Area	Proposed Tunnels / Cavern
NB01	Main Dam, Hung Shui Hang Irrigation Reservoir	No grade accorded	150	243	242
NB02	Upper Dam, Hung Shui Hang Irrigation Reservoir		40	>300	74
NB03	Yuen Long Fresh Water Service Reservoir with Wash Water Tank		250	>300	>300
NB04	H.K.W.W. Yuen Long R.G. Filters and Centrifloc Clarifier, Yuen Long Fresh Water Service Reservoir		176	249	>300
NB05	Former Quarters of Water Supplies Department in Lam Tei		55	144	>300
NB06	Lam Tei Gospel School		130	209	>300

⁴ *Ibid.*

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Irrigation Programme in the New Territories (file no.: HKRS276-8-51) [historical documents]

⁸ Hong Kong Government. (1963). Hong Kong Annual Report, 1963. Hong Kong Government.

⁹ Wai-lun Wong. (2017). 《土拓署礦務部帶大家「開山劈石」》. Development Bureau.

https://www.devb.gov.hk/tc/home/my_blog/index_id_293.html.

¹⁰ Ir Dr. S.W. Poon, Ir K.Y. Ma, Ir K.F. Man, Mr. T.W. Tsin, Dr. Y. Deng. (2013). *Quarrying in Hong Kong Since Second World War*. The University of Hong Kong.

¹¹ *Ibid.*

3 POTENTIAL IMPACTS ON THE ENVIRONMENT

3.1 Environmental Changes

- 3.1.1.1 With the development of underground quarry-cum-cavern proposed under the Project, the quarrying activities will be relocated from the surface land of LTQ to the underground strata of TLCP, moving away from the existing sensitive receivers nearby the LTQ. Besides, provided that access through Chui Fuk Road will no longer be used as the existing LTQ operation and previous proposal, nuisance to sensitive receivers at the western side of quarry (i.e. noise sensitive uses near Chui Fuk Road and Fu Fuk Road) can be reduced from that of the existing operation.
- 3.1.1.2 Given that the similar operation modes of the quarrying activities and the similar scale of ancillary operation to those of the existing LTQ operation, as well as screening effects provided by the natural topography with a height of more than 50mPD between the aboveground works area of the Project and the nearby sensitive receivers at the north to the Project site, only limited additional disturbance from the Project to the nearby sensitive receivers is anticipated. Potential environmental impacts arising from the Project are detailed in below sections.

3.2 Potential Environmental Impacts during Construction Phase

3.2.1 Air Quality

- 3.2.1.1 The potential dust impact would arise from the construction activities of the Project. Major construction activities to be conducted during the construction phase would be site clearance (e.g. vegetation removal and erection of fence), platform formation, construction of portals and the front sections (less than 10m) of MATs by mechanical excavation, installation of blasting door, minor slope stabilisation works associated with the portals' formation, as well as installation of ancillary facilities / plants. According to the latest engineering design, maximum of ~5,500m³ of rock will be excavated from the construction of portals and the front sections of MATs. The nature of the proposed construction activities is similar to that of the LTQ operation (e.g. aboveground quarrying activities, relocation and reinstallation of ancillary facilities / plants to facilitate the quarrying activities), while at the same time much less dusty compared to the current surface blasting operation. As a proven effective dust suppression measure under the current LTQ operation and in the past approved EIA reports, regular watering would reduce the dust impact due to the major construction activities to an acceptable level.
- 3.2.1.2 Potential dust and gaseous emissions from construction vehicles on the haul road within the Project site would also be anticipated. However, with the implementation of appropriate dust control measures (detailed in **Section 4.1.2**), such as paving (as far as practicable), regular watering on open haul roads, together with the limited number of construction vehicles (i.e. approximate 20 construction trucks per working day during the construction phase) will be involved, the construction vehicle movements outside the Project site would unlikely cause any significant air quality impact.
- 3.2.1.3 On-site use of diesel-powered engines is the potential source for other gaseous pollutants such as NO₂, SO₂ and smoke. According to the Air Pollution Control (Non-road Mobile Machinery (NRMM)) (Emission) Regulation, starting from 1 December 2015, only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites. The Contractor is required to ensure the adopted machines or non-road vehicle under the Project could meet the prescribed emission standards and requirement. In addition, legal control is imposed on the types of fuels allowed for use and their sulphur contents in commercial and industrial processes under the Air Pollution Control (Fuel Restriction) Regulation. To control the exhaust emissions from construction plant and equipment, the sulphur content of liquid fuel shall not exceed 0.005%. In addition, with the use of electrified Non-road Mobile Machineries (NRMMs) as far as practicable (**Section 4.1.2** refers), it is unlikely to cause significant smoke and gaseous

emissions. The use of exempted NRMMS will be avoided as far as practicable to minimize any air emissions from the use of NRMMS.

- 3.2.1.4 In view of the temporary and localised nature of the construction works, as well as with the implementation of real-time dust monitoring, appropriate dust suppression measures and good site practices as detailed in **Section 4.1.2**, the fugitive dust and gaseous emission from the construction works would be reduced to minimum.

Cumulative Air Quality Impact during Construction Phase

- 3.2.1.5 Based on the best available information at the time of writing, among the identified concurrent projects in **Table 1.1**, potential cumulative construction air quality impact will be only from the construction of TMB and has been reviewed.
- 3.2.1.6 According to Section 2.9 of the EIA Report of TMB, the key construction works in the vicinity of the Project site during the overlapping period are site formation, construction of northern portal, and underground magazine site. Appropriate dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation would be implemented by the contractors of TMB, resulting in minimum fugitive dust emission from their construction activities. Close liaison with the contractor of TMB will be taken place to minimize any construction activities to be taken place in the proximity at the same time as far as practicable. With the implementation of effective suppression measures, no adverse cumulative air quality impact on nearby ASRs during the construction phase is anticipated. A comprehensive EM&A programme with real-time monitoring of RSP and FSP, as well as regular site audits would also be conducted under both projects to ensure proper implementation of suppression measures and the compliance of AQOs during the construction phase.

3.2.2 Noise

- 3.2.2.1 As mentioned in **Section 1.3.1.5**, this PP only covers the construction and operational phases of the Project, not covering the subsequent uses of the caverns. Hence, any potential noise impact from the subsequent uses of the formed caverns will not be considered in this PP.
- 3.2.2.2 The potential sources of noise impact during the construction phase of the Project would be the use of PME for various construction activities. Major construction activities of the Project during the construction phase include site clearance, platform formation, construction of portals and the front sections of the MATs by mechanical excavation, installation of blasting door, minor slope stabilisation works associated with the construction of portals, as well as installation of ancillary facilities / other plants associated with quarry operation. No piling works will be required for the Project. The nature, the types and numbers of the PME to be used for the proposed construction works are similar to those adopted for the quarrying activities (after D&B and prior to the primary rock crusher) of the existing LTQ operation. No construction activities will be conducted during restricted hours, i.e. the time between 1900 and 0700 hours on all days, and any time on general holidays, including Sundays, which is same as the quarrying activities (after D&B and prior to the primary rock crusher) of the existing LTQ operation.
- 3.2.2.3 Construction activities during non-restricted hours are controlled under EIAO. Annex 5 of the EIAO-TM stipulates criteria of 65 to 75 dB(A) for daytime construction activities. In case any construction works are to be carried out during restricted hours, in general, a Construction Noise Permit (CNP) would be required under the NCO. The NCA will consider a well-justified CNP application, once filed, for construction works within restricted hours as guided by the relevant TMs issued under the NCO. It will also take into account contemporary conditions / situations of adjoining land uses and any previous complaints against construction activities at the site before deciding whether to grant / renew a CNP. Nothing in this PP shall bind the Noise Control Authority in making its decision, the future Contractor shall apply the CNP separately if any construction works to be conducted during the restricted hours. Failure to comply with any such conditions will lead to cancellation of the CNP and prosecution under the NCO.

3.2.2.4 As mentioned in **Section 1.6**, the construction phase of the Project will only last for one year, i.e. Q1 2025 to Q4 2025. As confirmed by the Project Engineer, there will be only aboveground works to be conducted within the aboveground works area (**Figure 2.3** refers) during the construction phase. Potential construction noise impact of the Project has been reviewed qualitatively at the representative NSRs based on the construction programme presented in **Appendix 1.1** and the tentative plant inventory listed in **Table 3.1** below, which have been confirmed to be practicable and feasible for completing the construction works within the intended schedule by the Project Engineer. Potential construction noise impacts at the representative NSRs are presented in **Table 3.2** below. Factors including direct line of sight, and the separations between the NSRs and the aboveground works area of the Project have been considered.

Table 3.1 Tentative Plant Inventory for Key Construction Activities

Key Construction Activities	Possible Powered Mechanical Equipment Required ⁽¹⁾	
Site Clearance	- Excavator/loader - Breaker	- Dump truck - Crane
Platform formation	- Excavator/loader - Bulldozer	- Dump truck - Vibratory roller
Construction of portals and front sections (i.e. less than 10m) of main access tunnels by mechanical excavation and installation of blasting door ⁽³⁾	- Excavator/loader - Breaker - Rock drill ⁽²⁾ - Dump truck - Air Compressor ⁽²⁾ - Water pump ⁽²⁾ - Generator ⁽²⁾ - Ventilation fan ⁽²⁾ - Rock bolt Rig ⁽²⁾	- Concrete pump ⁽²⁾ - Concrete lorry mixer ⁽²⁾ - Grout mixer ⁽²⁾ - Grout pump ⁽²⁾ - Crane ⁽²⁾ - Poker ⁽²⁾ - Bar bender and cutter - Shotcreting robot ⁽²⁾
Minor slope stabilization works associated with the portals' formation	- Drill rig - Air Compressor - Grout mixer	- Grout pump - Lorry
Installation of ancillary facilities / other plants associated with quarry operation (i.e. site office, rock processing facilities, concrete production plant, asphalt batching plant and stockpile facilities)	- Crane - Dump truck - Concrete pump - Concrete lorry mixer - Poker - Fork Lift	- Generator - Lorry - Bar bender and cutter - Drill - Cherry picker

Notes:

- (1) Quiet equipment or quality powered mechanical equipment (QPME) would be adopted where applicable and practicable.
- (2) The marked PME's also will be adopted for other activities related to the MATs and production cavern formation (prior to primary rock crusher), including the D&B and the quarrying activities mentioned in **Section 3.3.2**, during the operational phase.

Table 3.2 Potential Construction Noise Impact

ID	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Aboveground Works Area Boundary, m	Potential Screening Effect (Y/N)	Potential Construction Noise Impact
FHT1 (35mPD)	R	228	N	In view of the large separation of more than 220m between FHT1 and the works area for construction activities, along with the localised nature of construction activities involving only a limited number of PME, no adverse construction noise impact from the Project to FHT1 will be anticipated.

ID	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Aboveground Works Area Boundary, m	Potential Screening Effect (Y/N)	Potential Construction Noise Impact
FHT2 (34mPD)	R	129	Y (No direct line of sight to the works area and it is screened by natural topography with height of more than 50mPD)	In view of the large separation of more than 120m between FHT2 and the works area for construction activities, the localised nature of construction activities involving only a limited number of PME, as well as the screening effect from the construction sites provided by the natural topography (i.e. more than 50mPD) separating FHT2 and the works area (Appendix 3.2.1 refers), no adverse construction noise impact from the Project to FHT2 will be anticipated.
FHT5 (31mPD)	W	236	Y (No direct line of sight to the works area and it is screened by natural topography with height of more than 50mPD)	In view of the large separation of more than 230m between FHT5 and the works area for construction activities, the localised nature of construction activities involving only a limited number of PME, along with the screening effect from the construction sites provided by the natural topography (i.e. more than 50mPD) separating FHT5 and the works area (Appendix 3.2.1 refers), no adverse construction noise impact from the Project to FHT5 will be anticipated.

Note:

(1) R – Residential; W – Place of Public Worship

3.2.2.5 As presented in **Table 3.2** and **Figure 2.3**, representative NSRs are located far from the aboveground works area, with separations ranged from ~129m to ~236m. Construction noise impact to the nearby NSRs from the Project is considered insignificant. Nonetheless, it is always recommended to minimise the noise impact from construction activities by implementation of additional mitigation measures including the use of temporary noise barriers and quality powered mechanical equipment (QPME) / quieter construction methods as detailed in **Section 4.1.3**.

Cumulative Construction Noise Impact

3.2.2.6 Based on the best available information at the time of writing, among the identified concurrent projects in **Table 1.1**, the potential cumulative construction noise impact will be only from the construction of TMB and has been reviewed.

3.2.2.7 According to Section 2.9 of the EIA Report of TMB, the key construction works in the vicinity of the Project site during the overlapping period are site formation, construction of northern portal, and underground magazine site. Considering that the associated works area of TMB would be relatively close to the NSRs in Fu Tei Ha Tsuen (i.e. existing NSRs equivalent to FHT1 under the Project), potential cumulative construction noise impact to the NSRs will be expected. Nevertheless, based on the finding of the construction noise impact assessment conducted under the EIA Study of TMB, with the implementation of mitigation measures including the use of QPME, quieter construction methods and noise enclosures & barriers, no adverse construction noise impact would be anticipated during the construction phase of TMB.

3.2.2.8 As both of the Project and TMB will also implement all the best practices to abate the potential construction noise impacts where practicable, any cumulative construction noise impact from these projects is expected to be minimal. Further review will be conducted in the Construction Noise Management Plan (CNMP) at a later stage (as detailed in **Section 4.1.3.6**) when more detailed information is available to ensure compliance with the relevant EIAO requirements will be achieved.

3.2.3 **Water Quality**

- 3.2.3.1 The proposed construction activities of the Project as listed in **Section 1.6.1.1** would be land-based only and within the aboveground works area. Same as the existing LTQ operation, potential water quality impacts would arise from uncontrolled surface runoff and erosion of exposed soil, earthworks and stockpiles during rainstorms. Muddy water may also be generated from the construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment. Nevertheless, in view of the limited scale, localised nature and short duration (i.e. 1 year) of the construction works and with proper implementation of site practices and control measures as presented in **Section 4.1.4**, adverse water quality impact during construction phase would not be anticipated.
- 3.2.3.2 During the construction of the Project, the workforce on site will generate sewage effluents, which are characterised by high level of biochemical oxygen demand (BOD), ammonia and *E. coli* counts. Temporary sewage generation can be adequately handled and treated by interim sewage treatment facilities, such as portable chemical toilets, which have been provided in the LTQ. Provided that sewage is not discharged directly into stormwater drains or inland waters adjacent to the construction site, and temporary sanitary facilities are used and properly maintained, it is unlikely that sewage generated from the site would have a significant water quality impact.
- 3.2.3.3 Groundwater pumped out or from the dewatering process during any excavation works at the existing LTQ site could be potentially contaminated. Uncontrolled discharge / recharge of potentially contaminated groundwater may affect the surface / groundwater quality. Any contaminated material disturbed, or material which comes into contact with the contaminated material, has the potential to be washed with site run-off into watercourses. Proper treatment, discharge or recharge of contaminated groundwater, if any, following the mitigation measures given in **Section 4.1.4** would minimise the potential impacts. Same as the current practice of the existing LTQ operation, no direct discharge of contaminated groundwater will be allowed.

Cumulative Water Quality Impact during Construction Phase

- 3.2.3.4 Based on the best available information at the time of writing, among the identified concurrent projects in **Table 1.1**, the potential cumulative construction water quality impact will be only from the construction of TMB and has been reviewed.
- 3.2.3.5 According to Section 2.9 of the EIA Report of TMB, the key construction works in the vicinity of the Project site during the overlapping period are site formation, construction of northern portal, and underground magazine site. Considering of the associated works area of TMB would be relatively close to the WSRs identified for this Project, potential cumulative water quality impact to these WSRs will be expected during the construction phase. Nevertheless, based on the finding of the water quality impact assessment conducted under the EIA Study of TMB, with the implementation of mitigation measures including but not limited to adoption of Best Management Practices (BMPs) & good site practices, and provision of sufficient and adequate portable chemical toilets, no adverse water quality impact would be anticipated during the construction phase of TMB.
- 3.2.3.6 Both of the Project and TMB will also implement all the best practices to abate construction water quality impacts where practicable. On this basis, adverse cumulative construction water quality impacts from these projects are therefore expected to be minimal.

3.2.4 **Waste Management**

- 3.2.4.1 Similar to the existing LTQ operation, major wastes generated during construction phase of the Project include construction and demolition (C&D) materials, chemical waste, and general refuse.
- 3.2.4.2 C&D materials would be generated from the construction activities of the Project such as site clearance, construction of the portals and the front sections of MATs, minor slope stabilisation works and installation of ancillary plants. These C&D materials would contain a mixture of both inert (e.g. soil, rock, bricks, asphalt and concrete, etc.) and non-inert (e.g.

vegetation, timber, paper, plastics, packaging materials, etc.) components. Based on the current latest design information, the estimated volume of different types of C&D materials to be generated from the construction of the Project is summarised in **Table 3.3**. With the implementation of the mitigation measures as presented in **Section 4.1.5**, adverse environmental impacts arising from the storage, handling, and transportation of C&D materials would not be anticipated.

Table 3.3 Estimated Volume of C&D Materials Generated during the Construction Phase

Major Construction Activities	Inert C&D Materials (m ³) ⁽¹⁾	Non-inert C&D Materials (m ³)
Site Clearance	-	3
Main Access Tunnel and Portals Formation	5,500	-
Slope Stabilisation Works	10	-
Installation of Ancillary Plants for Quarry Operation	-	10

Note:

- (1) Inert C&D materials to be generated during the construction phase of the Project mainly comprised of rocks, which will be 100% stockpiled on-site (refer to **Figure 3.2** for the indicative locations of stockpiling areas) and reused as production materials during the operational phase.

3.2.4.3 General refuse such as food scraps, waste paper, empty containers, would be generated from workers. Release of general refuse into the roadside gully / surface channel should not be permitted as the introduction of these wastes is likely to have detrimental effects on water quality in the area. During the construction phase, it is estimated that around 50 workers would be working on-site per day. Based on the generation rate of 0.65kg per worker per day, it is estimated no more than 35kg general refuse per day would be generated from the construction of the Project. With the continuous implementation of the mitigation measures in **Section 4.1.5.4** and the proposed waste handling arrangements summarised in **Table 4.1**, adverse environmental impacts arising from the storage, handling, and transportation of general refuse would not be anticipated.

3.2.4.4 Small amount of chemical wastes (e.g. waste oil / grease, spent solvent / detergents, empty fuel / lubricant drums, used oil filters and scrap batteries) would be generated from the maintenance and servicing of construction plants and vehicles. In view of the limited scale of the construction activities, it is envisaged that the quantity of chemical waste would be insignificant (a few cubic metres per month). All possible opportunities would be taken to reuse and recycle the materials. Provided that the chemical wastes will be continually handled and disposed of in accordance with the currently adopted mitigation and control requirements in **Section 4.1.5.3** and the proposed waste handling arrangements summarised in **Table 4.1**, adverse environmental impacts would not be anticipated.

3.2.5 Land Contamination

3.2.5.1 As detailed in **Section 2.5**, no land contamination impact would be expected during the construction phase.

3.2.6 Hazard to Life

3.2.6.1 No explosives will be handled during the construction phase, and thus, no hazard to life impact would be expected during the construction phase.

3.2.7 Ecology

General

- *No Direct Impact on Sites of Conservation Importance*

3.2.7.1 Sites of conservation importance within the 500m study area include TLCP and the CA. Although the Project boundary lied within the boundary of TLCP, proposed works would be only conducted at the habitats of developed area / wasteland and plantation within the existing LTQ outside TLCP during the construction phase. Same as the existing LTQ

operation, no aboveground structure or works would be erected or conducted within TLCP and CA. In addition, the Project boundary is designed to align with the eastern boundary of the existing LTQ site so as to avoid encroachment on the CA. As a result, no direct impact on the aboveground habitats of the sites of conservation importance is anticipated.

- *No Direct Impact on Fragmentation of Natural Terrestrial Habitats*

3.2.7.2 The loss of habitat would be limited to the habitats of developed area / wasteland and plantation within the existing LTQ site arising from the aboveground works (**Section 3.2.7.4** refers). No aboveground natural terrestrial habitat will be directly impacted by the proposed construction works of the Project. Also, no fauna species of conservation importance were found to be closely associated with the aboveground works area. Given that all of the proposed construction works would be situated at the aboveground works area within the existing LTQ site, no fragmentation on natural terrestrial habitats is anticipated.

- *No Direct Injury / Mortality*

3.2.7.3 Given that no proposed construction works will be conducted on the natural terrestrial habitats within the 500m study area and no species of conservation importance were recorded within the aboveground works area of the Project, potential impact to fauna and floral species in terms of direct injury or mortality is anticipated to be insignificant during the construction phase of the Project.

Potential Direct Impacts

- *Direct Impact on Terrestrial Habitats outside TLCP*

3.2.7.4 All ancillary plants / facilities associated with the future quarry operation, e.g. concrete batching plant, asphalt production plant and stockpile area, would be set up and confined on the aboveground area of the existing LTQ (**Figure 3.2** refers). Hence, resulting in only limited areas of terrestrial habitat loss within the existing LTQ site, arising from the aboveground works area of the Project outside TLCP. The works of portals formation (including the minor slope stabilization works associated with the portal formation) and construction of the aboveground sections of the proposed MATs would occupy about 0.28ha developed area / wasteland and 0.30ha plantation at the man-made rock slope of existing LTQ. Given that the affected area is located at the habitats of developed area / wasteland and plantation at the man-made rock slope where vegetation is limited, with vegetation recorded were mainly exotic plantation tree species (e.g. Horsetail Tree, Brisbane Box, *Acacia* spp.) and pioneer native shrubs and herbs (e.g. Dichotomy Forked Fern, Pond Spice, Greenbrier), potential impact on terrestrial habitats is anticipated to be low. A summary of terrestrial habitat loss within the Project site is presented in **Table 3.4**.

Table 3.4 Loss of Terrestrial Habitats within the Project Site

	Developed Area / Wasteland (ha) ⁽¹⁾	Plantation (ha) ⁽¹⁾
Portal Area of Access Tunnels, Proposed Aboveground Access Tunnel	0.28	0.30

Note:

(1) The existing LTQ operation has already occupied developed area / wasteland (8.08ha), which will be the aboveground works area under this Project.

3.2.7.5 Only limited areas of terrestrial habitat loss (i.e. developed area / wasteland and plantation) outside TLCP are anticipated from the aboveground works area of the Project. Both developed area / wasteland and plantation are very common in the region and territory, and direct loss would only account for a limited proportion of the habitat in the region or territory. Moreover, there is no species of conservation importance recorded within the area to be directly lost. Thus, the regional significance for loss of developed area / wasteland and plantation is anticipated to be low.

Potential Indirect Impacts

- Disturbance from Construction Activities

3.2.7.6 Indirect impacts on the habitats and associated fauna would arise from the increase in human disturbance during the construction phase. Although there would be no quarry operation and D&B operation during the construction phase, a temporary increase in disturbance, including noise, dust emission, glare and other human activities, induced by aboveground construction activities may pose indirect impacts upon nearby habitats and ecological resources.

3.2.7.7 While these impacts are of potential concern, it should be noted that the proposed aboveground works area is situated at the existing LTQ site and is already subjected to the high levels of disturbance from current quarry operation. Although the works of portals formation and the construction of the front sections of MATs are surrounded by plantation at the upper man-made rock slope of the existing LTQ, this plantation has been subject to constant disturbance from the existing LTQ operation. Besides, the glare level would be of similar level with that of the existing LTQ, which would be of minimum necessary brightness to meet occupational safety to avoid potential impact to light-sensitive mammals and herpetofauna species recorded in TLCP and near the aboveground works area in LTQ. According to the survey findings, low abundance of bat species (such as Japanese Pipistrelle, Least Horseshoe Bat, Chinese Noctule, Unknown Vespertilionidae species 1 and Unknown Vespertilionidae species 2) were recorded utilising plantation and watercourses near the existing LTQ site. Also, low abundance of amphibian species such as Lesser Spiny Frog and Hong Kong Cascade Frog were recorded in watercourse W1 within TLCP. The known species recorded near the aboveground works area in LTQ are generally widely distributed in countryside areas and upland forest / mountain streams of Hong Kong. Measures such as designing and positioning of lighting away from natural habitats of TLCP (**Section 4.1.7.5** refers) would also be adopted to further reduce the potential glare impact, as appropriate. Hence, the disturbance from the construction activities on terrestrial habitat and associated fauna are anticipated to be minor.

- Change in Water Quality of Watercourses

3.2.7.8 Same as the existing LTQ operation, in case of any improper discharge of construction effluent, site run-off and sewage during the construction phase, it may contaminate water bodies nearby. Proposed construction works of the Project will be restricted to the developed area / wasteland within the existing LTQ site which is surrounded by man-made rock slopes. Potential water contamination is not expected to occur at watercourses and irrigation reservoirs. Modified watercourse W5, which is located at the downslope area of the LTQ (outside TLCP), may subject to the impacts due to change of water quality from uncontrolled site run-off and improper construction effluent discharge. Despite there are potential change in water quality for the modified watercourse at the downslope of the Project site, with the existing drainage system of the LTQ and the implementation of appropriate mitigation measures as detailed in **Section 4.1.4**, water quality impact is considered to be of low significance.

- Ground-borne Noise and Vibration Impact

3.2.7.9 During the construction phase, the portals and front sections of the MATs will be constructed by mechanical excavation underneath / at the rock cut slope of the existing LTQ outside TLCP, ground-borne noise and vibration may be generated and potentially impact the aboveground habitats and associated fauna, hence displacement of fauna. There will be no blasting carried out during the construction phase. However, the shortest horizontal and vertical distances between the works areas of portals and tunnels formation works and TLCP will be approximately 160m and 100m below ground surface, respectively. In view of the large separation between the aboveground works area and TLCP, as well as the minor scale of the construction activities which no blasting activities would be involved, disturbance impact caused by the ground-borne noise and vibration during the construction phase is considered to be of low significance.

- *Air Quality Impact*

- 3.2.7.10 Dust will be generated from the construction activities such as portals formation and the construction of the front sections of the MATs by mechanical means, which will potentially reduce the quality of nearby habitats, affect plant growth and cause minor impact to the terrestrial habitats. Given that the nearby habitats have been subject to existing impact from the aboveground rock excavation at LTQ and the associated constant traffic of heavy trucks and similar works operation, with the implementation of appropriate dust control measures outlined in **Section 4.1.2**, the ecological impact from changes in air quality arising from the Project during the construction phase is anticipated to be of low significance.

Cumulative Ecological Impact during the Construction Phase

- 3.2.7.11 Based on the best available information at the time of writing, among the identified concurrent projects in **Table 1.1**, the potential cumulative ecological impact during the construction phase will only from TMB and has been reviewed.
- 3.2.7.12 According to Section 2.9 of the EIA Report of TMB, the key construction works in the vicinity of the Project site during the overlapping period are site formation, construction of northern portal, and underground magazine site. The location of the underground magazine site of TMB would be situated within underground area of the developed area close to the northern part of the existing LTQ, while the construction of northern portal would be situated at developed area and plantation to the southwest of the existing LTQ, all are outside the Project boundary of this Project. Considering that during the overlapping period, the construction works of TMB will be located within the developed area and a small portion of plantation in the southwest part of the existing LTQ outside the Project boundary, and no underground works will be conducted during the construction phase within TLCP under both Project, potential cumulative ecological impact to the natural habitats during the construction phase is considered insignificant.

3.2.8 Landscape

Landscape Impact

- 3.2.8.1 In general, the magnitude of unmitigated landscape impacts on Lam Tei Quarry Site (LR1) and Lam Tei Quarry Landscape (LCA1) are small. Approximately 5 - 5.5ha of space will be utilised as works areas during the construction phase of the Project. However, the proposed construction works which only last for 1 year are temporary and localised. According to the observation from the tree survey, only 11 numbers of trees (i.e. 7 *Eucalyptus spp.*, 1 *Casuarina equisetifolia* and 3 *Melia azedarach*), with the conditions range from average to poor, will possibly be directly affected and removed during the construction phase. The locations of affected trees and the tree assessment schedule are presented in **Appendix 3.8**. The vegetations within LR1 and LCA1 are mainly self-seeding plants, wild grass and weeds in fair to poor condition. Some vegetations on the quarry benches serves as plantations for the rehabilitation of the existing quarry. Although Rural land (LR5) falls within the Project boundary, no construction works will be taken place outside the boundary of aboveground works area, and hence, LR5 would not be affected by the construction phase of the Project. Similarly, for Vegetation of Settled Valley (LR2), Watercourses / Reservoir (LR3), Hillside Woodland (LR4), and G/IC Facilities (LR6), as no construction works will be proposed within these LRs, the landscape impact to these LRs is considered negligible. For Lam Tei Miscellaneous Rural Fringe Landscape (LCA3), the access road to surface quarry will be retained for continuous usage, and no further works will be conducted in the area, resulting in a negligible impact. The same applies to Tai Lam Settled Valley Landscape (LCA2), and Tai Lam Upland and Hillside Landscape (LCA4). All proposed construction activities are confined within the aboveground works area in LCA1, and thus, no direct impact to the distinctive character / resources (i.e. LR3 and LCA2) is anticipated from the construction phase of the Project.

Cumulative Landscape Impact during the Construction Phase

- 3.2.8.2 Based on the best available information during the time of writing, among the identified concurrent projects in **Table 1.1**, the potential cumulative construction landscape impact will be only from the construction of TMB and it has been reviewed.
- 3.2.8.3 According to Section 2.9 of the EIA Report of TMB, the key construction works in the vicinity of the Project site during the overlapping period are site formation, construction of the northern portal, and underground magazine site. According to the landscape impact assessment conducted under the EIA Study of TMB, the landscape impact on the Lam Tei area will be insubstantial on LR and LCA and moderate on VSR. With the implementation of recommended mitigation measures, the residual impact during the construction phase of TMB will become insubstantial to slight. As neither the Project nor the concurrent project were anticipated to generate significant landscape impacts during the construction phase with the recommended mitigation measures in place, no adverse cumulative landscape impacts would be expected during the construction phase.

3.2.9 Cultural Heritage

Built Heritage

- 3.2.9.1 Given that no heritage sites, i.e. all declared monuments; proposed monuments; graded historic sites / buildings / structures; all sites, buildings / structures in the new list of proposed grading items; and Government historic sites are located within the 300m study area from the Project boundary, no impact to the abovementioned heritage sites from the construction of the Project is anticipated.
- 3.2.9.2 As mentioned in **Section 1.6**, only aboveground works (e.g. site clearance, construction of portals) will be conducted within the aboveground works area (**Figure 2.9** refers) during the construction phase. No tunnel and cavern formation works (i.e. blasting operation) will be conducted during the construction phase. In view of the minor scale and the localised nature of the construction activities and the large separation of more than 100m between the aboveground works area and the identified items (see **Table 2.11**), no direct or indirect impact from the Project during the construction phase is anticipated.

Archaeology

- 3.2.9.3 The Project site contains no archaeological potential. Hence, no archaeological impact is anticipated.

3.3 Potential Environmental Impacts during Operational Phase

3.3.1 Air Quality

- 3.3.1.1 During the operational phase of the Project, potential air quality impact from the underground quarrying (i.e. formation of MATs and production cavern by D&B method) and the ancillary operation at the aboveground works area would be anticipated.

Underground Quarrying

- 3.3.1.2 The underground quarrying would involve dusty activities including blasting, excavation and spoil handling, potential dust impact is expected during the operation of the Project. However, the proposed quarry activities are underground, i.e. confined space, it would unlikely have significant adverse impacts on the surrounding environment outside the portals. The dust generated inside the cavern would be emitted from the ventilation system of the portal area, the contractor would implement specific dust mitigation measures during underground quarrying activities. These include proper installation of blasting door inside the MATs, wet suppression with water sprinklers and use of dust collector for ventilation system. After D&B and further rock breaking (if necessary for on-site transportation), excavated rock will be loaded to the stockpiling area or primary rock crusher. The loaded material of the dump truck would be covered entirely to ensure dusty material would not be

leaked from the dump truck according to the requirement under Air Pollution Control Ordinance (APCO).

- 3.3.1.3 Raw materials and rock products would be transported between the underground quarry and aboveground works area by trucks. Haul road emission and tailpipe emission from these trucks which constitutes of mainly NO_x and particulates would be released to the ambient through the exhaust vent of the cavern and on open haul roads. Potential air quality impact due to transporting trucks is anticipated. Use of enclosed conveyor belt will be implemented as far as practicable, as existing LTQ practice, to minimise the potential emission associated with transport of rock and aggregate.
- 3.3.1.4 Same as construction phase, on-site use of diesel-powered engines is also the potential source for other gaseous pollutants, such as NO₂, SO₂, CO and smoke. Based on the current engineering design as confirmed by the Project Engineer, 2 drilling jumbos, 2 concrete lorries, 2 dump trucks, 2 excavators with hydraulic break, 2 air compressors, 2 mobile generators, 2 cherry pickers, 4 ventilation fans, 2 loaders, 2 breakers, 2 bulldozers, 1 shotcrete robot, 1 rock bolting rig and 1 folk lift are expected to operate at the site during the operational phase. The actual number of NRMMs would be subject to the future contractor but it is expected to be similar with that under the current LTQ operation in view of similar operation mode and business scale. All practices related to the use of NRMMs to be adopted during the construction phase (**Sections 3.2.1.3 and 4.1.2** refer) will also be adopted during the operational phase, and hence, the use of NRMMs during the operational phase is also unlikely to cause significant smoke and gaseous emissions.
- 3.3.1.5 As mentioned in **Section 1.2.5.4**, the operation frequency of D&B under the Project would be conducted once per day during daytime, which is same as that under the existing LTQ operation. With the development of the Project, with lower annual rock excavation rate compared to that of the existing LTQ operation, quarrying activities will be relocated from surface land to the underground strata of TLCP, resulting in less dust impact to the nearby ASRs. Besides, with the implementation of the good site practices and appropriate mitigation measures (e.g. wet suppression with water sprinklers and use of dust collector for ventilation system), air quality impact from the underground quarrying activities of the Project would be controlled.

Ancillary Operation

- 3.3.1.6 RSP and FSP are the major air pollutants by the activities during operation of the ancillary plants (e.g. rock crushers and concrete batching plant), which could be effectively controlled by frequent watering and adoption of enclosures. The tentative site setup plan is presented in **Figure 3.2**. Use of electricity as the power supply for its operations in general, thus no gaseous pollutants by fuel combustion is anticipated. However, the drying and mixing process in asphalt production would require heat generated by diesel fuel burners. Emissions of NO_x, SO₂ and particulate matters are expected from the fuel combustion processes. During heating of the bitumen, mixing process and load out of hot mix asphalt, bitumen fume (including Polycyclic Aromatic Hydrocarbons (PAH) and non-PAH hazardous air pollutants) and odorous gas are to be released. Heavy metal emission is also expected from the batch mix and bitumen heating process. As confirmed by the Project Engineer, emission from the asphalt production plant is vented to baghouse before released at the exhaust stack.
- 3.3.1.7 Under the current LTQ operation, there is 5 production lines for concrete and 1 production line for asphalt. According to the latest design, there will be maximum 6 production lines for concrete and 1 production line for asphalt under the Project operation. The ancillary operation under the Project and that of the LTQ are of same nature and similar in production scale. Besides, together with the consideration of the following reasons, air quality impact from the ancillary operation of the Project will be well controlled:
- *Adoption of More Advanced Technologies*
- 3.3.1.8 As detailed in **Section 3.3.1.6**, RSP and FSP generated from the operation of the ancillary plants, which could be effectively controlled by frequent watering and adoption of enclosures. However, emissions of NO_x, SO₂, particulate matters, heavy metal, odour and bitumen fume

will be generated from the asphalt production processes. For the bitumen heating, precise temperature control is an effective means to reduce bitumen fume and odorous gas emission. In the existing on-site asphalt production plant, high temperature cutoff device is being implemented to avoid bitumen temperature exceeding the corresponding temperature limit to cause excessive fume emission. The exhaust from hot mix is also vented to the dryer drum for combustive destruction and subsequently treated by baghouse before release to the ambient.

3.3.1.9 It is expected that, the technology is being more advanced every day and some of them are innovative that contributing to environmental improvement. For example, enter warm-mix asphalt technology, a game-changer in the industry. By reducing the temperature required for asphalt production, this innovative method could reduce bitumen fume and odorous gas emission, at the same time decreases energy consumption and lowers greenhouse gas emissions, all while maintaining the quality of the asphalt¹². Moreover, appropriate filter systems will be of higher removal efficiency with the technology development, and would also be considered for the rock processing plants and concrete batching plant.

- *Larger Separation from the Nearby ASRs*

3.3.1.10 As detailed in **Section 1.2.4.1**, the aboveground part of the Project will be confined at the eastern part of the existing LTQ site due to the development of Route 11 and TMB. The distance from the site boundary to the nearest existing ASR will be increased to more than 140m from ~5m (**Figure 2.2** refers), leading to a larger buffer between the emission sources and sensitive receivers.

- *Comprehensive Emissions Monitoring to Ensure the Compliance*

3.3.1.11 It is noted that FSP, RSP and bitumen fume have been monitored as a current practice of the existing LTQ operation. According to the monitoring reports provided by CEDD, the overall monitoring results in general in the past years comply with the respective criteria. To further ensure the compliance of various air emissions (e.g. RSP, FSP, NO_x, SO₂, heavy metals, bitumen fume, etc.) from the ancillary operation under the Project, the Contractor will comprehensively monitor the emissions at representative air quality impact monitoring locations to be recommended in the Air Pollution Control Plan. The monitoring locations shall also be close to any major emission source(s) of the Project. RSP and FSP will be monitored in a real-time manner at the first year of the operational phase, further monitoring may be necessary depending on the monitoring result of the first year and whether there is future change to the operation conditions and to be agreed with EPD. For bitumen fume, odour and heavy metals will be monitored upon commissioning and during the first three years of the operational phase, to determine whether these emissions can meet the respective requirements. Any other type(s) of emission(s) of the Project to be monitored, will be determined under the Air Pollution Control Plan before commencement of the Project. In case of any incompliance are observed, the relevant production process will be paused for investigation and implement further enhanced plant designs, e.g. replacement of component(s) / plant(s)/ air treatment system, if necessary.

- *Submission of Air Pollution Control Plan (APCP)*

3.3.1.12 Furthermore, an Air Pollution Control Plan (APCP) will be submitted to review and update the mitigation measures and monitoring locations based on the available information at the time of the Project implementation. The APCP shall also include an Event and Action Plan.

3.3.1.13 With adoption of ancillary plants with more advanced technologies compared to the existing ones, larger separation distance from the existing ASRs under the Project, implementation of comprehensive emission monitoring as well as further actions subject to the monitoring results, it is expected that the air quality impact from the Project operation will be well controlled.

3.3.2 Noise

¹² Cheraghian, G., Falchetto, A. C., You, Z., Chen, S., Kim, Y. S., Westerhoff, J., ... & Wistuba, M. P. (2020). Warm mix asphalt technology: An up to date review. *Journal of Cleaner Production*, 268, 122128.

Quarry Noise (Excluding Fixed Noise Sources)

- 3.3.2.1 Pursuant to Section 2 of Part I of NCO, any work in connection with or for the extraction from the earth of any matter whatsoever is defined as construction works. Hence, holes drilling before blasting and quarrying activities (e.g. rock mucking from blast faces, further rock breaking for easier transportation as necessary, tunnels & cavern stabilisation works including rock bolt installation and shotcreting) after blasting and prior to the primary rock crusher are construction activities. As confirmed by the Project Engineer, all activities related to the MATs and production cavern formation will only be conducted within non-restricted hours (i.e. 0700 – 1900 hours on any day not being a Sunday or general holiday). The airborne and ground-borne noise from construction activities during non-restricted hours are governed by EIAO-TM under the EIAO. In case any construction works are to be carried out during restricted hours, a CNP would be required under the NCO (**Section 3.2.2.3** refers).
- *Drill-and-blast*
- 3.3.2.2 D&B method will be adopted for the formation of the remaining sections of MATs and production cavern. Considering the relatively high cost effectiveness and the hardness of the rock in the Project site, D&B method, being adopted under the current LTQ operation, is the most suitable and appropriate method compared to other quieter construction methods for the formation of MATs and the production cavern.
- 3.3.2.3 With the development of the Project, the quarrying activities will be relocated from the surface area of LTQ to the underground strata of TLCP. D&B operation in frequency up to once a day within non-restricted hours (i.e. 0700 – 1900 hours on any day not being a Sunday or general holiday), which remains unchanged to that of the existing LTQ operation, will be undertaken at the depth of ~50m to ~200m below the ground surface of TLCP. Besides, the underground D&B operation will be conducted with the presence of an acoustically-sealed blasting door. Particular attention would be paid by the Contractor to the ventilation / exhaust system(s) to prevent noise leakage, and to ensure the blasting door is kept closed completely during the D&B operation.
- 3.3.2.4 During the drilling activities prior to blasting, potential ground-borne noise impacts arising from breaking the rock face by rock drill may affect the NSRs in the close vicinity of the works site. However, there is no NSRs located right above / within 300m from the works areas of D&B, i.e. proposed underground quarry extent. Given that the large separation between the D&B areas and NSRs, along with the limited numbers of PME to be involved (**Table 3.1** refers), ground-borne noise impact from the drilling activities would be insignificant.
- 3.3.2.5 The instant noise from blasting operation is considered to be minimal in terms of noise annoyance, as the duration of blasting is very short and infrequent. There is no statutory procedure or criteria under the NCO and EIAO for assessing the blasting noise impact. However, the administrative and procedural control of all blasting operations in Hong Kong is vested by the Mines Division of CEDD (Mines/CEDD). The Dangerous Goods (Control) Regulation (Cap. 295G) stipulates that a blasting permission and a Mine Blasting Certificate are required from Mines/CEDD for the use of explosives and carrying out blasting operation in a blasting site. Mines/CEDD is also responsible for carrying out audit inspections at times with the works activities of the Contractor.
- *Quarrying Activities (after D&B and prior to the Primary Rock Crusher)*
- 3.3.2.6 The quarrying activities after D&B and prior to the primary rock crusher are considered as construction works under NCO, utilisation of PME (see **Table 3.1**) will result in potential airborne and ground-borne noise impacts to the NSRs in the close vicinity of the works site. All of the quarrying activities will be carried out within MATs and production cavern behind the blasting door (to be opened for the on-site materials transportation) during non-restricted hours (i.e. 0700 – 1900 hours on any day not being a Sunday or general holiday), which will create less noise nuisance to the nearby NSRs as compared to that from surface quarrying activities under the current LTQ operation. Besides, in view of the significant depth of ~50m to ~200m from the surface land and the absence of NSRs above / within 300m of the works areas, air-borne and ground-borne noise impacts from the underground quarrying activities

after D&B and prior to the primary rock crusher during the operational phase of the Project is considered insignificant.

- *Cumulative Construction Noise Impact during the Project Operation*

- 3.3.2.7 As presented in **Table 1.1**, the construction phase of Route 11 and TMB will be overlapped with the operational phase of the Project from Q1 2026 to Q4 2033. The quarrying activities after D&B and prior to the primary rock crusher, together with the construction activities to be conducted in the vicinity of the Project site under Route 11 and TMB, there will be potential cumulative construction noise impact.
- 3.3.2.8 Based on the EIA studies of Route 11 and TMB, a combination of mitigation measures including but not limited to the use of QPME, quieter construction methods and noise enclosures & barriers, would be implemented. Thus, with the implementation of appropriate mitigation measures, no adverse construction noise impacts would be anticipated during the construction phases of Route 11 and TMB.
- 3.3.2.9 With adoption of good site practices as well as the recommended mitigation measures implemented by the three concurrent projects, cumulative construction noise impacts during the overlapped period would be minimal. Further review on the quarry noise impact (Excluding Fixed Noise Sources) will be conducted in the Noise Management Plan (NMP) at later stage (as detailed in **Sections 4.2.3.3 - 4.2.3.6**) when more detailed information is available, to ensure compliance with the relevant EIAO and NCO requirements.

Fixed Noise Sources

- 3.3.2.10 During the operational phase, fixed plant noise would be generated from fixed noise sources of the Project, such as heavy vehicles and conveyor belts used for on-site transportation, rock crushers, concrete batching plant, asphalt production plant, maintenance workshop, and ventilation systems of the site office and at portals, etc. Fixed noise sources are controlled under the NCO and Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM). The ANLs for the NSRs determined based on the ASR during different periods are detailed in **Section 2.3.1.3** and **Appendix 2.3.2**.
- 3.3.2.11 Tentative locations of the major fixed noise sources proposed which were advised by the Project Engineer are shown in **Figure 3.2**. As detailed in **Section 1.6**, the operational phase of the Project is from Q1 2026 to Q4 2044, and the aboveground operation will take place from hours 0700 to 1900 on working days (as same as the existing operation mode of LTQ). During the night-time period, all fixed noise sources will not operate as general conditions. Same as existing operation of LTQ, when there are night-time road works that require asphalt, the operation of asphalt production plant will be required during restricted hours. Road maintenance and repairing works are usually required to be carried out at the less busy night hours to avoid causing serious interruption to heavily trafficked roads during daytime.
- 3.3.2.12 Potential fixed noise sources impact of the Project during the normal daytime working hours and night-time have been reviewed qualitatively at the representative NSRs based on the locations of the proposed fixed noise sources as shown in **Figure 3.2**, with the evaluation presented in **Table 3.5** below. Factors including direct line of sight, and the separation between the NSRs and the proposed fixed noise sources have been considered.

Table 3.5 Potential Fixed Noise Sources Impact

ID	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Nearest Major Fixed Noise Source	Potential Screening Effect (Y/N)	Potential Fixed Noise Sources Impact
FHT1 (35mPD)	R	Asphalt Production Plant – 252m	N	In view of the large separation of more than 250m between FHT1 and the nearest fixed noise source, no adverse fixed noise sources

ID	Land Use ⁽¹⁾	Approximate Horizontal Distance to the Nearest Major Fixed Noise Source	Potential Screening Effect (Y/N)	Potential Fixed Noise Sources Impact
				impact from the Project to FHT1 during daytime and night-time will be anticipated.
FHT2 (34mPD)	R	Concrete Batching Plant – 187m	Y (No direct line of sight to the fixed noise sources due to the screening provided by natural topography with height of more than 50mPD)	In view of the large separation of more than 180m between FHT2 and the nearest fixed noise source, along with the screening effect provided by the natural topography between the Project site and the respective NSR (Appendix 3.2.1 refers), no adverse fixed noise sources impact from the Project to FHT2 during daytime and night-time will be anticipated.
FHT5 (31mPD)	W	Concrete Batching Plant – 284m	Y (No direct line of sight to the fixed noise sources due to the screening provided by natural topography with height of more than 50mPD)	In view of the large separation of more than 280m between FHT5 and the nearest fixed noise source, along with the screening effect provided by the natural topography between the Project site and the respective NSR (Appendix 3.2.1 refers), no adverse fixed noise sources impact from the Project to FHT5 during daytime and night-time will be anticipated.

Note:

(1) R – Residential; W – Public of Worship.

3.3.2.13 As presented in **Figure 3.2**, representative NSRs are located far from the aboveground works area, i.e. the area where the proposed fixed noise sources to be placed, with separations to the nearest fixed noise sources ranged from approximately 187m to 284m. Fixed noise sources impact to the nearby NSRs from the Project during daytime and night-time is considered insignificant. Nonetheless, additional mitigation measures such as selection of quieter plant, rearrangement of louvre orientation away from the NSRs, regular maintenance of the plant (as detailed in **Section 4.2.3.2**) should be implemented to further minimise any associated fixed noise sources impacts from the Project.

- *Cumulative Operational Fixed Noise Sources Impact*

3.3.2.14 As presented in **Table 1.1**, the operations of Route 11 and TMB are envisaged to commence in Q4 2033, which would overlap with the operational phase of the Project from Q4 2033 to Q4 2044. The major proposed fixed noise sources under Route 11 and TMB include administration building & associated facilities, ventilation building, satellite control building, the northern ventilation building and Highway / Tunnel Operation Area, which will be located in a close vicinity to the Project (**Figure 3.2** refers). These proposed fixed noise sources will be located close to the village house / squatter houses near Fu Tei Ha Tsuen (i.e. existing NSRs equivalent to FHT1 under the Project). Potential cumulative fixed noise sources impact will be anticipated.

3.3.2.15 Based on the EIA studies of Route 11 and TMB, a combination of mitigation measures including but not limited to selection of quieter plant, installation of acoustic silencer, installation of suitable sound attenuators, as well as suitable orientation of the key louvres to point away from the nearby NSRs, would be implemented. Thus, with the implementation of appropriate mitigation measures, no adverse operational fixed noise sources impacts would be anticipated during the operation of Route 11 and TMB.

- 3.3.2.16 With adoption of good site practices as well as the recommended mitigation measures implemented by the three concurrent projects, cumulative fixed noise sources impacts would be minimal. Further review on the fixed noise source impact will be conducted in the Noise Management Plan (NMP) at later stage (as detailed in **Section 4.2.3.3**) when more detailed information is available, to ensure compliance with the relevant EIAO and NCO requirements.

Road Traffic Noise

- 3.3.2.17 As confirmed by the Project Engineer, there will be no construction of new through roads and local roads, as well as road modification works to be carried out under the Project. Road traffic noise impact to the nearby NSRs will be generated from the traffic of the existing road network and the Project-related traffic, with the similar situation as that of the existing LTQ operation. Besides, as confirmed by the Project Engineer, the operation traffic routing of the Project (**Appendix 3.2.2** refers) will be similar to that of the existing LTQ, except (i) Chui Fuk Road will be no longer utilised as the western part of the existing LTQ will be handover to the project proponent of Route 11 and TMB for development; and (ii) a higher utilisation rate of Tak Fuk Road and Shun Tat Street after the junction improvement works (by other) in Year 2031. With the development of the Project, nuisance to the NSRs near Chui Fuk Road from the quarry induced traffic can be reduced from that of the existing operation. Although the project-related vehicles will travel everywhere in Hong Kong due to the business nature, further extent of roads would not be considered since the induced impacts from the Project would become insignificant after leaving the proposed area of influence as illustrated in **Appendix 3.2.2**.
- 3.3.2.18 Based on the information provided by the Project Engineer, the major vehicle types accessing the Project site would be heavy vehicles (e.g. trucks) for loading and unloading imported raw materials and exported products. During the operational phase, the estimated maximum traffic flows of trucks accessing the proposed concrete batching plant and rock processing plant will be approximately 52veh/hr in total; while those accessing the proposed asphalt production plant and the stockpile area will be approximately 3veh/hr and 1veh/hr respectively. The maximum traffic flow of trucks is estimated from the anticipated maximum production capacity of concrete and asphalt under the Project. It is anticipated that the estimated maximum two-way traffic flow of heavy vehicles induced by the Project will be 112veh/hr and a maximum total traffic flow of 124veh/hr, as summarised in **Table 3.6** below.

Table 3.6 Estimated Number of Vehicles during the Operation of the Project

Vehicle Type	Predicted Maximum One Way (Two-way) Traffic (veh/hr)
<i>Heavy Vehicles</i>	
Truck (24tonnes)	1
Truck (38tonnes)	15
Dump Truck	1
Asphalt Truck	3
Concrete Truck	30
Cement Truck	6
Sub-total	56 (112)
<i>Light vehicles</i>	
Private car / taxi	4
Van	2
Sub-total	6
Total	62 (124)

- 3.3.2.19 According to the observations from the 24-hour traffic survey conducted in December 2022, the maximum total traffic flow (two-way) from the existing LTQ amounting to approximately 125veh/hr (at 0800hr – 0900hr (AM)) and 120veh/hr (at 1200hr – 1300hr (PM)). The estimated maximum two-way traffic flow induced from the Project operation as shown in **Table 3.6** would be similar to that of the existing operation. Moreover, as confirmed by the Project Engineer, the production rate of concrete and asphalt from the Project will be similar to the existing LTQ operation. As such, the associated noise impacts induced by the Project-related traffic are anticipated to be similar to that of the existing condition.

- 3.3.2.20 The major carriageways in the vicinity of the Project are Yuen Long Highway and Castle Peak Road – Lam Tei, which are heavily trafficked and the dominant noise sources to the nearby sensitive receivers. According to the traffic survey of Yuen Long Highway and Castle Peak Road – Lam Tei conducted in 2022, the contribution of the induced traffic of the existing LTQ operation to Yuen Long Highway and Castle Peak Road – Lam Tei ranged from 0.05% to 0.54% and 0.54% to 6.32%, respectively (**Appendix 3.2.3** refers). Considering that the induced traffic flow of the Project operation will be similar to that of the existing LTQ operation, it is anticipated that the contribution from the Project-related traffic flow to the identified major carriageways will be similar. In view of the relatively low contribution, the road traffic noise impact associated with the Project-related traffic to the NSRs adjacent to the major carriageways will be insignificant.
- 3.3.2.21 As confirmed by the Project Engineer, except the asphalt production process (subject to the occurrence of any night-time road works), no quarry operation including rock processing and concrete batching will be carried out during the night-time period (detailed in **Section 3.3.2.11**). In such cases, asphalt trucks will be deployed for the exportation of asphalt. Nonetheless, considering that the maximum induced traffic flow associated with the asphalt production will only be approximately 3veh/hr, with the implementation of additional measures as detailed in **Section 4.2.3.8**, road traffic noise impact from the limited number of asphalt trucks to the NSRs along the operation traffic routings during night-time should therefore be considered insignificant.
- 3.3.2.22 As detailed in **Section 3.3.2.17**, apart from Chui Fuk Road will be no longer used under the Project, and a higher utilisation rate of Tak Fuk Road and Shun Tat Street after the junction improvement works (by other) in Year 2031, other traffic routings utilised by the Project-related traffic (**Appendix 3.2.2** refers) will be as same as those used by the current LTQ operation. Together with the similar maximum total traffic flow (**Section 3.3.2.19** refers), the traffic noise impact from the Project-related traffic to the NSRs located nearby Yuen Long Highway, Fuk Hang Tsuen Road (section after the junction with Chui Fuk Road), Wong Kong Wai Road, Castle Peak Road – Lam Tei will be similar to that from the existing LTQ operation. Changes in traffic noise impact from the Project-related traffic to the NSRs located nearby the slip road connecting to Fuk Hang Tsuen Path, Fuk Hang Tsuen Path, Fuk Hang Tsuen Road (section before the junction with Chui Fuk Road), Tak Fuk Road and Shun Tat Street are described below.
- *NSRs along the Slip Road Connecting to Fuk Hang Tsuen Path & Fuk Hang Tsuen Path & Fuk Hang Tsuen Road (Section before the Junction with Chui Fuk Road)*
- 3.3.2.23 The Project will be confined to the eastern section of the existing LTQ site due to the development of Route 11 and TMB, and only one entrance to Fuk Hang Tsuen Path will be utilised by the Project-related traffic. Hence, there will be changes in terms of traffic noise impact on the NSRs located near the slip road from the north-eastern entrance of the Project and Fuk Hang Tsuen Path (i.e. FHT2, FHT3, FHT4 and FHT5) and the NSRs nearby Fuk Hang Tsuen Road (section before the junction with Chui Fuk Road) due to the Project operation.
- 3.3.2.24 As advised by the Traffic Consultant of the Project, the induced maximum total traffic flow (i.e. 124veh/hr) of the future Project operation will be slightly higher than that of from existing LTQ operation (i.e. 117veh/hr) utilising the slip road to Fuk Hang Tsuen Path and Fuk Hang Tsuen Path. The increased traffic flow will result in an increase of 0.3dB(A) in basic noise level, which is considered insignificant (i.e. <1.0dB(A)).
- 3.3.2.25 Given that the estimated maximum total traffic flow induced by the Project operation would be similar to the that of the existing LTQ operation (**Section 3.3.2.19** refers), the associated traffic noise impact to the NSRs adjacent to Fuk Hang Tsuen Road (section before the junction with Chui Fuk Road) will be comparable. Hence, the change in traffic noise impact to the respective NSRs from the Project is also considered insignificant.
- *NSRs along Tak Fuk Road and Shun Tat Street*
- 3.3.2.26 As mentioned in **Section 3.3.2.17**, a relatively higher utilisation rate of Tak Fuk Road and Shun Tat Street of the quarry-related traffic is expected after the completion of road widening

works in Year 2031. Assuming the existing LTQ will continuously operate after Year 2031, more quarry-related traffic will travel along Tak Fuk Road and Shun Tat Street. Considering that the total induced traffic flow from the Project is expected to be similar to that of the existing LTQ operation, the associated road traffic noise impact from the Project to the NSRs along Tak Fuk Road and Shun Tat Street due to the increased utilisation rate will be similar to that from the existing quarry operation after Year 2031. Hence, the change in traffic noise impact to the respective NSRs from the Project is also considered insignificant.

- 3.3.2.27 Although the traffic noise impact associated with the Project-related vehicles will be similar to that from the LTQ operation, additional mitigation measures in terms of administrative measures as detailed in **Section 4.2.3.8** are recommended for the future operator to further enhance the environmental performance of the Project operation.

3.3.3 **Water Quality**

- 3.3.3.1 Same as the current LTQ operation, potential water quality impacts during the operational phase of the Project would arise from surface run-off from the area of the existing LTQ Site, sewage from operation workforce, industrial wastewater generated from concrete batching plants, wastewater from quarrying operation, and accidental spillage of chemicals and potential contamination of surface water and groundwater.
- 3.3.3.2 Given that the operation of the Project will be located in the area of the existing LTQ site with underground quarrying and without additional paved area, implying that surface runoff is from the area of the existing LTQ. No adverse water quality impact from non-point source surface run-off of the Project would be expected.
- 3.3.3.3 Sewage generated from the operation workforce from the Project during the operational phase is characterised by high levels of BOD, ammonia and *E. coli*. Following the current practice of the LTQ operation, all sewage generated from the operation workforce would be collected by proposed chemical toilets and holding tanks, and then collected by a registered waste collector with a licence under Water Pollution Control Ordinance (Cap. 358) (WPCO) for transportation to existing sewage treatment works, ideally Pillar Point Sewage Treatment Works for off-site treatment. No adverse water quality impact would therefore be anticipated.
- 3.3.3.4 Concrete batching plants will be set up at the aboveground works area under the Project to produce fresh concrete. Same as the current practice adopted under the existing LTQ operation, all wastewater and slurry generated will be collected by an on-site wastewater / slurry treatment system which is comprised of reclaimers and filter press systems. Treated effluent will be recycled and reused for production processes and dust control measures (e.g. wheels watering) at the Project Site. No treated effluent from the concrete batching plants will be discharged to nearby natural watercourses. Besides, no wastewater will be generated from the operations of asphalt production plant and rock processing plant in view of the high operating temperature and operation mode (i.e. no water would be involved), respectively. In view of the above, no adverse water quality impact would therefore be anticipated.
- 3.3.3.5 During the quarrying operation, i.e. excavation of rock for the formation of rock cavern and tunnels, wastewater will be generated during the process of rock bolt installation and on-site dust suppression. Potential water quality impacts due to wastewater discharge can be minimised if mitigation measures and good site practices suggested in **Section 4.2.4.4** are continually implemented to ensure that untreated wastewater from quarrying operation does not enter public drainage systems.
- 3.3.3.6 A number of chemicals would be stored on-site and used for ancillary plants within the Project site. Accidental spillage of chemicals, if not contained properly, may enter the downstream watercourses or infiltrate to groundwater and cause adverse water quality impacts. Adverse water quality impacts can be minimised by appropriate storage management and drainage system design as recommended in **Section 4.2.5.2**.

Cumulative Water Quality Impact during the Operational Phase

- 3.3.3.7 As mentioned in **Section 1.7**, according to the latest available information at the time of preparation of this PP, there are two projects to be operated currently with the Project,

namely Route 11 and TMB. During the operational phases of Route 11 and TMB, major sources of water quality impacts from the proposed LTQ Interchange and tunnel sections at the immediate west of the existing LTQ site are expected to be surface run-off from new paved areas, drainage of road surface and tunnel run-off, sewage generated by ventilation buildings and administration buildings, as well as wastewater generated from washing and maintenance operations. Based on the findings of the water quality impact assessments conducted under the EIA Studies of Route 11 and TMB, with implementation of the recommended mitigation measures, such as regular washing of roads and paved areas, as well as provision of sufficient treatment facilities and drainage systems with proper design, no adverse water quality impacts would be anticipated during the operation of the proposed LTQ Interchange and relevant tunnel sections of Route 11 and TMB.

- 3.3.3.8 With adoption of good site practices as well as the recommended mitigation measures implemented by the three concurrent projects, cumulative water quality impact during the overlapped operational phases would be minimal.

3.3.4 Waste Management

- 3.3.4.1 Similar to the existing LTQ operation, major wastes generated during construction phase of the Project include operational waste from rock processing, concrete batching and asphalt production, chemical waste, as well as general refuse.

- 3.3.4.2 Operational waste from the Project would mainly be solid waste including dried cements and dust paste from concrete batching and asphalt production. During concrete batching, waste concrete and slurry with an estimated quantity of approximate 40 tonnes per day will be generated due to improper concrete pouring and handling. To minimise the waste generation, they will be recycled and reused on-site by being diverted to the concrete recycling machine to separate aggregates and slurry after washing. The slurry will be directed into the settlement pits and the aggregates will be reused for the production of sub-base material. The final solid waste including dried cement with an estimated quantity of approximately 15 tonnes per day collected by filter press could not be further reused on-site and will be delivered to PFRFs by trucks. Besides, all rejected asphalt concrete during asphalt production will be crushed and recycled for production use. The excess filler generated will be conditioned as dust paste with an estimated volume of approximately 8 tonnes per day. The generated dust paste could not be further reused on-site and will be delivered to PFRFs for beneficial reuse in other projects. No adverse waste management impact is expected during the operation of the Project.

- 3.3.4.3 Chemical wastes such as oil / grease, hydraulic fluids, paints, solvents, and cleaners may be generated from maintenance and servicing of ancillary plants during the operational phase. A few cubic metres of chemical waste would be generated per month and should be collected by licensed collectors and disposed of at the Chemical Waste Treatment Centre (CWTC) at Tsing Yi. Wherever possible opportunities should be taken to reuse and recycle materials. Provided that proper management procedures as detailed in **Section 4.2.5** will be followed, potential hazard and spillage would not be anticipated.

- 3.3.4.4 General refuse including food waste, plastic, wastepaper, etc. would be generated by staff and office activities. It is estimated that around 110 staff would be working on-site per day during the operational phase, which is similar to that of the current LTQ operation. Based on a generation rate of 0.65kg per worker per day, the daily arising of general refuse would be about 72kg. Provided that the general refuse generated would be handled, transported and disposed of using the currently adopted methods and good site practices recommended in **Section 4.2.5**, no unacceptable environmental impact (including potential hazard, air and odour emissions, noise and wastewater discharges) and public transport impact would thus be expected.

3.3.5 Hazard to Life

- 3.3.5.1 The explosives will be directly transported to site by CEDD/Mines, so no overnight storage of explosives would be required for the Project. Hazard to life impacts related to the use and on-site transport of explosives for the operational phase of the Project, in which blasting activities, are expected.
- 3.3.5.2 As mentioned in **Section 1.2.5.3** above, the underground quarry comprised of production caverns with a dimension of approximately 26m span x 16m height and MATs with approximately 16m span x 18m height (**Figure 1.3** refers). Both tunnel portals are situated within the aboveground works areas of the Project and no ventilation shaft will be proposed under this Project.

Hazardous Events

- 3.3.5.3 Possible outcomes from hazardous events associated with on-site transport and use of explosives include:
- Primary hazards: Ground shock / vibrations and blast effects;
 - Secondary hazards: Effects on buildings, slopes and other sensitive receivers; and
 - Tertiary hazards: Landslide and boulders fall.

Surrounding Population (Figure 3.6 refers)

- On-site Population

- 3.3.5.4 A Hazard Management Plan (HMP) has been formulated with a view to aligning the understanding of the risk of the three projects (i.e. Route 11, TMB and this Project) and has been agreed among three projects. Hence, all the working populations at Lam Tei Quarry area, which includes the workforce induced under the construction and operational stages of three projects, were considered as on-site populations for all the three projects.

- Off-site Population

- 3.3.5.5 The only off-site population considered within the influence zone of the blasting operation was the road population of the proposed Route 11 and TMB, which are located at a distance of approximately 50m and 185m from the proposed underground quarry of this Project respectively.

Use of Explosives

- 3.3.5.6 Initially, the first front section (less than 10m) of the MATs will be excavated using mechanical means. Subsequently, both the top heading and bench of the production cavern and MATs will be excavated by D&B with the use of explosives. Blasting doors will be installed at the tunnel portals and completely closed during the whole blasting operations. Indicative blasting extent of the Project is presented in **Figure 3.6**. Hazards from the blasting process are considered to be the hazards induced by the blasting of a blast face. The design of the blast face is determined by the permitted vibration level of the sensitive receivers which is expected not to cause any damages to the receivers. However, potential hazards may occur when the process is completed with deviation with the designed process. Higher than expected vibration may be induced by such events.
- 3.3.5.7 According to WIL Study¹³, the major hazard from blasting operations is flying debris. Flying debris is identified as a rock that has been propelled beyond the blasting area by the force of an explosion. The cause of flying debris is mismatch of the distribution of explosive energy, type of confinement of the explosive charge, mechanical strength of the rock and lack of security measures at blasting area. The effects of overpressure and flying debris during blasting process were not considered under this review as a blasting door will be in place and completely closed during the blasting process. It would be controlled under the blasting permit mechanism separate from the EIAO.
- 3.3.5.8 The nearest off-site aboveground building structure in respect to the proposed underground quarry extent of this Project is the village house on Chui Fuk Road, which is located with a

¹³ ERM, 2008. West Island Line: Hazard to Life Assessment for the Transport, Storage and Use of Explosives.

separation distance of more than 400m. In view of the significant separation, no major damage is thus expected and the impact to the off-site aboveground building structure was not further considered in this review. Besides, with consideration of the topography, any mis-blast during the Project operation may result in slope failure or boulder fall into the directs of LTIR or HSHIR. No off-site population was identified in these potentially affected areas, and thus, the impact to slopes and boulders was not further considered in this review. In view of the above, no secondary and tertiary hazards as stated in **Section 3.3.5.3** from the use of explosives under the Project is anticipated.

On-site Transport of Explosives

- 3.3.5.9 Cartridged emulsions, detonators and detonating cords are on-site transported by a licensed diesel vehicle from the delivery point to the project area and then to the blast faces through the access tunnel. Indicative on-site transport route of the Project is presented in **Figure 3.6**. Potential hazards reviewed include higher than expected vibration and air overpressure due to detonation of full load of explosives during on-site transportation.

Cumulative Hazard to Life Impact during the Operational Phase

- 3.3.5.10 Among the concurrent projects listed in **Table 1.1**, only the preliminary designs of the proposed Route 11 and TMB are available at the time of preparation of this PP, and thus, they were considered in this review. According to the latest design from the Highways Department, surface blasting, tunnel blasting and magazine site at LTQ are required for the construction of Route 11 and TMB. Besides, their construction phase will overlap with the operational phase of this Project. Thus, the cumulative risk from the use and transportation of explosive from Route 11, TMB and this Project would be anticipated.
- 3.3.5.11 Although the construction phase of Route 11 and TMB will be overlapped with the operational phase of this Project, no knock-on effects of blasting among Route 11, TMB, and this Project will be expected due to the following reasons:
- Multi-blasting is common in D&B projects, and blasting at one blast face will not affect another;
 - There is a separation distance of at least 50m between the proposed underground quarry extent of the Project and Route 11 tunnel (**Figure 3.6** refers);
 - There is a separation distance of at least 300m between the proposed underground quarry extent of the Project and TMB tunnel (**Figure 3.6** refers);
 - There is a separation distance of at least 300m between the proposed underground quarry extent of the Project and the magazine site of Route 11 and TMB (**Figure 3.6** refers);
 - There is a separation distance of at least 100m between the proposed underground quarry extent of the Project & the associated transport route of explosives and the surface blasting extent of Route 11 and TMB (**Figure 3.6** refers);
 - There are no connections between the proposed underground quarry extent of the Project and the tunnels of Route 11 and TMB; and
 - A HMP between these 3 projects has been formulated to recommend a set of administrative and management measures for all the blasting related operations, including all surface blasting, underground blasting and transport of explosives of the Project. There is synergy for the blasting operations of the three projects to minimise the environmental and hazard to life impacts during the overlapping periods.

Statutory / License Requirement

- 3.3.5.12 Bulk emulsions and bulk Ammonium Nitrate / Fuel Oil are commonly manufactured at the blast sites and used immediately for rock blasting.
- 3.3.5.13 Under Section 16 of the Dangerous Goods (Control) Regulation, Cap. 295G, a manufacture (blasting) license is required to manufacture nitrate mixture, i.e. Group 2 Schedule 1 Dangerous goods (S1DG), within a blasting site. The Commissioner of Mines is the Authority for issuing the license. For the manufacturing of bulk emulsion at blasting sites, ammonium nitrate (AN), which is classified as DG Class 5 – Oxidizing Substances under Schedule 2 of

the Dangerous Goods (Application and Exemption) Regulations Cap. 295E, is used. A licence for the storage of DG Class 5 is required according to “A Guide to Application for Dangerous Goods Licence and Approval” from the Fire Services Department.

- 3.3.5.14 For the use of explosives, a blasting permit is required from the Mines/CEDD so that the use of explosives at a work site for the carrying out of blasting is allowed; and a Mine Blasting Certification is required so that the Shotfirer is permitted to use explosives in blasting.

Hazard to Life Risk Review

- 3.3.5.15 A hazard to life risk review was carried out to assess the risk issues arising from on-site transport and use of explosives during the operational phase of the Project. The results revealed that both individual risk and societal risk are within the acceptable limit. Nonetheless, there are some recommendations / best practices detailed in **Section 4.2.6** specific to the use of explosives during the underground quarrying activities to further minimise the risks.

3.3.6 Ecology

Potential Direct Impact

- 3.3.6.1 The operation of quarrying activities would be located underground, and thus, no aboveground habitat loss outside the boundary of the existing LTQ. Besides, no species of conservation importance were recorded within the aboveground works area, no direct impact to associated species of conservation importance is hence anticipated. The operation of the ancillary plants would be located at the existing LTQ site and comparable to the present operation. Given that there would be no habitat loss and the aboveground ancillary plants will be located at the developed area of the existing LTQ, no direct impact on the aboveground habitats and the associated species of conservation importance including those within TLCP from the Project during the operational phase is anticipated. Besides, given that the aboveground facilities related to quarry operation will be located in developed area / wasteland, direct ecological impact due to the removal of aboveground facilities after the Project completion is not anticipated.

Potential Indirect Impact

- Changes in Water Quality

- 3.3.6.2 The future quarry operation may pose potential water quality impact (e.g. deterioration of water quality, increase in suspended solids and potential contaminants) to the water bodies in the vicinity of the Project site due to uncontrolled surface run-off, improper discharge of effluent and sewage. Aquatic habitats identified in the vicinity of the Project site include watercourses, modified watercourses, LTIR and HSHIR (**Figures 2.7.2.1 and 2.7.2.2** refer). While water quality impact on watercourses and irrigation reservoirs which are located at the upslope of the Project site is not expected, there might be water quality impact on modified watercourse W5 at the downslope area outside TLCP. However, provided that watercourse W5 is a modified section with relatively low water quality, the ecological impact from the changes in water quality is anticipated to be low.
- 3.3.6.3 With the provision of sufficient and efficient sewage collection facilities, drainage system and implementation of recommended mitigation measures as detailed in **Section 4.2.4**, no residual adverse water quality impact on the aquatic habitats adjacent to the Project site during the operational phase is anticipated.

- Hydrological Disruption due to Groundwater Drawdown

- 3.3.6.4 The proposed production caverns and MATs would encroach to the underground area of TLCP and other natural resources including watercourse W1, some minor tributaries of W2a, plantation and shrubland habitats (**Figure 2.7.2** refers). D&B operation may cause potential hydrological disruption on these aquatic habitats (i.e. watercourses and irrigation reservoirs) due to groundwater drawdown. According to the Hydrogeological Assessment of this Project conducted and submitted to CEDD under separate mechanism, water drawdown in

reservoirs or watercourses (including W1 and W2a) near or above the proposed underground quarry extent may occur with insignificant level (AECOM, 2023).

3.3.6.5 Despite potential groundwater drawdown could result in different degrees of settlement on aboveground habitats as well as dewatering of surface water features, the groundwater level in the vicinity of the proposed quarry extent is generally below the rockhead level. As such, change in groundwater level is anticipated to be minimal and insignificant. Nonetheless, as a precautionary measure and a general engineering practice, hydrogeological monitoring by piezometers and standpipes will be conducted to monitor the change in groundwater flow resulting from the underground quarrying activities. The groundwater monitoring data will be submitted to GEO regularly to ascertain the hydrogeological conditions. In case any abnormal decrease in groundwater level arises during the cavern and tunnels construction, the future operator is required to implement remedial measures (e.g. review and strengthen water control strategies), where necessary. Given that appropriate measures as detailed in **Section 4.2.7** would be taken, potential change in surface flow at watercourses above the proposed quarry extent (e.g. W1 and W2a) would be minimal. Thus, the ecological impact caused by hydrological disruption is anticipated to be low. Precautionary measure such as pre-grouting would be deployed to further control any potential groundwater drawdown during the construction of production cavern and MATs, if found necessary.

- *Changes in Air Quality*

3.3.6.6 During the operational phase of the Project, potential air quality impact from both underground quarrying activities and aboveground ancillary operation is anticipated. The underground quarrying would involve dusty activities including blasting, excavation and spoil handling, therefore potential dust impact is expected during the operational phase of the Project. Besides, the drying and mixing process in asphalt production would require heat generated by diesel fuel burners, in which missions of NO_x, SO₂ and particulate matters are expected from the fuel combustion processes. Emission of air pollutants and dust may lead to adverse ecological impact such as reduction in the quality of habitats and the growth rate of plants. With the similar business mode with that of the existing LTQ operation, the implementation of air control technologies and good maintenance practices as detailed in **Section 4.2.2**, the level of air pollutants emission (e.g. fugitive dust, NO_x, SO₂ and particulate matters) is expected to be similar to that from the current operation at the existing LTQ. In view of this, the ecological impact from changes in air quality is anticipated to be minor.

- *Potential Ground-borne Noise and Vibration Impact from D&B Operation*

3.3.6.7 During the operational phase, the production cavern and MATs will be constructed by D&B method, which could cause noise and vibration disturbance to the aboveground habitats and associated fauna, and hence displacement of fauna. However, as confirmed by the Project Engineer, under the current design of the Project, D&B operation will be carried out at a significant depth of at least 50m to 200m below the ground surface of TLCP. As a general practice, blasting doors would be installed at each explosion phase such that D&B activities will be undertaken underground / inside rock mass in a fully enclosed condition. Besides, D&B operation would only be conducted once per day during daytime. Vibration monitors within TLCP and CA will also be set up as a general engineering practice to monitor the vibration level during D&B operation. As mentioned in **Section 3.3.2.5**, adverse ground-borne noise impact from the Project would be unlikely given the very short duration and infrequent of the blasting operation. In view of the transient nature and short duration of blasting operation of the Project, the impact from induced ground-borne noise and vibration are not expected to cause significant disturbance to TLCP, the CA, terrestrial habitats and fauna at the surface area.

- *Other Potential Noise Impacts from the Project Operation*

3.3.6.8 As detailed in **Section 3.3.2.10**, there will be potential fixed noise impact from the operation of fixed noise sources (i.e. rock crushers, concrete batching plant, asphalt production plant, maintenance workshop, conveyor belts and ventilation systems of the site office) which will be situated at the aboveground works area and road traffic noise impact from induced traffic

flow during the operational phase of the Project, in which posing potential impact to adjacent habitats and the associated wildlife. Given that the adjacent habitats and associated wildlife have been subject to the noise impacts from the operation of existing LTQ, and the operation mode of ancillary plants and induced traffic flow under the Project will be similar to the current ones, no unacceptable noise impact arising from the Project during operational phase would be anticipated.

- *Night-time Glare and Light Pollution to the Nearby Natural Environment*

3.3.6.9 Artificial lighting / glare could potentially affect light sensitive / nocturnal wildlife (e.g. bats and herpetofauna species) by attracting, disorienting or disrupting their light-sensitive cycles. This could consequently affect their migration, foraging and breeding success and causing reduction of faunal density in the area. According to the survey findings, bat species were recorded utilising plantation and watercourses near the existing LTQ site and amphibian species such as Lesser Spiny Frog and Hong Kong Cascade Frog were recorded in watercourse W1 within TLCP. As the light setting of the aboveground works area would be similar to that of the existing LTQ, in which no additional glare or lighting to surrounding area including TLCP is expected to be caused by the operation of the Project. The ecological impact of changes in light level is anticipated to be of low significance. Mitigation measures such as lighting control and careful design shall be implemented to further avoid and minimise glare impact and light pollution / intrusion during night-time to the surrounding natural areas, i.e. TLCP and the CA.

- *Sewage Effluent from Workforce*

3.3.6.10 Domestic sewage would be generated from the workforce during the operational phase. Given that all sewage generated from the operation workforce would be collected by proposed chemical toilets and holding tanks, and then collected by a registered waste collector with a WPCO licence for transportation to existing sewage treatment works, as well as no sewage would be discharged directly into water bodies and storm drains adjacent to the Project site, no adverse water quality impact would therefore be anticipated. No ecological impact is anticipated to arise due to sewage effluent from workforce.

- *Heat Emission*

3.3.6.11 Potential heat emission would be generated from the operation of powered mechanical equipment (PME) inside the underground cavern and tunnels. Heat emitted through the D&B operation, operation of electrical and diesel machinery may cause a rise in the ambient soil temperature. Nonetheless, the production cavern and MATs will be constructed at the underground area of at least 50m to 200m below ground surface of TLCP. By maintaining proper ventilation via installation of ventilation ducts and fans to control the temperature within the constructed access tunnels and production cavern, the targeted desirable room temperature of the cavern would be below 40°C. In view of the large separation between the ground level of TLCP and the crown of underground production cavern and access tunnel, and with the implementation of ventilation measures, ecological impact from heat emission to the aboveground area is anticipated to be insignificant. Monitoring of the temperature of access tunnels and production cavern is also proposed to avoid potential heat impacts to the terrestrial ecology during the operational phase of the Project.

3.3.6.12 The operation of asphalt production plant which will be situated at the aboveground works area within the boundary of the existing LTQ could also generate heat and may cause a rise in ambient air temperature. The heat emitted may affect the usage of habitats by fauna species (e.g. avifauna and flying mammals). Considering that a production rate of the operation of the Project is expected to be similar to that of the existing LTQ, it is also anticipated that the operation mode of the asphalt production plant will remain similar. Moreover, the surface temperature of all insulated plant facilities shall be controlled to be no more than 55°C. Given that the horizontal distance between the asphalt production plant, TLCP and the CA would be more than 200m, as well as the abovementioned circumstances, no significant ecological impact arising from heat emission is anticipated.

- *Disturbance from Traffic and Human Activity*

- 3.3.6.13 During the operational phase of the Project, the presence of human activities, heavy vehicles and machinery is anticipated to be similar to that from the operation of the existing LTQ. The presence of human activities and traffic may bring about disturbances to the faunal groups utilising the habitats in the vicinity of the Project site. As the level of disturbance is expected to be comparable to the operation of the existing LTQ and the quarrying works would mainly be operated underground, nuisance to the terrestrial fauna is minimised. In this regard, the ecological impact due to the presence of traffic and human activity is expected to be of low significance.

Cumulative Ecological Impact during the Operational Phase

- 3.3.6.14 As mentioned in **Section 1.7**, based on the latest available information at the time of preparation of this PP, the construction and operational phases of Route 11 and TMB will be overlapped with the operational phase of the Project. Potential cumulative ground-borne noise and vibration impact may arise due to underground works. However, given that the underground D&B operation of the three projects would not be conducted together at the same period, the adverse cumulative ground-borne noise and vibration impact would be anticipated to be minor (**Section 3.3.5.11** refers). Close liaison and coordination will be made between the project proponents / contractors of concurrent projects to minimise the associated environmental impacts.
- 3.3.6.15 During the operational phases of Route 11 and TMB, major ecological impacts from the proposed LTQ Interchange and tunnel sections at the immediate west of the existing LTQ site are identified to be the potential disturbance impacts such as increase level of noise and light intensity from the road traffic and associated facilities, however, located outside the natural habitats. Based on the findings of the ecological impact assessments conducted under the EIA Studies of Route 11 and TMB, with implementation of appropriate mitigation measures and design, the adverse ecological impacts would be anticipated to be insignificant during the operation of the proposed LTQ Interchange and relevant tunnel sections of Route 11 and TMB.
- 3.3.6.16 With adoption of good site practices as well as the recommended mitigation measures implemented by the three concurrent projects, cumulative ecological impact during the overlapped operational phases would be minimal.

3.3.7 Landscape and Visual

- 3.3.7.1 The magnitude and significance of the unmitigated landscape and visual impacts during the operation of the Project are studied below.

Landscape Impact

- 3.3.7.2 The sources of landscape impact during the operational phase would mainly be the portal areas and ancillary operation within the aboveground works area. As detailed in **Appendix 3.8**, there will also be a permanent removal of 11 numbers of existing trees and other vegetations planted by existing LTQ operator as part of the rehabilitation works at the two proposed portal areas. However, these impacts would be temporary and can be alleviated by the implementation of appropriate mitigation measures as detailed in **Section 4.2.8**. Provided that the major components of the Project (i.e. the proposed production cavern and MATs) will be underground, it will be compatible to the surrounding environment. During the operational phase of the Project, ancillary operation will be confined within the aboveground works area in LCA1 and the quarrying activities will be conducted underground, and thus, no landscape impact to the distinctive character / resources within LCA2 is anticipated. Hence, the significance of landscape impacts on the affected LRs, LCAs and public viewers during the operational phase is the same as in the construction phase, ranging from small to insubstantial.

Visual Impact

- 3.3.7.3 Most of the major components of the Project (i.e. the proposed production cavern and MATs) will be underground, and only the portal areas will be permanent in nature under the Project. Provided that the portal areas will be visually compatible with the surrounding environment, only slight magnitude of visual change is anticipated during the operational phase of the Project and after the completion of the Project. The proposed greening works as detailed in **Section 4.2.8** can also alleviate the potential visual impacts in the long term. Hence, the significance of visual impacts on the affected public viewers from the permanent aboveground structures of the Project is slight.

Cumulative Landscape Impact during the Operational Phase

- 3.3.7.4 As mentioned in **Section 1.7**, based on the latest available information at the time of preparation of this PP, Route 11 and TMB will be operated concurrently with the Project. Nonetheless, according to the landscape impact assessment conducted under the EIA Studies of Route 11 and TMB, relevant residual impact on the Lam Tei area ranges from moderate to insubstantial.
- 3.3.7.5 Taking into account the potential impacts on existing vegetation, temporary disturbance of the quarry view and residual impact of Route 11 and TMB, the cumulative landscape impacts during the operational phase is evaluated as moderate to insubstantial. With the implementation of the mitigation measures, the cumulative landscape impact during the operational phase is considered insubstantial to slight.

3.3.8 Cultural Heritage

Built Heritage

- 3.3.8.1 Given that no heritage sites are located within the 300m study area from the Project boundary, no impact to the abovementioned heritage sites from the operation of the Project is anticipated.
- 3.3.8.2 Although tunnels and cavern formation work (i.e. blasting operation) is carried out during the operational phase, level of indirect impacts of ground borne vibration on the identified items (see **Table 2.11**) is anticipated as acceptable as they are located more than 50m from the proposed tunnels and cavern extent. NB02 is the nearest identified item from the Project site. According to Clause 6.36(6)(a) of the General Specification for Civil Engineering Works 2020, blasting should not be carried out within 50m on plan from any water retaining structure of WSD. In addition, WSD has advised that the allowable peak vibration limit for NB02 is 13mm/s. With the consideration of the distance between blast face and the sensitive receivers, the expected peak vibration limit due to blasting is less than 13mm/s. Impacts on the sensitive receivers are, therefore, insignificant.

Archaeology

- 3.3.8.3 The Project site contains no archaeological potential. Hence, no archaeological impact is anticipated.

4 DESCRIPTIONS OF MITIGATION MEASURES

4.1 Construction Phase

4.1.1.1 Referring to **Section 1.6.1.1**, major construction activities include minor site clearance, platform formation, construction of portals and the front sections of the MATs by mechanical excavation, installation of blasting door, minor slope stabilisation works associated with the portals formation, as well as installation of ancillary facilities / plants, which are similar to the quarrying activities (after blasting) and works for plants installation of the existing LTQ in terms of nature and scale. The good site practices and control measures currently adopted under the LTQ operation will be continually deployed during the construction phase of the Project. Besides, some additional measures were recommended in below sections (as specified / with an asterisk* for indication) to further minimise the environmental impacts from the Project construction.

4.1.2 Air Quality

4.1.2.1 Dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation and good site practices listed below should be carried out to further minimise construction air quality impact:

- Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;
- Use of frequent watering for particularly dusty construction areas and areas close to ASRs;
- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;
- Avoid position of material stockpiling areas, major haul roads and dusty works within the construction site close to concerned ASRs;
- Haul roads should be paved and regularly wetted to suppress the fugitive dust emission caused by the travelling construction vehicles;
- Avoid unnecessary exposed earth;
- Locate all the dusty activities away from any nearby ASRs as far as practicable;
- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs;
- Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the site such that no residue on the body of construction vehicle would cause dust emission on public roads;
- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
- Properly maintain the equipment to minimize any emissions;
- Imposition of speed controls (not higher than 8km/h) for vehicles on site haul roads;
- For the work sites close to the ASRs with a separation distance less than 10 m, provide hoardings of not less than 3.5 m high from ground level along the site boundary; for the other work sites in general, provide hoarding not less than 2.4m high from ground level along site boundary except for site entrance or exit*; and
- Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise*.

4.1.2.2 Guidelines stipulated in EPD's Recommended Pollution Control Clauses for Construction Contracts should also be incorporated in the future contract document to abate construction air quality impacts. These clauses include:

- The Contractor shall observe and comply with APCO and its subsidiary regulation, particularly the Air Pollution Control (Construction Dust) Regulation.

- The Contractor shall undertake at all times to prevent dust nuisance as a result of the construction activities.
- The Contractor shall ensure that there will be adequate water supply /storage for dust suppression.
- The Contractor shall devise and arrange methods of working and carrying out the works in such a manner so as to minimise dust impact on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented properly.
- Before the commencement of any work, the Contractor may be required to submit the methods of working, plant, equipment and air pollution control system to be used on the site for the Supervising Officer inspection and approval.

4.1.2.3 To minimise the exhaust emission from NRMMS during the construction phase, the following measures should be applied as far as practicable:

- Avoid exempted NRMMS as far as practicable;
- Connect construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment; and
- Deploy electrified NRMMS as far as practicable*.

4.1.2.4 With the implementation of control measures as described above, no adverse residual air quality impact from the construction of the Project would be anticipated.

4.1.3 Noise

4.1.3.1 In view of the large distance separation with a range from approximately 129m to 236m between the NSRs and the aboveground works areas, the minor scale and the localised nature of the construction activities involved, no adverse construction noise impact would be anticipated during the construction phase. Nonetheless, in order to minimise the potential noise nuisance to nearby NSRs due to the construction of the Project, following mitigation measures which were confirmed to be practicable and feasible by the Project Engineer shall be considered by the contractors:

- Good site practices to limit noise emissions at the sources;
- Use of quiet powered mechanical equipment (PME) and quieter construction methods (if practicable)*; and
- Adoption of construction noise barriers / enclosures to screen noise from construction plants*.

Good Site Practice

4.1.3.2 Although the noise mitigation effects are not easily quantifiable, and the benefits may vary with site conditions and operating conditions, good site practices are easy to implement and do not impact upon the works schedule. The site practices listed below should be continually followed during construction works of the Project:

- Only well-maintained PME should be operated on-site and should be serviced regularly during construction works;
- Silencers or mufflers on construction equipment should be utilised (if appropriate) and should be properly maintained during the construction;
- Mobile plant, if any, should be sited as far away from NSRs as possible;
- Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- Plant known to emit noise strongly in one direction should, wherever possible, be orientated to direct noise away from the nearby NSRs;
- Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities; and
- The Contractor should devise, arrange methods of working and carrying out the works to minimise noise impacts to the surrounding environment, and should provide experienced personnel with suitable training to ensure all these measures are implemented properly.

Use of Quieter PME and Quieter Construction Method*

- 4.1.3.3 The use of quieter PME is considered a practicable means to mitigate the construction noise impact. Quieter PME refers to those PME which could deliver the same output but having a sound power level lower than the value specified in the Technical Memorandum on Noise from Construction Work Other Than Percussive Piling (GW-TM). In addition, the use of quieter PME associated with the construction works (e.g. site clearance, construction of portals and installation of ancillary facilities or plants) could made reference to the EPD's website of Quality PME¹⁴ (e.g. bulldozer, excavator, mobile crane, air compressor, generator, etc.). The use of quieter PME / quality PME will be further reviewed in the detailed design stages and in the Construction Noise Management Plan (CNMP).
- 4.1.3.4 A number of quieter construction methods¹⁵ have also been evaluated and reviewed by the Project Engineer to see if they are practicable to be adopted as an additional measure during the construction phase (**Appendix 4.1** refers). Considering the practicability, technical constraint and cost-effectiveness of each method, hydraulic splitter for site formation; and pre-casting & prefabrication technology and self-compacting concrete / rubber head vibratory poker for the installation of ancillary facilities / other plants associated with quarry operation could be considered and adopted as far as practicable. For the use of pulse plasma rock fragmentation and modular lightweight formwork, although these methods do not involve technical issues, these quieter construction methods will only be considered for mitigating the excessive construction noise (if any) due to the cost ineffectiveness, subject to the detailed design.

Adoption of Construction Noise Barriers / Enclosures*

- 4.1.3.5 Movable noise barriers that can be placed close to the construction equipment and moved along with the PME are effective for screening noise from NSRs. A typical design which has been used locally is a wooden framed barrier with a cantilevered upper portion of superficial density no less than 10kg/m² on a skid footing with internal sound absorptive lining. The length of the noise barrier should be at least five times greater than its height. This measure is particularly effective for low level zone of NSRs. A longer cantilevered top cover would be required to achieve screening benefits at upper floors of NSRs. The Contractor shall be responsible for the design and actual position of the movable noise barriers with due consideration given to the position and size of the PME, and the requirement of intercepting the line-of-sight from the NSRs to the PME, as well as ensuring that the barriers should have no opening and gap. It is anticipated that properly designed noise barriers would achieve a 5dB(A) reduction for mobile PME and a 10 dB(A) reduction for static PME. The use of full enclosure could also be considered to shelter the noise from relatively stationary plants (e.g. air compressor and generator). The minimum surface density of the enclosure panel should achieve 14kg/m² and lined with noise absorptive material internally. These enclosures could provide about 10 – 15 dB(A) noise reduction. The use of construction noise barriers / enclosures will be further reviewed in the detailed design and in the CNMP.
- 4.1.3.6 The Contractor(s) shall prepare and submit the CNMP prior to the commencement of construction works. The CNMP shall contain a quantitative construction noise impact assessment, the adopted quieter construction method and equipment, noise mitigation measures and the construction noise impact monitoring and audit programme with reference to the latest construction programme and plant inventory. The CNMP shall also include an implementation schedule listing the mitigation measures, as well as the responsible party, location, timing and environmental performance required for the implementation of the mitigation measures. The methodology for the quantitative construction noise assessment in the CNMP shall follow the procedures outlined in the GW-TM. If there is any change to the recommended noise mitigation measures or the plant inventory in the CNMP, an updated CNMP shall be submitted one month before the implementation of any such change. Any

¹⁴ <https://www.epd.gov.hk/epd/english/environmentinhk/noise/gpme/index.html>

¹⁵ Environmental Protection Department. Quieter Construction Methods.

https://www.epd.gov.hk/epd/misc/construction_noise/contents/index.php/en/home2/quieter-construction-methods.html

mitigation measures recommended and requirements specified in the CNMP / updated CNMP shall be fully implemented.

- 4.1.3.7 Same as the current practice of LTQ operation, guidelines stipulated in EPD's Recommended Pollution Control Clauses for Construction Contracts should also be incorporated in the future contract document to ensure proper implementation of noise mitigation measures and minimisation of the potential construction noise impact arising from the Project. In addition, appropriate requirements and recommendations on the practices for minimizing construction noise mentioned in ProPECC PN1/24 "Minimizing Noise from Construction Activities" shall also be included in the future contract document and shall be followed by the future Contractor.

4.1.4 Water Quality

- 4.1.4.1 The site practices outlined in ProPECC PN 2/23 "Construction Site Drainage" should be continually implemented during the construction phase in order to minimise surface runoff and the chance of erosion. The Water Quality Objectives (WQOs) and Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) stipulated under the WPCO should also be continually observed. The following measures should be continually implemented to ensure all construction runoff are well controlled, so as to minimise water quality impacts:

- Sand / silt removal facilities such as sand / silt traps and sediment basins should be provided to remove sand / silt particles from runoff and from rainwater pumped out from trenches to meet the TM-DSS under the WPCO. Earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities.
- All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- All vehicles and plants should be cleaned before leaving the construction site to ensure no earth, mud, debris and the like are deposited outside the construction works areas.
- Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms.
- Good site practices should be implemented to remove rubbish and litter from construction site. It is recommended to clean the construction site on a regular daily basis.

- 4.1.4.2 The practices outlined in ETWB TCW No. 5/2005 "*Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works*" should be continually adopted where applicable, including but not limited to the below measures to minimise the water quality impacts upon any natural streams or surface water systems:

- Stockpiling of construction materials and spoil, if any, should be properly covered and located away from any natural watercourse / river;
- Construction works close to the inland waters should be carried out in dry season as far as practicable where the flow in the surface channel or watercourse is low;
- Construction debris and spoil should be covered up and / or disposed of as soon as possible to avoid being washed into the nearby water receivers; and
- Removal of existing vegetation alongside the riverbanks should be avoided or minimised. When disturbance to vegetation is unavoidable, all disturbed areas should be hydroseeded or planted with suitable vegetation to blend in with the natural environment upon completion of works.

- 4.1.4.3 As same as the current LTQ operation, chemical spillage and potential contamination of groundwater and surface water could be minimised by observing and complying the Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation for control of chemical wastes. The Contractor is also recommended to develop management procedures for chemicals used and prepare an emergency spillage handling procedure to deal with chemical spillage in case of accidents

occur. Any service shop and maintenance facilities should be continually located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance and follow the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance.

- 4.1.4.4 As mentioned **Section 3.2.3.2**, adequate and sufficient portable chemical toilets will be provided, following the current practice, in the works areas to handle sewage from construction workforce and no discharge of sewage to the stormwater drains and inland water will be allowed. A licensed collector should be employed to clean and maintain the chemical toilets on a regular basis.
- 4.1.4.5 For minimising the potential water quality impact from groundwater and run-off from potentially contaminated area, no direct discharge of groundwater from contaminated areas, if any, should be adopted. Prior to any excavation works within the potentially contaminated areas at the existing LTQ site (if found to be), the baseline groundwater quality in these areas should be reviewed based on the relevant site investigation data and any additional groundwater quality measurements to be performed with reference to *Guidance Note for Contaminated Land Assessment and Remediation* and the review results should be submitted to EPD for examination. If the review results indicated that the groundwater to be generated from the excavation works would be contaminated, this contaminated groundwater should be either properly treated or properly recharged into the ground in compliance with the requirements of the TM-DSS. If wastewater treatment is to be deployed for treating the contaminated groundwater, the wastewater treatment unit shall deploy suitable treatment processes (e.g. oil interceptor / activated carbon) to reduce the pollution level to an acceptable standard and remove any prohibited substances (such as Total Petroleum Hydrocarbons) to an undetectable range. All treated effluent from the wastewater treatment plant shall meet the requirements as stated in TM-DSS and should be either discharged into the foul sewers or tankered away for proper disposal.
- 4.1.4.6 If deployment of wastewater treatment is not feasible for handling the contaminated groundwater, groundwater recharging wells should be installed as appropriate for recharging the contaminated groundwater back into the ground. The recharging wells should be selected at places where the groundwater quality will not be affected by the recharge operation as indicated in Section 2.3 of the TM-DSS. The baseline groundwater quality should be determined prior to the selection of the recharge wells, and submit a working plan to EPD for agreement. Pollution levels of groundwater to be recharged shall not be higher than pollutant levels of ambient groundwater at the recharge well. Groundwater monitoring wells should be installed near the recharge points to monitor the effectiveness of the recharge wells and to ensure that no likelihood of increase in groundwater level and transfer of pollutants beyond the site boundary. Prior to recharge, free products should be removed as necessary by installing the petrol interceptor. The Contractor should apply for a discharge licence under the WPCO through the Regional Office of EPD for groundwater recharge operation or discharge of treated groundwater.

4.1.5 Waste Management

Good Site Practices

- 4.1.5.1 A Waste Management Plan (WMP) would be prepared in accordance with *ETWB TC (Works) No. 19/2005 "Environmental Management on Construction Sites"* and submitted to Engineer for approval prior to the commencement of construction works. The following good waste management plan and practices will be implemented, following the current practice, to ensure proper handling and disposal of waste, and to minimise the quantity of waste and C&D materials generated:
- Train site personnel in site cleanliness, proper waste management and chemical handling procedures;
 - Provision of sufficient waste reception / disposal points, and regular collection of waste;
 - Adopt a regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;

- Segregate and store different types of wastes in labelled containers or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- Plan and stock construction materials carefully to minimise waste generation and avoid unnecessary waste generation;
- Adopt proper storage and site practices to minimise the potential for damage or contamination of construction materials;
- Provide workers training about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle;
- Maintain and clean waste storage areas routinely;
- Provide covers and, if necessary, water spraying system, to waste storage areas to prevent materials from wind-blown or being washed away;
- Cover the wastes while transferring to avoid wind-blown; and
- Designate different locations within the work area to stock each material to enhance reuse where applicable.

C&D Materials

- 4.1.5.2 All C&D materials generated will be sorted by the contractor into different categories for disposal at public fill reception facilities, landfills or recycling as appropriate. To minimise off-site disposal of inert C&D materials, the inert materials (other than excavated rock to be reused as production materials during the Project operation) with suitable characteristics / size should be reused on-site as fill material as far as practicable. The surplus inert C&D materials would be transported and delivered to PFRFs for beneficial reuse as filling material by other projects. Prior to disposal of non-inert C&D materials, wood, steel and other metals should also be separated for reuse and / or recycle where practicable so as to minimise the quantity of waste to be disposed of at landfill. Disposal of C&D materials should be managed in accordance with the Development Bureau *Technical Circular (Works) DEVB TC(W) No. 6/2010 "Trip Ticket System for Disposal of Construction & Demolition Materials"*. GPS tracking should be considered as an additional measure to prevent fly-tipping during transportation to waste disposal facility.

Chemical Waste

- 4.1.5.3 As same as the current LTQ operation, chemical waste will also be produced on the construction site, the Contractor would still be required to register with the EPD as a Chemical Waste Producer and must follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Following the current practice, good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. The future Contractor should also employ a licensed collector to transport and dispose of the chemical wastes at a licensed chemical waste treatment and disposal facility such as CWTC at Tsing Yi in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.

General Refuse

- 4.1.5.4 General refuse will be continually stored in enclosed bins or compaction units, separated from C&D materials and chemical wastes. A reputable waste collector will also be employed by the contractor to collect and dispose of general refuse, which will be separated from C&D materials and chemical wastes, on a daily or every second day basis to minimise odour, pest and litter impacts.
- 4.1.5.5 **Table 4.1** provides a summary of the various types of waste likely to be generated during the construction of the Project, together with the recommended handling and disposal outlets, following the current practice of LTQ.

Table 4.1 Summary of Waste Handling Procedures and Disposal Outlets during Construction Phase

Waste Type	Handling	Disposal Outlet
<i>Construction Phase</i>		
Inert C&D Materials ⁽¹⁾	<ul style="list-style-type: none"> Segregation from non-inert C&D materials Reuse on-site as far as practicable 	<ul style="list-style-type: none"> Tuen Mun Area 38 Fill Bank for beneficial reuse in other projects
Non-inert C&D Materials	<ul style="list-style-type: none"> Segregation from inert C&D materials Reusable materials should be separated and recycled as far as practicable 	<ul style="list-style-type: none"> Y-Park (if possible) ⁽²⁾ West East New Territories (WENT) Landfill
Chemical Waste	<ul style="list-style-type: none"> Unused chemicals would be collected for recycling by licensed collectors. Store on-site within suitably designed containers 	<ul style="list-style-type: none"> CWTC
General Refuse	<ul style="list-style-type: none"> Provide on-site refuse collection facilities. Provide on-site clearly labelled recycling bins for segregation of recyclable waste and employ reliable waste recycling agents for collection 	<ul style="list-style-type: none"> WENT Landfill

Notes:

- (1) Rock excavated from the construction of portals and short portions (i.e. less than 10m) of main tunnel access and minor slope stabilisation works, which will be stockpiled on-site and reused as production materials during the operational phase.
- (2) No vegetation removal is required under the existing LTQ operation, and this is the additional disposal outlet proposed for the Project. Vegetations removed from the rock slope berm will be delivered to Y-Park for recycling in order to minimise the amount of waste for landfill and convert the yard waste into different useful materials and products.

4.1.6 Hazard to Life

- 4.1.6.1 As no blasting operation will be conducted during the construction phase of the Project, no hazard to life impact is anticipated. Hence, no mitigation measure is required.

4.1.7 EcologyAvoidance

- *Avoidance of Aboveground Encroachment on Recognised Site of Conservation Importance*

- 4.1.7.1 Recognised sites of conservation importance within the Project boundary include TLCP and CA. The boundary of aboveground works area is designed to avoid encroachment on these recognised sites of conservation importance. No direct impact on the aboveground habitats of the recognised sites of conservation importance is anticipated.

- *Avoidance of Natural Habitat Loss*

- 4.1.7.2 The current Project design greatly follows the footprint of the existing LTQ. The proposed design and layout are carefully defined within the habitats of developed area / wasteland. Loss of natural habitats such as mixed woodland, shrubland and watercourse habitat is fully avoided.

Minimisation

- 4.1.7.3 To minimise loss of the habitats and impact to the associated wildlife in the vicinity of the Project site, the following mitigation measure shall be implemented.

- *Construction Runoff Control*

- 4.1.7.4 All mitigation measures for construction runoff control as detailed in **Section 4.1.4** will be implemented throughout the construction phase, following current practice, to minimise the water quality impacts from the Project.

- *Reducing Glare / Light Pollution*

4.1.7.5 The overall reduction of glare during the construction phase of the Project shall be considered. Following current practice, a balance between lighting for safety and avoiding excessive lighting can be achieved through the use of directional lighting to avoid light spill into sensitive areas and control the timing of lighting periods of some facilities which will be located at the area near TLCP and CA. Moreover, the construction lighting will also be of minimum necessary brightness which will be designed and positioned away from the natural habitats of TLCP to avoid potential glare impact. Hence, potential indirect impact on the aboveground habitats of the sites of conservation importance and associated wildlife (e.g. herpetofauna and mammal species) could be minimised.

- *Minimisation of Impacts from Disturbance*

4.1.7.6 Mitigation measures should be implemented to minimise the impacts from disturbance (e.g. noise, glare and dust) to the surrounding habitats and their associated wildlife arising from the Project, including but not limited to the followings:

- Dust suppression measures (refer to **Section 4.1.2** for details) to avoid and minimise emission and dispersal dust, which would cover vegetation and potentially discourage usage of nearby wildlife;
- Noise mitigation measures (refer to **Section 4.1.3** for details) to minimise the noise impact from the Project.

Good Site Practices

4.1.7.7 Good site practices should be continually followed to avoid adverse impacts arising from the project. Recommendations for good site practices include:

- Confining the works within the site boundary;
- Storage of equipment or stockpile in the existing urbanized area within the site boundary of the Project to minimise disturbance to vegetated areas;
- Nomination of approved personnel, such as a site manager, to be responsible for implementation of good site practices, arrangements for waste collection and effective disposal to an appropriate facility;
- Training of site personnel in site cleanliness, concepts of waste reduction, reuse and recycling, proper waste management and chemical waste handling procedures;
- Provision of sufficient waste reception / disposal points, and regular collection of waste;
- Adoption of appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- Provision of regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- Adoption of a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites); and
- Preparation of Waste Management Plan (WMP), as part of the Environmental Management Plan (EMP).

4.1.7.8 With the implementation of appropriate mitigation measures, no adverse residual ecological impact is anticipated from the construction phase of the Project.

4.1.8 Cultural Heritage

Built Heritage

4.1.8.1 No impact on the identified items is anticipated during the construction phase. Therefore, no mitigation measure is required.

Archaeology

4.1.8.2 No archaeological impact is anticipated and thus, no mitigation measure is required during the construction phase. As a precautionary measure, AMO should be informed immediately in case of the discovery of antiquities or supposed antiquities in the course of works, so that

appropriate mitigation measures, if needed, can be timely formulated and implemented in agreement with AMO.

4.2 Operational Phase

4.2.1.1 Major elements of the Project operation are underground quarrying activities (i.e. rock extraction from the formation of MATs and production cavern by D&B) and the aboveground ancillary operation, which are similar to the existing LTQ operation in terms of nature. The good site practices and control measures currently adopted under the LTQ operation will be continually deployed during the operational phase of the Project. Besides, some additional measures were recommended in below sections (as specified / with an asterisk for indication) to further minimise the environmental impacts from the Project operation.

4.2.2 Air Quality

4.2.2.1 Dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation, good site practices, guidelines stipulated in EPD's Recommended Pollution Control Clauses for Construction Contracts and measures for NRMMS emissions described in **Section 4.1.2** should also be carried out throughout the operational phase of the Project to further minimise the air quality impact. The emission control measures as stipulated in the EPD Guidance Notes on Best Practicable Means (BPM) for Cement Works (Concrete Batch Plant), Mineral Works (Stone crushing Works), Tar and Bitumen Works (Asphaltic Concrete) should also be implemented. Besides, proper designs, e.g. equipping concrete batching plants with dust tight silo & fabric dust collector at 99% dust removal efficiency and fully enclose and regular watering the conveyors belts, following current practice, should be adopted during the operational phase of the Project.

4.2.2.2 Differ from the surface blasting conducted under the current LTQ operation, underground blasting will be carried out under the Project. Blasting door and water sprayers should be provided to control the likely particulate emission from the underground quarry operations. Ventilation with exhaust at portal should also be provided in the cavern. A dust collector with dust removal efficiency of at least 80% should be installed at the ventilation exhaust.

4.2.2.3 Other control measures (e.g. water sprinklers, baghouses, selective catalytic reduction for diesel fuel burners, use of ultra-low-sulphur diesel etc.), following current practice, should also be incorporated in the design of ancillary operations to further minimise the air quality impact.

4.2.2.4 With the implementation of mitigation measures as described above, as well as more advanced technologies discussed in **Section 3.3.1.9** and comprehensive emissions monitoring, air quality impacts from the operational phase of the Project could be well controlled.

4.2.3 Noise

Quarry Noise (Excluding Fixed Noise Sources)

4.2.3.1 As detailed in **Section 3.3.2.1**, the holes drilling activities before blasting and the quarrying activities after blasting and prior to primary rock crusher are construction activities. Although no adverse noise impact from the quarrying activities will be anticipated due to the large separation between the works area and the NSRs, good site practices as stipulated in **Section 4.1.3.2** should be continually adopted as far as practicable to further minimise the associated potential noise nuisance.

Fixed Noise Sources

4.2.3.2 In view of the large distance separation with a range from ~187m to ~284m between the NSRs and nearest proposed fixed noise source (according to the latest site layout presented in **Figure 3.2**), no adverse fixed noise sources impact would be expected during the operational phase. Nonetheless, in order to minimise the potential noise nuisance to nearby NSRs due to the operation of the Project, the following noise reduction measures, which are

confirmed to be practical by the Project Engineer, are recommended to be considered during the detailed design and procurement stages:

- Selection of quieter plant*;
- Provision of silencer, enclosure, acoustic louvres or acoustic doors*;
- Locating fixed plants / louvres away from any NSRs*;
- Avoiding unloading of rubbles or aggregates in the cold feed system to minimise any noise impact generation from metal surface during the asphalt production process in night-time; and
- Development and implementation a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain controlled level of noise. The programme should be implemented by properly trained personnel.

Noise Management Plan*

- 4.2.3.3 The Contractor(s) shall prepare and submit a Noise Management Plan (NMP), including Quarry Noise Management Plan (Excluding Fixed Noise Sources) and Fixed Noise Sources Management Plan, before the commencement of implementation of the Project.
- 4.2.3.4 Considering the holes drilling activities before blasting and the quarrying activities after blasting and prior to primary rock crusher are construction activities, the Quarry Noise Management (Excluding Fixed Noise Sources) Plan should also include the relevant contents in CNMP as detailed in **Section 4.1.3.6**.
- 4.2.3.5 For the Fixed Noise Sources Management Plan (FNMP) shall contain a quantitative fixed noise impact assessment, an identified fixed plant inventories, a layout plan showing the locations of all fixed noise sources and associated noise mitigation measures. The methodology for the quantitative fixed noise sources assessment in the FNMP shall followed the procedures outlined in the IND-TM. The FNMP will also include an implementation schedule clearly listing the mitigation measures to be implemented, as well as the responsible party, location, timing and environmental performance required the implementation of the mitigation measures. A fixed noise sources commissioning test plan should also be provided in the FNMP if necessary. If there is any change to the specification of the planned fixed plant, layout design, operation modes, mitigation measures or any other factors that could have adverse implications on the fixed noise sources impact as concluded in the FNMP, an updated FNMP or the NMP shall be submitted one month before the implementation of any such change.
- 4.2.3.6 Any mitigation measures recommended and requirements specified in the NMP / updated NMP shall be fully implemented by the Contractor.

Road Traffic Noise*

- 4.2.3.7 As mentioned in **Section 3.3.2.19**, the traffic flow induced from the future Project operation will be similar to that of the existing LTQ operation, a similar road traffic noise impact on the NSRs adjacent to the operation traffic routings is hence anticipated. The change in road traffic noise impact from the operation of the Project would be insignificant, and thus, no mitigation measures are required. However, in a bid to minimise the potential road traffic noise nuisance on the NSRs which are located in the vicinity of the operation traffic routes, setting up additional administrative measures for drivers should be considered and implemented by the future quarry operator where appropriate.
- 4.2.3.8 The future quarry operator is required to set up administrative measures and management techniques to avoid mal-practice of diesel-powered truck drivers. An induction training should be provided to the drivers by the future quarry operator where appropriate to remind the drivers to avoid mal-practice when passing by the noise sensitive roads (e.g. slip road heading to Fuk Hang Tsuen Path, Fuk Hang Tsuen Path, Fuk Hang Tsuen Road, Tat Fuk Road, Wong Kong Wai Road and Shun Tat Street). Some mal-practices including hard pedalling and abrupt acceleration or deceleration can generate excessive traffic noise. This could happen when vehicle is towing under heavy load. In addition, the future operator will also be required to ensure the truck engine and exhaust system of heavy vehicles (e.g. concrete truck, asphalt truck, truck over 38 tonnes, etc.) are well-maintained with regular

checking and inspection. Other administrative measures such as setting up big signage with clear signal of “No Hard Pedalling! No Abrupt Acceleration or Deceleration!” at the site entrance and along the slip road to Fuk Hang Tsuen Path should also be implemented.

4.2.4 Water Quality

4.2.4.1 Provided that all the aboveground quarry operation associated with the Project will be situated at the existing LTQ site, no additional paved area will be proposed under this Project. Hence, no adverse water quality impact from non-point source surface run-off of the Project would be expected. Nonetheless, BMPs listed below for stormwater discharge should be adopted, following current practice, to reduce stormwater pollution arising from the quarry operation:

Design Measures

- Exposed surface shall be avoided within the aboveground works area to minimise soil erosion. The aboveground works area shall be either hard paved or covered by plantation where appropriate.
- The drainage system within the aboveground works area should be designed to cater for the runoff from 50-year-return-period rainstorm.

Devices / Facilities to Control Pollution

- Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system.
- Road gullies with standard design and silt traps and oil interceptors should be incorporated during the detailed design to remove particles present in stormwater runoff.

Administrative Measures

- Good management measures such as regular cleaning and sweeping of road surface / open areas are suggested. The road surface / open area cleaning should also be carried out prior to occurrence of rainstorm.
- Manholes, as well as storm water gullies, ditches provided among the development areas should be regularly inspected and cleaned (e.g. monthly). Additional inspection and cleansing should be carried out before forecasting heavy rainfall.

4.2.4.2 As presented in **Figure 2.4**, WGGs are located at the uphill area at the southern part of the Project boundary. Although there will be no adverse water quality impact from the Project due to the geological condition, as an additional measure, all site practices outlined in WSD’s Conditions of Working within Water Gathering Ground should be strictly followed during the underground works in order to protect the water quality of the water gathering grounds.

4.2.4.3 As mentioned **Section 3.3.3.3**, following the current practice of LTQ, all sewage generated from the operation workforce would be collected by proposed chemical toilets and holding tanks, and then collected by a registered waste collector with a WPCO licence for transportation to existing sewage treatment works, ideally Pillar Point Sewage Treatment Works for off-site treatment.

4.2.4.4 Following the current practice, wastewater from quarrying operation will be settled out through the sedimentation tank before being discharged to drainage system. Discharge licence under WPCO shall be obtained from EPD before commencing any discharges during the operational phase. The discharge quality must meet the requirements specified in the discharge licence. All the wastewater generated from the quarrying operation will be continually treated so that it satisfies all the standards listed in the TM-DSS. On site recycling of the treated effluent can minimise water consumption and reduce the effluent discharge volume.

4.2.4.5 To avoid accidental spillage of chemicals from entering the storm drain in case of accidental spillage, following current practice, chemicals will be stored on-site at bunded area and separate drainage system as appropriate should be provided to avoid any spilled chemicals

from entering the storm drain in case of accidental spillage. In addition, adequate tools for cleanup of spilled chemicals, provision of appropriate training, and in compliance with the Waste Disposal Ordinance in chemical waste disposal are the measures to minimise chemical spillages and contamination to groundwater and surface water.

4.2.5 Waste Management

- 4.2.5.1 The operation and maintenance practices would be similar to that of the existing LTQ. The operational waste including solid waste (i.e. dried cements and dust paste from concrete batching and asphalt production), and general refuse from workforce, would be respectively stored in the designated stockpile area and enclosed bins or compaction units and transported to the designated outlets for disposal as soon as possible following good waste management practices for the handling of C&D materials generated during the construction phase as detailed in **Sections 4.1.5.1 to 4.1.5.2**.
- 4.2.5.2 Plant / equipment maintenance schedules should be planned in order to minimise the generation of chemical waste, following the current practice of LTQ. Any unused chemicals or those with remaining functional capacity should be reused as far as practicable. All chemical wastes from the operation of the Project should be 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*. The Contractor should be required to register with EPD as a Chemical Waste Producer and to follow the guidelines stated in the *Code of Practice on the Packaging Labelling and Storage of Chemical Wastes*.
- 4.2.5.3 Waste reduction measures including avoidance of waste generation, maximise recovery and recycling should be followed during the operational phase. To promote the recycling of wastes such as used paper, aluminium cans and plastic bottles, it is recommended that recycling bins should be clearly labelled and placed at locations with easy access.
- 4.2.5.4 **Table 4.2** provides a summary of the various types of waste likely to be generated from the operation of the Project, together with the recommended handling and disposal outlets following the current practices of LTQ.

Table 4.2 Summary of Waste Handling Procedures and Disposal Outlets during Operational Phase

Waste Type	Handling	Disposal Outlet
<i>Operational Phase</i>		
Operational Waste	<ul style="list-style-type: none"> Segregation from non-inert operational waste Reusable materials (if any) should be separated and recycled as far as practicable 	<ul style="list-style-type: none"> Tuen Mun Area 38 Fill Bank for beneficial reuse in other projects WENT Landfill (as necessary)
Chemical Waste	<ul style="list-style-type: none"> Store in compatible containers in designated area on site for off-site disposal by licensed collectors 	<ul style="list-style-type: none"> CWTC
General Refuse	<ul style="list-style-type: none"> Provide on-site clearly labelled recycling bins for segregation of recyclable waste 	<ul style="list-style-type: none"> WENT Landfill

4.2.6 Hazard to Life

- 4.2.6.1 Although the review result revealed that both individual risk and societal risk from the on-site transport and use of explosives during the operational phase of the Project are within the acceptable limit (detailed in **Section 3.3.5**), following best practices specific to the use of explosives during the Project operations are recommended to be continually adopted to further minimise the hazard to life impact associated with the blasting operation:
- Blast Charge Weight should be within the maximum MIC as specified for the given blast face;
 - Temporary mitigation measures such as blast doors or heavy duty blast curtains should be installed at the portals and at suitable locations underground to prevent flyrock and control the air overpressure;
 - It is not intended to carry out a complete evacuation of the quarry site, secure refuge areas should be identified to workers within the site;

- Shotfirer to be provided with a lightning detector, and appropriate control measures should be in place;
- Speed limit for the diesel vehicle truck and bulk emulsion truck in the access tunnel and cavern should be imposed. The truck may be escorted while underground to ensure route is clear from hazards and obstructions; and
- Hot works should be suspended during the passage of the diesel vehicle truck and bulk emulsion truck in the access tunnel and cavern.

4.2.6.2 Besides, the project proponents of the Project, Route 11 and TMB shall continue the close and on-going liaison to optimise the construction interface between the three projects to further reduce the cumulative risk impacts. A HMP has been formulated and agreed by the three projects. The measures stipulated in the HMP included but not limited to the following:

- Each blasting team shall coordinate with one another to effectively communicate about blasting activities and any necessary evacuation requirements and any postponement of the blast due to unforeseen circumstances;
- Conduct blasting vibration monitoring within blasting influence zone and concentrated at the nearest structures and any particularly sensitive receivers that have low allowable vibration levels;
- Provide adequate drills or trainings for all staff and workers of the three projects to ensure all the workforce can evacuate efficiently during any risk events;
- All personnel from Route 11, TMB and LTUQ sites within the evacuation distance as agreed with Mines Division from the tunnel firing point of Route 11 / TMB / LTUQ shall be evacuated before blasting;
- During the operational phases of Route 11 and TMB, trial blast(s) shall be carried out by LTUQ operator to ensure no adverse impact on the operation of Route 11 and TMB before handover to the future operational department, and conduct appropriate vibration monitoring on the nearest permanent structures of Route 11 and TMB within the blasting influence zone;
- All site personnel and visitors shall attend an induction training conducted by the safety team upon their initial arrival, which includes hazard identification of interface projects and the evacuation plan; and
- The emergency contact list shall be shared to ensure effective communication and coordination amongst the three projects.

4.2.7 Ecology

4.2.7.1 As discussed in **Section 3.3.6**, potential ecological impacts from the Project during the operational phase are considered to be of low significance. Mitigation measures for minimisation of impacts from construction runoff (**Section 4.1.7.4** refers), glare / light pollution (**Section 4.1.7.5** refers), disturbance (**Section 4.1.7.6** refers) and good site practices (**Section 4.1.7.7** refers) to be adopted during the construction phase will also be implemented during the operational phase. Besides, considering that the formation of MATs and production cavern is from the proposed addition of the Project, additional measures for minimisation of groundwater infiltration should be implemented during the operational phase to further minimise the potential impact.

Minimisation of Groundwater Infiltration*

4.2.7.2 To minimise groundwater infiltration and change in groundwater levels arising from formation of cavern and tunnels, appropriate measures should be implemented at the time of cavern and tunnels construction during the operational phase. The groundwater control strategies include:

- Probing Ahead: As a general practice, the Contractor will undertake rigorous probing of the ground ahead of excavation works to identify zones of significant water inflow. The probe drilling results will be evaluated to determine specific grouting requirements in line with the tunnel advance. In such zones of significant water inflow that could occur as a result of discrete, permeable features, the intent would be to reduce overall inflow by means of cut-off grouting executed ahead of the tunnel advance.

- Pre-grouting: Where water inflow quantities are excessive, pre-grouting will be required to reduce the water inflow into the tunnel. The pre-grouting will be achieved via a systematic and carefully specified protocol of grouting. In principle, the grout pre-treatment means drilling grout holes around the tunnel perimeter ahead of excavation and injecting grouting material into the holes to seal up rock fissures.
- The installation of waterproof lining would also be adopted after the formation of the tunnels.
- In the event of excessive infiltration, post grouting will be undertaken. Whilst unlikely to be required in significant measure, such a contingency should be allowed for reduction in permeability of the tunnel surround (by grouting) to limit inflow to acceptable levels.

4.2.7.3 In case seepage of groundwater occurs, groundwater should be pumped out from works areas and discharged to the drainage system via silt trap. Uncontaminated groundwater from dewatering process should also be discharged to the storm system via silt removal facilities. The practical groundwater control measures stated above are proven technologies and have been extensively applied in other past projects. These measures or other similar methods, as approved by the Supervising Officer to suit the works condition, should be applied to minimise the groundwater infiltration.

4.2.7.4 With the implementation of appropriate mitigation measures, no adverse residual ecological impact is anticipated from the operational phase of the Project.

4.2.8 **Landscape and Visual**

4.2.8.1 Aesthetically pleasing design will be continually adopted and an additional measure, i.e. compensatory planting, is proposed to enhance the environmental performance of the Project operation (**Table 4.3** and **Figure 4.8.1** refer).

Table 4.3 Landscape and Visual Mitigation Measures during Operational Phase

ID	Landscape and Visual Mitigation Measures
<i>Operational Phase</i>	
OM1	<u>Aesthetically Pleasing Design</u> Aesthetically pleasing design as regard to the form and species of the compensatory plantings should be incorporated to the slope near the portals so as to blend in the structures to the adjacent landscape and visual context.
OM2	<u>Compensatory Planting</u> Preservation for compensation of vegetation. Whip trees, woodland shrubs, and climber mix at a spacing from 500mm to 2500mm will be compensated. The compensatory planting will follow the guidelines of DEVB on tree preservation / compensatory planting.

4.2.8.2 The proposed mitigation measures listed above should be adopted during the detailed design stage and should be built as part of the construction works so that they are in place before decommissioning of the Project. However, it should be noted that the full effect of the soft landscape mitigation measures would not be appreciated for several years.

4.2.8.3 Three photomontages are illustrated to demonstrate the effectiveness of the proposed mitigation measures. Photomontages at representative locations showing the comparison between existing conditions, and the proposed development with and without mitigation measures at the operational phase were prepared and presented from **Figures 4.8.2 to 4.8.4**. The proposed development will be only visible in VP2. Considering that whip trees, woodland shrubs and climber mix will be planted near the portals under OM2, the potential visual impacts of the proposed development can be alleviated. Viewpoint locations of the photomontages are shown in **Figure 2.8.6**.

4.2.8.4 With the continuous implementation of the visual mitigation measure OM1, the planting design will add aesthetic value to the Site. Thus, the residual visual impact would be reduced from slight to insubstantial during the operational phase of the Project.

4.2.8.5 With the implementation of the landscape mitigation measure OM2, the compensatory plantings will add ecological value to the Site. Thus, the residual landscape impact would be reduced from slight to insubstantial during the operational phase of the Project.

4.2.9 Cultural Heritage

Built Heritage

- 4.2.9.1 Given that all identified items are located more than 50m from the nearest proposed tunnel and cavern extent, no direct and indirect impact is anticipated. Therefore, no mitigation measure is required during the operation phase.

Archaeology

- 4.2.9.2 No archaeological impact is anticipated during the operational phase. Thus, no mitigation measure is required.

4.3 Environmental Monitoring and Audit

- 4.3.1.1 With the implementation of recommended mitigation measures that are currently adopted in other similar projects, no adverse environmental impacts would be anticipated during both construction and operation phases of the Project. Nonetheless, in view of the material changes from the Project to the exempted project and to enhance to environmental performance in terms of air quality and noise during the construction and operation phases of the Project, Environmental Monitoring and Audit (EM&A) are recommended as below.

- 4.3.1.2 An Environmental Team (ET) should be established before the commencement of construction of the Project. The ET should be led and managed by an ET Leader (ETL) or its representative. The ETL should possess at least 7 years of experience in EM&A and/or environmental management. The ET should monitor all of the mitigation measures as detailed in **Sections 4.1** and **4.2** are properly implemented and maintained by the Contractor by weekly site inspection / audits to ensure the compliance with the intended aims of the measures. An Independent Environmental Checker (IEC) or its representative should also be employed before commencement of construction of the Project. The IEC should advise the Permit Holder on environmental issues related to the Project. The IEC should possess at least 7 years of experience in EM&A and/or environmental management. The IEC should not be in any way an associated body of the ET and the Contractor of the Project. Both ETL and IEC will only be for the EM&A phase.

Air Quality

- 4.3.1.3 Real-time dust monitoring of RSP and FSP should be conducted at representative air quality impact locations throughout the construction phase and at the first year of the operational phase so as to check compliance with the legislative requirements. Further monitoring on RSP and FSP during the operational phase may be necessary depending on the monitoring result of the first year and whether there is future change to the operation conditions and to be agreed with EPD.
- 4.3.1.4 Monitoring of bitumen fume, odour and heavy metals should be conducted at representative air quality impact locations upon commissioning and during the first three years of the operational phase to determine whether these emissions can meet the respective requirements.
- 4.3.1.5 The representative air quality impact monitoring locations will be recommended in Air Pollution Control Plan, and agreed with EPD. Any air monitoring relocation proposal shall be certified by the ETL and verified by the IEC. The types of emissions other than those mentioned in **Sections 4.3.1.3** to **4.3.1.4** to be monitored, will be also determined in Air Pollution Control Plan, and as agreed with EPD.

Noise

- 4.3.1.6 As detailed in **Sections 4.1.3.6** and **4.2.3.3**, CNMP for construction phase and NMP for operational phase should be prepared to evaluate the potential construction and operational noise impacts and to assess the effectiveness of the proposed noise mitigation measures. An EM&A programme, if necessary, would be included in CNMP and NMP.

4.3.2 Any Further Implications

- 4.3.2.1 The operation of the proposed Project, including underground quarrying activities and aboveground ancillary operations, will follow the contract requirements from the Project Proponent in accordance with relevant ordinances, regulations and standards. Further implications are not anticipated.

5 HEALTH IMPACT FROM RADON

- 5.1.1.1 Radon emission from granitic rock is a concern during the construction of the MATs and production caverns. When either the gas or these particles are inhaled, some will be deposited in the lung and will continue to emit radiation. As radon further decays, a series of tiny radioactive particles (Rn progeny) are formed. This will pose potential health hazard for personnel who works inside cavern.
- 5.1.1.2 The Occupational Safety and Health Ordinance (Cap 509) and the Factories and Industrial Undertakings Ordinance (Cap 59) provide the statutory authority for controlling the occupational health risks of Rn and Rn progeny exposure to workers. Relevant provisions of the said Ordinances and their subsidiary legislation especially the requirements on provision of ventilation at workplace shall be fully observed. Guidance Notes on Ventilation and Maintenance of Ventilation Systems, published by the Labour Department, should also be followed.
- 5.1.1.3 Proper ventilation system would be utilized and maintained inside the cavern during formation of MATs and production caverns, the risk posed to workers from Rn and Rn progeny exposure is insignificant.

6 USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1 History of Approved EIA Report with Similar Nature

6.1.1.1 A review has been made to the previously approved Environmental Impact Assessment Reports (EIA Reports) under EIAO which were prepared for the projects similar in nature to this Project. Descriptions of the relevant EIA Reports are summarised **Table 6.1** below.

Table 6.1 Summary of Previously Approved EIA Reports Prepared for the Projects with Similar Nature

Register No.	Project Title	Description of Works	Relevance to this Project	Reference Section in this PP
AEIAR-232/2021 (Approved without conditions on 16 November 2021)	Relocation of Diamond Hill Fresh Water and Salt Water Service Reservoirs to Caverns	It aims to relocate the existing Diamond Hill Fresh Water and Salt Water Service Reservoirs (DHSRs) into caverns for releasing the existing DHSRs site for housing and/or other compatible and beneficial uses. It is of similar nature to the Project in terms of cavern construction. The study concluded that the project would comply with the requirements of the EIAO and EIAO-TM with the implementation of the proposed mitigation measures.	Its findings and recommended mitigation measures in relation to construction dust, noise, water, ecology are valid and relevant for consideration of cumulative impacts with this PP.	S.4.1.2, S.4.1.3, S.4.1.4, S.4.1.7, S.4.2.7.2
AEIAR-202/2016 (Approved with condition on 28 November 2016)	Sha Tin Cavern Sewage Treatment Works	It covers the demolition (and associated relocation) of the existing Sha Tin Sewage Treatment Work. It is of similar nature to the Project in terms of cavern construction. The study concluded that the project would comply with the requirements of the EIAO and EIAO-TM with the implementation of the proposed mitigation measures.	Its findings and recommended mitigation measures in relation to construction dust, noise, water and ecology are valid and relevant for consideration of cumulative impacts with this PP.	S.4.1.2, S.4.1.3, S.4.1.4, S.4.1.7, S.4.2.7.2
AEIAR-194/2016 (Approved without condition on 15 March 2016)	Development of Anderson Road Quarry site – Rock Cavern Developments	It involves the construction of a cavern for the quarry exhibition centre at the northern rock slope of the Anderson Road Quarry (ARQ) development. It is of similar nature to the Project in terms of cavern construction. The study concluded that the project would comply with the requirements of the EIAO and EIAO-TM with the implementation of the proposed mitigation measures.	Its findings and recommended mitigation measures in relation to construction dust, noise and water are valid and relevant for consideration of cumulative impacts with this PP.	S.4.1.2, S.4.1.3, S.4.1.4, S.4.2.7.2

6.2 Other Relevant Approved EIA Reports

6.2.1.1 Reference had also been made to the approved EIA reports of Route 11 (Registered No.: AEIAR-255/2023) and TMB (Registered No.: AEIAR-256/2023) with their ecological survey areas overlapping / covering the Project site. As mentioned in **Section 3** above, any ecological impact and cumulative environmental impact were considered in the aforesaid two approved EIA reports which find insignificant impact / environmentally acceptable.

7 CONCLUSION

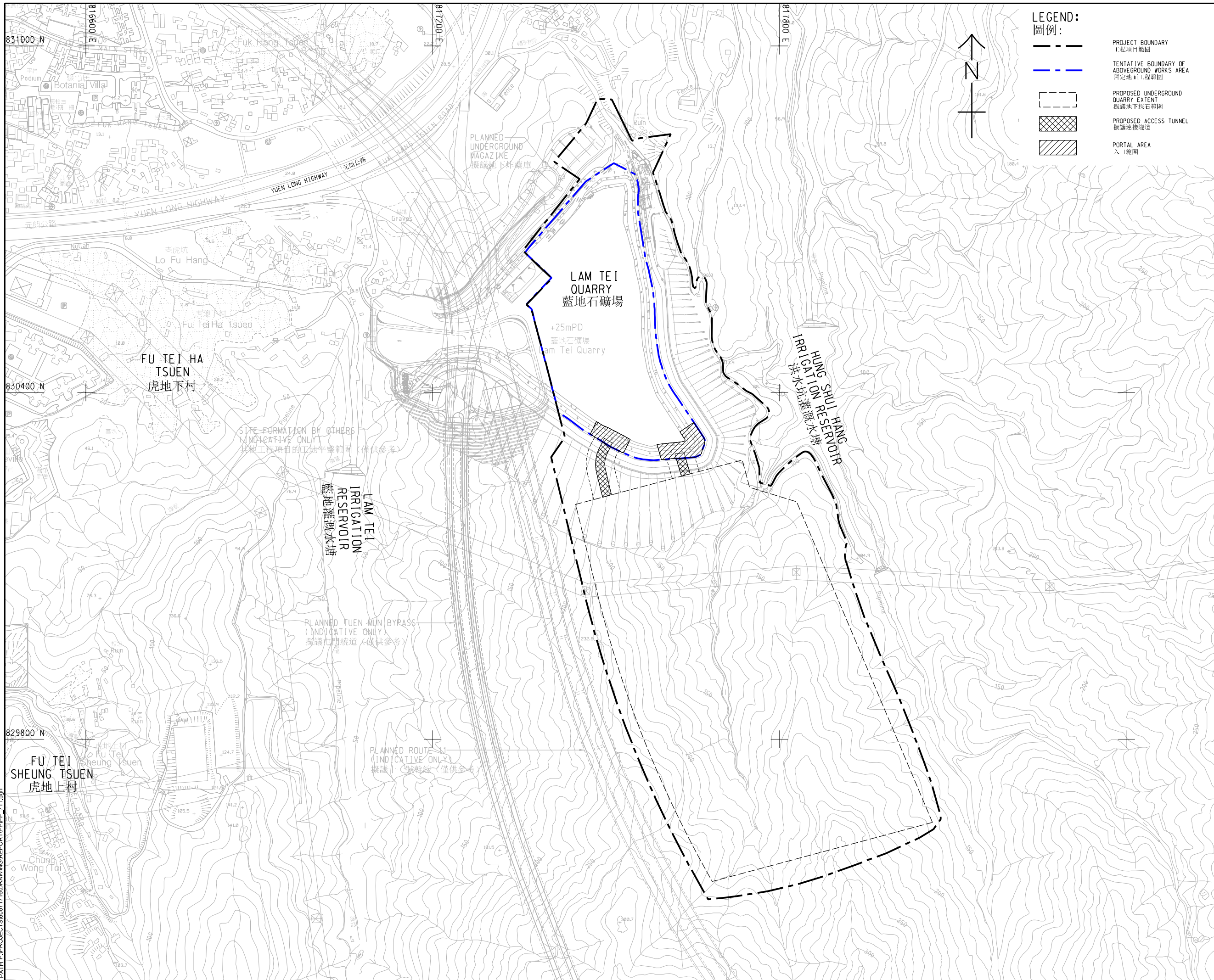
- 7.1.1.1 The proposed underground quarry-cum-cavern development to extend the quarrying activities is considered to constitute material changes to the exempted designated project, i.e. Lam Tei Quarry, under the EIAO. Hence, this Project Profile is prepared to seek permission from the Director of Environmental Protection under Section 5(10) of the EIAO to apply directly for an Environmental Permit.
- 7.1.1.2 The predicted environmental impacts from the Project are unlikely to be adverse with the implementation of the currently adopted measures and additional measures for enhancement as described in this Project Profile. Relevant requirements in the EIAO-TM are considered to have been met.

FIGURES
附圖

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ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:
 Plot File by: Feng S
 31/03/2024
 PATH: P:\PROJECTS\606717\DRAWING\REPORT\PPPP-71.dgn



LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議連接隧道
- PORTAL AREA
入口範圍



PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

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SUB-CONSULTANTS
分包/附屬公司

ISSUE/REVISION
修訂

IR	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE
比例
A3 1 : 6000

DIMENSION UNIT
量度單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

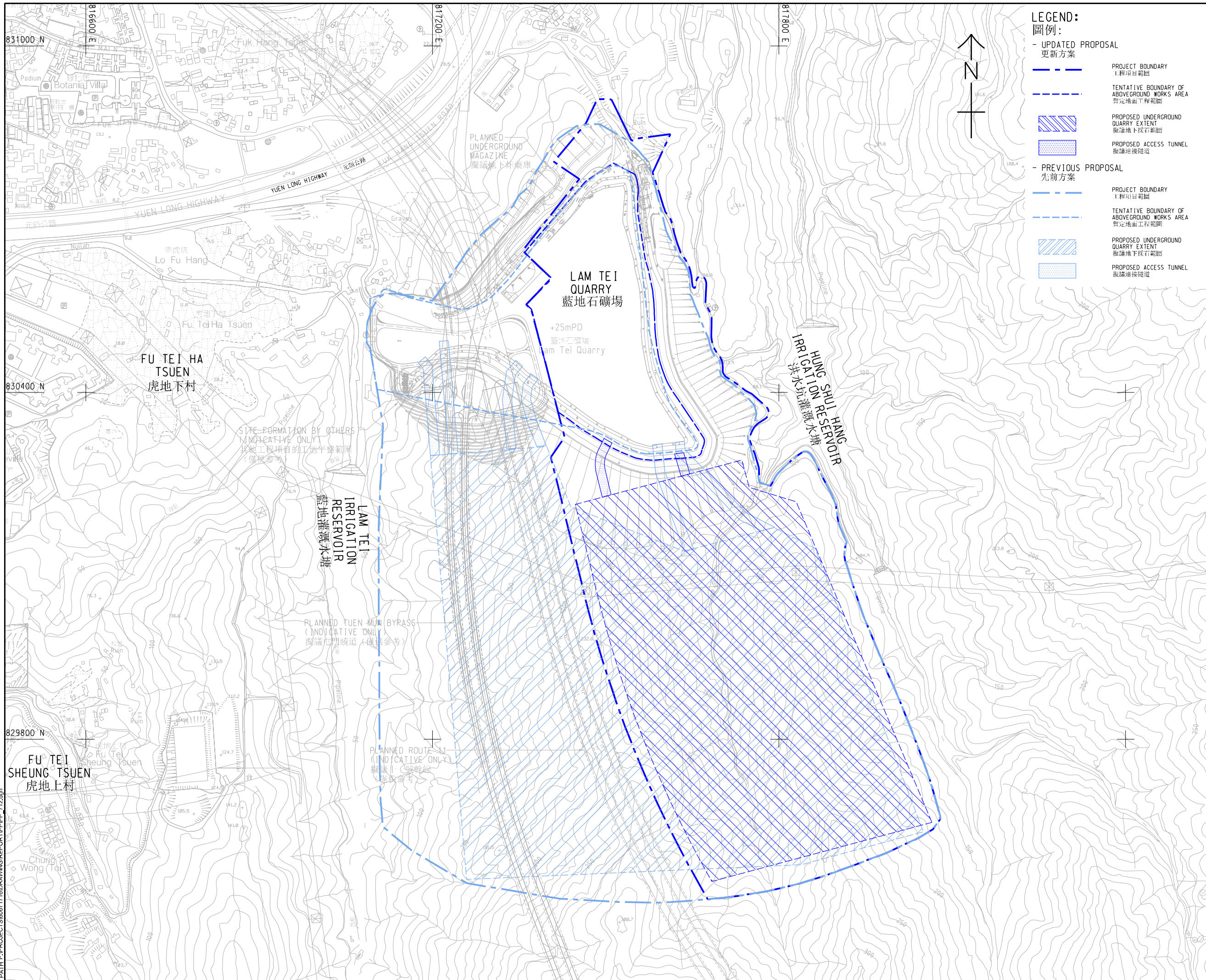
SHEET TITLE
圖號/圖名

PROJECT LOCATION AND LAYOUT PLAN
項目位置及平面圖

SHEET NUMBER
圖號/圖號
60671716/PP/FIGURE 1.1
60671716/PP/圖 1.1

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 4/19/2021



LEGEND:
 圖例:

- UPDATED PROPOSAL
 更新方案

- PREVIOUS PROPOSAL
 先前方案

PROJECT BOUNDARY
 工程項目範圍

TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
 暫定地面工程範圍

PROPOSED UNDERGROUND QUARRY EXTENT
 擬議地下採石範圍

PROPOSED ACCESS TUNNEL
 擬議連接隧道

AECOM

PROJECT
 LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
 藍地石礦場 (藍地地下採石場發展)

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

CONSULTANT
 AECOM Asia Company Ltd.
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ISSUE/REVISION
 修訂

IR	DATE	DESCRIPTION	CHK.

STATUS
 編定

SCALE
 比例

A3 1 : 6000

DIMENSION UNIT
 尺寸單位

METRES

KEY PLAN
 索引圖

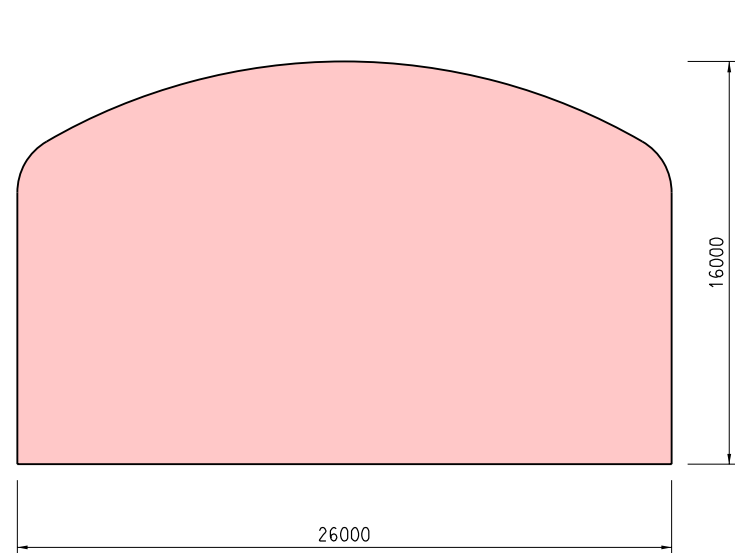
PROJECT NO.
 項目編號
 60671716

AGREEMENT NO.
 協議編號
 CE 51/2020 (GE)

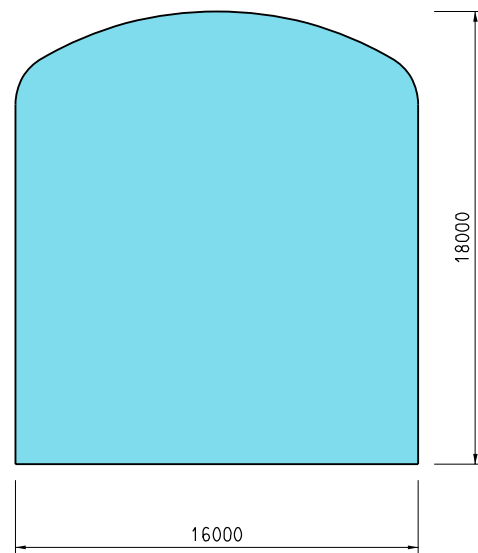
SHEET TITLE
 圖號
 COMPARISON BETWEEN PREVIOUS PROPOSAL AND UPDATED PROPOSAL
 先前方案和更新方案的比較

SHEET NUMBER
 圖號
 60671716/PP/FIGURE 1.2
 60671716/PP/圖 1.2

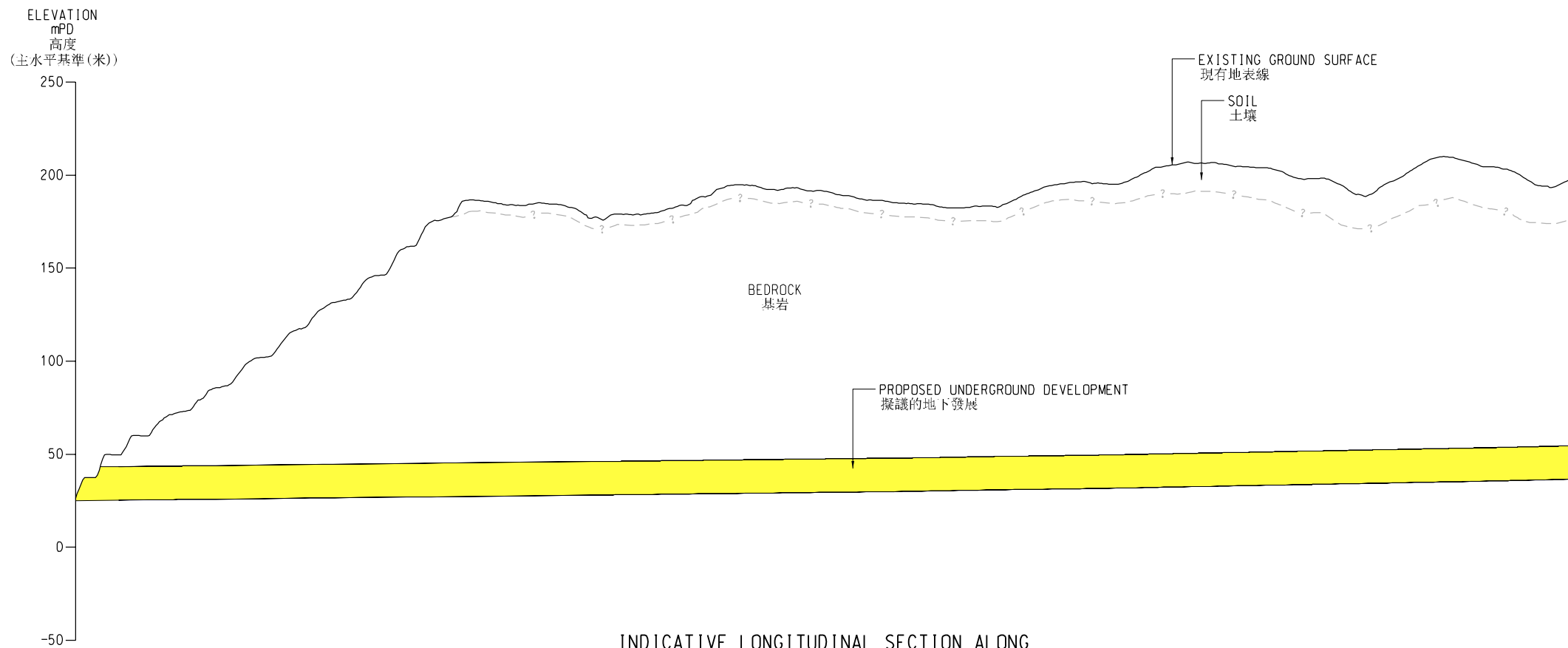
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PRODUCTION CAVERN
岩洞



MAIN ACCESS TUNNEL
連接隧道



INDICATIVE LONGITUDINAL SECTION ALONG
UNDERGROUND DEVELOPMENT AREA
地下發展位置 - 示意縱剖面
SCALE 1 : 3000
(比例 1 : 3000)

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE DIMENSION UNIT

N.T.S. MILLIMETRES

KEY PLAN

PROJECT NO. AGREEMENT NO.

60671716 CE 51/2020 (GE)

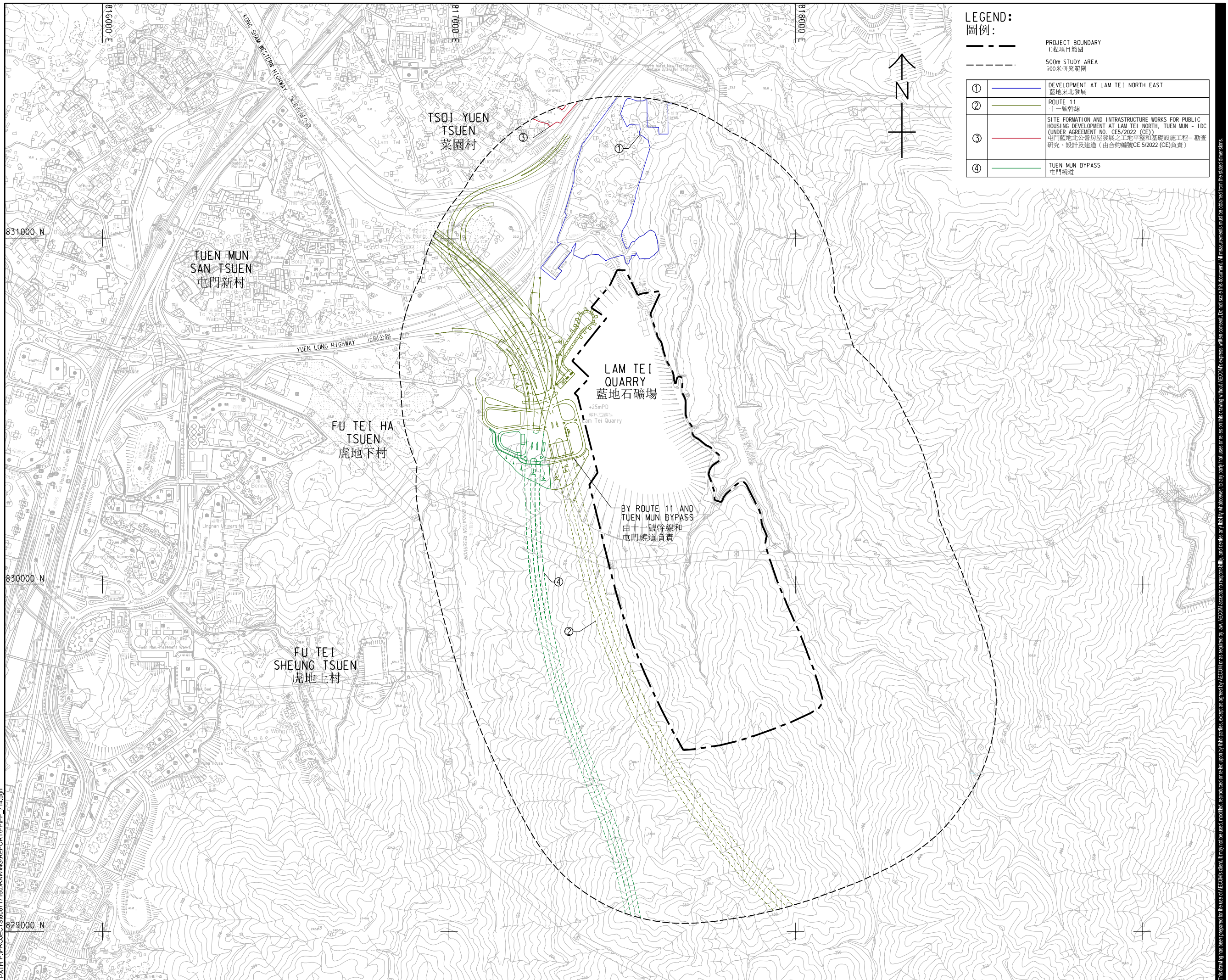
SHEET TITLE

CROSS SECTION OF PRODUCTION
CAVERNS AND MAIN ACCESS
TUNNELS (INDICATIVE)
岩洞和連接隧道剖面示意圖

SHEET NUMBER

60671716/PP/FIGURE 1.3

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LEGEND:
圖例:

---	PROJECT BOUNDARY 1. 項目範圍
---	500m STUDY AREA 500米研究範圍
①	DEVELOPMENT AT LAM TEI NORTH EAST 藍地東北發展
②	ROUTE 11 十一號幹線
③	SITE FORMATION AND INFRASTRUCTURE WORKS FOR PUBLIC HOUSING DEVELOPMENT AT LAM TEI NORTH, TUEN MUN - 1DC (UNDER AGREEMENT NO. CE/2022 (CE)) 屯門藍地北公營房屋發展之工地平整和基礎設施工程— 勘察、研究、設計及建造 (由合約編號CE 5/2022 (CE)負責)
④	TUEN MUN BYPASS 屯門繞道

AECOM

PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

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

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ISSUE/REVISION
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I/R 序號	DATE 日期	DESCRIPTION 內容簡述	CHK. 核對

STATUS
編號

SCALE
比例
A3 1: 10000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
位置圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

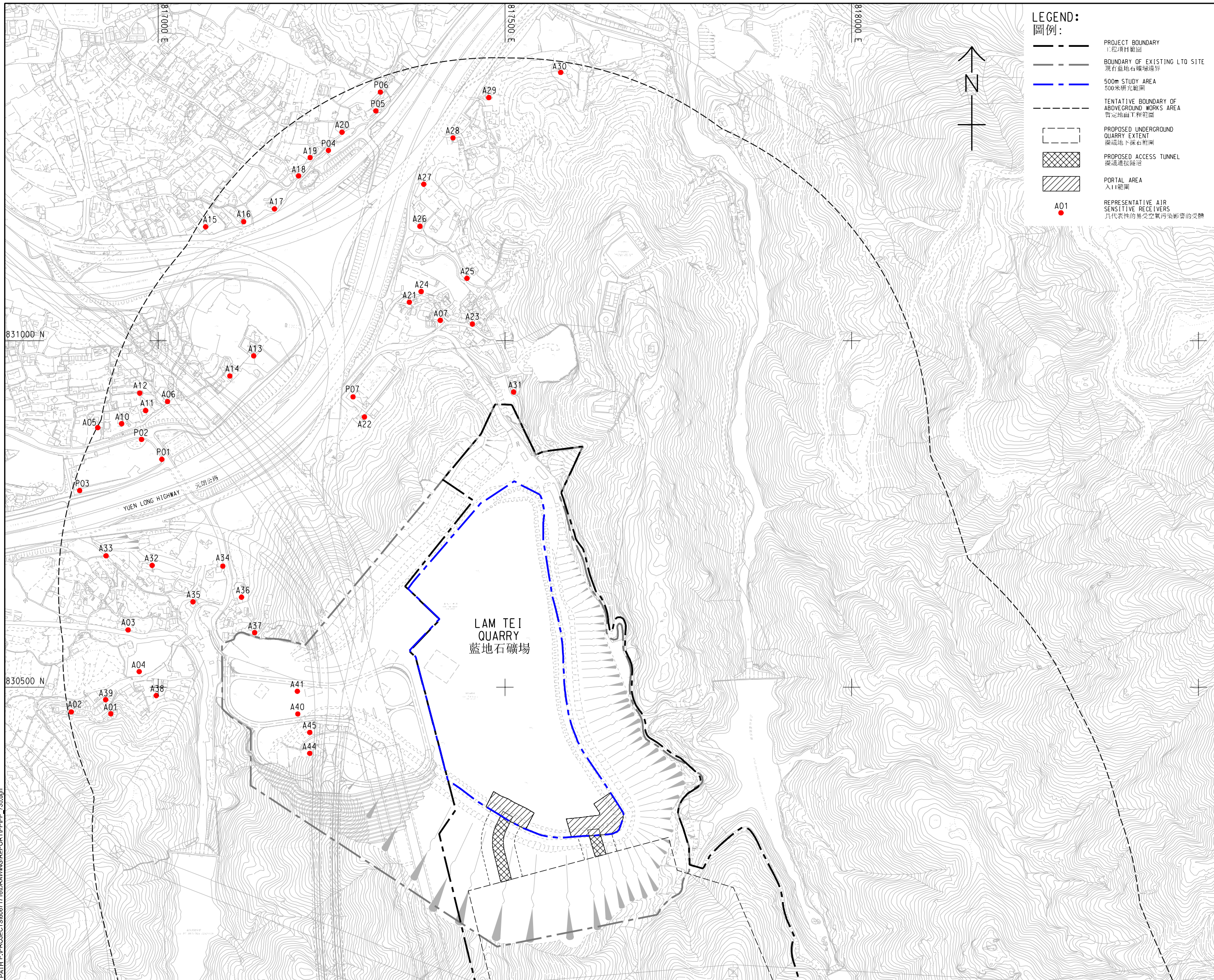
SHEET TITLE
圖紙名稱

INTERACTION WITH OTHER
PROJECTS
與其他工程項目的關連

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 1.4
60671716/PP/圖 1.4

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LEGEND:
圖例:

- PROJECT BOUNDARY
項目範圍
- - - BOUNDARY OF EXISTING LTO SITE
現有藍地石礦場邊界
- 500m STUDY AREA
500米研究範圍
- - - TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議通道
- PORTAL AREA
入口範圍
- A01 REPRESENTATIVE AIR SENSITIVE RECEIVERS
具代表性的易受空氣污染影響的受體

AECOM

PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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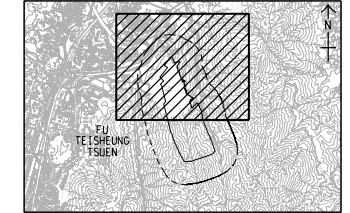
NO.	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE
比例
A3 1:5000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN A3 1:10000
小圖



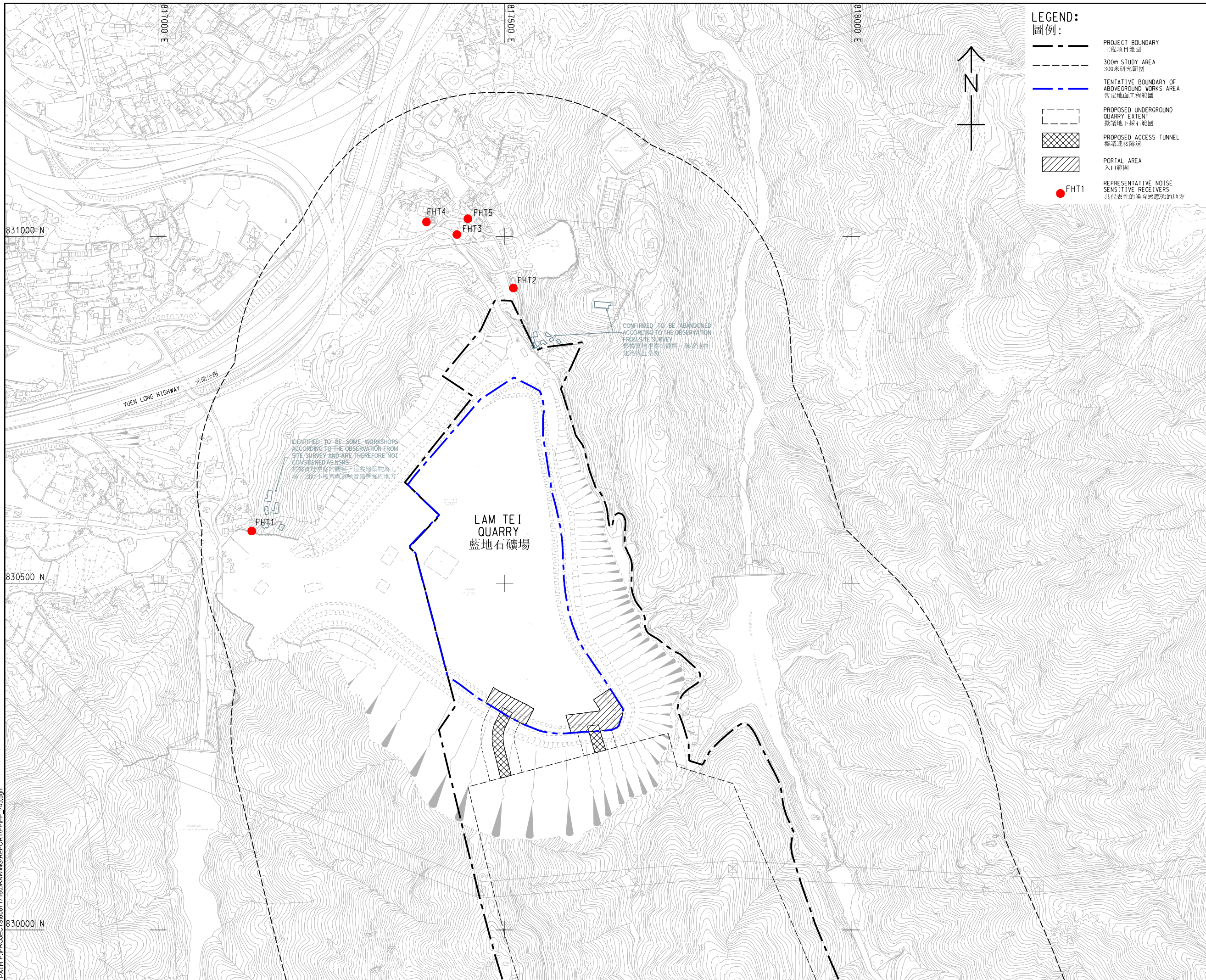
PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS
具代表性的易受空氣污染影響的受體位置

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.2
60671716/PP/圖 2.2

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LEGEND:
圖例:

- PROJECT BOUNDARY
項目範圍
- 300m STUDY AREA
300米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENT
擬定地下採石範圍
- PROPOSED ACCESS TUNNEL
擬定探取隧道
- PORTAL AREA
入口範圍
- FHT1
REPRESENTATIVE NOISE SENSITIVE RECEIVERS
具代表性的噪音感應強的地方



PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

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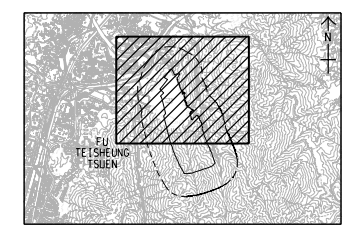
I/R	DATE	DESCRIPTION	CHK.
序號	日期	內容簡述	核對

STATUS
編定

SCALE
比例
A3 1 : 5000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN A3 1 : 10000



PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

**LOCATIONS OF REPRESENTATIVE
NOISE SENSITIVE RECEIVERS**
具代表性的噪音感應強的地方位置

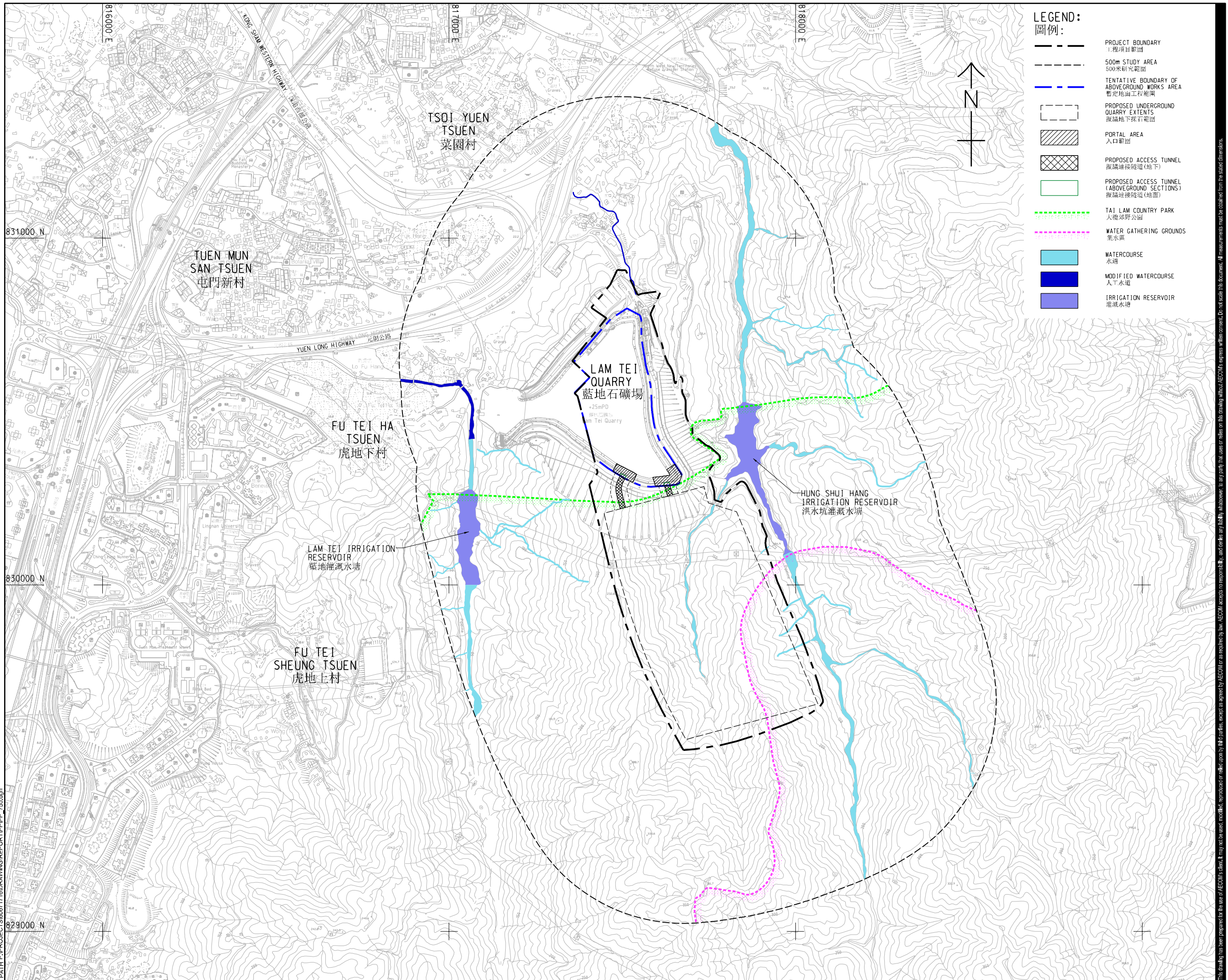
SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.3
60671716/PP/圖2.3

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IDENTIFIED TO BE SOME WORKSHOPS
ACCORDING TO THE OBSERVATION FROM
SITE SURVEY AND ARE THEREFORE NOT
CONSIDERED AS NSRS
根據現場探測的觀察，這些建築物為工
作室，因此不被考慮為噪音敏感的地方

CONFIRMED TO BE ABANDONED
ACCORDING TO THE OBSERVATION
FROM SITE SURVEY
根據現場探測的觀察，確認這些
建築物已荒廢

LAM TEI
QUARRY
藍地石礦場



LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- 500m STUDY AREA
500米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENTS
擬議地下採石範圍
- PORTAL AREA
入口範圍
- PROPOSED ACCESS TUNNEL
擬議連接隧道(地下)
- PROPOSED ACCESS TUNNEL (ABOVEGROUND SECTIONS)
擬議連接隧道(地面)
- TAI LAM COUNTRY PARK
大嶼郊野公園
- WATER GATHERING GROUNDS
集水區
- WATERCOURSE
水道
- MODIFIED WATERCOURSE
人工水道
- IRRIGATION RESERVOIR
灌溉水塘



PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

CLIENT
業主
CEDD 土木工程拓展署
Civil Engineering and
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ISSUE/REVISION
修訂

IR	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE 比例尺: A3 1: 10000
DIMENSION UNIT 量度單位: METRES

KEY PLAN
位置圖

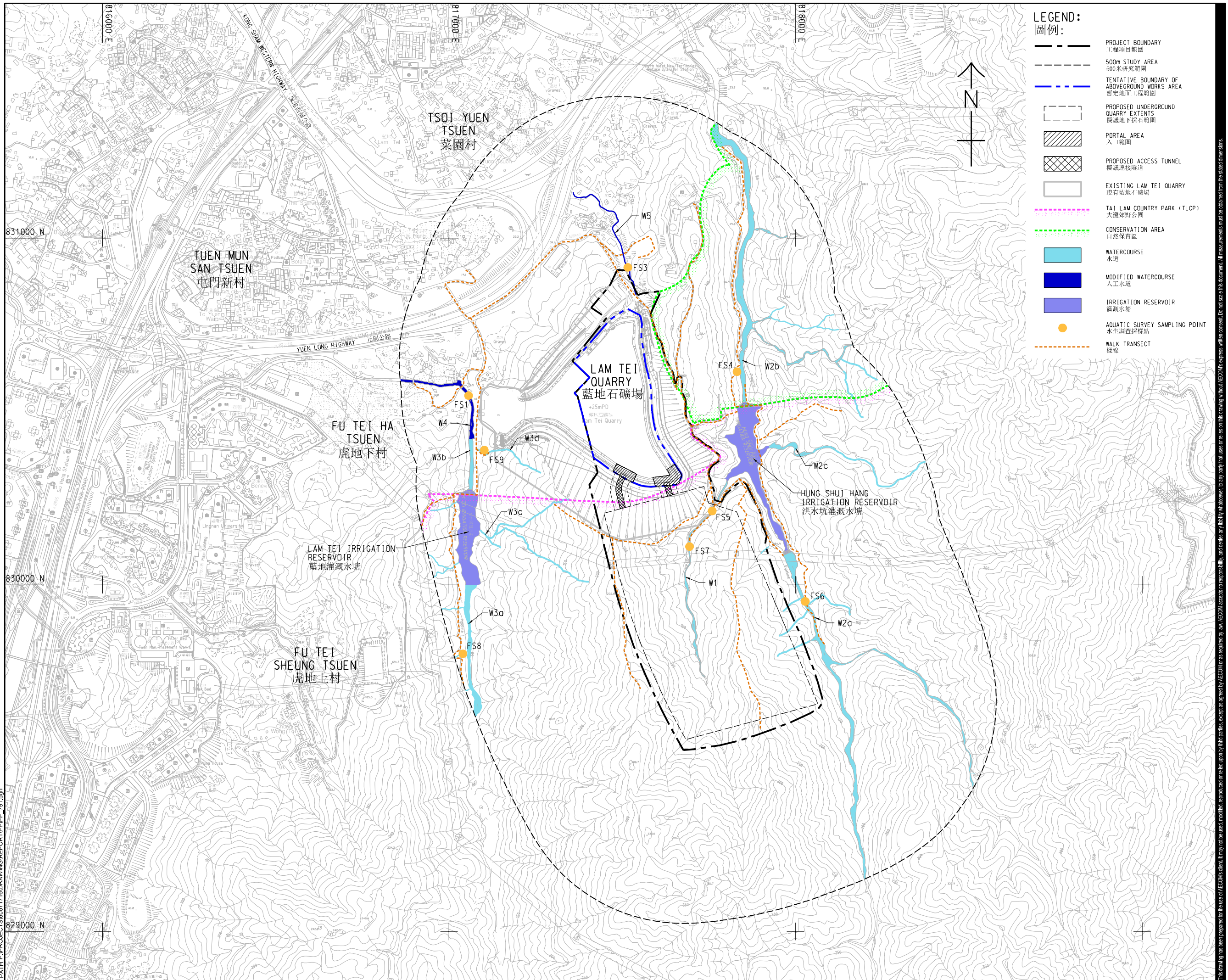
PROJECT NO. 項目編號: 60671716
AGREEMENT NO. 協議編號: CE 51/2020 (GE)

SHEET TITLE
圖號/圖名

**LOCATIONS OF
WATER SENSITIVE RECEIVERS**
具代表性的水質敏感受體位置

SHEET NUMBER
圖號/圖號
60671716/PP/FIGURE 2.4
60671716/PP/圖2.4

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LEGEND:
圖例:

- PROJECT BOUNDARY
工程範圍
- 500M STUDY AREA
500米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENTS
擬議地下採石範圍
- PORTAL AREA
入口範圍
- PROPOSED ACCESS TUNNEL
擬議進路隧道
- EXISTING LAM TEI QUARRY
現有藍地石礦場
- TAI LAM COUNTRY PARK (TLCP)
大嶼郊野公園
- CONSERVATION AREA
自然保育區
- WATERCOURSE
水道
- MODIFIED WATERCOURSE
人工水道
- IRRIGATION RESERVOIR
灌溉水塘
- AQUATIC SURVEY SAMPLING POINT
水生調查採樣點
- WALK TRANSECT
樣線

AECOM

PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

CLIENT
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IR	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE
比例尺
A3 1: 10000

DIMENSION UNIT
量度單位
METRES

KEY PLAN
總圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖號
WALK TRANSECT AND AQUATIC SAMPLING POINTS
樣線及水生調查採樣點

SHEET NUMBER
圖號
60671716/PP/FIGURE 2.7.1
60671716/PP/圖2.7.1

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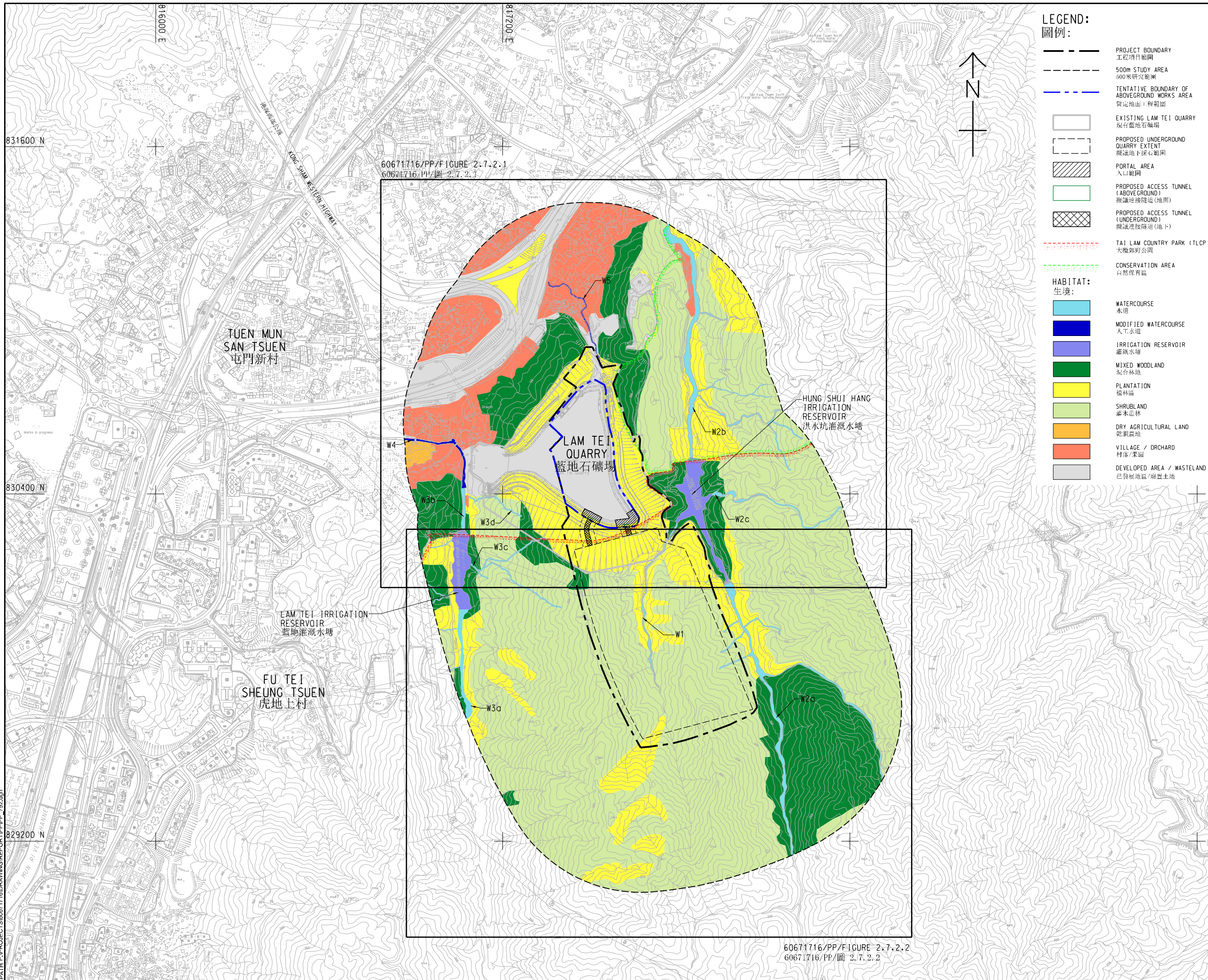
Relevant Experience of Key Ecological Surveyors

Faunal/floral group under study	Key Surveyors		
	Full Name	Brief description of relevant experience	No. of years of relevant experience
Floral Group	Shirley Mak	Certified arborist. Experienced surveyor for flora and habitat identification in various ecological surveys, EIA, EcolA and DIR.	10 years
Faunal Group	Connie Tsoi	Experienced surveyor for fauna identification in various ecological surveys, EIA, EcolA and DIR.	10 years
Faunal Group	Zoe Yeung	Experienced surveyor for fauna identification in various ecological surveys, EIA, EcolA and DIR.	5 years
Faunal Group	Anthony Yim	Experienced surveyor for fauna identification in various ecological surveys, EIA, EcolA and DIR.	5 years
Faunal Group	Matthew Yip	Experienced surveyor for fauna identification in various ecological surveys, EIA, EcolA and DIR.	4 years

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 Project Management Initials:
 Plot File by: Feng S
 PATH: P:\PROJECTS\60671716\DRAWING\REPORT\PP\PP_792.dgn
 5/21/2024



- LEGEND:**
圖例:
- PROJECT BOUNDARY
工程項目範圍
 - 500m STUDY AREA
500米研究範圍
 - TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
 - EXISTING LAM TEI QUARRY
現有藍地石礦場
 - PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
 - PORTAL AREA
入口範圍
 - PROPOSED ACCESS TUNNEL (ABOVEGROUND)
擬議地接隧道(地面)
 - PROPOSED ACCESS TUNNEL (UNDERGROUND)
擬議地接隧道(地下)
 - TAI LAM COUNTRY PARK (TLCP)
大欖郊野公園
 - CONSERVATION AREA
自然保育區
- HABITAT:**
生境:
- WATERCOURSE
水道
 - MODIFIED WATERCOURSE
人工水道
 - IRRIGATION RESERVOIR
灌溉水塘
 - MIXED WOODLAND
混合林地
 - PLANTATION
植林區
 - SHRUBLAND
灌木叢林
 - DRY AGRICULTURAL LAND
乾涸農地
 - VILLAGE / ORCHARD
村落/果園
 - DEVELOPED AREA / WASTELAND
已發展地區/廢置土地



AECOM

PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

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STATUS
編定

SCALE
比例
A3 1: 12000

DIMENSION UNIT
量度單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
HABITAT MAP (KEY PLAN)
生境地圖 (索引圖)

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.7.2
60671716/PP/圖 2.7.2

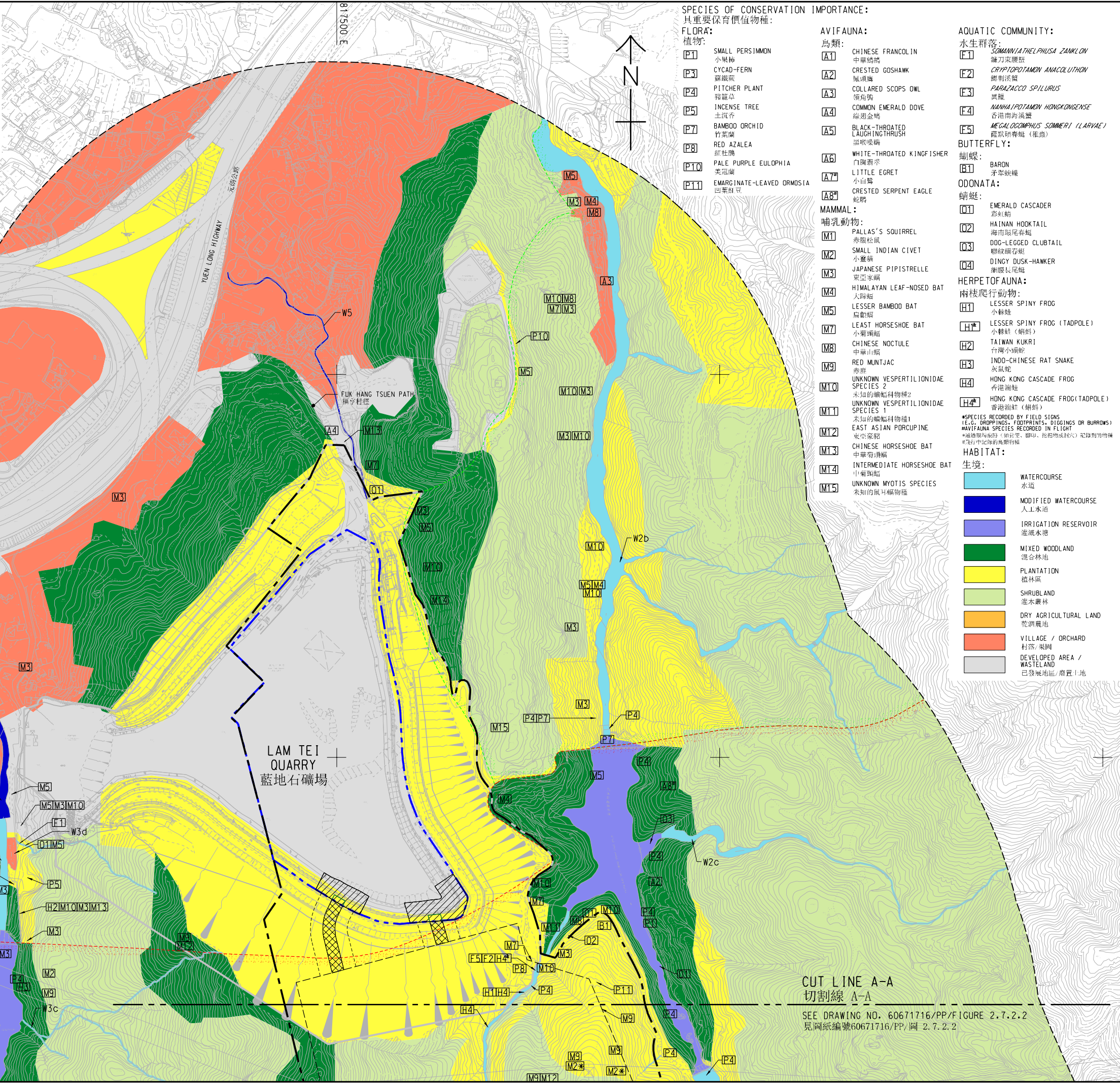
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60671716/PP/FIGURE 2.7.2.2
60671716/PP/圖 2.7.2.2

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Designer:
Project Management Initials:

NOTE:
註釋:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60671716/PP/FIGURE 2.7.2.1 TO FIGURE 2.7.2.2.
1. 請一併閱讀圖紙編號60671716/PP/圖2.7.2.1至圖2.7.2.2。

- LEGEND:**
圖例:
- PROJECT BOUNDARY
工程項目範圍
 - 500M STUDY AREA
500米研究範圍
 - TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
 - EXISTING LAM TEI QUARRY
現有藍地石礦場
 - PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
 - PROPOSED ACCESS TUNNEL (ABOVEGROUND)
擬議連接隧道(地面)
 - PROPOSED ACCESS TUNNEL (UNDERGROUND)
擬議連接隧道(地下)
 - PORTAL AREA
入口範圍
 - TAI LAM COUNTRY PARK (TLCP)
大欖郊野公園
 - CONSERVATION AREA
自然保育區



SPECIES OF CONSERVATION IMPORTANCE:
具重要保育價值物種:

- FLORA:**
植物:
- P1 SMALL PERSIMMON
小果柿
 - P3 CYCAD-FERN
蘇鐵蕨
 - P4 PITCHER PLANT
豬籠草
 - P5 INCENSE TREE
土沉香
 - P7 BAMBOO ORCHID
竹葉蘭
 - P8 RED AZALEA
紅杜鵑
 - P10 PALE PURPLE EULOPHIA
美冠蘭
 - P11 EMARGINATE-LEAVED ORMOZIA
凹葉刺楸
- AVIFAUNA:**
鳥類:
- A1 CHINESE FRANCOLIN
中華鴉鴉
 - A2 CRESTED GOSHAWK
鳳頭鷹
 - A3 COLLARED SCOPS OWL
領角鴞
 - A4 COMMON EMERALD DOVE
綠翅金鳩
 - A5 BLACK-THROATED LAUGHINGTHRUSH
黑喉吸蜜
 - A6 WHITE-THROATED KINGFISHER
白胸鵝
 - A7 LITTLE EGRET
小白鷺
 - A8 CRESTED SERPENT EAGLE
蛇鵟
- AQUATIC COMMUNITY:**
水生群落:
- E1 SOMANNA/THELPHUSA ZANKLON
鎌刀水履蟲
 - E2 CRYPTOPOTAMON ANACOLUTION
德刺溪蟹
 - E3 PARAZACCO SPILLURUS
異蝨
 - E4 NANHA/POTAMON HONGKONGENSE
香港滑海溪蟹
 - E5 MEGALOCOMPUS SOMMERI (LARVAE)
藍地刺毒蝨(稚蟲)
- BUTTERFLY:**
蝴蝶:
- B1 BARON
牙榮蛩蝶
- ODONATA:**
蜻蜓:
- O1 EMERALD CASCADER
彩虹蜻
 - O2 HAINAN HOOKTAIL
海南斑尾春蜓
 - O3 DOG-LEGGED CLUBTAIL
聯紋鐘石蜓
 - O4 DINGY DUSK-HAWKER
謝腰長尾蜓
- HERPETOFAUNA:**
兩棲爬行動物:
- H1 LESSER SPINY FROG
小棘蛙
 - H2 LESSER SPINY FROG (TADPOLE)
小棘蛙(蝌蚪)
 - H3 TAIWAN KUKRI
台灣小頭蛇
 - H4 INDO-CHINESE RAT SNAKE
灰鼠蛇
 - H5 HONG KONG CASCADE FROG
香港瀑蛙
 - H6 HONG KONG CASCADE FROG(TADPOLE)
香港瀑蛙(蝌蚪)
- MAMMAL:**
哺乳動物:
- M1 FALLAS'S SOUJIREL
赤腹松鼠
 - M2 SMALL INDIAN CIVET
小靈貓
 - M3 JAPANESE PIPITRELLA
東亞家貓
 - M4 HIMALAYAN LEAF-NOSED BAT
大蹄蝠
 - M5 LESSER BAMBOO BAT
扁齒蝠
 - M7 LEAST HORSESHOE BAT
小蹄蝠
 - M8 CHINESE NOCTULE
中華山蝠
 - M9 RED MUNTJAC
赤豚
 - M10 UNKNOWN VESPERTILIONIDAE SPECIES 2
未知的蝙蝠科物種2
 - M11 UNKNOWN VESPERTILIONIDAE SPECIES 1
未知的蝙蝠科物種1
 - M12 EAST ASIAN PORCUPINE
東亞豪豬
 - M13 CHINESE HORSESHOE BAT
中華菊頭蝠
 - M14 INTERMEDIATE HORSESHOE BAT
中間蹄蝠
 - M15 UNKNOWN MYOTIS SPECIES
未知的鼠耳蝠物種
- HABITAT:**
生境:
- WATERCOURSE
水道
 - MODIFIED WATERCOURSE
人工水道
 - IRRIGATION RESERVOIR
灌溉水塘
 - MIXED WOODLAND
混合林地
 - PLANTATION
植林區
 - SHRUBLAND
灌木叢林
 - DRY AGRICULTURAL LAND
乾澆農地
 - VILLAGE / ORCHARD
村落/果園
 - DEVELOPED AREA / WASTELAND
已發展地區/廢置土地

AECOM

PROJECT
項目

LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

CLIENT
業主

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

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NO.	DATE	DESCRIPTION	CHK.

STATUS
狀態

SCALE
比例

A3 1:5000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60671716

AGREEMENT NO.
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

HABITAT MAP
生境地圖

SHEET NUMBER
圖紙編號

60671716/PP/FIGURE 2.7.2.1
60671716/PP/圖 2.7.2.1

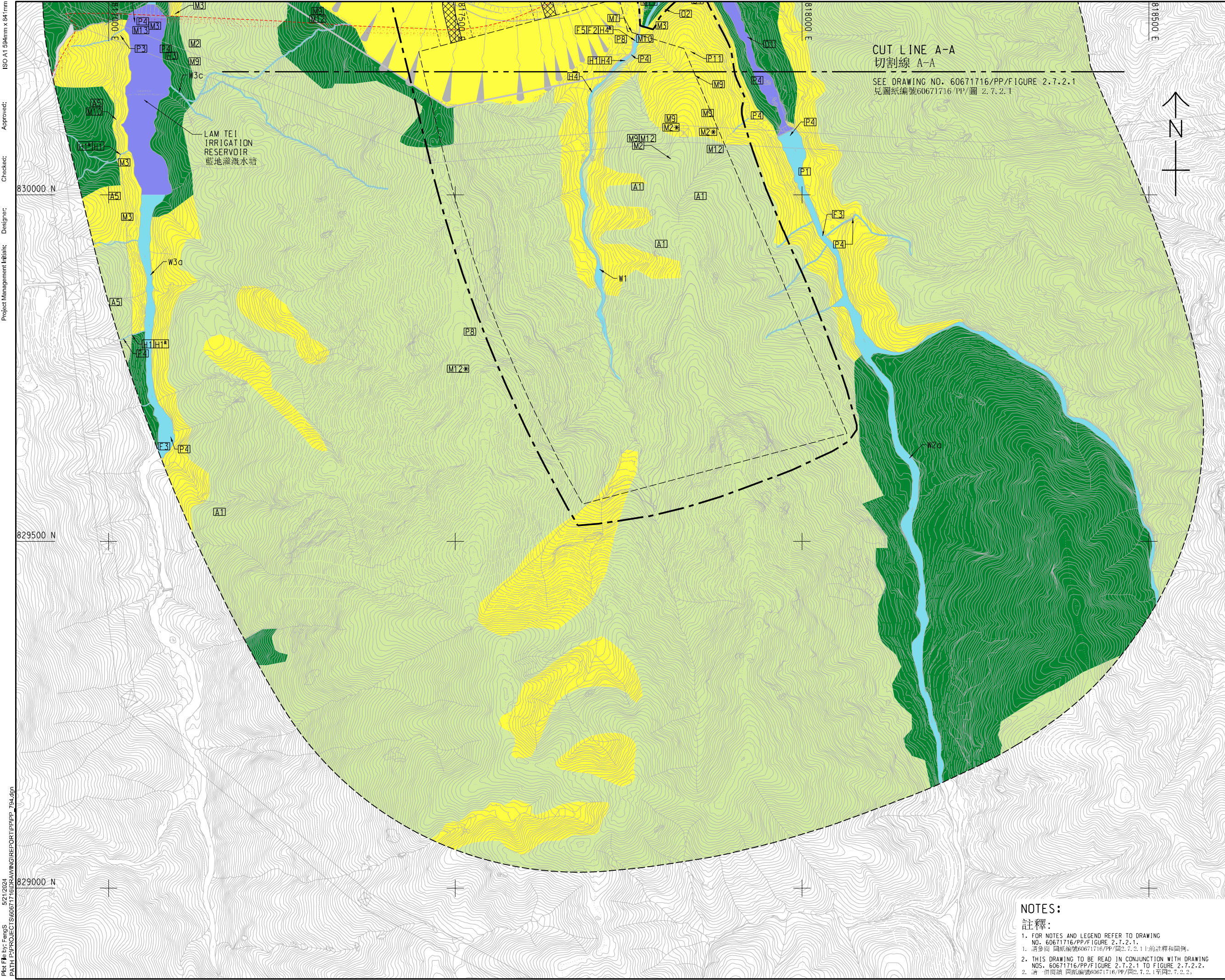
(SHEET 1 OF 2)
(第一頁, 共兩頁)

CUT LINE A-A
切割線 A-A

SEE DRAWING NO. 60671716/PP/FIGURE 2.7.2.2
見圖紙編號60671716/PP/圖 2.7.2.2

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IR	DATE	DESCRIPTION	CHK.
序號	日期	內容簡述	核對

STATUS
 狀態

SCALE
 比例

DIMENSION UNIT
 量度單位

A3 1 : 5000 METRES

KEY PLAN
 位置圖

PROJECT NO.
 項目編號

AGREEMENT NO.
 協議編號

60671716 CE 51/2020 (GE)

SHEET TITLE
 圖號/圖名

HABITAT MAP
 生境地圖

SHEET NUMBER
 圖號/圖名

60671716/PP/FIGURE 2.7.2.2
 60671716/PP/圖 2.7.2.2

CUT LINE A-A
 切割線 A-A
 SEE DRAWING NO. 60671716/PP/FIGURE 2.7.2.1
 見圖紙編號60671716/PP/圖 2.7.2.1



NOTES:
 註釋:

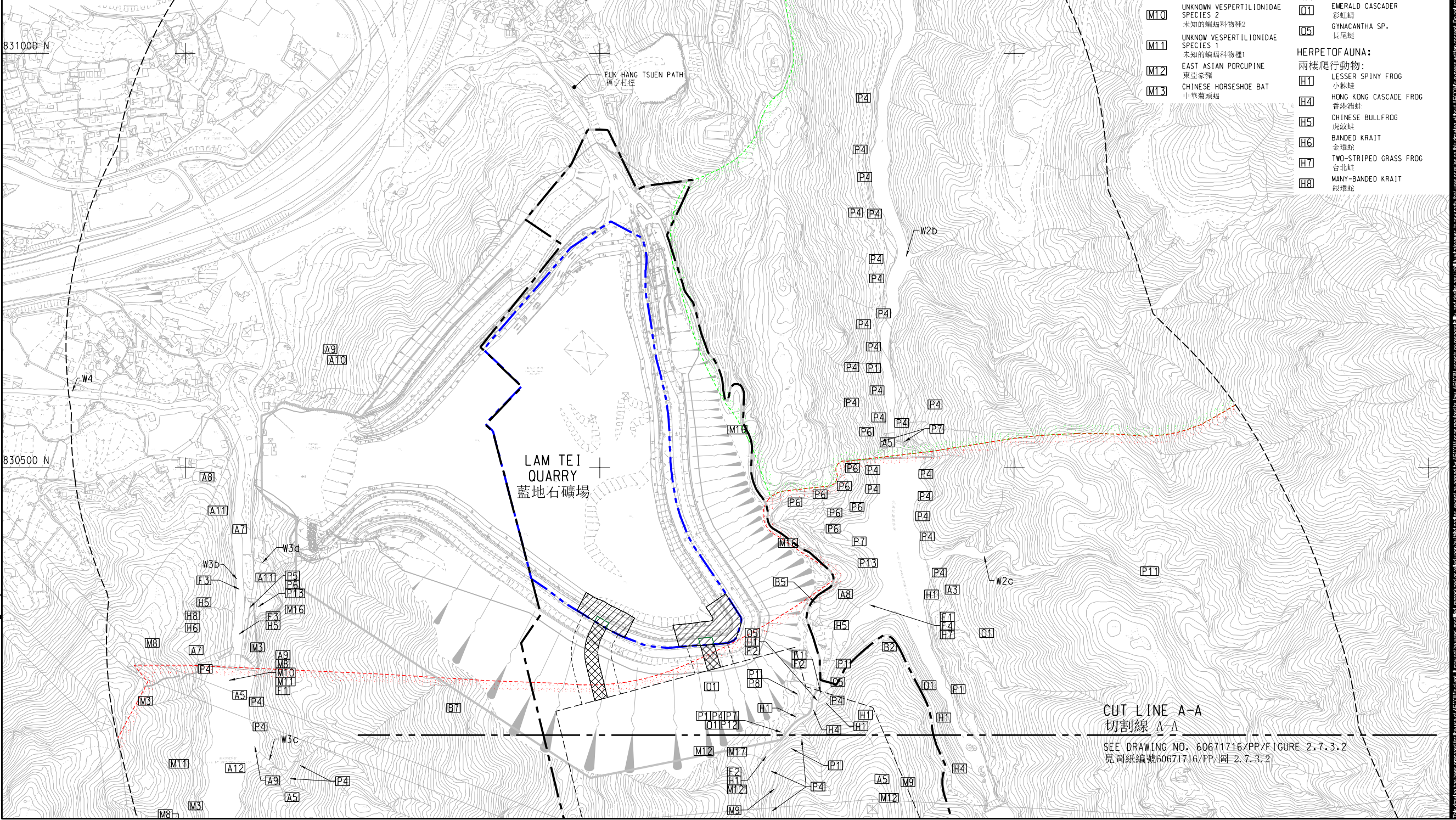
- FOR NOTES AND LEGEND REFER TO DRAWING NO. 60671716/PP/FIGURE 2.7.2.1.
 1. 請參閱 圖紙編號60671716/PP/圖2.7.2.1 的註釋和圖例。
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 2. 請 併閱圖 圖紙編號60671716/PP/圖2.7.2.1至圖2.7.2.2。

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1. 請一併閱讀圖紙編號60671716/PP/圖2.7.3.1至圖2.7.3.2。

- LEGEND:**
圖例:
- PROJECT BOUNDARY
工程項目範圍
 - TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
 - 500m STUDY AREA
500米研究範圍
 - TAI LAM COUNTRY PARK (TLCP)
大欖郊野公園
 - CONSERVATION AREA
自然保育區
 - EXISTING LAM TEI QUARRY
現有藍地石礦場
 - PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
 - PROPOSED ACCESS TUNNEL (ABOVEGROUND)
擬議地接隧道(地面)
 - PROPOSED ACCESS TUNNEL (UNDERGROUND)
擬議地接隧道(地下)
 - PORTAL AREA
入口範圍



SPECIES OF CONSERVATION IMPORTANCE:
具重要保育價值物種:

- FLORA:**
植物:
- P1 SMALL PERSIMMON 小葉柿
 - P2 PITCHER PLANT 豬籠草
 - P5 INCENSE TREE 土沉香
 - P6 PURPLE BULB ORCHID 香港玄圃
 - P7 BAMBOO ORCHID 竹葉蘭
 - P8 RED AZALEA 紅杜鵑
 - P11 SILVER-BACK ARTOCARPUS 白桂木
 - P12 LESSER PLANTHERA 小盾唇蘭
 - P13 WALKING-STICK ORCHID 地寶蘭
- AVIFAUNA:**
鳥類:
- A3 COLLARED SCOPS OWL 領角鴞
 - A5 CRESTED SERPENT EAGLE 蛇鵟
 - A7 BLACK KITE 黑鷹
 - A8 BLACK-THROATED LAUGHING THRUSH 黑喉噪鶇
 - A9 WHITE-THROATED KINGFISHER 白胸翡翠
 - A10 GREATER COUCAL 褐翅鴉
 - A11 RUFOUS-CAPPED BABBLER 紅頭標鴉
 - A12 LITTLE EGRET 小白鷺
 - A13 GREY NIGHTJAR 普通夜鷹
- MAMMAL:**
哺乳動物:
- M3 JAPANESE PIPISTRELLE 東亞家蝠
 - M5 LESSER BAMBOO BAT 黑鼻蝠
 - M8 CHINESE NOCTULE 中華山蝠
 - M9 RED MUNTJAC 赤鹿
 - M10 UNKNOWN VESPERTILIONIDAE SPECIES 2 未知的蝙蝠科物種2
 - M11 UNKNOWN VESPERTILIONIDAE SPECIES 1 未知的蝙蝠科物種1
 - M12 EAST ASIAN PORCUPINE 東亞豪豬
 - M13 CHINESE HORSESHOE BAT 中華菊頭蝠
- AQUATIC COMMUNITY:**
水生群落:
- F1 SOMANVIATHALPUSA ZANKLON 鎌刀束腰蟹
 - F2 CRYPTOPTAMON ANACOLYTHON 藍刺溪蟹
 - F3 PARAZACCO SPILLURUS 異龍
 - F4 MANHAIPOTAMON HONGKONGENSE 香港南海溪蟹
- BUTTERFLY:**
蝴蝶:
- B2 FORGET-ME-NOT 勿忘草
 - B3 METALLIC CERULEAN 金屬藍蝶
 - B4 TINY GRASS BLUE 小藍灰蝶
 - B5 GREEN SKIRT BARON 綠裙蛺蝶
 - B6 DANAIID EGGFLY 金環蛺蝶
 - B7 SWALLOWTAIL 粉蝶
- ODONATA:**
蜻蜓:
- O1 EMERALD CASCADE 彩虹龍
 - O5 GYNACANTHA SP. 長尾龍
- HERPETOFAUNA:**
兩棲爬行動物:
- H1 LESSER SPINY FROG 小棘蛙
 - H4 HONG KONG CASCADE FROG 香港瀑蛙
 - H5 CHINESE BULLFROG 虎紋蛙
 - H6 BANDED KRAIT 金環蛇
 - H7 TWO-STRIPED GRASS FROG 台北蛙
 - H8 MANY-BANDED KRAIT 銀環蛇

AECOM

PROJECT
項目

LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

CLIENT
業主

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

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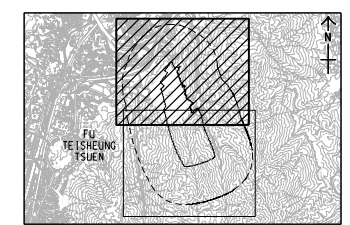
NO.	DATE	DESCRIPTION	CHK.

STATUS
狀態

SCALE
比例

A3 1:5000 DIMENSION UNIT: METRES

KEY PLAN A3 1:10000



PROJECT NO.
項目編號

60671716 **AGREEMENT NO.**
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

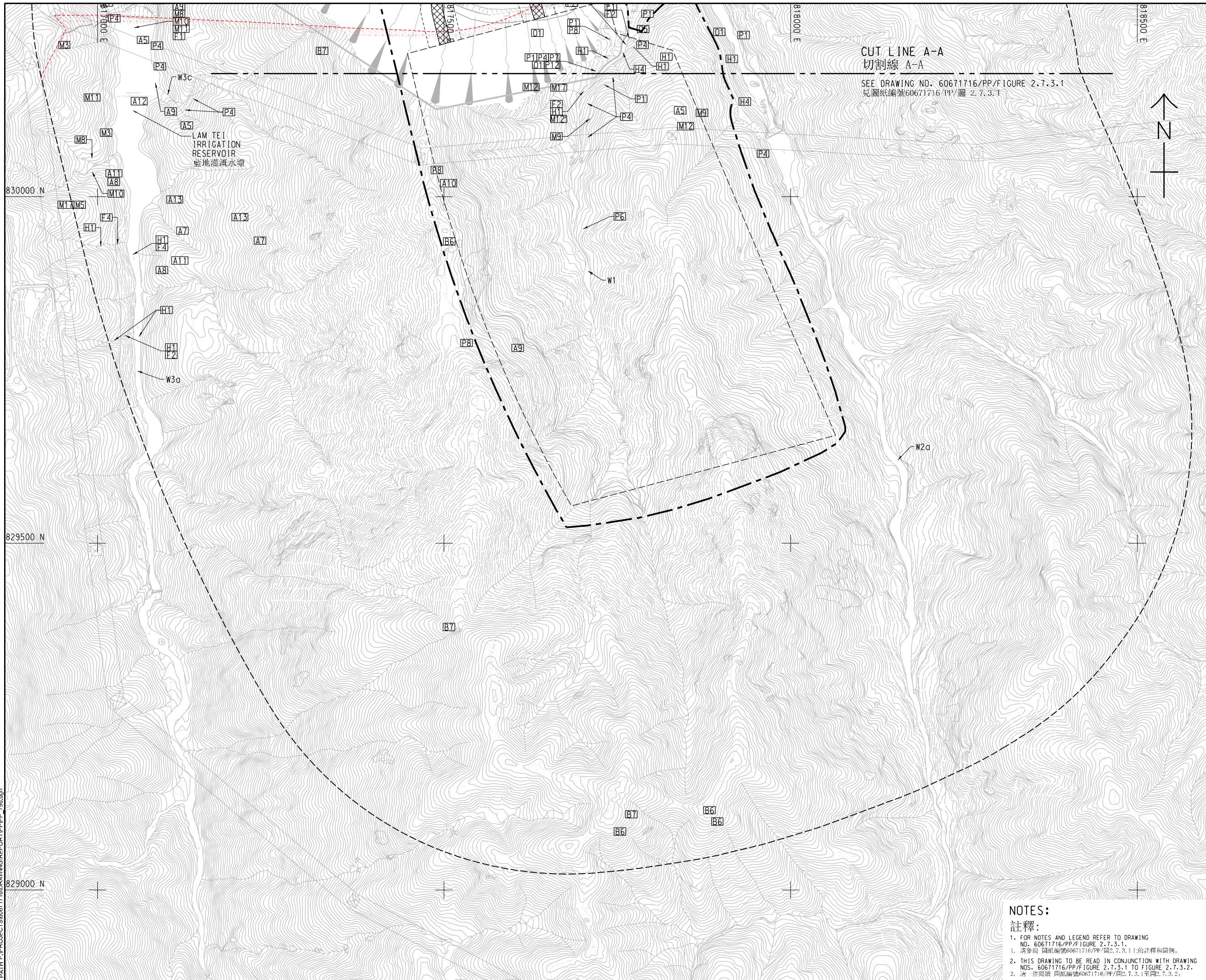
LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE RECORDED IN PREVIOUS STUDIES
以往研究記錄到的具重要保育價值物種的位置 (SHEET 1 OF 2)
圖紙編號

60671716/PP/FIGURE 2.7.3.1
60671716/PP/圖 2.7.3.1

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4/17/2021

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CUT LINE A-A
 切割線 A-A
 SEE DRAWING NO. 60671716/PP/FIGURE 2.7.3.1
 見圖紙編號60671716/PP/圖 2.7.3.1



PROJECT
 LAM TEI QUARRY
 (DEVELOPMENT OF
 LAM TEI UNDERGROUND
 QUARRY)
 藍地石礦場 (藍地地下採石場
 發展)

CLIENT
 業主
 土木工程拓展署
 Civil Engineering and
 Development Department

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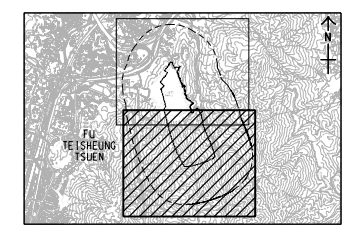
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 修訂

I/R 序號	DATE 日期	DESCRIPTION 內容簡述	CHK. 核對

STATUS
 情況

SCALE
 比例
 A3 1 : 5000
 DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN A3 1 : 10000
 索引圖



PROJECT NO.
 項目編號
 60671716
 AGREEMENT NO.
 協議編號
 CE 51/2020 (GE)

SHEET TITLE
 圖紙名稱

LOCATIONS OF SPECIES OF
 CONSERVATION IMPORTANCE
 RECORDED IN PREVIOUS STUDIES
 以往研究記錄到的具重
 要保育價值物種的位置 (SHEET 2 OF 2)
 (第二頁, 共兩頁)
 SHEET NUMBER
 圖紙編號

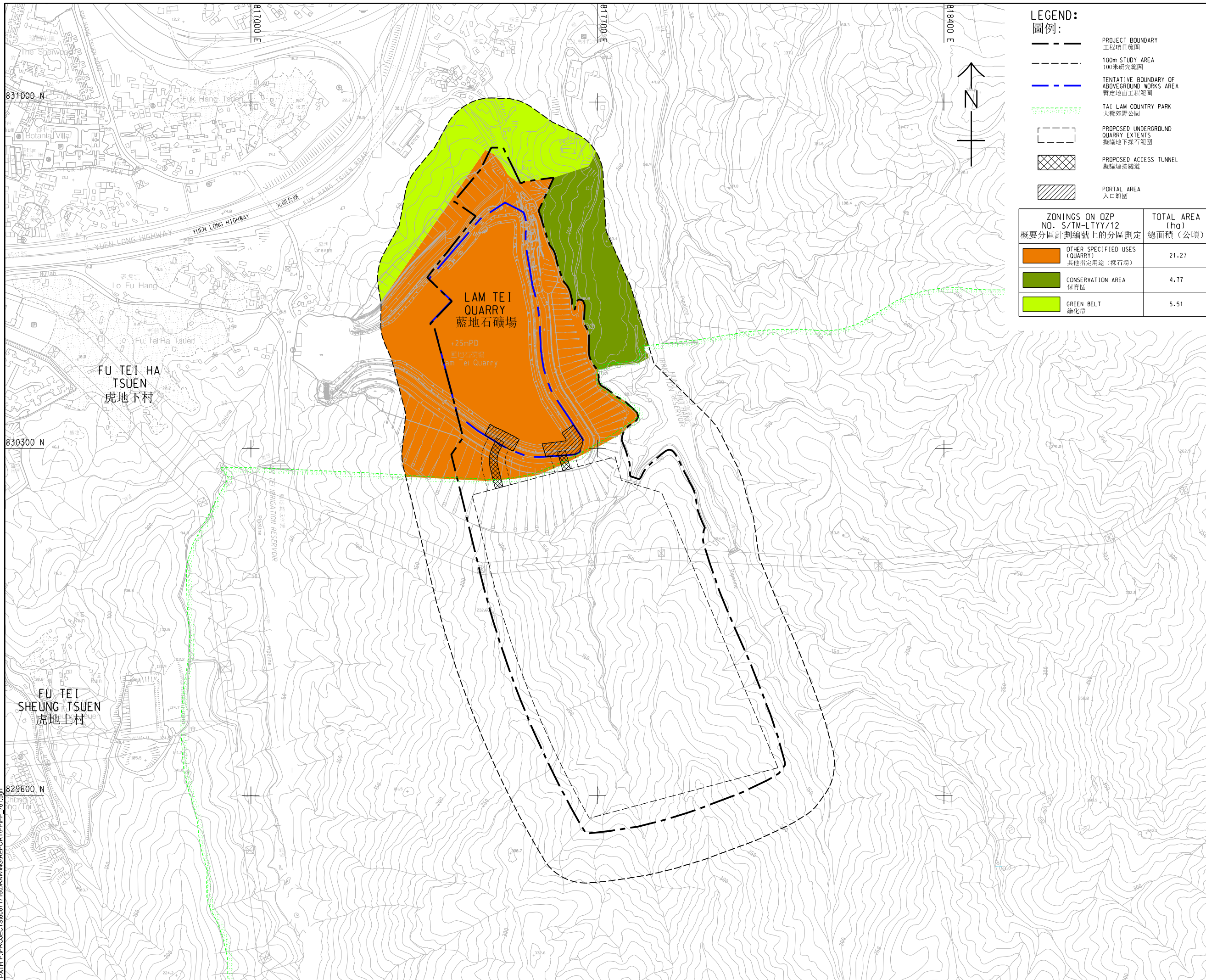
60671716/PP/FIGURE 2.7.3.2
 60671716/PP/圖 2.7.3.2

NOTES:
 註釋:
 1. FOR NOTES AND LEGEND REFER TO DRAWING
 NO. 60671716/PP/FIGURE 2.7.3.1.
 1. 請參閱 圖紙編號60671716/PP/圖2.7.3.1 的註釋和圖例。
 2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING
 NOS. 60671716/PP/FIGURE 2.7.3.1 TO FIGURE 2.7.3.2.
 2. 請 併閱圖 圖紙編號60671716/PP/圖2.7.3.1至圖2.7.3.2。

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 4/22/2021



LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- 100m STUDY AREA
100米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- TAI LAM COUNTRY PARK
大棠郊野公園
- PROPOSED UNDERGROUND QUARRY EXTENTS
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議連接隧道
- PORTAL AREA
入口範圍

ZONINGS ON OZP NO. S/TM-LTY/12 概要分區計劃編號上的分區劃定	TOTAL AREA (ha) 總面積 (公頃)
OTHER SPECIFIED USES (QUARRY) 其他指定用途 (採石場)	21.27
CONSERVATION AREA 保育區	4.77
GREEN BELT 綠化帶	5.51

AECOM

PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

CONSULTANT
顧問公司
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IR	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE
比例尺
A3 1 : 7000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

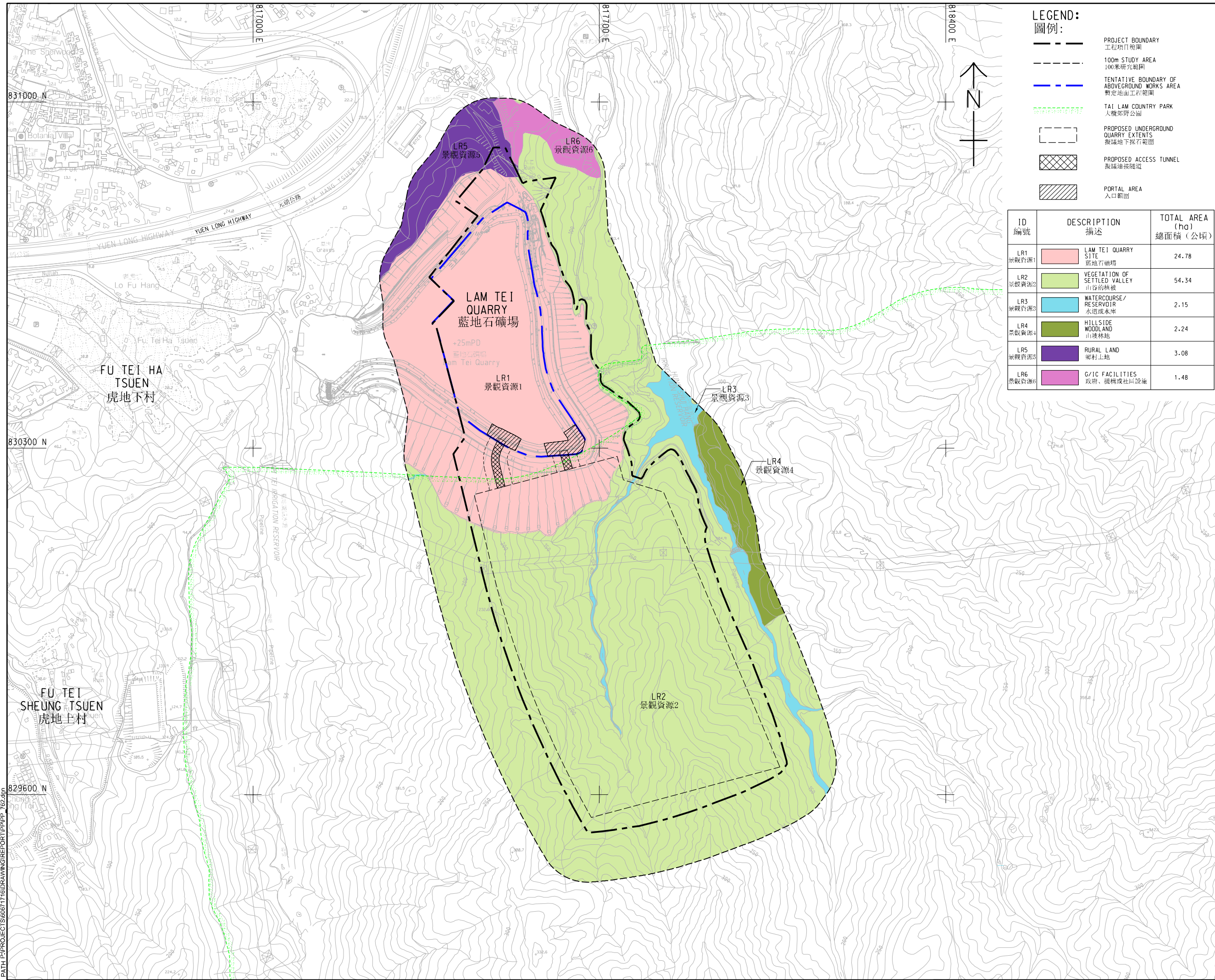
AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
EXISTING PLANNING & DEVELOPMENT FRAMEWORK WITHIN 100m STUDY AREA
100米研究區域內的現行規劃和發展框架

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.8.1
60671716/PP/圖2.8.1

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LEGEND:
圖例:

- PROJECT BOUNDARY 工程項目範圍
- 100m STUDY AREA 100米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA 暫定地面工程範圍
- TAI LAM COUNTRY PARK 大欖郊野公園
- PROPOSED UNDERGROUND QUARRY EXTENTS 擬議地下採石範圍
- PROPOSED ACCESS TUNNEL 擬議連接隧道
- PORTAL AREA 入口範圍

ID 編號	DESCRIPTION 描述	TOTAL AREA (ha) 總面積 (公頃)
LR1 景觀資源1	LAM TEI QUARRY SITE 藍地石礦場	24.78
LR2 景觀資源2	VEGETATION OF SETTLED VALLEY 山谷的植被	54.34
LR3 景觀資源3	WATERCOURSE/RESERVOIR 水道或水庫	2.15
LR4 景觀資源4	HILLSIDE WOODLAND 山坡林地	2.24
LR5 景觀資源5	RURAL LAND 鄉村土地	3.08
LR6 景觀資源6	G/C FACILITIES 政府、機構或社區設施	1.48

AECOM

PROJECT
 LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
 藍地石礦場 (藍地地下採石場發展)

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 Civil Engineering and Development Department

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I/R 修訂	DATE 日期	DESCRIPTION 內容描述	CHK. 核對

STATUS
 編定

SCALE
 比例尺: A3 1:7000

DIMENSION UNIT
 尺寸單位: METRES

PROJECT NO.
 項目編號: 60671716

AGREEMENT NO.
 協議編號: CE 51/2020 (GE)

SHEET TITLE
 圖則名稱: KEY LANDSCAPE RESOURCES WITHIN 100m STUDY AREA 100米研究區域內的主要景觀資源

SHEET NUMBER
 圖則編號: 60671716/PP/FIGURE 2.8.2 60671716/PP/圖2.8.2

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LR 1 LAM TEI QUARRY SITE
景觀資源 1 藍地石礦場



LR 2 VEGETATION OF SETTLED VALLEY
景觀資源 2 山谷的植被



LR 3 WATERCOURSE/ RESERVOIR
景觀資源 3 水道或水庫



LR 4 HILLSIDE WOODLAND
景觀資源 4 山坡林地



LR 5 RURAL LAND
景觀資源 5 鄉村土地



LR 6 G/IC FACILITIES
景觀資源 6 政府、機構或社區設施

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容簡述	CHK. 核對

STATUS
情況

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60671716

AGREEMENT NO.
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

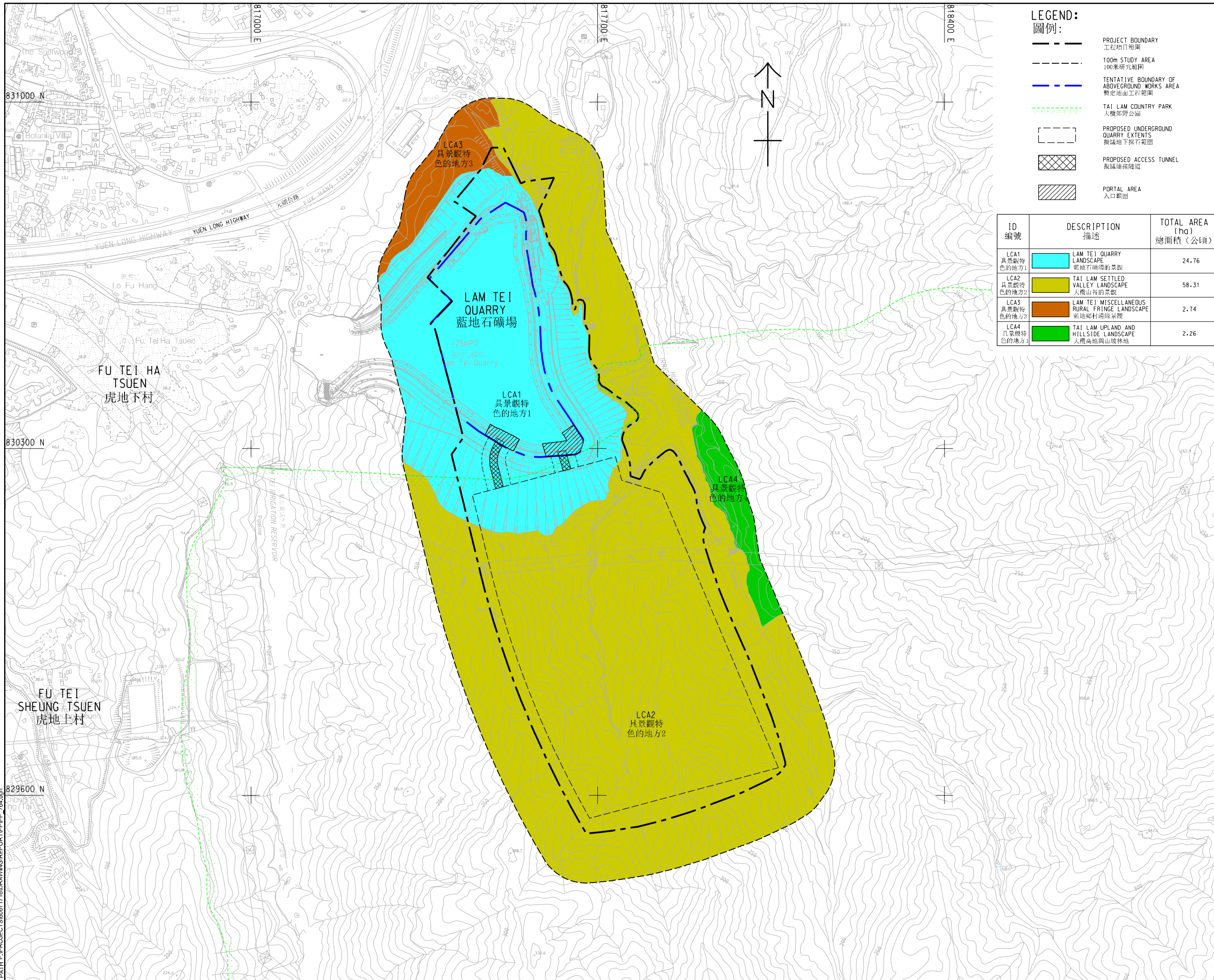
PHOTOGRAPHS OF KEY
LANDSCAPE RESOURCES
主要景觀資源的照片

SHEET NUMBER
圖紙編號

60671716/PP/FIGURE 2.8.3
60671716/PP/圖2.8.3

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ID 編號	DESCRIPTION 描述	TOTAL AREA (ha) 總面積 (公頃)
LCA1 具景觀特色的地方1	LAM TEI QUARRY LANDSCAPE 藍地石礦場的景觀	24.76
LCA2 具景觀特色的地方2	TAI LAM SETTLED VALLEY LANDSCAPE 大棠山谷的景觀	58.31
LCA3 具景觀特色的地方3	LAM TEI MISCELLANEOUS RURAL FRINGE LANDSCAPE 藍地鄉村邊線景觀	2.74
LCA4 具景觀特色的地方4	TAI LAM UPLAND AND HILLSIDE LANDSCAPE 大棠高地與山坡林地	2.26

LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- 100m STUDY AREA
100米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- TAI LAM COUNTRY PARK
大棠郊野公園
- PROPOSED UNDERGROUND QUARRY EXTENTS
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議連接隧道
- PORTAL AREA
入口範圍



PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

CONSULTANT
顧問公司
AECOM Asia Company Ltd.
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I/R	DATE	DESCRIPTION	CHK.

STATUS
編定

SCALE
比例
A3 1 : 7000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
KEY LANDSCAPE CHARACTER AREAS WITHIN 100m STUDY AREA
100米研究區域的主要具景觀特色的地方
SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.8.4
60671716/PP/圖2.8.4

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LCA 1 LAM TEI QUARRY LANDSCAPE
具景觀特色的地方 1 藍地石礦場的景觀



LCA 2 TAI LAM SETTLED VALLEY LANDSCAPE
具景觀特色的地方 2 大欖山谷的景觀



LCA 3 LAM TEI MISCELLANEOUS RURAL FRINGE LANDSCAPE
具景觀特色的地方 3 藍地鄉村邊緣景觀



LCA 4 TAI LAM UPLAND AND HILLSIDE LANDSCAPE
具景觀特色的地方 4 大欖高地與山坡林地

ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容簡述	CHK. 核對

STATUS
情況

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60671716

AGREEMENT NO.
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

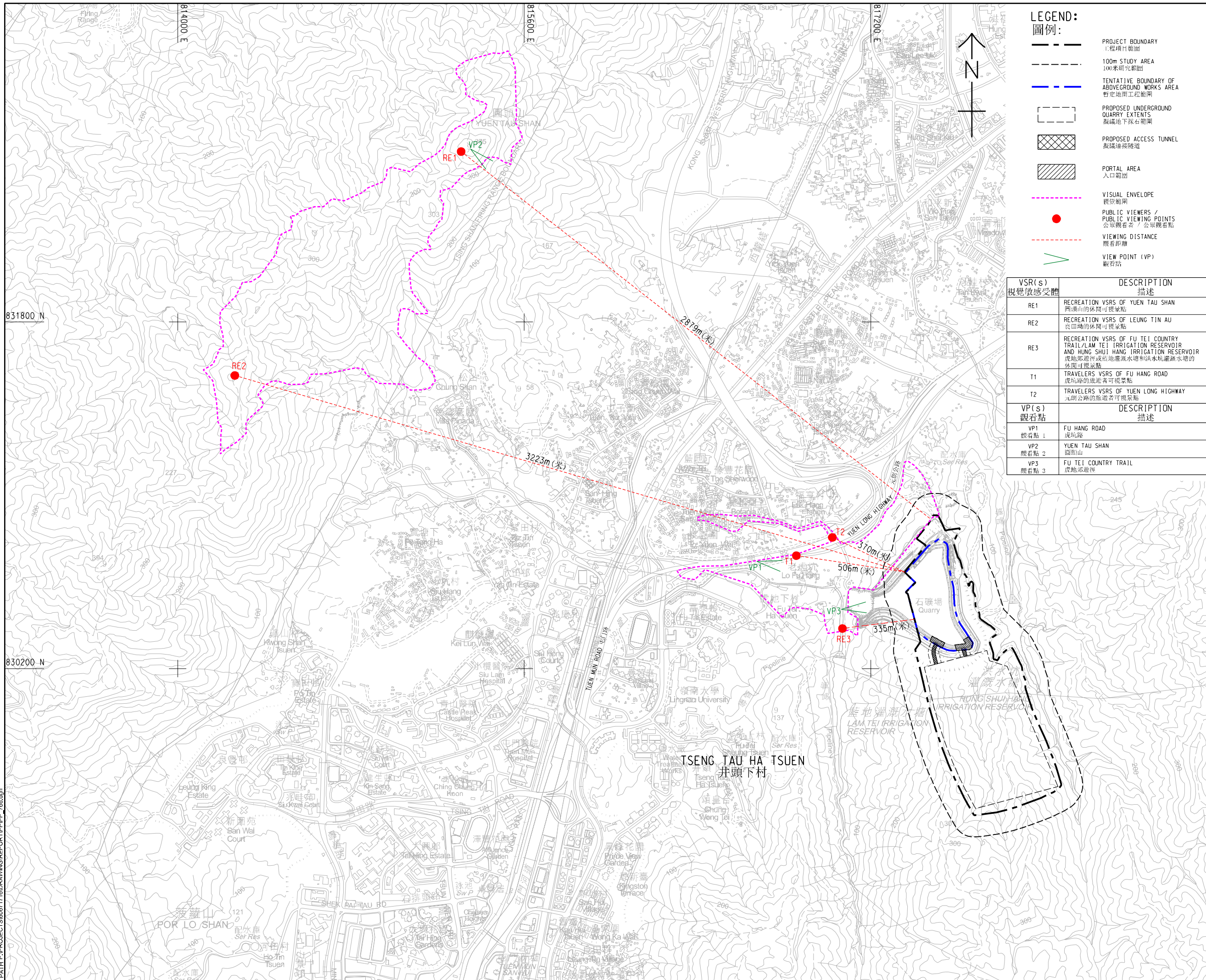
PHOTOGRAPHS OF KEY
LANDSCAPE CHARACTER AREA
主要具景觀特色的地方的照片

SHEET NUMBER
圖紙編號

60671716/PP/FIGURE 2.8.5
60671716/PP/圖2.8.5

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 830200 N
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LEGEND:
圖例:

- PROJECT BOUNDARY
工程計劃範圍
- 100m STUDY AREA
100米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENTS
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議連接隧道
- PORTAL AREA
入口範圍
- VISUAL ENVELOPE
視空範圍
- PUBLIC VIEWERS / PUBLIC VIEWING POINTS
公眾觀者 / 公眾觀看點
- VIEWING DISTANCE
觀看距離
- > VIEW POINT (VP)
觀看點

VSR (s) 視覺感受體	DESCRIPTION 描述
RE1	RECREATION VSRS OF YUEN TAU SHAN 圓頭山的休閒可視景點
RE2	RECREATION VSRS OF LEUNG TIN AU 良田地的休閒可視景點
RE3	RECREATION VSRS OF FU TEI COUNTRY TRAIL/LAM TEI IRRIGATION RESERVOIR AND HUNG SHUI HANG IRRIGATION RESERVOIR 赤地郊遊徑或藍地灌溉水塘和洪水坑灌溉水塘的休閒可視景點
T1	TRAVELERS VSRS OF FU HANG ROAD 虎坑路的旅客可視景點
T2	TRAVELERS VSRS OF YUEN LONG HIGHWAY 元朗公路的旅客可視景點
VP (s) 觀看點	DESCRIPTION 描述
VP1 觀看點 1	FU HANG ROAD 虎坑路
VP2 觀看點 2	YUEN TAU SHAN 圓頭山
VP3 觀看點 3	FU TEI COUNTRY TRAIL 赤地郊遊徑

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PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

CONSULTANT
顧問公司
AECOM Asia Company Ltd.
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STATUS
編制

SCALE
比例
A3 1: 16000

DIMENSION UNIT
量度單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

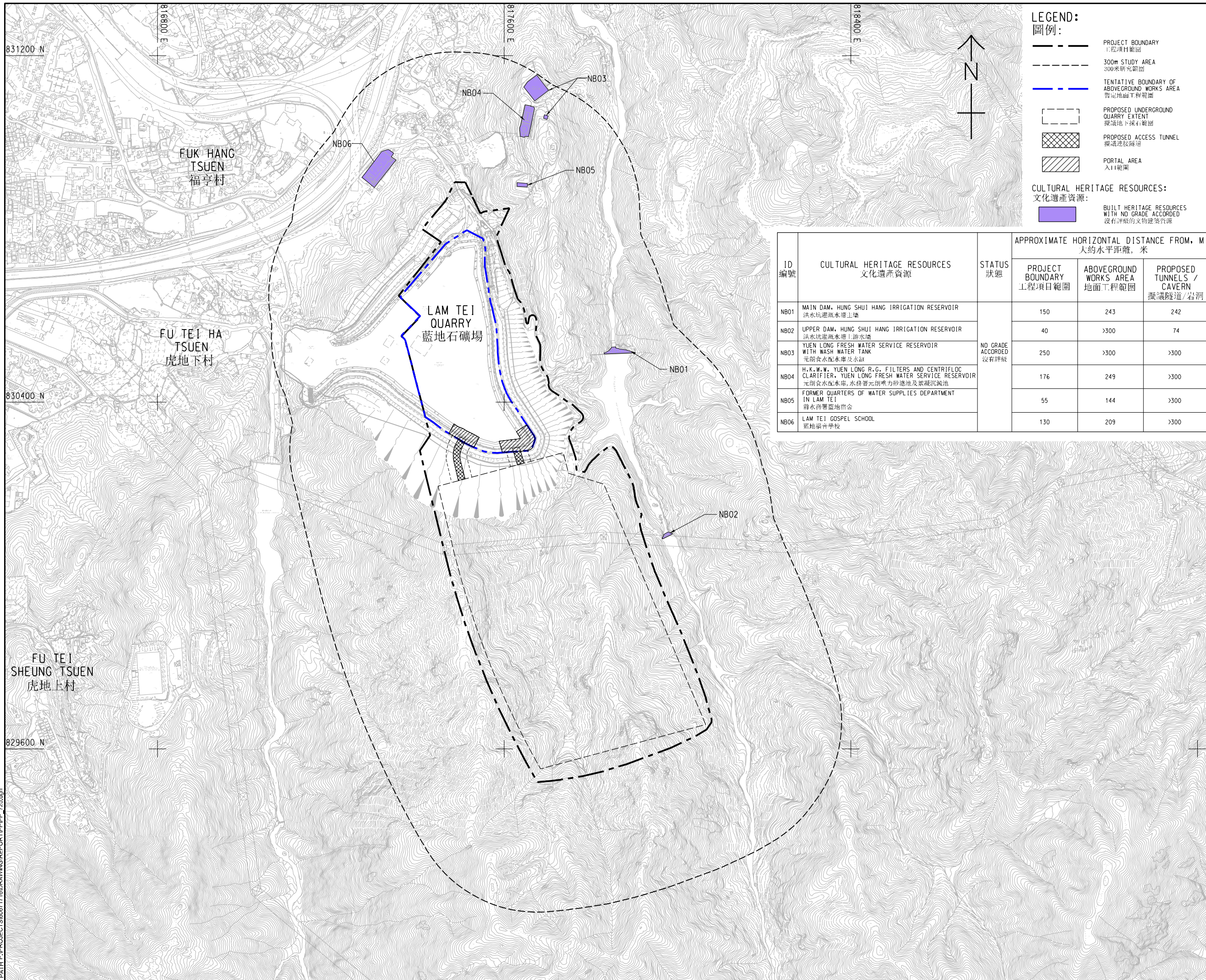
AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
LOCATIONS OF KEY VISUAL SENSITIVE RECEIVERS AND PHOTOMONTAGE VIEWPOINTS
主要視覺敏感受體與拼貼照片的觀看點

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.8.6
60671716/PP/圖2.8.6

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LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- 300m STUDY AREA
300米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENT
擬議地下採石範圍
- PROPOSED ACCESS TUNNEL
擬議探石隧道
- PORTAL AREA
入口範圍

CULTURAL HERITAGE RESOURCES:
文化遺產資源:

- BUILT HERITAGE RESOURCES WITH NO GRADE ACCORDED
沒有評級的文物建築資源

ID 編號	CULTURAL HERITAGE RESOURCES 文化遺產資源	STATUS 狀態	APPROXIMATE HORIZONTAL DISTANCE FROM, M 大約水平距離, 米		
			PROJECT BOUNDARY 工程項目範圍	ABOVEGROUND WORKS AREA 地面工程範圍	PROPOSED TUNNELS / CAVERN 擬議隧道/岩洞
NB01	MAIN DAM, HUNG SHUI HANG IRRIGATION RESERVOIR 洪水坑灌溉水塘上壩	NO GRADE ACCORDED 沒有評級	150	243	242
NB02	UPPER DAM, HUNG SHUI HANG IRRIGATION RESERVOIR 洪水坑灌溉水塘上壩水塘		40	>300	74
NB03	YUEN LONG FRESH WATER SERVICE RESERVOIR WITH WASH WATER TANK 元朗食水配水庫及水缸		250	>300	>300
NB04	H.K.W.W. YUEN LONG R.G. FILTERS AND CENTRIFLOC CLARIFIER, YUEN LONG FRESH WATER SERVICE RESERVOIR 元朗食水配水庫, 水務署元朗噴力砂濾池及絮凝沉澱池		176	249	>300
NB05	FORMER QUARTERS OF WATER SUPPLIES DEPARTMENT IN LAM TEI 前水務署藍地宿舍		55	144	>300
NB06	LAM TEI GOSPEL SCHOOL 藍地福音學校		130	209	>300

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PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

CONSULTANT
顧問公司
AECOM Asia Company Ltd.
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NO.	DATE	DESCRIPTION	CHK.

STATUS
狀態

SCALE
比例尺
A3 1:8000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

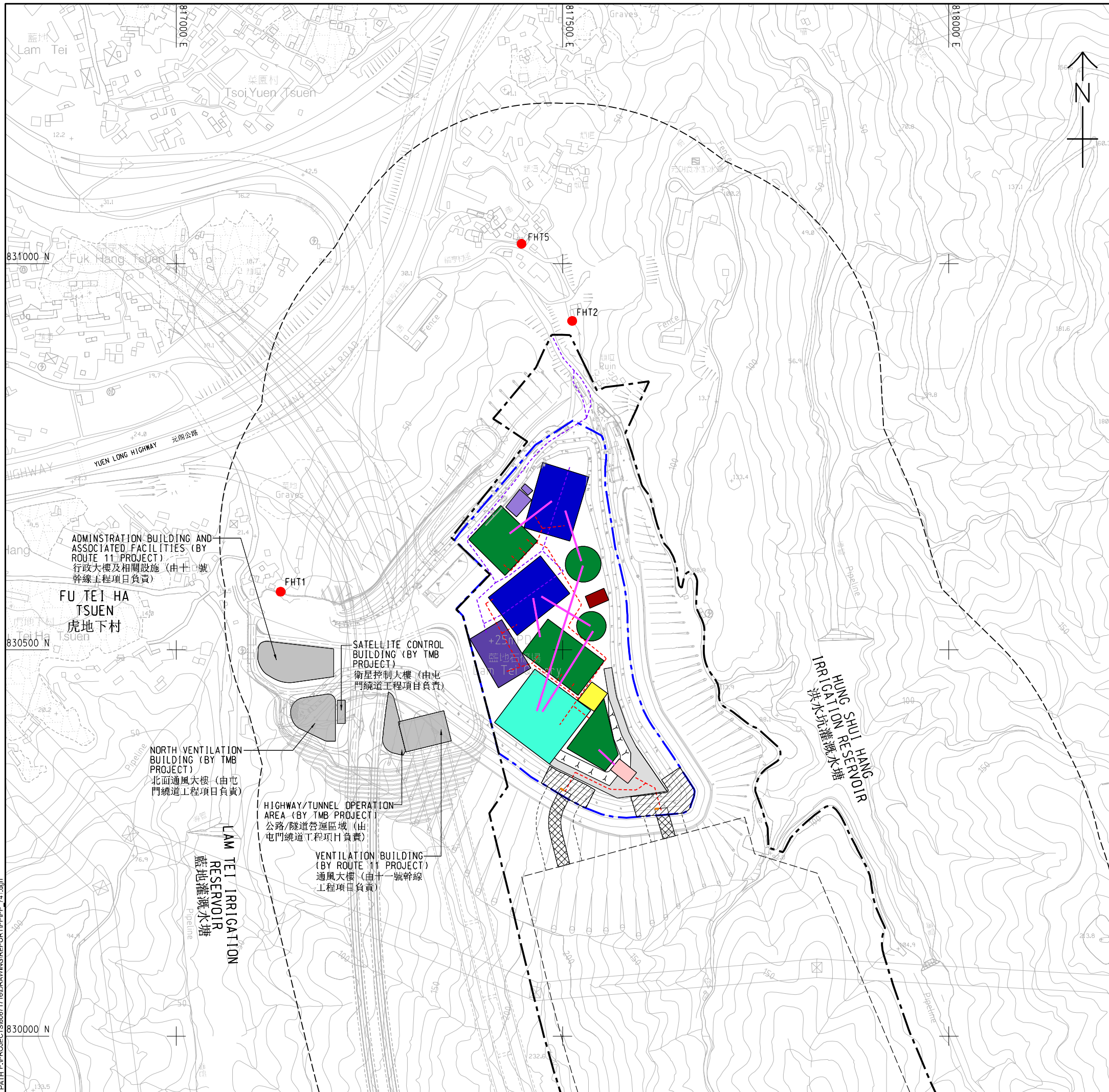
PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
LOCATIONS OF CULTURAL HERITAGE RESOURCES WITHIN 300m STUDY AREA
300米研究範圍內文化遺產資源的位置

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 2.9
60671716/PP/圖2.9

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LEGEND:
圖例:

- PROJECT BOUNDARY
1. 項目範圍
- 300m STUDY AREA
300米研究範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- PROPOSED UNDERGROUND QUARRY EXTENT
擬定地下採石範圍
- PROPOSED ACCESS TUNNEL
擬定運送隧道
- PORTAL AREA
入口範圍
- FHT1
- INTERNAL TRAFFIC ROUTE (LOADER)
場內運輸路線(搬土機)
- EXTERNAL TRAFFIC ROUTE (CONCRETE TRUCK)
場外運輸路線(混凝土車)
- CONVEYOR BELT
輸送帶
- VENTILATION SYSTEM
通風系統
- PROPOSED FILL SLOPE (1 IN 1.5)
擬定填土坡
- PRIMARY ROCK CRUSHER
初級岩石破碎機
- SECONDARY & TERTIARY ROCK CRUSHER
次級及進階岩石破碎機
- STOCKPILE AREA
石材存放區
- CONCRETE BATCHING PLANT
混凝土配料廠
- ASPHALT PRODUCTION PLANT
瀝青生產廠
- RAMP / PLATFORM
坡道/平台
- WORKSHOP
工場
- TRANSFORMER ROOM
變壓器房
- SITE OFFICE
地盤辦公室

MAJOR FIXED NOISE SOURCES 主要固定噪音源	QUANTITY 數量
PRIMARY ROCK CRUSHER 初級岩石破碎機	1
SECONDARY & TERTIARY ROCK CRUSHER 次級及進階岩石破碎機	1
CONCRETE BATCHING PLANT 混凝土配料廠	2
ASPHALT PRODUCTION PLANT 瀝青生產廠	1
WORKSHOP FOR MAINTENANCE 維修工場	1
TRANSFORMER ROOM 變壓器房	1
CONVEYOR BELT 輸送帶	7
VENTILATION SYSTEM 通風系統	2

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修訂

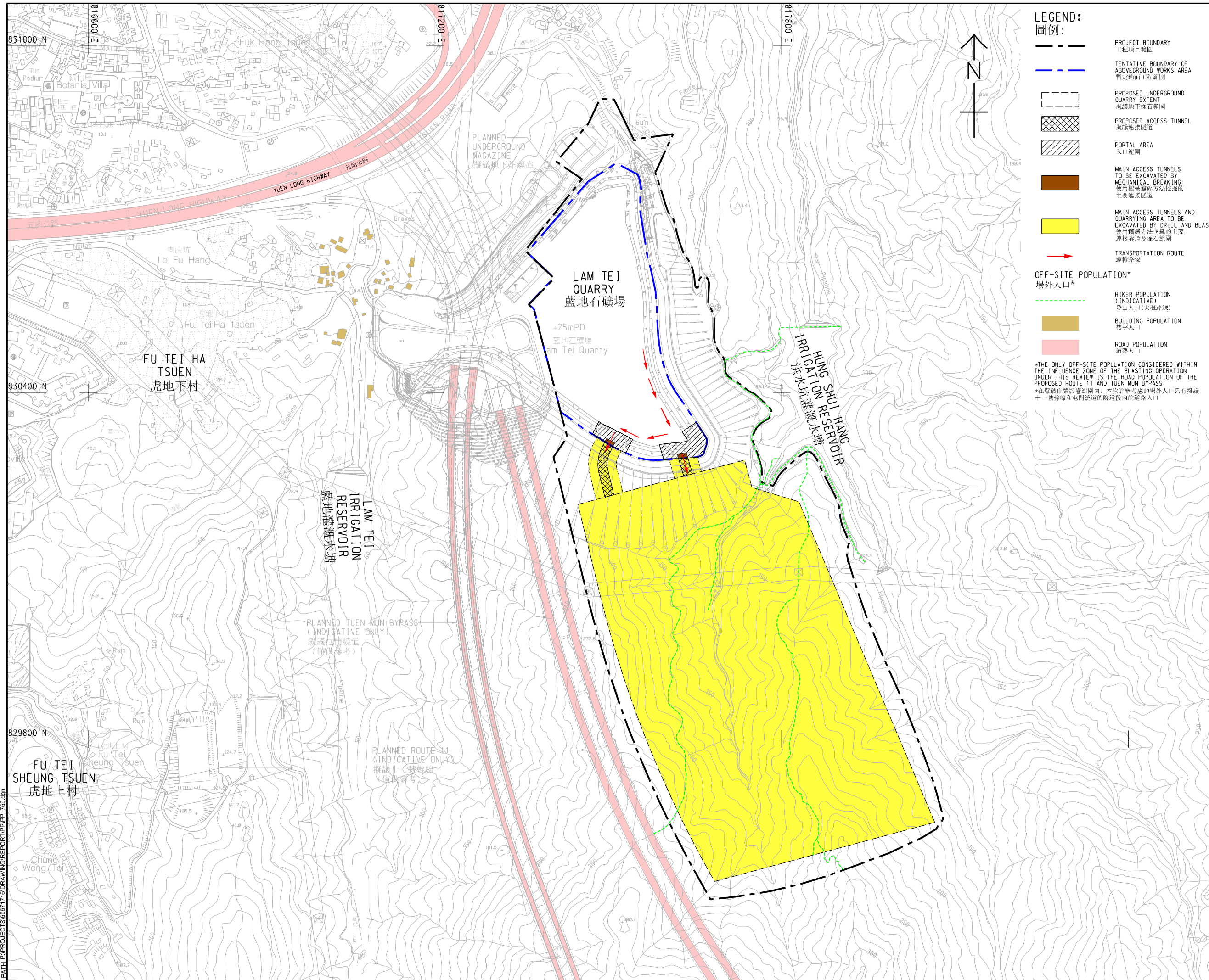
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STATUS
編製

KEY PLAN
索引圖

SHEET TITLE
圖號/片名

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LEGEND:
圖例:

- PROJECT BOUNDARY (項目範圍)
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA (暫定地面工程範圍)
- PROPOSED UNDERGROUND QUARRY EXTENT (擬議地下採石範圍)
- PROPOSED ACCESS TUNNEL (擬議連接隧道)
- PORTAL AREA (入口範圍)
- MAIN ACCESS TUNNELS TO BE EXCAVATED BY MECHANICAL BREAKING (使用機械鑿斫方法挖掘的主要連接隧道)
- MAIN ACCESS TUNNELS AND QUARRYING AREA TO BE EXCAVATED BY DRILL AND BLAST (使用鑽爆方法挖掘的主要連接隧道及採石範圍)
- TRANSPORTATION ROUTE (運輸路線)
- OFF-SITE POPULATION* (場外人口*)
 - HIKER POPULATION (INDICATIVE) (登山人口(大概路線))
 - BUILDING POPULATION (樓宇人口)
 - ROAD POPULATION (道路人口)

*THE ONLY OFF-SITE POPULATION CONSIDERED WITHIN THE INFLUENCE ZONE OF THE BLASTING OPERATION UNDER THIS REVIEW IS THE ROAD POPULATION OF THE PROPOSED ROUTE 11 AND TUEN MUN BYPASS.
 *在爆破作業影響範圍內，本次評審考慮的場外人口只有擬議十一號幹線和屯門繞道的隧道段內的道路人口。

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PROJECT
 LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
 藍地石礦場 (藍地地下採石發展)

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

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NO.	DATE	DESCRIPTION	CHK.

STATUS
 編製

SCALE
 比例

A3 1 : 6000

DIMENSION UNIT
 單位

METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60671716

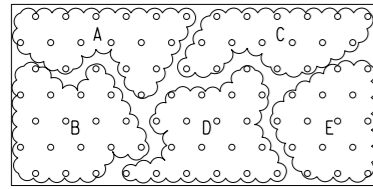
AGREEMENT NO.
 協議編號
 CE 51/2020 (GE)

SHEET TITLE
 圖則名稱
 BLASTING EXTENT AND ON-SITE TRANSPORT ROUTE (INDICATIVE) & LOCATIONS OF OFF-SITE POPULATION
 爆破範圍及場內運輸路線示意圖 & 場外人口位置圖

SHEET NUMBER
 圖則編號
 60671716/PP/FIGURE 3.6
 60671716/PP/圖3.6

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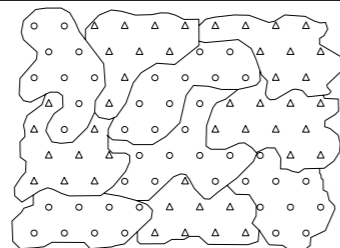


INDICATIVE LAYOUT OF PLANTING MATRIX FOR WOODLAND SHRUB AND CLIMBER MIX PLANTING
灌木和攀援植物混合種植的示意佈局

NOTE:
備注
1. PLANT EACH SPECIES IN GROUPS OF 15 TO 30 IN RANDOM. PLANT ALL SPECIES IN STAGGER PATTERN.
1. 每個物種以15到30株為一組，隨機分佈進行種植。所有物種按錯落的模式進行種植。

LEGEND:
圖例

WOODLAND SHRUB AND CLIMBER
林地灌木和攀援植物

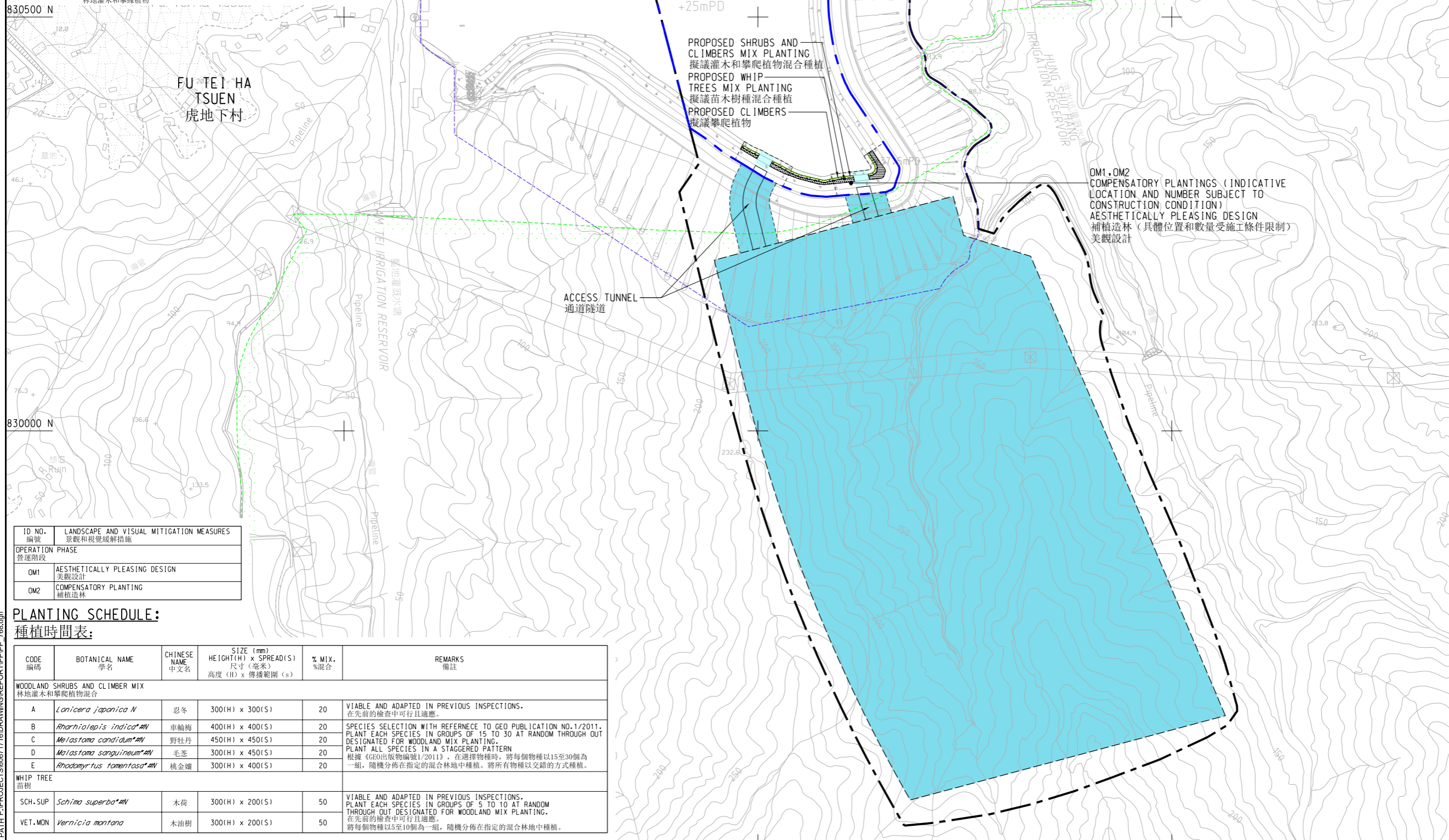


INDICATIVE LAYOUT OF PLANTING MATRIX FOR WHIP TREE MIX PLANTING
苗樹混合種植的示意佈局

NOTE:
備注
1. PLANT EACH SPECIES IN GROUPS OF 5 TO 10 IN RANDOM. PLANT ALL SPECIES IN STAGGER PATTERN.
1. 每個物種以5到10株為一組，隨機分佈進行種植。所有物種按錯落的模式進行種植。

LEGEND:
圖例

SCH. SUP.
VET. MON.



LEGEND:
圖例:

- PROJECT BOUNDARY
工程項目範圍
- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- SITE BOUNDARY OF EXISTING LAM TEI QUARRY / SURFACE LAND OF UNDERGROUND QUARRY
現有藍地石礦場範圍或地下採石場面層
- PROPOSED CLIMBERS
擬議攀援植物
- TAI LAM COUNTRY PARK
大欖郊野公園
- LAM TEI UNDERGROUND QUARRY
藍地地下採石場
- PERMANENT LAND REMOVAL
永久土地移除
- PROPOSED SHRUBS AND CLIMBERS MIX PLANTING
擬議灌木和攀援植物混合種植
- PROPOSED WHIP TREES MIX PLANTING
擬議苗樹混合種植

AECOM

PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

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NO.	DATE	DESCRIPTION	CHK.

STATUS
階段

SCALE
比例
A3 1 : 5000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

ID NO. 編號	LANDSCAPE AND VISUAL MITIGATION MEASURES 景觀和視覺緩解措施
OPERATION PHASE 營運階段	
OM1	AESTHETICALLY PLEASING DESIGN 美觀設計
OM2	COMPENSATORY PLANTING 補植造林

PLANTING SCHEDULE:
種植時間表:

CODE 編碼	BOTANICAL NAME 學名	CHINESE NAME 中文名	SIZE (mm) HEIGHT (H) x SPREAD(S) 尺寸 (毫米) 高度 (H) x 傳播範圍 (s)	% MIX. %混合	REMARKS 備註
WOODLAND SHRUBS AND CLIMBER MIX 林地灌木和攀援植物混合					
A	<i>Lonicera japonica</i> N	忍冬	300(H) x 300(S)	20	VIALE AND ADAPTED IN PREVIOUS INSPECTIONS. 在先前的檢查中可行且適應。
B	<i>Rhynchospora indica</i> *#N	車輪梅	400(H) x 400(S)	20	SPECIES SELECTION WITH REFERENCE TO GEO PUBLICATION NO.1/2011. PLANT EACH SPECIES IN GROUPS OF 15 TO 30 AT RANDOM THROUGH OUT DESIGNATED FOR WOODLAND MIX PLANTING. PLANT ALL SPECIES IN A STAGGERED PATTERN. 根據《GEO出版物編號1/2011》，在選擇物種時，將每個物種以15至30個為一組，隨機分佈在指定的混合林地中種植。將所有物種以交錯的方式種植。
C	<i>Meibomia candidum</i> *#N	野牡丹	450(H) x 450(S)	20	
D	<i>Malostoma sanguineum</i> *#N	毛蕊	300(H) x 450(S)	20	
E	<i>Rhodomyrtus tomentosa</i> *#N	桃金娘	300(H) x 400(S)	20	
WHIP TREE 苗樹					
SCH. SUP.	<i>Schima superba</i> *#N	木荷	300(H) x 200(S)	50	VIALE AND ADAPTED IN PREVIOUS INSPECTIONS. PLANT EACH SPECIES IN GROUPS OF 5 TO 10 AT RANDOM THROUGH OUT DESIGNATED FOR WOODLAND MIX PLANTING. 在先前的檢查中可行且適應。
VET. MON.	<i>Vernicia montana</i>	木油樹	300(H) x 200(S)	50	將每個物種以5至10個為一組，隨機分佈在指定的混合林地中種植。

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PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
LANDSCAPE AND VISUAL MITIGATION MEASURES
景觀和視覺緩解措施

SHEET NUMBER
圖紙編號
60671716/PP/FIGURE 4.8.1
60671716/PP/圖4.8.1

EXISTING CONDITION 現有狀況



WITHOUT MITIGATION 沒有緩解措施



WITH MITIGATION 有緩解措施



PROJECT

LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)
藍地石礦場 (藍地地下採石場
發展)

CLIENT



CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

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

STATUS

SCALE

A3 1: 1000

DIMENSION UNIT

METRES

KEY PLAN

PROJECT NO.

60671716

AGREEMENT NO.

CE 51/2020 (GE)

SHEET TITLE

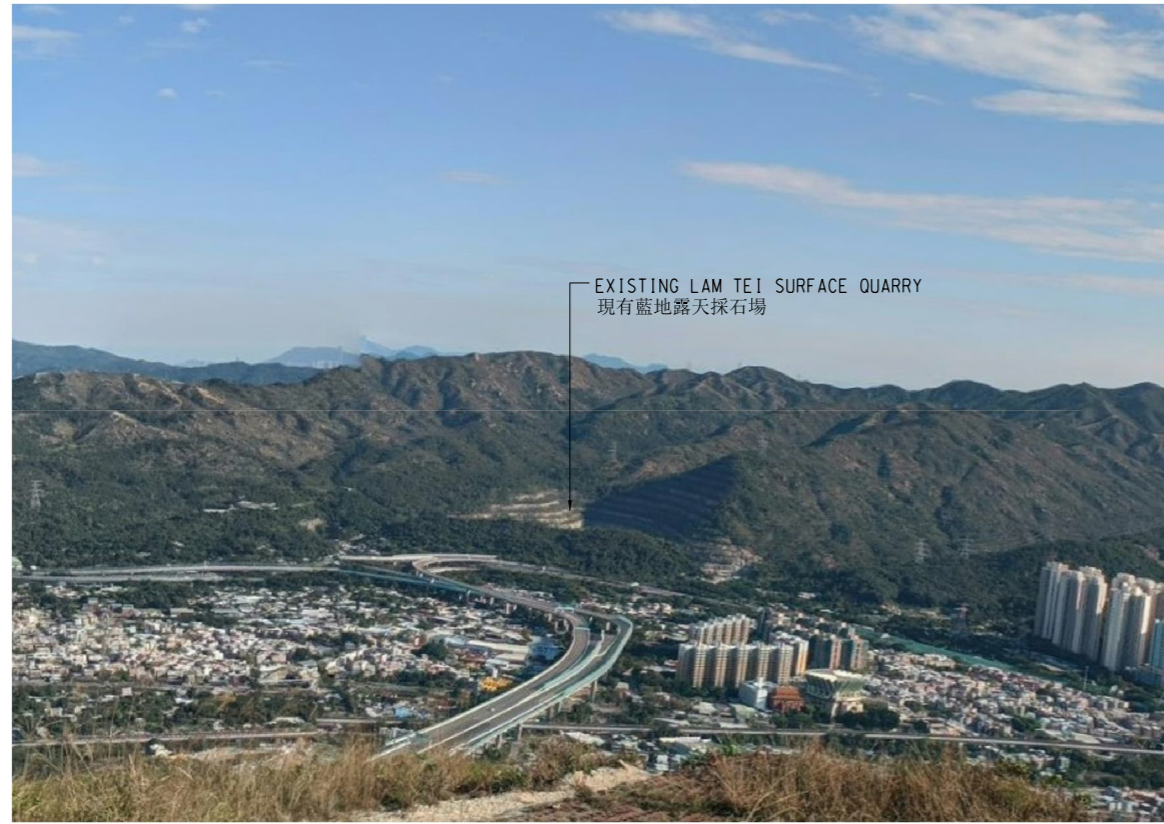
PHOTOMONTAGE OF VP1
觀看點 1 的拼貼照片

SHEET NUMBER

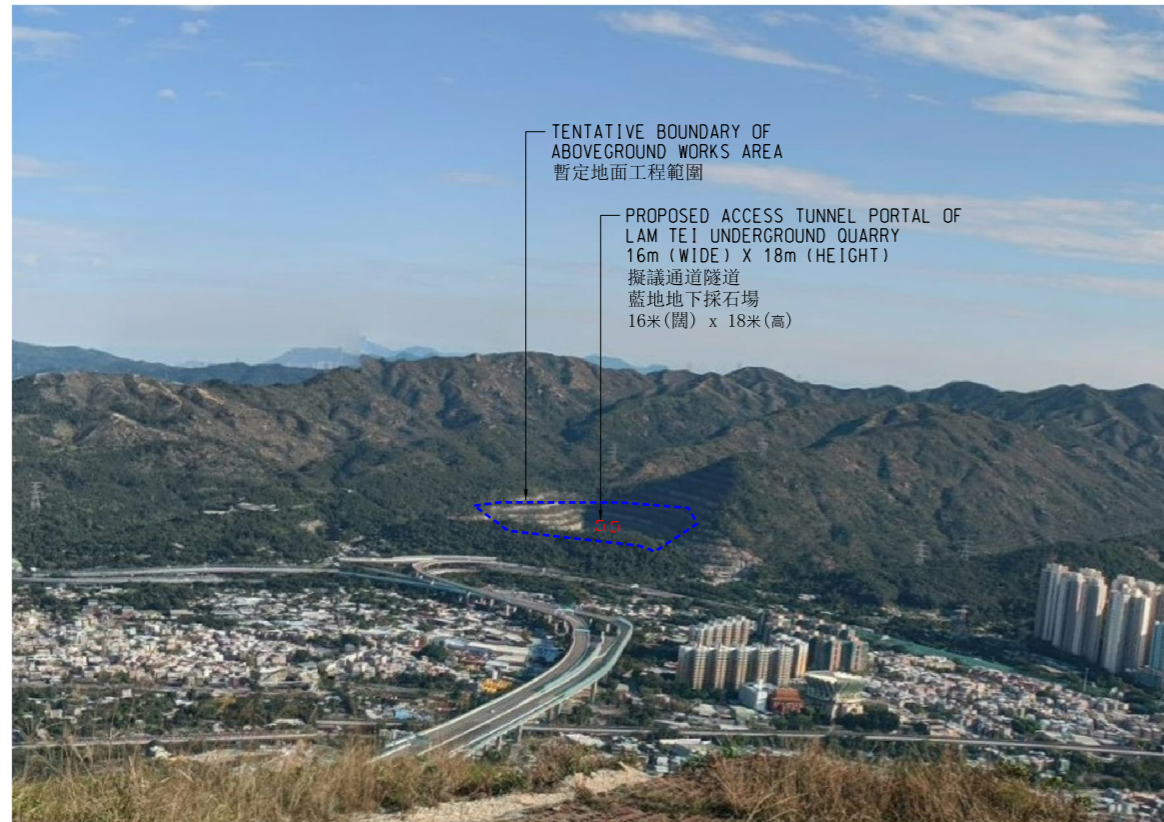
60671716/PP/FIGURE 4.8.2
60671716/PP/圖4.8.2

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EXISTING CONDITION
現有狀況



WITHOUT MITIGATION
沒有緩解措施



WITH MITIGATION
有緩解措施



PROJECT
項目

LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)
藍地石礦場 (藍地地下採石場
發展)

CLIENT
業主



CONSULTANT
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ISSUE/REVISION
修訂

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

STATUS
階段

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60671716

AGREEMENT NO.
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

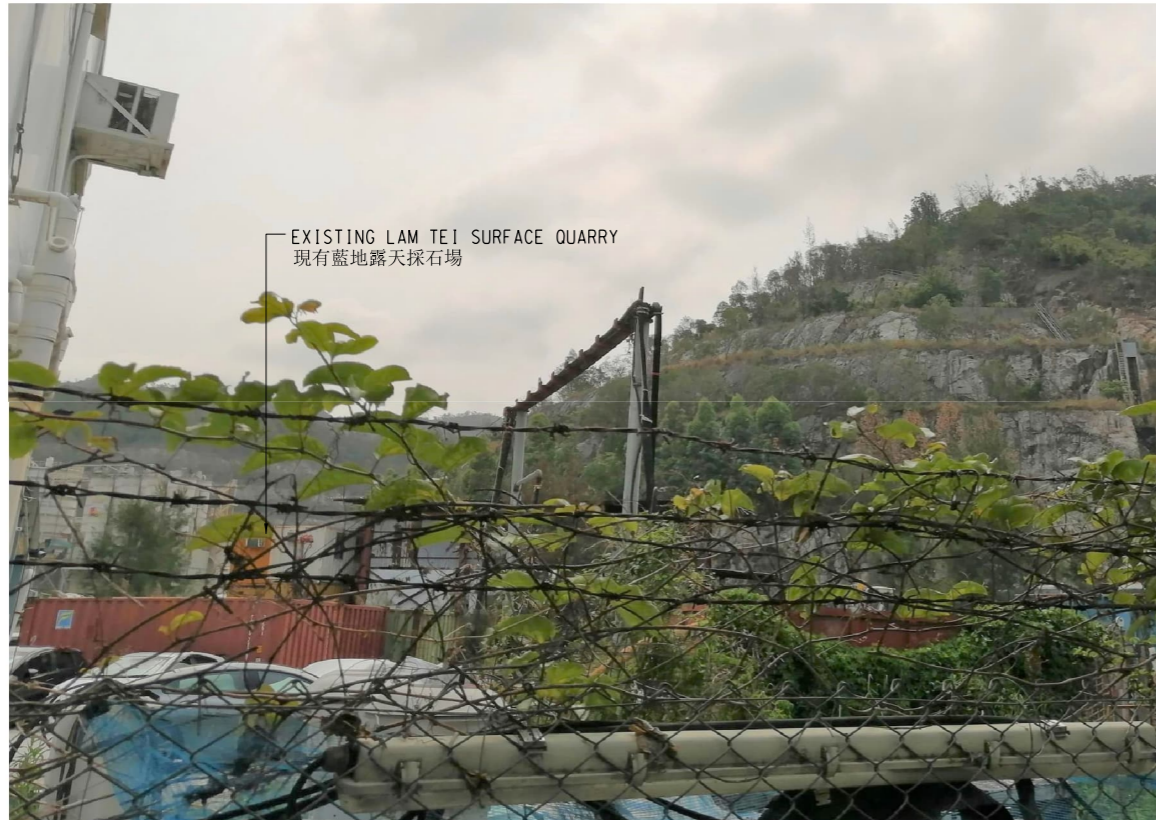
PHOTOMONTAGE OF VP2
觀看點 2 的拼貼照片

SHEET NUMBER
圖紙編號

60671716/PP/FIGURE 4.8.3
60671716/PP/圖4.8.3

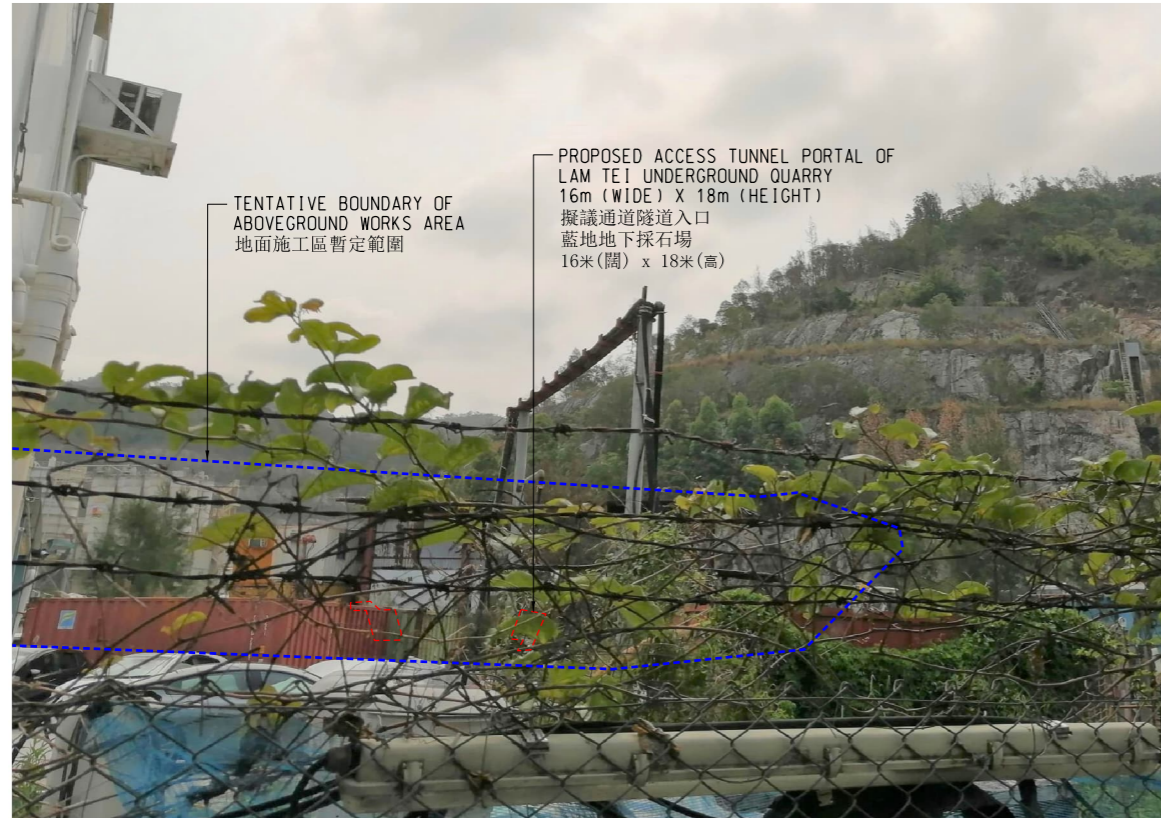
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EXISTING CONDITION
現有狀況



EXISTING LAM TEI SURFACE QUARRY
現有藍地露天採石場

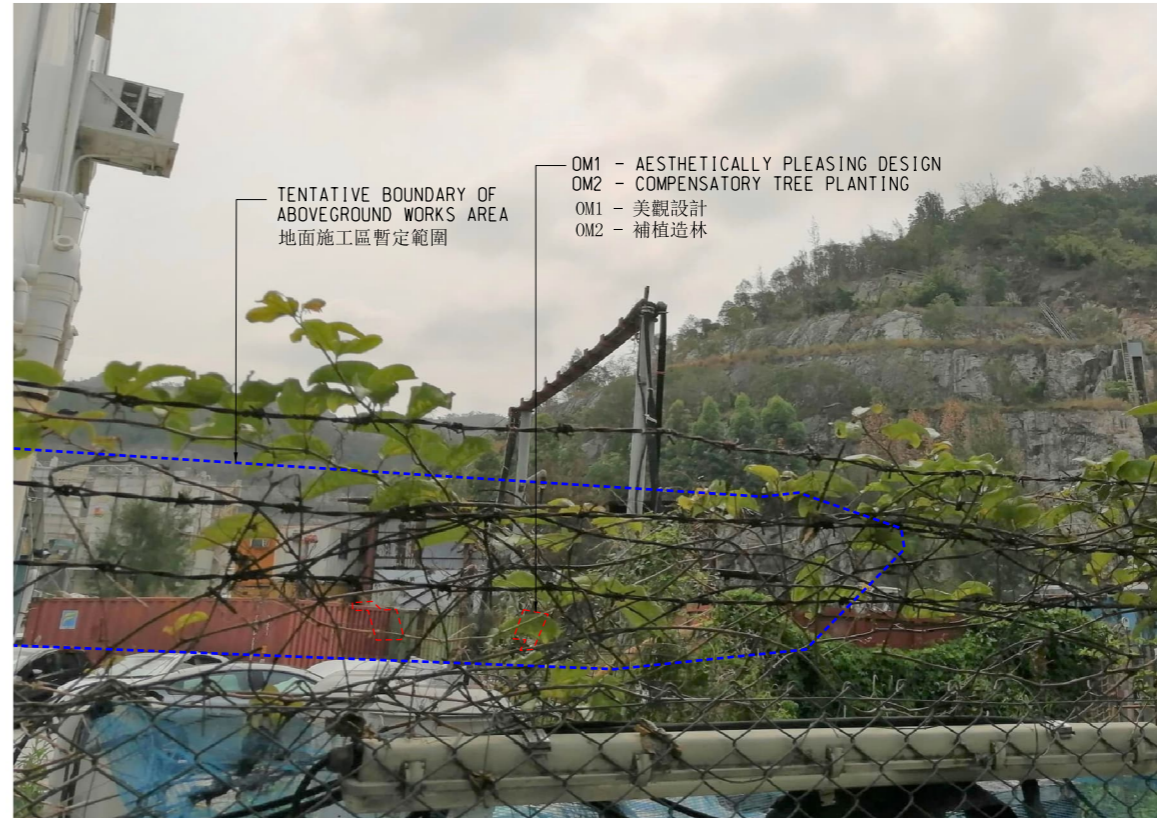
WITHOUT MITIGATION
沒有緩解措施



TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
地面施工區暫定範圍

PROPOSED ACCESS TUNNEL PORTAL OF LAM TEI UNDERGROUND QUARRY
16m (WIDE) X 18m (HEIGHT)
擬議通道隧道入口
藍地地下採石場
16米(闊) x 18米(高)

WITH MITIGATION
有緩解措施



TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
地面施工區暫定範圍

OM1 - AESTHETICALLY PLEASING DESIGN
OM2 - COMPENSATORY TREE PLANTING
OM1 - 美觀設計
OM2 - 補植造林

ISSUE/REVISION
修訂

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

STATUS
狀態

SCALE
比例

A3 1 : 1000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

60671716

AGREEMENT NO.
協議編號

CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

PHOTOMONTAGE OF VP3
觀看點 3 的拼貼照片

SHEET NUMBER
圖紙編號

60671716/PP/FIGURE 4.8.4
60671716/PP/圖4.8.4

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APPENDICES
附錄

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Appendix 1.1
Tentative Project Programme
附錄 1.1
暫定工程項目計劃

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Appendix 2.3.1
Photographs of Representative Noise Sensitive Receivers

附錄 2.3.1
具代表性噪音感應強的地方的相片

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Plate 1 相片 1 –
FHT1: Squatter House out of the Northwestern Entrance of the Existing Lam Tei Quarry
現有藍地石礦場西北面入口外的寮屋



Plate 2 相片 2–
FHT2: Squatter House at the Northeast of the Project Boundary
工程項目範圍東北面的寮屋



Plate 3 相片 3 –
FHT3: Squatter House at the West of 173 Fuk Hang Tsuen
福亨村 173 號西面的寮屋



Plate 4 相片 4 –
FHT4: Village House at 175 Fuk Hang Tsuen
福亨村 175 號村屋



Plate 5 相片 5 –
FHT5: Tin Hau Temple
天后宮

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AECOM

Agreement No. CE 51/2020 (GE)
Lam Tei Quarry (Development of Lam Tei
Underground Quarry)
合約編號 CE 51/2020 (GE)
藍地石礦場 (藍地地下採石場發展)

**Photographs of Representative Noise Sensitive
Receivers**

具代表性噪音感應強的地方的相片

DATE 日期

May-24

DRAWN 繪製

LAUS

JOB NO.

60671716

**Appendix No.
附錄
2.3.1**

Rev

-

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Appendix 2.3.2
Prevailing Background Noise Measurement and Adopted
Criteria

附錄 2.3.2
主要的背景噪音測量和採用的標準

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Appendix 2.3.2 Prevailing Background Noise Measurement and Adopted Criteria

1 INTRODUCTION

1.1 In accordance with Table 1A of the EIAO-TM, noise criteria for planned fixed plant sources should be determined as follows:

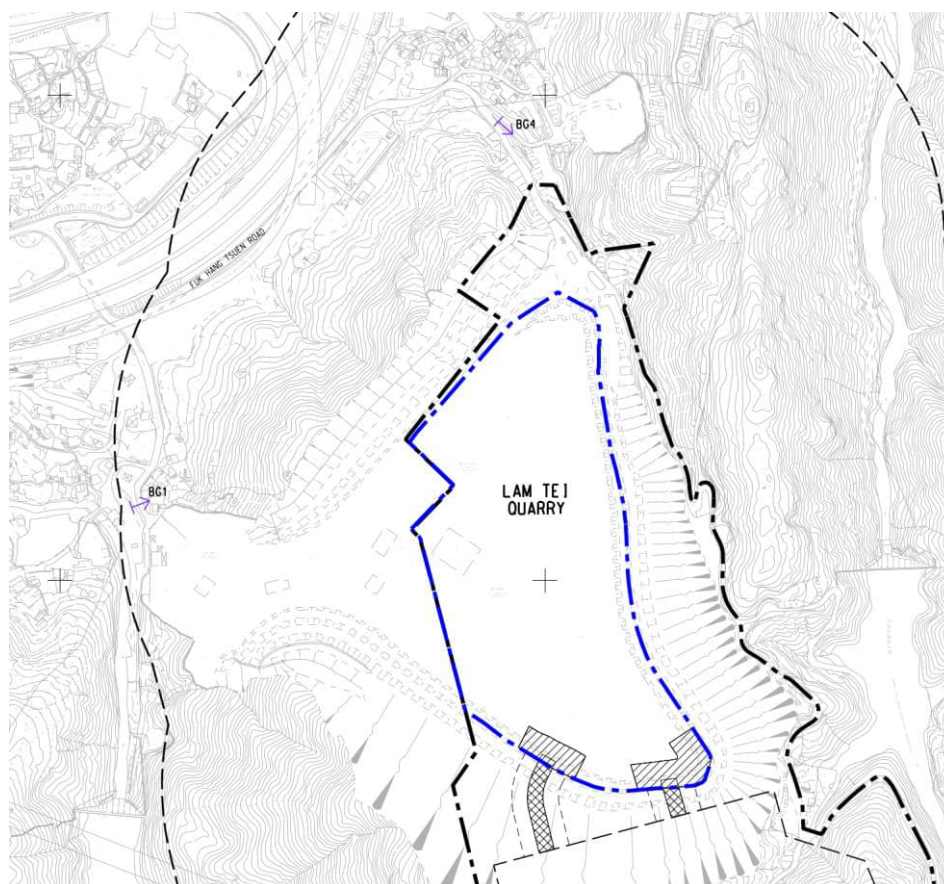
- 5 dB(A) below the appropriate ANL set out in the IND-TM; or
- prevailing background noise level where the prevailing background noise level is 5 dB(A) below the appropriate ANL (i.e. ANL – 5 dB(A)).

1.2 Prevailing background noise measurements were conducted to determine the noise criteria for fixed plant noise assessment. This appendix presents the details of the prevailing background noise measurement and the results of the measurement.

2 MEASUREMENT PARAMETERS

Measurement Location and Date

2.1 The prevailing background noise measurements were conducted at two locations (i.e. BG_1 and BG_4) in Lam Tei for a continuous period of 48 hours, including one weekday and one Sunday or public holiday.



2.2 The details of the noise measurement conducted in April 2023 are presented in **Table 1** below. Photographs taken during the measurement are presented in **Annex A** of this Appendix.

Table 1 Measurement Locations and Dates

Location ID	Measurement Location	Measurement Type	Measurement Date
BG1	Chui Fuk Road near the Entrance of the Existing LTQ	Free-field	14 th & 15 th April 2023 (Weekday) 16 th April 2023 (Weekend)
BG4	Lamp Post (VD1246) at Fuk Hang Tsuen Path	with façade	21 st & 22 nd April 2023 (Weekday) 23 rd April 2023 (Weekend)

3 MEASUREMENT EQUIPMENT

3.1 In accordance with the Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (IND-TM), sound level meters in compliance with the International Electrotechnical Commission Publications 651:1979 (Type 1) and 804:1985 (Type 1) specifications were used for carrying out the noise measurement. Immediately prior to and following each noise measurement, the accuracy of the sound level meter was checked using an acoustic calibrator generating 94dB at 1000 Hz. Measurement was considered to be valid with the calibration level from before and after the noise measurement within 1.0dB. **Table 2** summarises the equipment used in the noise measurement.

Table 2 Noise Measurement Equipment

Equipment	Model ⁽¹⁾
Integrating Sound Level Meter	• Nti XL2 (Serial No. A2A-17788-EO)
Calibrator	• B&K 4231 (Serial No. 3006428)

Note:

(1) Calibration certificates are provided in **Annex B** of this appendix.

4 MEASUREMENT PROCEDURES

4.1 During the noise measurement, the following procedures were followed:

- Parameters such as frequency weighting, the time weighting and the duration of measurement were set as follows:

Frequency weighting:	A
Time weighting:	Fast
Duration of measurement:	48 hours (with data being logged at every one second)

4.2 Prior to and after each noise measurement, the sound level meter was calibrated using the Calibrator for 94 dB at 1000 Hz. If the difference in the calibration level before and after measurement was more than 1 dB (A), the measurement is considered invalid and a repeat of noise measurement should be required after repair or re-calibration of the equipment.

- All the measurement data within the sound level meter system were downloaded through the computer software. All these data were then checked and reviewed properly.
- Noise measurement was conducted in the absence of fog, rain, and wind with a steady speed lower than 5 m/s, or wind with gusts lower than 10 m/s.

5 RESULTS OF NOISE MEASUREMENT

5.1 The results of the measurement are summarised in **Table 3**. The noise criteria for fixed plant noise assessment were determined after the prevailing background noise measurements were conducted and presented in **Table 4**. Reference of prevailing noise measurement results were also made to the concurrent projects (i.e. Route 11 and Tuen Mun Bypass). The lowest measured background noise levels should be adopted for determining the appropriate fixed noise criteria for the nearby NSRs.

Table 3 Measured Prevailing Background Noise Level

Location ID	Measurement Location	Measured Noise Level ⁽¹⁾ , L ₉₀ (1hr), dB(A)				Measurement Condition
		Daytime and Evening (0700 to 2300 hours)		Night-time (2300 to 0700 hours)		
		Weekday	Weekend	Weekday	Weekend	
LTQ Projects						
BG1	Chui Fuk Road near the Entrance of the Existing LTQ	55	52	48	50	Free-field
BG4	Lamp Post (VD1246) at Fuk Hang Tsuen Path	50	47	43	42	with façade
Route 11 and Tuen Mun Bypass ⁽²⁾						
PNM-LT	Fu Tei Ha Tsuen, Lam Tei	50	52	45	47	Free-field

Notes:

- (1) A +3dB(A) façade correction was added to the free-field measurement result to account for the façade effect.
- (2) Reference of the prevailing noise measurement results from the EIA Reports of Route 11 (EIA-297/2023) and Tuen Mun Bypass (EIA-298/2023) was also made. Given that the measurement location at PNM-LT under Route 11 and Tuen Mun Bypass Projects was located in close proximity to BG1, a direct comparison between BG1 and PNM-LT was conducted to determine the appropriate fixed noise criteria for the nearby NSRs (i.e. FHT1).

Table 4 Fixed Plant Noise Criteria

NSR	Description	Area Sensitive Rating	Acceptable Noise Level (ANL), dB(A)		ANL-5, dB(A)		Referred Measurement Location	Prevailing Noise Level, dB(A)				Fixed Plant Noise Criterion for Assessment, dB(A)	
			Daytime & Evening	Night-time	Daytime & Evening	Night-time		Daytime & Evening		Night-time		Daytime & Evening	Night-time
								Weekday	Weekend	Weekday	Weekend		
FHT1	Squatter House out of the Northwestern Entrance of the Existing Lam Tei Quarry	A	60	50	55	45	PNM-LT	50	52	45	47	50	45
FHT2	Squatter House at the Northeast of the Project Boundary	A	60	50	55	45	BG4	50	47	43	42	47	42
FHT3	Squatter House at the West of 173 Fuk Hang Tsuen	A	60	50	55	45	BG4	50	47	43	42	47	42
FHT4	Village House at 175 Fuk Hang Tsuen	A	60	50	55	45	BG4	50	47	43	42	47	42
FHT5	Tin Hau Temple	A	60	50	55	45	BG4	50	47	43	42	47	42

Annex A
Setup of Sound Level Meter

- BG1 Measurement at Chui Fuk Road near the Entrance of the Existing LTQ



- BG4 Measurement at Lamp Post (VD1246) at Fuk Hang Tsuen Path



Annex B
Calibration Certificates

1. Calibration Certificate - Sound Level Meter



綜合試驗有限公司

SOILS & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈

Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong

Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.: 22CA0512 02-01

Page 1 of 2

Item tested

Description:	Sound Level Meter (Type 1)	Microphone	Preamp
Manufacturer:	Nti	Nti Andio	Nti Andio
Type/Model No.:	XL2	MC230A	MA220
Serial/Equipment No.:	A2A-17788-EO	A18398	9065
Adaptors used:	-		

Item submitted by

Customer Name: AECOM
Address of Customer: -
Request No.: -
Date of receipt: 12-May-2022

Date of test: 13-May-2022

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Multi function sound calibrator	B&K 4226	2288444	23-Aug-2022	CIGISMEC
Signal generator	DS 360	33873	27-May-2022	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- 1, The Sound Level Meter has been calibrated in accordance with the requirements as specified in BS 7580: Part 1: 1997 and the lab calibration procedure SMTP004-CA-152.
- 2, The electrical tests were performed using an electrical signal substituted for the microphone which was removed and replaced by an equivalent capacitance within a tolerance of $\pm 20\%$.
- 3, The acoustic calibration was performed using an B&K 4226 sound calibrator and corrections was applied for the difference between the free-field and pressure responses of the Sound Level Meter.

Test results

This is to certify that the Sound Level Meter conforms to BS 7580: Part 1: 1997 for the conditions under which the test was performed.

Details of the performed measurements are presented on page 2 of this certificate.

Actual Measurement data are documented on worksheets.

Approved Signatory:

Feng Junqi

Date: 14-May-2022

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument. The results apply to the item as received.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 22CA0512 02-01

Page 2 of 2

1, Electrical Tests

The electrical tests were performed using an equivalent capacitance substituted for the microphone. The results are given in below with test status and the estimated uncertainties. The "Pass" means the result of the test is inside the tolerances stated in the test specifications. The "-" means the result of test is outside these tolerances.

Test:	Subtest:	Status:	Expanded Uncertainty (dB)	Coverage Factor
Self-generated noise	A	Pass	0.3	
	C	Pass	0.8	2.1
	Lin	Pass	1.6	2.2
Linearity range for Leq	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Reference SPL on all other ranges	Pass	0.3	
	2 dB below upper limit of each range	Pass	0.3	
	2 dB above lower limit of each range	Pass	0.3	
Linearity range for SPL	At reference range, Step 5 dB at 4 kHz	Pass	0.3	
	Frequency weightings	A	0.3	
Time weightings	A	Pass	0.3	
	C	Pass	0.3	
	Lin	Pass	0.3	
Peak response	Single Burst Fast	Pass	0.3	
	Single Burst Slow	Pass	0.3	
R.M.S. accuracy	Single 100µs rectangular pulse	Pass	0.3	
	Crest factor of 3	Pass	0.3	
Time weighting I	Single burst 5 ms at 2000 Hz	Pass	0.3	
	Repeated at frequency of 100 Hz	Pass	0.3	
Time averaging	1 ms burst duty factor 1/10 ³ at 4kHz	Pass	0.3	
	1 ms burst duty factor 1/10 ⁴ at 4kHz	Pass	0.3	
Pulse range	Single burst 10 ms at 4 kHz	Pass	0.4	
	Sound exposure level	Single burst 10 ms at 4 kHz	Pass	0.4
Overload indication	SPL	Pass	0.3	
	Leq	Pass	0.4	

2, Acoustic tests

The complete sound level meter was calibrated on the reference range using a B&K 4226 acoustic calibrator with 1000Hz and SPL 94 dB. The sensitivity of the sound level meter was adjusted. The test result at 125 Hz and 8000 Hz are given in below with test status and the estimated uncertainties.

Test:	Subtest	Status	Expanded Uncertainty (dB)	Coverage Factor
Acoustic response	Weighting A at 125 Hz	Pass	0.3	
	Weighting A at 8000 Hz	Pass	0.5	

3, Response to associated sound calibrator

N/A

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date:

Fung Chi Yiq
13-May-2022

- End -

Checked by:

Date:

Chan Yuk Yiu
14-May-2022

The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are calibrated on a schedule to maintain the required accuracy level.



Test Data for Sound Level Meter

Page 1 of 6

Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

SELF GENERATED NOISE TEST

The noise test is performed in the most sensitive range of the SLM with the microphone replaced by an equivalent impedance.

Noise level in A weighting 9.6 dB
Noise level in C weighting 14.2 dB
Noise level in Lin 22.1 dB

LINEARITY TEST

The linearity is tested relative to the reference sound pressure level using a continuous sinusoidal signal of frequency 4 kHz. The measurement is made on the reference range for indications at 5 dB intervals starting from the 94 dB reference sound pressure level. And until within 5 dB of the upper and lower limits of the reference range, the measurements shall be made at 1 dB intervals. (SLM set to LEQ/SPL)

Reference/Expected level	Actual level		Tolerance	Deviation	
	non-integrated	integrated		non-integrated	integrated
dB	dB	dB	+/- dB	dB	dB
94.0	94.0	94.0	0.7	0.0	0.0
99.0	99.0	99.0	0.7	0.0	0.0
104.0	104.0	104.0	0.7	0.0	0.0
109.0	109.0	109.0	0.7	0.0	0.0
114.0	114.0	114.0	0.7	0.0	0.0
115.0	115.0	115.0	0.7	0.0	0.0
116.0	116.0	116.0	0.7	0.0	0.0
117.0	117.0	117.0	0.7	0.0	0.0
118.0	118.0	118.0	0.7	0.0	0.0
119.0	119.0	119.0	0.7	0.0	0.0
120.0	120.0	120.0	0.7	0.0	0.0
89.0	89.0	89.0	0.7	0.0	0.0
84.0	84.0	84.0	0.7	0.0	0.0
79.0	79.0	79.0	0.7	0.0	0.0
74.0	74.0	74.0	0.7	0.0	0.0
69.0	69.0	69.0	0.7	0.0	0.0
64.0	64.0	64.0	0.7	0.0	0.0
59.0	59.0	59.0	0.7	0.0	0.0
54.0	54.0	54.0	0.7	0.0	0.0
49.0	49.0	49.0	0.7	0.0	0.0
44.0	44.0	44.0	0.7	0.0	0.0
39.0	39.0	39.0	0.7	0.0	0.0
34.0	34.1	34.1	0.7	0.1	0.1
33.0	33.1	33.1	0.7	0.1	0.1



Test Data for Sound Level Meter

Page 2 of 6

Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

32.0	32.1	32.1	0.7	0.1	0.1
31.0	31.1	31.1	0.7	0.1	0.1
30.0	30.2	30.2	0.7	0.2	0.2

Measurements for an indication of the reference SPL on all other ranges which include it

Other ranges	Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
40-140	94.0	94.0	0.7	0.0
20-120	94.0	94.0	0.7	0.0
0-100	94.0	94.0	0.7	0.0

Measurements on all level ranges for indications 2 dB below the upper limit and 2 dB above the lower limit

Ranges	Reference/Expected level	Actual level	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
40-140	50.0	50.7	0.7	0.7
	138.0	138.0	0.7	0.0
20-120	30.0	30.2	0.7	0.2
	118.0	118.0	0.7	0.0
0-100	30.0	30.0	0.7	0.0
	98.0	98.0	0.7	0.0

FREQUENCY WEIGHTING TEST

The frequency response of the weighting networks are tested at octave intervals over the frequency ranges 31.5 Hz to 12500 Hz. The signal level at 1000 Hz is set to give an indication of the reference SPL.

Frequency weighting A:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
				+	-	
Hz	dB	dB	dB			dB
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	54.6	54.4	1.5	1.5	-0.2
63.1	94.0	67.8	67.7	1.5	1.5	-0.1
125.9	94.0	77.9	77.8	1.0	1.0	-0.1
251.2	94.0	85.4	85.3	1.0	1.0	-0.1
501.2	94.0	90.8	90.8	1.0	1.0	0.0
1995.0	94.0	95.2	95.2	1.0	1.0	0.0
3981.0	94.0	95.0	95.0	1.0	1.0	0.0
7943.0	94.0	92.9	92.9	1.5	3.0	0.0
12590.0	94.0	89.7	89.6	3.0	6.0	-0.1

Frequency weighting C:

Frequency	Ref. level	Expected level	Actual level	Tolerance(dB)		Deviation
				+	-	
Hz	dB	dB	dB			dB



Test Data for Sound Level Meter

Page 3 of 6

Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
 Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	91.0	90.8	1.5	1.5	-0.2
63.1	94.0	93.2	93.1	1.5	1.5	-0.1
125.9	94.0	93.8	93.8	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	93.8	93.8	1.0	1.0	0.0
3981.0	94.0	93.2	93.2	1.0	1.0	0.0
7943.0	94.0	91.0	91.0	1.5	3.0	0.0
12590.0	94.0	87.8	87.6	3.0	6.0	-0.2

Frequency weighting Lin:

Frequency Hz	Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
				+	-	
1000.0	94.0	94.0	94.0	0.0	0.0	0.0
31.6	94.0	94.0	93.8	1.5	1.5	-0.2
63.1	94.0	94.0	93.9	1.5	1.5	-0.1
125.9	94.0	94.0	94.0	1.0	1.0	0.0
251.2	94.0	94.0	94.0	1.0	1.0	0.0
501.2	94.0	94.0	94.0	1.0	1.0	0.0
1995.0	94.0	94.0	94.0	1.0	1.0	0.0
3981.0	94.0	94.0	94.0	1.0	1.0	0.0
7943.0	94.0	94.0	94.0	1.5	3.0	0.0
12590.0	94.0	94.0	94.0	3.0	6.0	0.0

Note: No corrections for the frequency response of the microphone, instrument case and windshield are made to the sound level meter.

TIME WEIGHTING FAST TEST

Time weighting F is tested on the reference range with a single sinusoidal burst of duration 200 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
			+	-	
116.0	115.0	115.0	1.0	1.0	0.0

TIME WEIGHTING SLOW TEST

Time weighting S is tested on the reference range with a single sinusoidal burst of duration 500 ms at a frequency 2000 Hz and an amplitude which produces an indication 4 dB below the upper limit of the primary indicator range when the signal is continuous. (Weight A, Maximum hold)

Ref. level dB	Expected level dB	Actual level dB	Tolerance(dB)		Deviation dB
			+	-	
116.0	111.9	111.9	1.0	1.0	0.0



Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
 Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

PEAK RESPONSE TEST

The onset time of the peak detector is tested on the reference range by comparing the response to a 100 us rectangular test pulse with the response to a 10 ms reference pulse of the same amplitude. The amplitude of the 10 ms reference pulse is such as to produce an indication 1 dB below the upper limit of the primary indicator range.

Positive polarities: (Weighting Z, set the generator signal to single, Lzpeak)

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.9	2.0	-0.1

Negative polarities:

Ref. level	Response to 10 ms	Response to 100 us	Tolerance	Deviation
dB	dB	dB	+/- dB	dB
119.0	119.0	118.8	2.0	-0.2

RMS ACCURACY TEST

The RMS detector accuracy is tested on the reference range for a crest factor of 3.

Test frequency: 2000 Hz
 Amplitude: 2 dB below the upper limit of the primary indicator range.
 Burst repetition frequency: 40 Hz
 Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz. (Set to INT)

Time weighting	Ref. Level	Expected level	Tone burst signal	Tolerance	Deviation
	dB	dB	indication(dB)	+/- dB	dB
Slow	118.0+6.6	118.0	117.9	0.5	-0.1

TIME WEIGHTING IMPULSE TEST

Time weighting I is tested on the reference range (Set the SLM to LAImax)

Test frequency: 2000 Hz
 Amplitude: The upper limit of the primary indicator range.

Single sinusoidal burst of duration 5 ms:

Ref. Level	Single burst indication		Tolerance	Deviation
	dB	Expected (dB)	Actual (dB)	+/- dB
120.0	111.2	111.1	2.0	-0.1

Repeated at 100 Hz

Ref. Level	Repeated burst indication		Tolerance	Deviation
	dB	Expected (dB)	Actual (dB)	+/- dB
120.0	117.3	117.2	1.0	-0.1

TIME AVERAGING TEST

This test compares the SLM reading for continuous sine signals with readings obtained from a sine tone burst sequence having the same RMS level. The test level is 30 dB below the upper limit of the linearity range and repeated for Type 1 SLM with 40 dB below the upper limit of the linearity.

Frequency of tone burst: 4000 Hz

Duration of tone burst: 1 ms

Repetition Time	Level of tone burst	Expected Leq	Actual Leq	Tolerance	Deviation	Remarks



Test Data for Sound Level Meter

Page 5 of 6

Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
 Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

msec	dB	dB	dB	+/- dB	dB	
1000	90.0	90.0	89.9	1.0	-0.1	60s integ.
10000	80.0	80.0	79.9	1.0	-0.1	6min. integ.

PULSE RANGE AND SOUND EXPOSURE LEVEL TEST

The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range

Test frequency: 4000 Hz
 Integration time: 10 sec

The integrating sound level meter set to Leq:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10	88.0	58.0	57.8	1.7	-0.2

The integrating sound level meter set to SEL:

Duration	Rms level of	Expected	Actual	Tolerance	Deviation
msec	tone burst (dB)	dB	dB	+/- dB	dB
10.0	88.0	68.0	68.0	1.7	0.0

OVERLOAD INDICATION TEST

For SLM capable of operating in a non-integrating mode.

Test frequency: 2000 Hz
 Amplitude: 2 dB below the upper limit of the primary indicator range.
 Burst repetition frequency: 40 Hz
 Tone burst signal: 11 cycles of a sine wave of frequency 2000 Hz.

Level	Level reduced by	Further reduced	Difference	Tolerance	Deviation
at overload (dB)	1 dB	3 dB	dB	dB	dB
121.2	120.2	117.2	3.0	1.0	0.0

For integrating SLM, with the instrument indicating Leq.

For integrating SLM, with the instrument indicating Leq and set to the reference range. The test signal as following:
 The test tone burst signal is superimposed on a baseline signal corresponding to the lower limit of reference range
 Test frequency: 4000 Hz
 Integration time: 10 sec
 Single burst duration: 1 msec

Rms level	Level reduced by	Expected level	Actual level	Tolerance	Deviation
at overload (dB)	1 dB	dB	dB	dB	dB
127.4	126.4	86.4	86.2	2.2	-0.2

ACOUSTIC TEST

The acoustic test of the complete SLM is tested at the frequency 125 Hz and 8000 Hz using a B&K type 4226 Multifunction Acoustic Calibrator. The test is performed in A weighting.

Frequency	Expected level	Actual level	Tolerance (dB)		Deviation
Hz	dB	Measured (dB)	+	-	dB



Test Data for Sound Level Meter

Page 6 of 6

Sound level meter type: XL2 Serial No. A2A-17788-EO Date 13-May-2022
Microphone type: MC230A Serial No. A18398

Report: 22CA0512 02-01

1000	94.0	94.0	0.0	0.0	0.0
125	77.9	77.8	1.0	1.0	-0.1
8000	92.9	93.1	1.5	3.0	0.2

-----END-----

2. Calibration Certificate - Acoustical Calibrator



綜合試驗有限公司
SOILS & MATERIALS ENGINEERING CO., LTD.

香港新界葵涌永基路22-24號好爸爸創科大廈
Good Ba Ba Hitech Building, Nos. 22-24 Wing Kei Road, Kwai Chung, New Territories, Hong Kong
Tel: (852) 2873 6860 Fax: (852) 2555 7533 E-mail: smec@cigismec.com Website: www.cigismec.com



CERTIFICATE OF CALIBRATION

Certificate No.: 22CA0504 01

Page: 1 of 2

Item tested

Description: Acoustical Calibrator (Class 1)
Manufacturer: B & K
Type/Model No.: 4231
Serial/Equipment No.: 3006428
Adaptors used: -

Item submitted by

Customer: AECOM
Address of Customer: -
Request No.: -
Date of receipt: 04-May-2022

Date of test: 04-May-2022

Reference equipment used in the calibration

Description:	Model:	Serial No.	Expiry Date:	Traceable to:
Lab standard microphone	B&K 4180	2341427	04-May-2022	SCL
Preamplifier	B&K 2673	2239857	31-May-2022	CEPREI
Measuring amplifier	B&K 2610	2346941	01-Jun-2022	CEPREI
Signal generator	DS 360	33873	27-May-2022	CEPREI
Digital multi-meter	34401A	US36087050	27-May-2022	CEPREI
Audio analyzer	8903B	GB41300350	28-May-2022	CEPREI
Universal counter	53132A	MY40003662	02-Jun-2022	CEPREI

Ambient conditions

Temperature: 22 ± 1 °C
Relative humidity: 55 ± 10 %
Air pressure: 1005 ± 5 hPa

Test specifications

- The Sound Calibrator has been calibrated in accordance with the requirements as specified in IEC 60942 1997 Annex B and the lab calibration procedure SMTP004-CA-156.
- The calibrator was tested with its axis vertical facing downwards at the specific frequency using insert voltage technique.
- The results are rounded to the nearest 0.01 dB and 0.1 Hz and have not been corrected for variations from a reference pressure of 1013.25 hectoPascals as the maker's information indicates that the instrument is insensitive to pressure changes.

Test results

This is to certify that the sound calibrator conforms to the requirements of annex B of IEC 60942: 1997 for the conditions under which the test was performed. This does not imply that the sound calibrator meets IEC 60942 under any other conditions.

Details of the performed measurements are presented on page 2 of this certificate.

Approved Signatory:

Feng Junqi

Date: 05-May-2022

Company Chop:



Comments: The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument.



CERTIFICATE OF CALIBRATION

(Continuation Page)

Certificate No.: 22CA0504 01

Page: 2 of 2

1, Measured Sound Pressure Level

The output Sound Pressure Level in the calibrator head was measured at the setting and frequency shown using a calibrated laboratory standard microphone and insert voltage technique. The results are given in below with the estimated uncertainties.

(Output level in dB re 20 μ Pa)

Frequency Shown Hz	Output Sound Pressure Level Setting dB	Measured Output Sound Pressure Level dB	Estimated Expanded Uncertainty dB
1000	94.00	94.16	0.10

2, Sound Pressure Level Stability - Short Term Fluctuations

The Short Term Fluctuations was determined by measuring the maximum and minimum of the fast weighted DC output of the B&K 2610 measuring amplifier over a 20 second time interval as required in the standard. The Short Term Fluctuation was found to be:

At 1000 Hz STF = 0.014 dB

Estimated expanded uncertainty 0.005 dB

3, Actual Output Frequency

The determination of actual output frequency was made using a B&K 4180 microphone together with a B&K 2673 preamplifier connected to a B&K 2610 measuring amplifier. The AC output of the B&K 2610 was taken to an universal counter which was used to determine the frequency averaged over 20 second of operation as required by the standard. The actual output frequency at 1 KHz was:

At 1000 Hz Actual Frequency = 999.96 Hz

Estimated expanded uncertainty 0.1 Hz Coverage factor k = 2.2

4, Total Noise and Distortion

For the Total Noise and Distortion measurement, the unfiltered AC output of the B&K 2610 measuring amplifier was connected to an Agilent Type 8903 B distortion analyser. The TND result at 1 KHz was:

At 1000 Hz TND = 0.4 %

Estimated expanded uncertainty 0.7 %

The expanded uncertainties have been calculated in accordance with the ISO Publication "Guide to the expression of uncertainty in measurement", and gives an interval estimated to have a level of confidence of 95%. A coverage factor of 2 is assumed unless explicitly stated.

Calibrated by:

Date: 04-May-2022

Fung Chi Yip

- End -

Checked by:

Date: 05-May-2022

Chan Yuk Yiu

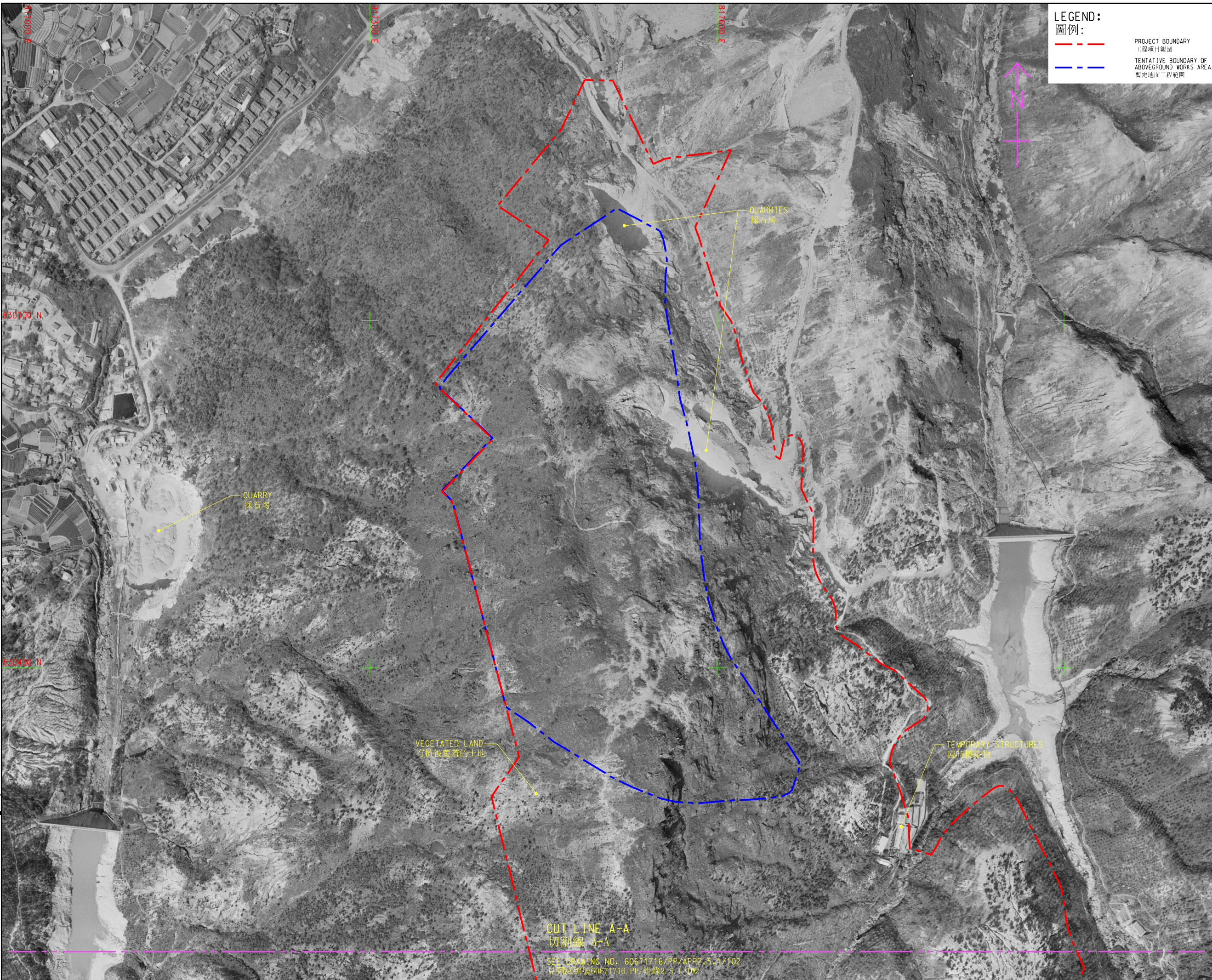
The standard(s) and equipment used in the calibration are traceable to national or international recognised standards and are carry no implication regarding the long-term stability of the instrument. The results apply to the item as received.

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Appendix 2.5.1
Aerial Photographs
附錄 2.5.1
航空照片

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 Checked:
 Designer:
 Project Management Initials:
 31/9/2024
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 Plot File by: FengS



LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍

AECOM

PROJECT
項目
LAM TEI QUARRY (DEVELOPMENT OF LAM TEI UNDERGROUND QUARRY)
藍地石礦場 (藍地地下採石場發展)

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

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AECOM Asia Company Ltd.
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I/R	DATE	DESCRIPTION	CHK.
序號	日期	內容簡述	核對

STATUS
編定

SCALE 比例
A3 1 : 3000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
圖則

PROJECT NO. 項目編號
60671716

AGREEMENT NO. 協議編號
CE 51/2020 (GE)

SHEET TITLE 圖則名稱
AERIAL PHOTOGRAPH 1963
航空照片1963

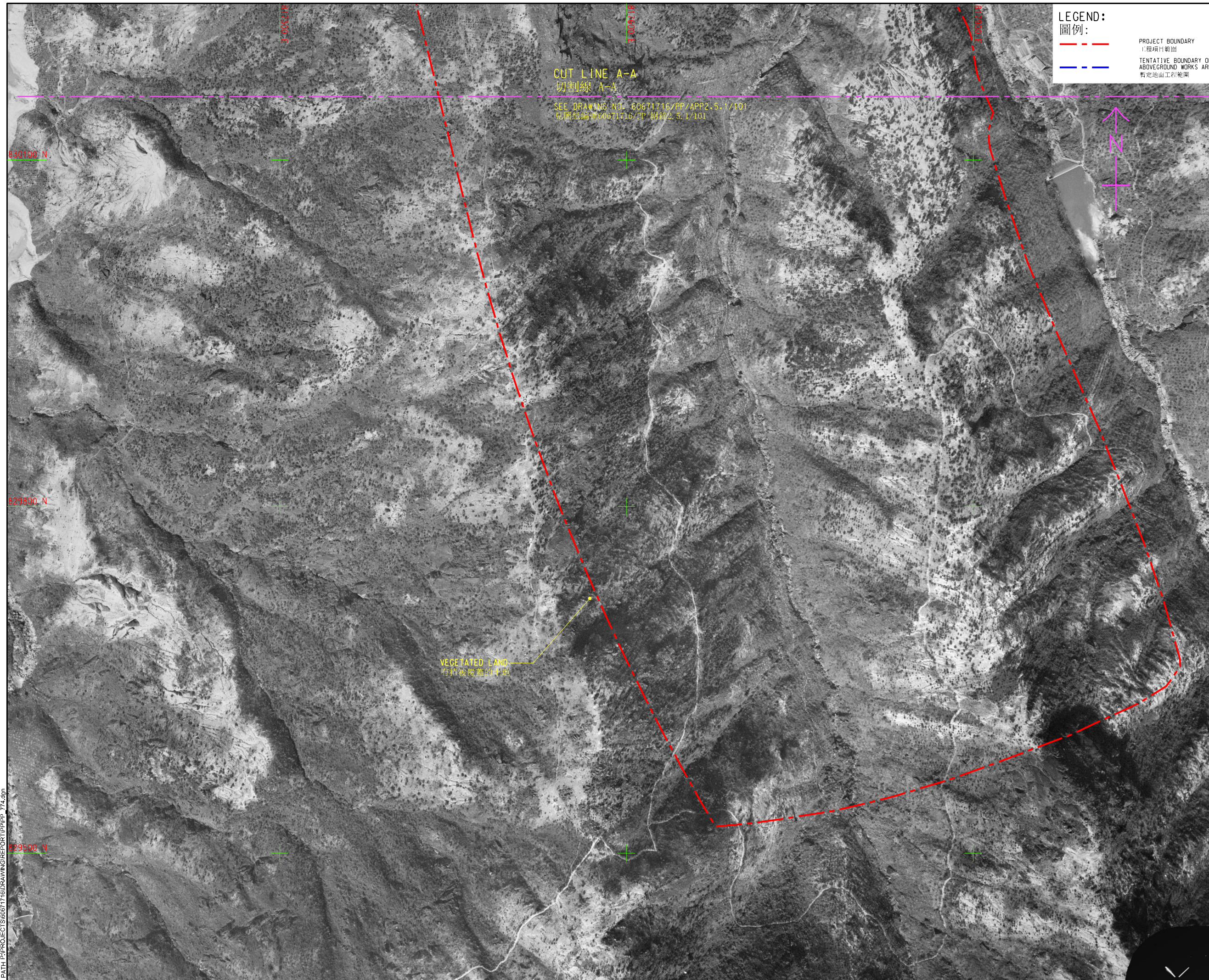
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(SHEET 1 OF 2)
(第一頁, 共兩頁)

60671716/PP/APP2.5.1/101
60671716/PP/附錄2.5.1/101

CUT LINE A-A
切線 A-A

SEE DRAWING NO. 60671716/PP/APP2.5.1/102
見附錄圖號 60671716/PP/附錄2.5.1/102

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LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍

CUT LINE A-A
切割線 A-A

SEE DRAWING NO. 60671716/PP/APP2.5.1/101
見圖紙編號60671716/PP/附錄2.5.1/101

VEGETATED LAND
有植被覆蓋的地區

AECOM

PROJECT
項目

**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

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情況

SCALE **DIMENSION UNIT**
比例 單位

A3 1 : 3000 METRES

KEY PLAN
位置圖

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

60671716 CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

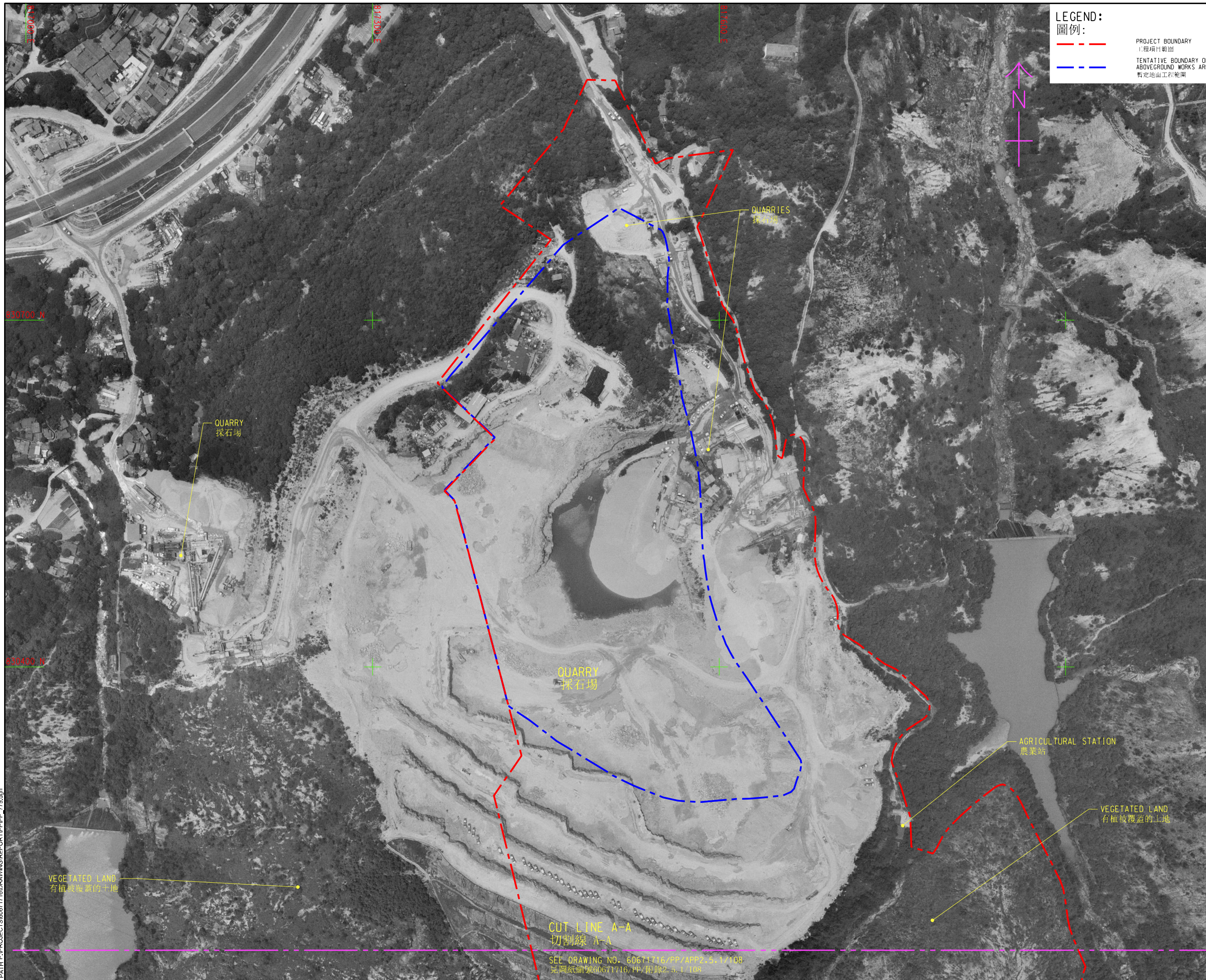
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航空照片1963

SHEET NUMBER
圖紙編號

(SHEET 2 OF 2)
(第二頁, 共兩頁)

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60671716/PP/附錄2.5.1/102

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LEGEND:
 圖例:

--- PROJECT BOUNDARY
 工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
 暫定地面工程範圍



PROJECT
 項目
**LAM TEI QUARRY
 (DEVELOPMENT OF
 LAM TEI UNDERGROUND
 QUARRY)**
 藍地石礦場 (藍地地下採石場
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STATUS
 階段

SCALE
 比例
 A3 1 : 3000

DIMENSION UNIT
 單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60671716

AGREEMENT NO.
 協議編號
 CE 51/2020 (GE)

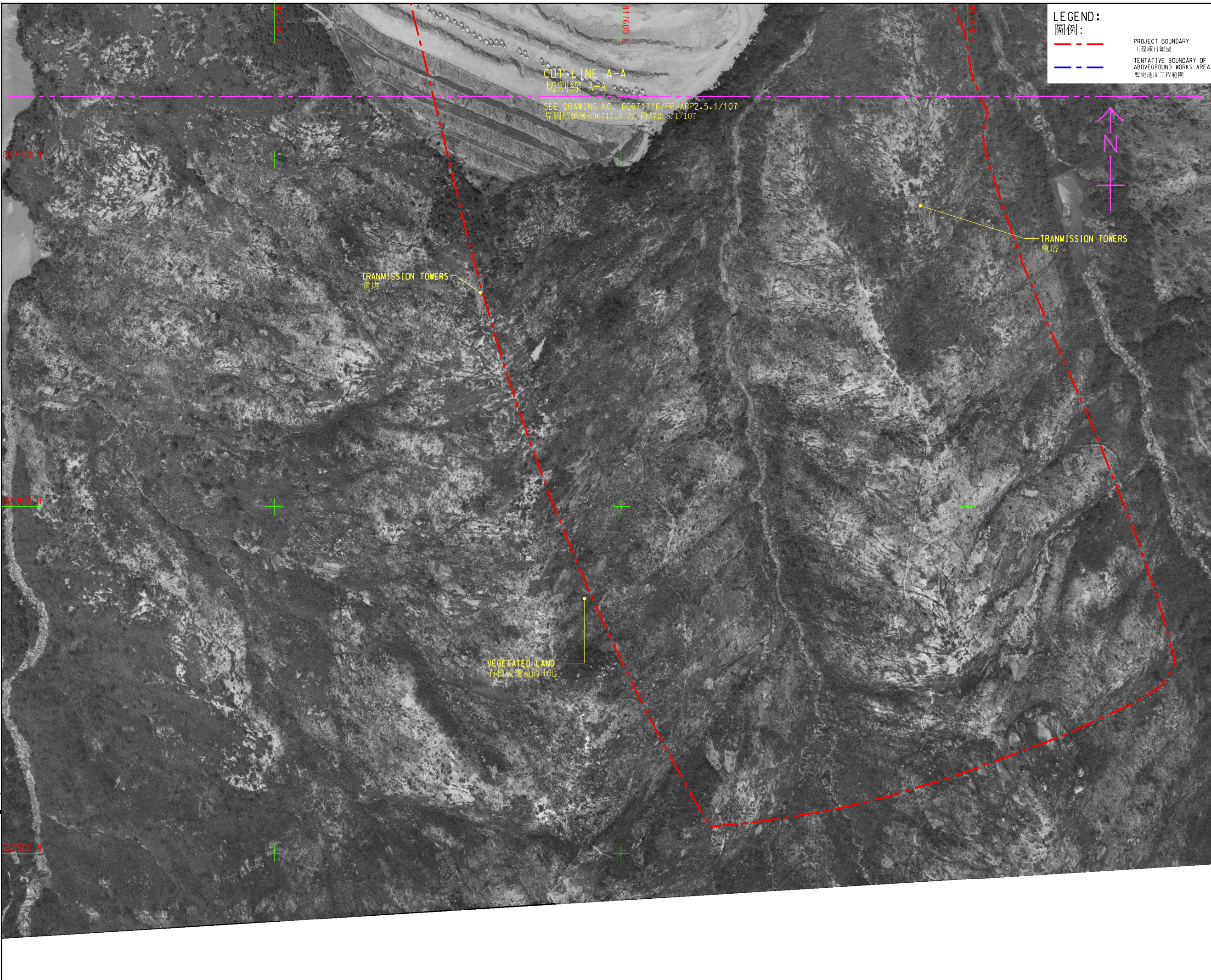
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 圖紙名稱
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 航空照片1993

SHEET NUMBER
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CUT LINE A-A
 切割線 A-A

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 見圖紙編號60671716/PP/附錄2.5.1/108



LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍



PROJECT
項目

**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
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藍地石礦場 (藍地地下採石場
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狀況

SCALE **DIMENSION UNIT**
比例 單位

A3 1 : 3000 METRES

KEY PLAN
索引圖

PROJECT NO. **AGREEMENT NO.**
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60671716 CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

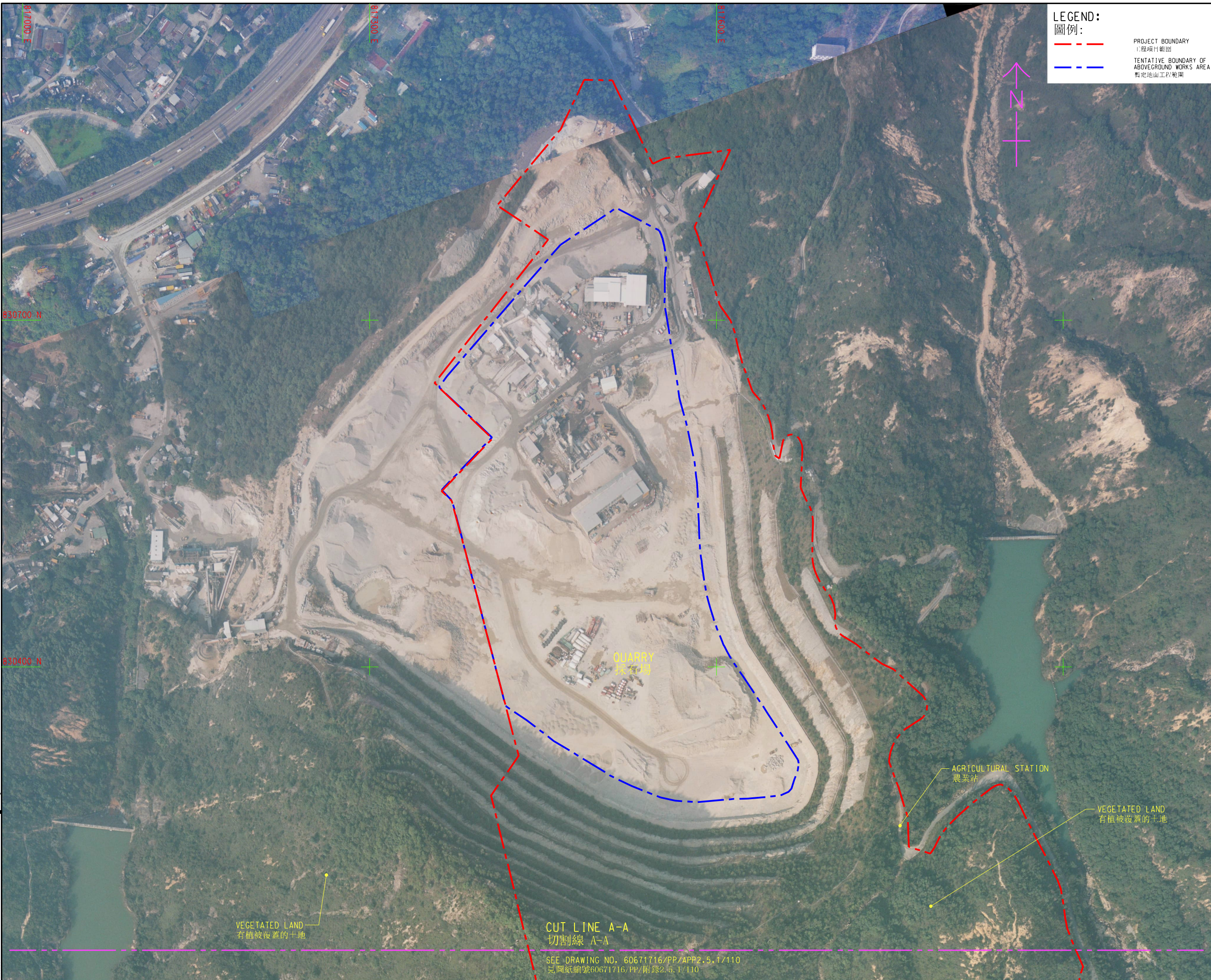
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60671716/PP/附錄2.5.1/108

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 Checked:
 Designer:
 Project Management Initials:
 3/19/2024
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LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍



AECOM

PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
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STATUS
編定

SCALE **DIMENSION UNIT**
比例 單位
A3 1 : 3000 METRES

KEY PLAN
索引圖

PROJECT NO. **AGREEMENT NO.**
項目編號 協議編號
60671716 CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
AERIAL PHOTOGRAPH 2003
航空照片2003

SHEET NUMBER
圖紙編號
60671716/PP/APP2.5.1/109
60671716/PP/附錄2.5.1/109

(SHEET 1 OF 2)
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CUT LINE A-A
切割線 A-A
SEE DRAWING NO. 60671716/PP/APP2.5.1/110
見圖紙編號60671716/PP/附錄2.5.1/110

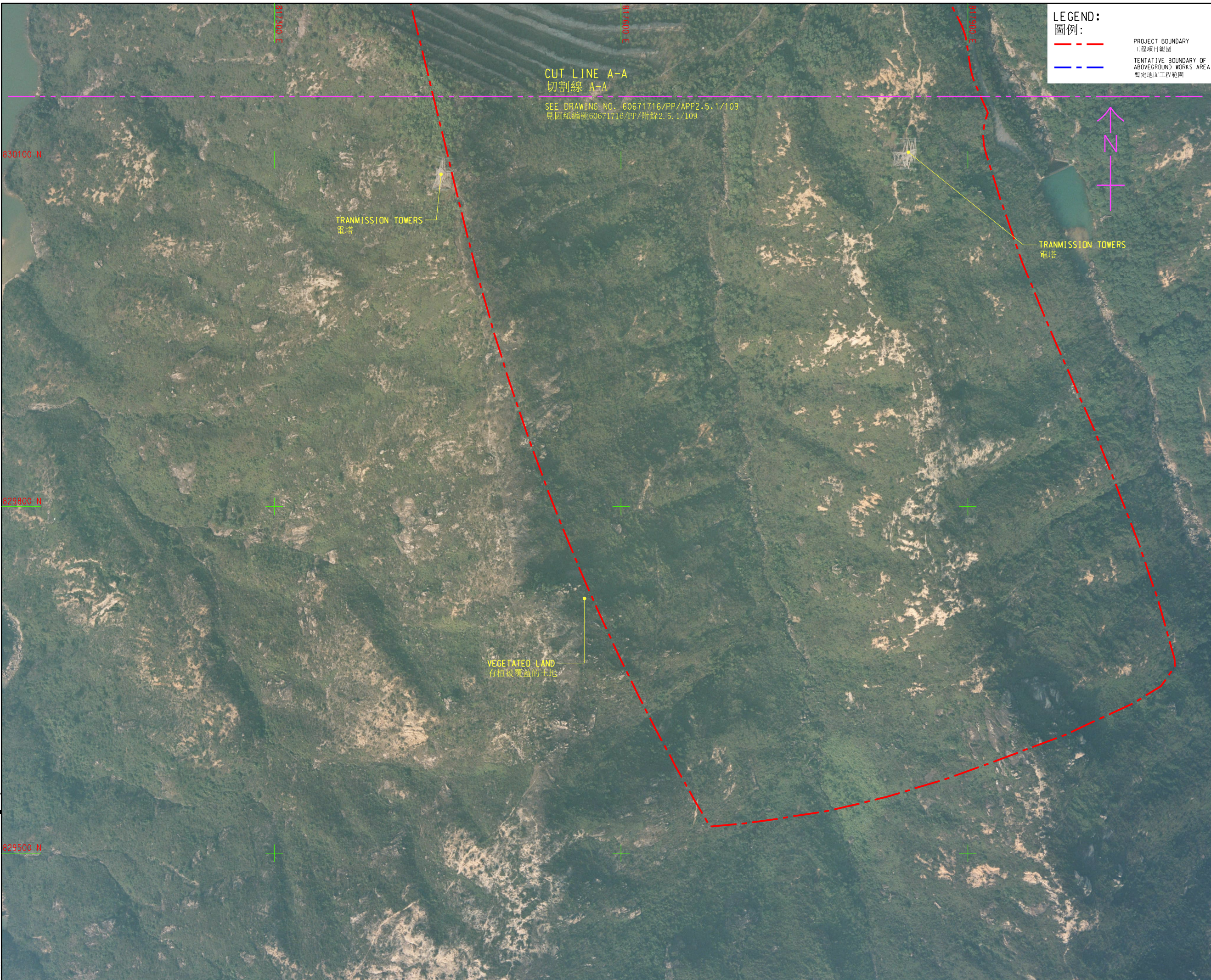
VEGETATED LAND
有植被覆蓋的土地

AGRICULTURAL STATION
農業站

VEGETATED LAND
有植被覆蓋的土地

QUARRY
採石場

ISO A1 594mm x 841mm
 Approved:
 Checked:
 Designer:
 Project Management Initials:
 31/10/2024
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LEGEND:
 圖例:

--- PROJECT BOUNDARY
 工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
 暫定地面工程範圍

CUT LINE A-A
 切割線 A-A

SEE DRAWING NO. 60671716/PP/APP2.5.1/109
 見圖紙編號60671716/PP/附錄2.5.1/109

TRANSMISSION TOWERS
 電塔

TRANSMISSION TOWERS
 電塔

VEGETATED LAND
 有植被覆蓋的土地

AECOM

PROJECT
 項目

**LAM TEI QUARRY
 (DEVELOPMENT OF
 LAM TEI UNDERGROUND
 QUARRY)**
 藍地石礦場 (藍地地下採石場
 發展)

CLIENT
 業主

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

CONSULTANT
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ISSUE/REVISION
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I/R	DATE	DESCRIPTION	CHK.

STATUS
 狀況

SCALE **DIMENSION UNIT**
 比例 尺寸單位

A3 1 : 3000 METRES

KEY PLAN
 索引圖

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

60671716 CE 51/2020 (GE)

SHEET TITLE
 圖紙名稱

AERIAL PHOTOGRAPH 2003
 航空照片2003

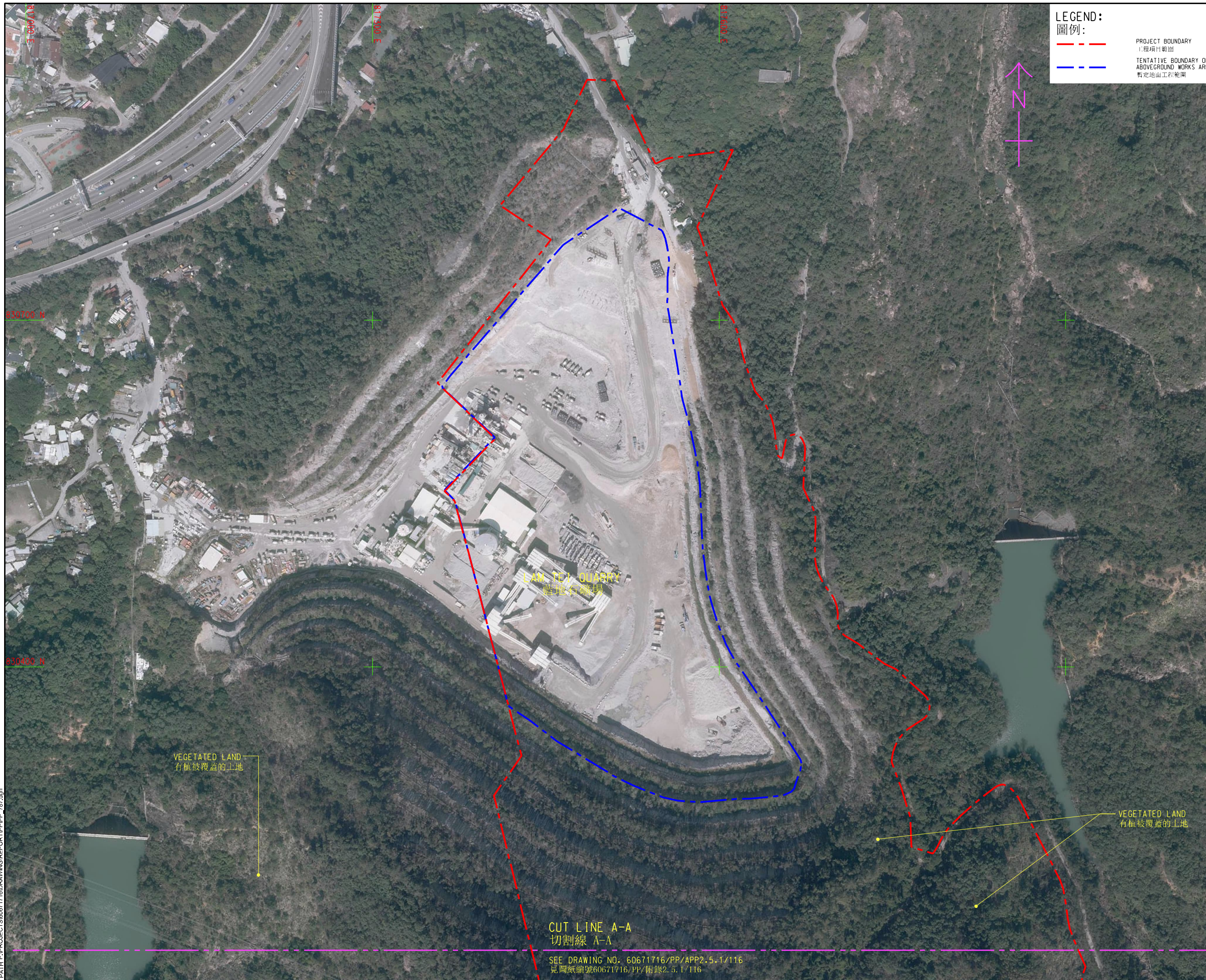
SHEET NUMBER
 圖紙編號

60671716/PP/APP2.5.1/110
 60671716/PP/附錄2.5.1/110

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(SHEET 2 OF 2)
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ISO A1 594mm x 841mm
 Approved:
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 Designer:
 Project Management Initials:



LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍



PROJECT
項目

**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

CLIENT
業主

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

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STATUS
編定

SCALE
比例

DIMENSION UNIT
尺寸單位

A3 1 : 3000 METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

AGREEMENT NO.
協議編號

60671716 CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH 2022
航空照片2022

SHEET NUMBER
圖紙編號

60671716/PP/APP2.5.1/115
60671716/PP/附錄2.5.1/115

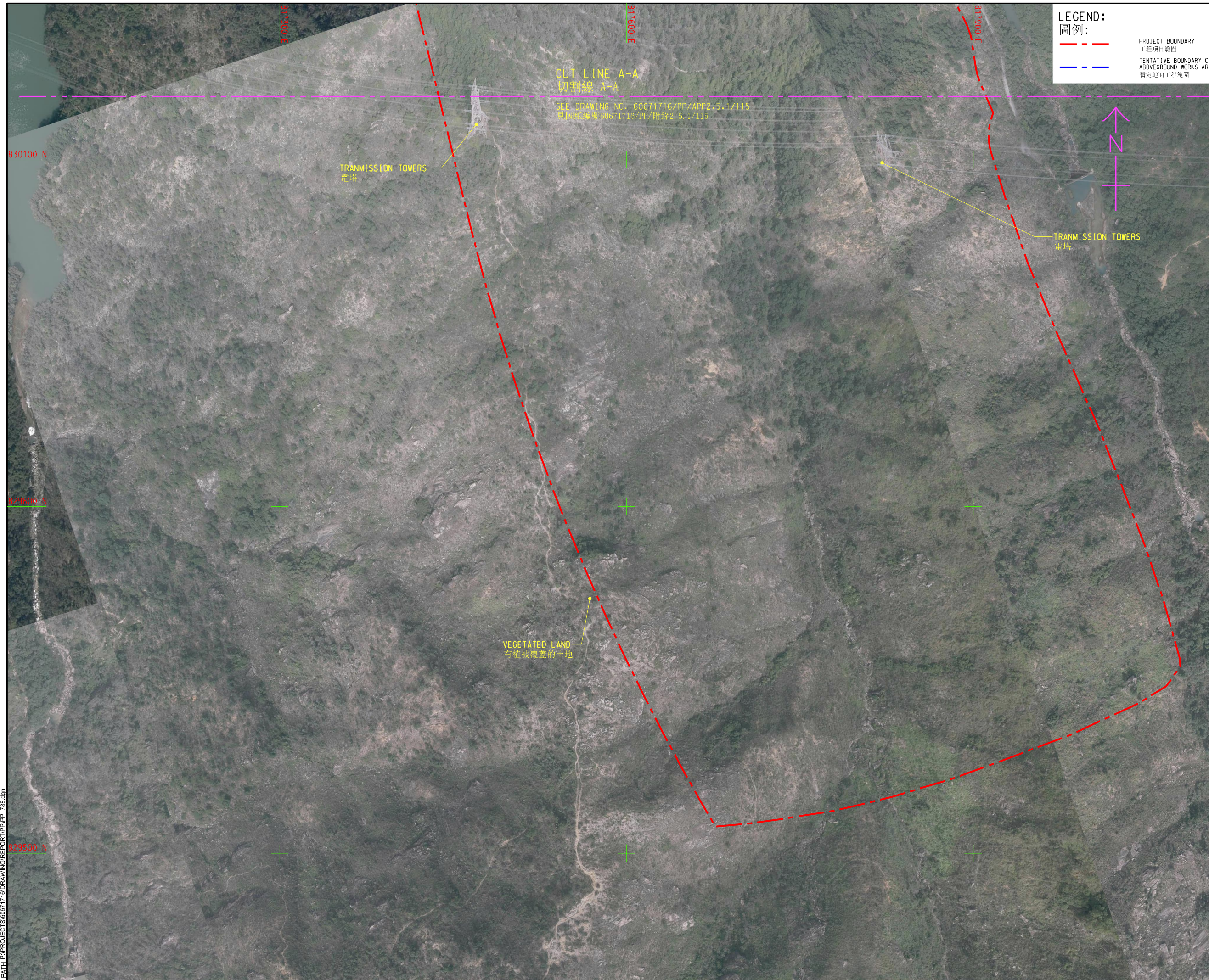
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CUT LINE A-A
切割線 A-A

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見圖紙編號60671716/PP/附錄2.5.1/116

(SHEET 1 OF 2)
(第一頁, 共兩頁)



LEGEND:
圖例:

--- PROJECT BOUNDARY
工程項目範圍

--- TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍

CUT LINE A-A
切割線 A-A

SEE DRAWING NO. 60671716/PP/APP2.5.1/115
見圖號 60671716/PP/附錄 2.5.1/115

TRANSMISSION TOWERS
電塔

TRANSMISSION TOWERS
電塔

VEGETATED LAND
有植被覆蓋的土地

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PROJECT
項目

LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)
藍地石礦場 (藍地地下採石場
發展)

CLIENT
業主

CEDD 土木工程拓展署
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ISSUE/REVISION
修訂

I/R	DATE	DESCRIPTION	CHK.

STATUS
狀況

SCALE **DIMENSION UNIT**
比例 單位

A3 1 : 3000 METRES

KEY PLAN
索引圖

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

60671716 CE 51/2020 (GE)

SHEET TITLE
圖紙名稱

AERIAL PHOTOGRAPH 2022
航空照片2022

SHEET NUMBER
圖紙編號

60671716/PP/APP2.5.1/116
60671716/PP/附錄 2.5.1/116

(SHEET 2 OF 2)
(第二頁, 共兩頁)

Appendix 2.7.1A
Evaluation of Habitats within the 500m Study Area
附錄 2.7.1A
500米研究範圍內的生境評估

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Table 1 Ecological Evaluation of Watercourse, Modified Watercourse and Irrigation Reservoir within the Study Area

表 1 研究範圍內水道、人工水道及灌溉水塘的生態評估

Criteria 準則	Watercourses 水道 (W1, W2a, W2b, W2c, W3a, W3b, W3c, W3d & tributaries 支流)	Modified Watercourses 人工水道 (W4 & W5)	Irrigation Reservoir 灌溉水塘
Naturalness 天然程度	High 高	Low 低	Low 低
Size 生境面積	Small (Approx. 4.21 ha, 2.61 km) 小 (約 4.21 公頃, 2.61 公里)	Very small (Approx. 0.29 ha, 0.16 km) 很小 (約 0.29 公頃, 0.16 公里)	Small (3.02 ha) 小 (3.02 公頃)
Diversity 多樣化	Low to moderate flora diversity and moderate fauna diversity 低至中等植物多樣化及中等動物多樣化	Low flora and fauna diversity 低植物及動物多樣化	Low flora and fauna diversity 低植物及動物多樣化
Rarity 稀有程度	<p>Common habitat in Hong Kong. 香港常見生境</p> <p><u>Watercourse within the Proposed Underground Quarry Extent and TLCP (W1 & W2a)</u> <u>位於擬議地下採石場範圍上及大欖郊野公園內的水道 (W1 & W2a)</u> W1 was a rock-bed watercourse located within TLCP which also had a sandy bed pool recorded in the lower section. It has permanent and fast flow and good water, with a width of approximately 3.0 m and a depth of 0.5 m. W1 是一條位於大欖郊野公園內、有岩石作底層物質、有穩定急速的水流，和良好水質的水道（約 3 米闊和 0.5 米深），下游部分亦有一個以岩石為底層物的水池。 W2a was a watercourse of approximately 4.5 m wide and 1.0 m deep located within TLCP. It was found to have permanent water flow with fast flow rate and good water quality, and riverbed consist of sand. W2a 是一條位於大欖郊野公園內、有砂石作底層物質、穩定急速的水流，和良好水質的水道（約 4.5 米闊和 1 米深）。</p> <p>Seven species of conservation importance were recorded in previous studies (including Lesser Platanthera (<i>Platanthera minor</i>), East Asian Porcupine (<i>Hystrix brachyura</i>), Lesser Spiny Frog (<i>Quasipaa exilispinosa</i>), Hong Kong Cascade Frog (<i>Amolops hongkongensis</i>), <i>Gynacantha</i> sp., <i>Somanniathelphusa zanklon</i> and <i>Cryptopotamon anacoluthon</i>), while 5 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 7 個具重要保育價值物種（包括小舌唇蘭、東亞豪豬、小棘蛙、香港湍蛙、長尾蜓、鐮刀束腰蟹和鰓刺溪蟹），而本次調查則錄得 5 個具重要保育價值物種（參見附錄 2.7.2 和 2.7.3）。</p> <p><u>Other Watercourses (W2a, W2b, W2c, W3a, W3b, W3c, W3d) and Tributaries</u> <u>其他水道 (W2a, W2b, W2c, W3a, W3b, W3c, W3d) 及支流</u> Six species of conservation importance were recorded in previous studies (including Chinese Bullfrog (<i>Hoplobatrachus chinensis</i>), Lesser Spiny Frog (<i>Quasipaa exilispinosa</i>), Hong Kong Freshwater Crab (<i>Nanhaipotamon hongkongense</i>), Predaceous Chub (<i>Parazacco spilurus</i>), <i>Somanniathelphusa zanklon</i> and</p>	<p>Common habitat in Hong Kong. 香港常見生境</p> <p>One species of conservation importance were recorded in previous studies (Emerald Cascader (<i>Zygonyx iris insignis</i>)), while 2 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 1 個具重要保育價值物種—彩虹蜻，而本次調查則錄得 2 個具有重要保育價值的物種（參見附錄 2.7.2 和 2.7.3）。</p>	<p>Common habitat in Hong Kong. 香港常見生境</p> <p>Ten species of conservation importance were recorded in previous studies (including Pitcher Plant (<i>Nepenthes mirabilis</i>), Bamboo Orchid (<i>Arundina graminifolia</i>), Little Egret (<i>Egretta garzetta</i>), White-throated Kingfisher (<i>Halcyon smyrnensis</i>), Chinese Noctule (<i>Nyctalus plancyi</i>), Japanese Pipistrelle (<i>Pipistrellus abramus</i>), unknown Vespertilionidae species 1, unknown Vespertilionidae species 2, Two-striped Grass Frog (<i>Hylarana taipehensis</i>)) and <i>Somanniathelphusa zanklon</i>, while 7 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 10 個具重要保育價值物種（包括豬籠草、竹葉蘭、小白鷺、白胸翡翠、中華山蝠、東亞家蝠、未知的蝙蝠科物種 1、未知的蝙蝠科物種 2、台北蛙和鐮刀束腰蟹），而本次調查則錄得 7 個具重要保育價值物種（參見附錄 2.7.2 和 2.7.3）。</p>

Criteria 準則	Watercourses 水道 (W1, W2a, W2b, W2c, W3a, W3b, W3c, W3d & tributaries 支流)	Modified Watercourses 人工水道 (W4 & W5)	Irrigation Reservoir 灌溉水塘
	<i>Cryptopotamon anacoluthon</i>), while 6 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 6 個具重要保育價值物種 (包括虎紋蛙、小棘蛙、香港南海溪蟹、異蠟、鎌刀束腰蟹和鯉刺溪蟹)，而本次調查則錄得 6 個具重要保育價值物種 (參見附錄 2.7.2 和 2.7.3)。		
Re-creatability 可再造程度	Low 低	High 高	High 高
Fragmentation 生境破碎程度	Low 低	High 高	Low 低
Ecological linkage 生態連繫	W1, W2a, W2c, W3a and W3c fell within TLCP; and W2b lied within the CA W1、W2a、W2c、W3a 和 W3c 位於大欖郊野公園內；W2b 位於自然保育區內 Structurally and functionally connected to the irrigation reservoirs, adjacent watercourses and other natural habitats at TLCP and/or CA 在結構和功能上與大欖郊野公園和／或自然保育區的灌溉水塘、相鄰水道和其他自然生境聯繫	Structurally and functionally connected to the two irrigation reservoirs and adjacent watercourses that located at TLCP and/or CA 在結構和功能上與大欖郊野公園和／或自然保育區的兩個灌溉水塘和相鄰水道聯繫	Both Lam Tei and Hung Shui Hang Irrigation Reservoir fell within TLCP 藍地灌溉水塘及洪水坑灌溉水塘均位於大欖郊野公園內 Structurally and functionally connected to adjacent watercourses located within TLCP and/or CA 在結構和功能上與大欖郊野公園和／或自然保育區內的相鄰水道聯繫
Potential value 潛在價值	Moderate 中等	Low to moderate 低至中等	Low 低
Nursery / Breeding ground 育哺場／繁育場	Tadpoles of Hong Kong Cascade Frog and Lesser Spiny Frog were recorded in W1 and W3a W1 和 W3a 記錄到香港湍蛙和小棘蛙的蝌蚪	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為
Age 久遠程度	N/A 不適用	N/A 不適用	N/A 不適用
Abundance / Richness of Wildlife 野生生物的數量／豐富程度	Low to moderate 低至中等	Low 低	Low 低
Ecological value 生態價值	Moderate 中等	Low 低	Low to moderate 低至中等

Table 2 Ecological Evaluation of Mixed Woodland within the Study Area

表 2 研究範圍內混合林地的生態評估

Criteria 準則	Mixed Woodland 混合林地
Naturalness 天然程度	Moderate 中等
Size 生境面積	Moderate (42.72 ha) 中等 (42.72 公頃)
Diversity 多樣化	Low flora and fauna diversity 低植物及動物多樣化
Rarity 稀有程度	Common habitat in Hong Kong. 香港常見生境 Eleven species of conservation importance was recorded in previous studies (including Purple Orchid (<i>Ania hongkongensis</i>), Black Kite (<i>Milvus migrans</i>), Black-throated Laughingthrush (<i>Garrulax chinensis</i>), Greater Coucal (<i>Centropus sinensis</i>), Rufous-capped Babbler (<i>Stachyridopsis ruficeps</i>), White-throated Kingfisher (<i>Halcyon smyrnensis</i>), Chinese Noctule (<i>Nyctalus plancyi</i>), Japanese Pipistrelle (<i>Pipistrellus abramus</i>), Chinese Bullfrog (<i>Hoplobatrachus chinensis</i>), Banded Krait (<i>Bungarus fasciatus</i>) and Many Banded Krait (<i>Bungarus multicinctus</i>)), while 17 species of conservation importance were recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 11 個具重要保育價值物種 (包括香港安蘭、黑鳶、黑喉噪鵲、褐翅鴉鵂、紅頭穗鵲、白胸翡翠、中華山蝠、東亞家蝠、虎紋蛙、金環蛇和銀環蛇)，而本次調查錄得 17 個具重要保育價值物種 (參見 附錄 2.7.2 和 2.7.3)。
Re-creatability 可再造程度	Low 低
Fragmentation 生境破碎程度	Low 低
Ecological linkage 生態連繫	Mixed woodland within TLCP was structurally and ecologically connected to shrubland, plantation, watercourse and/or irrigation reservoir within TLCP. 大欖郊野公園內的混合林地之結構和生態上與大欖郊野公園內的灌木叢林、植林區、水道和／或灌溉水塘聯繫
Potential value 潛在價值	Moderate 中等
Nursery / Breeding ground 育哺場／繁育場	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為
Age 久遠程度	N/A 不適用
Abundance / Richness of Wildlife 野生生物的數量／豐富程度	Low to moderate 低至中等
Ecological value 生態價值	Low to moderate for mixed woodlands close to developed area at existing LTQ. 鄰近現有藍地石礦場已發展地區的混合林地之生態價值為 低至中等 Moderate for mixed woodland within CA and TLCP. 自然保育區和大欖郊野公園內的混合林地之生態價值為 中等

Table 3 Ecological Evaluation of Plantation and Shrubland within the Study Area

表 3 研究範圍內植林區及灌木叢林的生態評估

Criteria 準則	Plantation 植林區	Shrubland 灌木叢林
Naturalness 天然程度	Low 低	Moderate to high 中等至高
Size 生境面積	Moderate (46.35 ha) 中等 (46.35 公頃)	Large (150.72 ha) 大 (150.72 公頃)
Diversity 多樣化	Moderate flora and fauna diversity 中等植物及動物多樣化	Low to moderate flora and fauna diversity 低至中等植物及動物多樣化
Rarity 稀有程度	<p>Common habitat in Hong Kong. 香港常見生境</p> <p>Twenty-five species of conservation importance were recorded in previous studies (including Purple Bulb Orchid (<i>Ania hongkongensis</i>), Incense Tree (<i>Aquilaria sinensis</i>), Bamboo Orchid (<i>Arundina graminifolia</i>), Dense-flowered Geodorum (<i>Geodorum densiflorum</i>), Small Persimmon (<i>Diospyros vaccinioides</i>), Pitcher Plant (<i>Nepenthes mirabilis</i>), Red Azalea (<i>Rhododendron simsii</i>), Black Kite (<i>Milvus migrans</i>), Black-throated Laughingthrush (<i>Garrulax chinensis</i>), Collared Scops Owl (<i>Otus lettia</i>), Crested Serpent Eagle (<i>Spilornis cheela</i>), Rufous-capped Babbler (<i>Stachyridopsis ruficeps</i>), Chinese Noctule (<i>Nyctalus plancyi</i>), Japanese Pipistrelle (<i>Pipistrellus abramus</i>), Lesser Bamboo Bat (<i>Tylonycteris fulvida</i>), Masked Palm Civet (<i>Paguma larvata</i>), unknown Vespertilionidae species 2, Unidentified Bat, Red Muntjac (<i>Muntiacus muntjak</i>), Forget-me-not (<i>Catochrysops strabo</i>), Green Skirt Baron (<i>Euthalia niepelti</i>), Hong Kong Cascade Frog (<i>Amolops hongkongensis</i>), Lesser Spiny Frog (<i>Quasipaa exilispinosa</i>), Emerald Cascader (<i>Zygonyx iris insignis</i>) and <i>Gynacantha</i> sp.), while 21 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer).</p> <p>過往研究曾錄得 25 個具重要保育價值物種 (包括香港安蘭、土沉香、竹葉蘭、地寶蘭、小果柿、豬籠草、紅杜鵑、黑鳶、黑喉噪鷗、領角鴉、蛇鵡、紅頭穗鷗、中華山蝠、東亞家蝠、扁顛蝠、果子狸、未知的蝙蝠科物種 2、尚未確認的蝙蝠、赤麂、咖灰蝶、綠裙蛺蝶、香港湍蛙、小棘蛙、彩虹蜻和長尾蜓)，而本次調查則錄得 21 個具重要保育價值物種 (參見附錄 2.7.2 和 2.7.3)。</p>	<p>Common habitat in Hong Kong. 香港常見生境</p> <p>Sixteen species of conservation importance were recorded in previous studies (including Purple Bulb Orchid (<i>Ania hongkongensis</i>), Silver-back Artocarpus (<i>Artocarpus hypargyreus</i>), Pitcher Plant (<i>Nepenthes mirabilis</i>), Red Azalea (<i>Rhododendron simsii</i>), Black Kite (<i>Milvus migrans</i>), Greater Coucal (<i>Centropus sinensis</i>), Grey Nightjar (<i>Caprimulgus jotaka</i>), Chinese Noctule (<i>Nyctalus plancyi</i>), Japanese Pipistrelle (<i>Pipistrellus abramus</i>), Lesser Bamboo Bat (<i>Rhinolophus pusillus</i>), unknown Vespertilionidae species 1, unknown Vespertilionidae species 2, East Asian Porcupine (<i>Hystrix brachyura</i>), Red muntjac (<i>Muntiacus muntjak</i>), Danaid Eggfly (<i>Hypolimnas misippus</i>) and Swallowtail (<i>Papilio xuthus</i>)), while 12 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer).</p> <p>過往研究曾錄得 16 個具重要保育價值物種 (包括香港安蘭、白桂木、豬籠草、紅杜鵑、黑鳶、褐翅鴉鷗、普通夜鷹、中華山蝠、東亞家蝠、扁顛蝠、未知的蝙蝠科物種 1、未知的蝙蝠科物種 2、東亞豪豬、赤麂、金斑蛺蝶和柑橘鳳蝶)，而本次調查則錄得 12 個具重要保育價值物種 (參見附錄 2.7.2 和 2.7.3)。</p>
Re-creatability 可再造程度	High 高	Moderate 中等
Fragmentation 生境破碎程度	Moderate 中等	Low 低
Ecological linkage 生態連繫	<p>Part of the plantation fell within TLCP and the CA 部分植林區位於大欖郊野公園和自然保育區內</p> <p>Other part of the plantation was functionally and structurally connected to adjacent plantation and shrubland in TLCP and/or CA</p>	<p>Part of the shrubland fell within TLCP and/or CA, which was physically and ecologically connected with its adjoining habitats, including mixed woodland, plantation and natural hillstreams</p> <p>部分灌木叢林位於大欖郊野公園和/或自然保育區內，在物理和生態上與其毗鄰的生境 (包括混合林地、植林區和天然山澗) 聯繫</p>

Criteria 準則	Plantation 植林區	Shrubland 灌木叢林
	植林區的其他部分在功能和結構上與大欖郊野公園和／或自然保育區的相鄰植林區和灌木叢林聯繫	Other part of the shrubland was functionally and structurally connected to adjacent shrubland and plantation within TLCP and/or CA 灌木叢林的其他部分在功能和結構上與大欖郊野公園和／或自然保育區內的相鄰灌木叢林和植林區聯繫
Potential value 潛在價值	Moderate 中等	Moderate 中等
Nursery / Breeding ground 育哺場／繁育場	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為
Age 久遠程度	N/A 不適用	N/A 不適用
Abundance / Richness of Wildlife 野生生物的數量／豐富程度	Moderate 中等	Moderate 中等
Ecological value 生態價值	Low to moderate 低至中等	Low to moderate 低至中等

Table 4 Ecological Evaluation of Dry Agricultural Land within the Study area

表 4 研究範圍內乾涸農地的生態評估

Criteria 準則	Dry Agricultural Land 乾涸農地
Naturalness 天然程度	Low 低
Size 生境面積	Small (0.72 ha) 小 (0.72 公頃)
Diversity 多樣化	Low flora and fauna diversity 低植物及動物多樣化
Rarity 稀有程度	Common habitat in Hong Kong. 香港常見生境 No species of conservation importance was recorded in previous studies, while 4 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究未曾錄得任何具重要保育價值物種，而本次調查則錄得 4 個具重要保育價值物種（參見附錄 2.7.2 和 2.7.3）。
Re-creatability 可再造程度	High 高
Fragmentation 生境破碎程度	Low 低
Ecological linkage 生態連繫	N/A 不適用
Potential value 潛在價值	Low 低
Nursery / Breeding ground 育哺場／繁育場	No notable nursery and breeding behaviour 沒有明顯的育哺和繁育行為
Age 久遠程度	N/A 不適用
Abundance / Richness of Wildlife 野生生物的數量／豐富程度	Low 低
Ecological value 生態價值	Low 低

Table 5 Ecological Evaluation of Village/Orchard and Developed Area/Wasteland within the Study Area

表 5 研究範圍內村落／果園及已發展地區／廢置土地的生態評估

Criteria 準則	Village/Orchard 村落／果園	Developed Area/Wasteland 已發展地區／廢置土地
Naturalness 天然程度	Low 低	Low 低
Size 生境面積	Moderate (23.12 ha) 中等 (23.12 公頃)	Moderate (26.98 ha) 中等 (26.98 公頃)
Diversity 多樣化	Low flora diversity and low to moderate fauna diversity 低植物多樣化及低至中等動物多樣化	Low flora and fauna diversity 低植物及動物多樣化
Rarity 稀有程度	Very common habitat in Hong Kong. 香港常見生境 Five species of conservation importance were recorded in previous studies (including Black-throated Laughingthrush (<i>Garrulax chinensis</i>), Chinese horseshoe Bat (<i>Rhinolophus sinicus</i>), unknown Vespertilionidae species 1, Metallic Cerulean (<i>Jamides alecto</i>) and Tiny Grass Blue (<i>Zizula hylax</i>)), while 7 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 5 個具重要保育價物種 (包括黑喉噪鵲、中華菊頭蝠、未知蝙蝠科物種 1、素雅灰蝶和長腹灰蝶)，而本次調查則錄得 7 個具重要保育價物種 (參見附錄 2.7.2 和 2.7.3)。	Very common habitat in Hong Kong. 香港常見生境 One species of conservation importance were recorded in previous studies (including Japanese Pipistrelle (<i>Pipistrellus abramus</i>)), while 5 species of conservation importance recorded in present survey (Appendices 2.7.2 & 2.7.3 refer). 過往研究曾錄得 1 個具重要保育價物種 (包括東亞家蝠)，而本次調查則錄得 5 個具重要保育價物種 (參見附錄 2.7.2 和 2.7.3)。
Re-creatability 可再造程度	High 高	High 高
Fragmentation 生境破碎程度	Moderate 中等	Low 低
Ecological linkage 生態連繫	A narrow strip of village/orchard area fell within the CA 其中有一部分呈狹長狀的村莊／果園區域位於自然保育區內 No notable ecological linkage with other areas 與其他地區沒有明顯的生態聯繫	No notable ecological linkage with other areas 與其他地區沒有明顯的生態聯繫
Potential value 潛在價值	Low 低	Low 低
Nursery / Breeding ground 育哺場／繁育場	No notable nursery and breeding behaviour 沒有顯著的育哺和繁育行為	No notable nursery and breeding behaviour 沒有顯著的育哺和繁育行為
Age 久遠程度	N/A 不適用	N/A 不適用
Abundance / Richness of Wildlife 野生生物的數量／豐富程度	Low 低	Low 低
Ecological value 生態價值	Low 低	Low 低

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Appendix 2.7.1B
Representative Photographs of Habitat Types within 500m
Study Area

附錄 2.7.1B
500米研究範圍內具代表性的生境種類相片

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Plate 1 - Watercourse
相片一 - 水道



Plate 2 - Modified Watercourse
相片二 - 人工水道



Plate 3 - Irrigation Reservoir
相片三 - 灌溉水塘



Plate 4 - Mixed Woodland
相片四 - 混合林地



Plate 5 - Plantation
相片五 - 植林



Plate 6 - Shrubland
相片六 - 灌木叢

	Agreement No. CE 51/2020 (GE) Lam Tei Quarry (Development of Lam Tei Underground Quarry) 合約編號 CE 51/2020 (GE) 藍地石礦場（藍地地下採石場發展）	SCALE	N.T.S.	DATE	Apr-24
	Representative Photographs of Habitat Types within 500m Assessment Area 500米研究範圍內具代表性的生境種類相片	CHECK	LAMCCG	DRAWN	KWOKWH
	JOB NO.	60671716	Appendix No.	2.7.1B	Rev



Plate 7 - Dry Agricultural Land
相片七 - 乾涸農地



Plate 8 - Village / Orchard
相片八 - 鄉村/果園



Plate 9 - Developed Area / Wasteland
相片九 - 已發展土地/廢置土地

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AECOM	Agreement No. CE 51/2020 (GE) Lam Tei Quarry (Development of Lam Tei Underground Quarry) 合約編號 CE 51/2020 (GE) 藍地石礦場 (藍地地下採石場發展)	SCALE	N.T.S.	DATE	Apr-24
	Representative Photographs of Habitat Types within 500m Assessment Area 500米研究範圍內具代表性的生境種類相片	CHECK	LAMCCG	DRAWN	KWOKWH
		JOB NO.	60671716	Appendix No. 2.7.1B	

Appendix 2.7.2
Floral Species Recorded within 500m Study Area
附錄 2.7.2
500米研究範圍內記錄到的植物物種

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Appendix 2.7.2: Flora Species Recorded within the 500m Study Area
附錄 2.7.2: 500米研究範圍內記錄到的植物物種

Scientific Name 學名	Common Name 俗名	Growth Form 生長型態	Native / Exotic to Hong Kong	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Protection/Conservation Status 保護/保育狀況 ⁽²⁾	Assessment Area 研究範圍									
						WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	
<i>Clauseria lansium</i>	Wampoi 黃皮	small tree 小喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+					+	
<i>Clerodendrum fortunatum</i>	Glorybower 鬼燈籠	shrub 灌木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+	+					
<i>Coccinia grandis</i>	Ivy-gourd 紅瓜	herbaceous vines 草本藤本	native 原生	Wong Chuk Hang, Tsuen Wan, Shan Liu, Ping Shan 黃竹坑, 荃灣, 山寮, 屏山	-								+		+
<i>Colocasia esculenta</i>	Taro 芋	herb 草本	exotic 外來	Cultivated or wild 栽種或野生	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		+
<i>Commelina diffusa</i>	Diffuse Day-flower 節節草	herb 草本	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危		+			+					
<i>Corymbia citriodora</i>	Lemon-scented Gum 檸檬桉	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		
<i>Corymbia torelliana</i>	Cadaga 毛葉桉	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		
<i>Cratogeomys cochinchinense</i>	Yellow Cow Wood 黃牛木	shrub or tree 灌木至喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+	+	+				
<i>Cucumis sativus</i>	Cucumber 黃瓜	climbing or creeping herb 攀援或匍伏草本	exotic 外來	Cultivated 栽培種	-										+
<i>Cunninghamia lanceolata</i>	China Fir 杉	tree 喬木	exotic 外來	Widely planted in countryside 廣泛栽種於郊區	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+				
<i>Curcuma longa</i>	薑黃	herb 草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Data Deficient 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 數據缺乏										+
<i>Cuscuta campestris</i>	田野菟絲子	herb 草本	native 原生	Common in Hong Kong 香港常見	-				+	+	+				
<i>Cyclosorus parasiticus</i>	Wood-fern 蕁南毛蕨	herb 草本	native 原生	-	-	+	+		+	+	++				+
<i>Cymbopogon nardus</i>	Citronella Grass 亞香茅	herb 草本	exotic 外來	Cultivated 栽培種	-									+	
<i>Cyperus involucreatus</i>	Umbrella Plant 風車草	herb 草本	exotic 外來	Cultivated or naturalized 栽種或歸化種	-										+
<i>Daemonorops jenkinsiana</i>	Rattan Palm 黃藤	climbing palm 攀援棕櫚	native 原生	Victoria Peak, Wong Nai Chung, Tai Po, Lantau Island 太平山, 黃泥涌, 大埔, 大嶼山	-		+							+	
<i>Dalbergia benthamii</i>	Bentham's Rosewood 兩廣黃檀	climber: vine 攀藤, 藤本	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+				
<i>Dalbergia hancei</i>	Scandent Rosewood 藤黃檀	climber: vine 攀藤, 藤本	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		
<i>Delonix regia</i>	Flame Tree 鳳凰木	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危										+
<i>Desmos chinensis</i>	Desmos 假鷹爪	woody vine 木質藤本	native 原生	Common in Hong Kong 香港常見	-				++	+	+				+
<i>Dianella ensifolia</i>	Dianella 山菅蘭	herb 草本	native 原生	Common in Hong Kong 香港常見	-					+	++				
<i>Dicranopteris pedata</i>	Dicotomy Forked Fern 芒蕨	herb 草本	native 原生	very common 非常常見	-	+	+			++	++				
<i>Dimocarpus longan</i> ⁽⁴⁾	Longan 龍眼	tree 喬木	exotic 外來	Cultivated 栽培種	Threatened Species List of China's Higher Plants: Vulnerable; Rare and Endangered Plants and National Key Protected Plants in Guangdong: Near Threatened; IUCN Red List (ver. 2023.1): Near Threatened 中國植物受高等威脅物種名錄: 易危; 廣東省國家重點保護野生稀有瀕危植物資源: 近危; 國際自然保護聯盟紅色名錄 (版本2023.1): 近危					+	+	+	+	+	
<i>Dioscorea opposita</i>	薯蕷	climber: vine 攀藤, 藤本	-	-	-										+
<i>Diospyros vaccinioides</i>	Small Persimmon 小果柿	shrub 灌木	native 原生	Common in Hong Kong 香港常見	Threatened Species List of China's Higher Plants: Endangered; IUCN Red List (ver. 2023.1): Critically Endangered 中國植物受高等威脅物種名錄: 瀕危; 國際自然保護聯盟紅色名錄 (版本2023.1): 極危					+	+				
<i>Diplospora dubia</i>	Common Tricalasia 狗骨柴	shrub or tree 灌木至喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+				
<i>Dracaena fragrans</i>	Fragrant Dragon Tree 巴西鐵樹	shrub 灌木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危									+	+
<i>Dracaena spp.</i>	-	-	exotic 外來	-	-										+
<i>Drosera spathulata</i>	寬苞茅膏菜	insectivorous herb 食蟲草本	native 原生	Hong Kong Island, Tai Mo Shan, Ho Pui, Ma On Shan, Castle Peak, Lantau Island 香港島, 大帽山, 河郊, 馬鞍山, 青山, 大嶼山	-		+								
<i>Elephantopus tomentosus</i>	白花地膽草	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-								+		
<i>Embellia laeta</i>	Twig-hanging Embellia 酸藤果	climber: vine 攀藤, 藤本	native 原生	Widely distributed in Hong Kong 於香港廣泛分佈	-								+		
<i>Embellia ribes</i>	White-flowered Embellia 白花酸藤子	climber: vine 攀藤, 藤本	native 原生	Widely distributed in Hong Kong 於香港廣泛分佈	-								+		
<i>Emilia sonchifolia</i>	Tassel Flower 一點紅	herb 草本	native 原生	Common in Hong Kong 香港常見	-				+	+					
<i>Epiremium aureum</i>	Ivy-arum 綠蘿	tall climbing plant 大型攀藤	exotic 外來	-	-										+
<i>Eriobotrya japonica</i>	Loquat 枇杷	small tree 小喬木	exotic 外來	Cultivated 栽培種	-					+					+
<i>Eriocaulon sexangulare</i>	Six-angled Pipewort 華南穀精草	herb 草本	native 原生	Common in Hong Kong 香港常見	-			+							+

Appendix 2.7.2: Flora Species Recorded within the 500m Study Area
 附錄 2.7.2: 500米研究範圍內記錄到的植物物種

Scientific Name 學名	Common Name 俗名	Growth Form 生長型態	Native / Exotic to Hong Kong	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Protection/Conservation Status 保護/保育狀況 ⁽²⁾	Assessment Area 研究範圍									
						WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	
<i>Ischaemum aristatum</i> var. <i>glaucum</i>	Duck-beak Grass 鴨咀草	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-	+									
<i>Itea chinensis</i>	Itea 水鼠刺	shrub or small tree 灌木或小喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危						+				
<i>Jasminum sambac</i>	Arabian Jasmine 茉莉花	climbing shrub 攀援灌木	exotic 外來	Cultivated 栽培種	-									+	
<i>Juniperus chinensis</i>	Chinese Juniper 圓柏	tree 喬木	exotic 外來	Cultivated in gardens 栽種於花園	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危									+	
<i>Juniperus chinensis</i> 'Kaizuca'	Dragon Juniper 龍柏	tree 喬木	exotic 外來	-	-										+
<i>Kyllinga polyphylla</i>	Aromatic Kyllinga 水蜈蚣	herb 草本	exotic 外來	Victoria Park, Tsiu Hang, Tai Po Kau 維多利亞公園, 蕉坑, 大埔滘	-	+									
<i>Lantana camara</i>	Lantana 雪白馬纓丹	shrub 灌木	exotic 外來	Naturalized in Hong Kong 歸化種	-		+			+	+				+
<i>Lasianthus chinensis</i>	Chinese Lasianthus 粗葉木	shrub 灌木	native 原生	Hong Kong Island, Tai Mo Shan, Ma On Shan, Sai Kung, Lantau Island 香港島, 大嶼山, 馬鞍山, 西貢, 大嶼山	-	++		+	++	+	+				
<i>Lemnaphyllum microphyllum</i>	伏石蕨	herb 草本	native 原生	-	-				+						
<i>Leonurus japonicus</i>	Mother-wort 益母草	biennial herb 二年生草本	native 原生	Tai Po Kau, Tai Po, Plover Cove, Sai Kung, Yuen Long, Lantau Island 大埔滘, 大埔, 船灣, 西貢, 元朗, 大嶼山	-				+						
<i>Lepidosperma chinense</i>	Chinese Scaleseed Sedge 鱗子莎	herb 草本	native 原生	Common in Hong Kong 香港常見	-	+		++		+	++				
<i>Leucaena leucocephala</i>	White Popinac 銀合歡	small tree 小喬木	exotic 外來	Cultivated and naturalized 栽培及歸化種	-	+	+		++	+					++
<i>Ligustrum sinense</i>	Chinese Privet 山指甲	shrub or small tree 灌木或小喬木	exotic 外來	Common in Hong Kong and widely cultivated 香港常見及廣泛栽種	-				+	+					
<i>Liquidambar formosana</i>	Sweet Gum 楓香	tree 喬木	native 原生	Common in Hong Kong. Also widely planted 香港常見及廣泛栽種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+					
<i>Liriope spicata</i>	Lily Turf 山葵冬	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-				+						
<i>Litchi chinensis</i> ⁽⁴⁾	Lychee 荔枝	tree 喬木	exotic 外來	Cultivated 栽培種	List of Wild Plants under State Protection: Category II; Threatened Species List of China's Higher Plants: Endangered; Rare and Endangered Plants and National Key Protected Plants in Guangdong; Near Threatened 國家重點保護野生動物名錄: 2級; 中國植物受高等威脅物種名錄: 瀕危; 廣東省國家重點保護野生動物瀕危植物資源: 近危								+	+	
<i>Litsea glutinosa</i>	Pond Spice 潺槁樹	tree 喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+	++	+				+
<i>Litsea monopetala</i>	Persimmon-leaved Litsea 假柿木薑子	small tree 小喬木	native 原生	Hong Kong Island, Sai Kung, Lantau 香港島, 西貢, 大嶼山	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+									
<i>Litsea rotundifolia</i> var. <i>oblongifolia</i>	Oblong-leaved Litsea 羽皮樟	shrub 灌木	native 原生	Common in Hong Kong 香港常見	-	+			++	+	+++				
<i>Livistona chinensis</i> ⁽⁴⁾	Chinese Fan-palm 蒲葵	tree palm 棕櫚喬木	exotic 外來	Cultivated 栽培種	Threatened Species List of China's Higher Plants: Vulnerable 中國植物受高等威脅物種名錄: 易危										+
<i>Lobelia chinensis</i>	Chinese Lobelia 半邊蓮	perennial herb 多年生草本	native 原生	Sha Tin, Tai Mo Shan, Tai Po, Fanling, Ng Tung Chai, Tsiu Hang, Wu Kau Tang, Lantau Island 沙田, 大嶼山, 大埔, 粉嶺, 梧桐寨	-					+					
<i>Lophatherum gracile</i>	Common Lophantherum 淡竹葉	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-				++	+					
<i>Lophostemon confertus</i>	Brisbane Box 紅膠木	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+			++	++	++				
<i>Loropetalum chinense</i> f. <i>rubrum</i>	Red Strap Flower 紅花繼木	shrub or small tree 灌木或小喬木	exotic 外來	-	-										+
<i>Lycopersicon esculentum</i>	Tomato 番茄	herb 草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+	+	
<i>Lygodium japonicum</i>	Climbing Fern 海金沙	climbing herb 攀藤草本	native 原生	-	-				+	+	++				
<i>Lygodium scandens</i>	Scansorial Climbing Fern 小葉海金沙	climbing herb 攀藤草本	native 原生	-	-				+	+					
<i>Macaranga tanarius</i> var. <i>tomentosa</i>	Elephant's Ear 血桐	tree 喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+	+		++	+					++
<i>Mallotus paniculatus</i>	Turn-in-the-wind 白楸	shrub or tree 灌木至喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+	+					
<i>Mangifera indica</i>	Mango 芒果	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Data Deficient 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 數據缺乏									+	+
<i>Melaleuca cajuputi</i> subsp. <i>cumingiana</i>	Paper-bark Tree 白千層	tree 喬木	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+		+		++					+
<i>Melastoma dodecandrum</i>	Twelve-stamened Melastoma 地蕊	diffuse subshrub 擴散的亞灌木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危						+				
<i>Melastoma sanguineum</i>	Blood-red Melastoma 毛蕊	shrub 灌木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+				+	++				
<i>Melia azedarach</i>	China-berry 苦楝	tree 喬木	exotic 外來	Cultivated or naturalized 栽培或歸化種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危				+						+

Appendix 2.7.2: Flora Species Recorded within the 500m Study Area
 附錄 2.7.2: 500米研究範圍內記錄到的植物物種

Scientific Name 學名	Common Name 俗名	Growth Form 生長型態	Native / Exotic to Hong Kong	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Protection/Conservation Status 保護/保育狀況 ⁽²⁾	Assessment Area 研究範圍									
						WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	
<i>Melicope pteleifolia</i>	Thin Evodia 三椏苦	shrub or small tree 灌木或小喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+				
<i>Melinis repens</i>	Redtop 紅毛草	perennial herb 多年生草本	exotic 外來	Common in Hong Kong (naturalized) 香港常見(歸化種)	-							+		+	
<i>Microcos nervosa</i>	Microcos 布渣葉	shrub or small tree 灌木或小喬木	native 原生	Common in Hong Kong 香港常見	-				+	+					
<i>Microstegium ciliatum</i>	Ciliate Microstegium 剛莠竹	perennial procumbent herb 多年生匍匐草本	native 原生	Common in Hong Kong 香港常見	-	+		+							
<i>Mikania micrantha</i>	Millie-a-minute Weed 薇甘菊	climbing herb 攀藤草本	exotic 外來	Naturalized and widely distributed in Hong Kong 歸化及於香港廣泛分布	-	+	+		+				+	+	+
<i>Millettia nitida</i>	Glittering-leaved Millettia 亮葉崖豆藤	climbing shrub 攀援灌木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+					
<i>Mimosa pudica</i>	Sensitive Plant 含羞草	herb 草本	exotic 外來	Naturalized in Hong Kong 歸化種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+	+	+
<i>Momordica charantia</i> var. <i>abbreviata</i>	短角苦瓜	procumbent plant 匍匐植物	exotic 外來	-	-								+		
<i>Morinda parvifolia</i>	Little-leaved Indian-mulberry 雞眼藤	climbing shrub 攀援灌木	native 原生	Common in Hong Kong 香港常見	-								+		
<i>Morus alba</i>	White Mulberry 桑	shrub or tree 灌木至喬木	native 原生	Common in Hong Kong. Also cultivated 香港常見及廣泛栽種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+					+
<i>Murraya paniculata</i>	Orange-essamine 九里香	small tree 小喬木	exotic 外來	Cultivated or naturalized 栽種或歸化種	-					+	+				
<i>Musa x paradisiaca</i>	Common Banana 大蕉	perennial herb 多年生草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+	+						+	+	
<i>Mussaenda pubescens</i>	Splash-of-white 玉葉金花	climbing shrub 攀援灌木	native 原生	Common in Hong Kong 香港常見	-					+	+				
<i>Nepenthes mirabilis</i>	Pitcher Plant 豬籠草	carnivorous herb 肉食草本	native 原生	Tai Lam Chung, So Kwun Wat, Castle Peak, Lantau Island 大帽涌, 掃管笏, 青山, 大嶼山	Protected under Forests and Countryside Ordinance (Cap. 96); Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586); Rare and Precious Plants of Hong Kong (Status in China): Category 4 (Vulnerable); Threatened Species List of China's Higher Plants; Vulnerable; IUCN Red List (ver. 2023.1): Least Concern 受《林務規例》(第96章)保護; 受《動植物(瀕危物種保護)條例》(第586章)保護; 香港稀有及珍貴植物(中國狀態): 類別4(易危); 中國植物受高等威脅物種名錄: 易危; 國際自然保護聯盟紅色名錄(版本2023.1): 無危	++			++	+	+				
<i>Oncidium flexuosum</i> ⁽⁴⁾	跳舞蘭	herb 草本	exotic 外來	-	Protected under Forests and Countryside Ordinance (Cap. 96); Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) 受《林務規例》(第96章)保護; 受《動植物(瀕危物種保護)條例》(第586章)保護;									+	
<i>Opuntia stricta</i> var. <i>dillenii</i>	Prickly-pear 仙人掌	perennial herb 多年生草本	exotic 外來	Cultivated or naturalized 栽培或歸化種	-									+	
<i>Ormosia emarginata</i>	Emarginate-leaved Ormosia 凹葉紅豆	small tree 小喬木	native 原生	Common in Hong Kong 香港常見	List of Wild Plants under State Protection: Category II 國家重點保護野生植物名錄: 2級								+		
<i>Oxalis corniculata</i>	Sorrel 酢漿草	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-					+					
<i>Oxalis debilis</i> subsp. <i>corymbosa</i>	Lavender Sorrel 紅花酢漿草	perennial herb 多年生草本	exotic 外來	A common weed in Hong Kong 香港常見的野草	-		+							+	
<i>Paederia scandens</i>	Chinese Feervine 雞矢藤	climber: vine 攀藤、藤本	native 原生	Common in Hong Kong 香港常見	-					+	+			+	
<i>Pailinhæa cernua</i>	Nodding Clubmoss 鋪地蜈蚣	creeping herb 匍匐草本	native 原生	-	-								+	+	
<i>Pandanus austrosinensis</i>	露兜草	herb 草本	native 原生	Tai Mo Shan 大帽山	-										+
<i>Panicum maximum</i>	Guinea Grass 大黍	perennial herb 多年生草本	exotic 外來	Cultivated for forage 栽種作飼料	-					++	+			+	+
<i>Passiflora foetida</i>	Passion Flower 龍珠果	herbaceous vine 草本藤本	exotic 外來	Common in Hong Kong. Naturalized 香港常見、歸化種	-					+	+				
<i>Pennisetum alopecuroides</i>	Plume Grass 狼尾草	perennial herb 多年生草本	native 原生	Common in Hong Kong 香港常見	-								+		
<i>Pennisetum purpureum</i>	Napier Grass 象草	perennial herb 多年生草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		
<i>Perilla frutescens</i>	Perilla 紫蘇	herb 草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+	+	
<i>Persicaria chinensis</i>	Chinese Knotweed 火炭母	herb 草本	native 原生	Common in Hong Kong 香港常見	-					+			+	+	
<i>Philodendron</i> spp.	-	climbing herb 攀藤草本	exotic 外來	-	-										+
<i>Phragmites vallatorius</i>	Reed 卡開蘆	perennial herb 多年生草本	native 原生	Mai Po, Castle Peak, Lin Au, Sai Kung, Lantau Island, Soko Islands 米埔, 青山, 蓮澳, 西貢, 大嶼山, 索罟群島	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危	+									
<i>Phyllanthus cochinchinensis</i>	Vietnam Leaf-flower 越南葉下珠	shrub 灌木	native 原生	Common in Hong Kong 香港常見	-	+		++	+	+	+				+
<i>Phyllanthus emblica</i>	Myrobalan 餘甘子	shrub or tree 灌木至喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+		

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Scientific Name 學名	Common Name 俗名	Growth Form 生長型態	Native / Exotic to Hong Kong	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Protection/Conservation Status 保護/保育狀況 ⁽³⁾	Assessment Area 研究範圍								
						WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA
<i>Thunbergia alata</i>	Black-eyed Susan 翼葉老鴉嘴	climber vine 攀藤藤本	exotic 外來	Cultivated or naturalised 栽培或歸化種	-							+		
<i>Thysanolaena latifolia</i>	Tiger-grass 棕葉蘆	herb 草本	native 原生	Common in Hong Kong 香港常見	-					+			+	
<i>Tradescantia spathacea</i>	Oyster Plant 紫背萬年青	herb 草本	exotic 外來	Cultivated 栽培種	-								+	
<i>Trema tomentosa</i>	India-charcoal Trema 山黃麻	shrub or small tree 灌木或小喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+			
<i>Tylophora ovata</i>	Ovate Tylophora 娃兒藤	slender woody vine 細長的木質藤本	native 原生	Common in Hong Kong 香港常見	-					+				
<i>Urena lobata</i>	Rose Mallow 肖梵天花	subshrubby herb 灌木草本	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+			
<i>Utricularia bifida</i>	Small Yellow Bladderwort 割雞芒	small herb 小草本	native 原生	Hong Kong Island, Tai Mo Shan, Sheung Shui, Sai Kung, Lo Wu, Lantau Island 香港島、大帽山、上水、西貢、羅湖、大嶼山	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危						++			
<i>Vernonia amygdalina</i>	南非葉	shrub 灌木	exotic 外來	-	-									+
<i>Vernonia cinerea</i>	Iron-weed 夜香牛	herb 草本	native 原生	Common in Hong Kong 香港常見	-					+				
<i>Vitex quinata</i>	Wild Vitex 山牡荊	small tree 小喬木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+	+
<i>Wedelia trilobata</i>	三裂葉鋸齒菊	perennial herb 多年生草本	exotic 外來	Naturalized and widely cultivated 歸化及廣泛栽種	-	+			+	+				+
<i>Wikstroemia indica</i>	Indian Wikstroemia 了哥王	shrub 灌木	native 原生	Common in Hong Kong 香港常見	-					+	+			
<i>Youngia japonica</i>	Hawk's Beard 黃鸚菜	herb 草本	native 原生	Common in Hong Kong 香港常見	-			+						
<i>Zanthoxylum avicennae</i>	Prickly Ash 荊棘花椒	tree 喬木	native 原生	Common in Hong Kong 香港常見	-	+			++	+	+			
<i>Zanthoxylum nitidum</i>	Shiny-leaved Prickly Ash 兩面針	climbing shrub 攀援灌木	native 原生	Common in Hong Kong 香港常見	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危					+	+	+		
<i>Zea mays</i>	Maize 玉蜀黍	herb 草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Least Concern 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 無危								+	
<i>Zingiber officinale</i>	Ginger 薑	perennial herb 多年生草本	exotic 外來	Cultivated 栽培種	IUCN Red List (ver. 2023.1): Data Deficient 列入《國際自然保護聯盟紅色名錄》(版本: 2023.1): 數據缺乏								+	
Total number of species 物種數量						46	16	17	95	137	83	59	46	55

Notes 備註：

(1) Distribution in Hong Kong follows 香港分佈根據：

(2) Yip, Y., Yip, K.L., Liu, K.J., Ngai, Y.N. & Lai, C.C. (2010). A Floristic Survey of Marshes in Hong Kong. Hong Kong Biodiversity. Issue No. 19.

(3) Protection statuses follow 保護狀態根據：

Listed under the Forests and Countryside Ordinance (Cap. 96)

Listed under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)

AFCD (2022). Rare and Precious Plants of Hong Kong. Agriculture, Fisheries and Conservation Department, HKSAR.

List of Wild Plants Under State Protection. (promulgated by the National Forestry and Grassland Administration in 2021).

Fu, K.L. & Chin, C.M. (1992). China Plant Red Data Book, Vol. 1 - Rare and Endangered Plants. Science Press, Beijing. 736 pages. (In Chinese only)

Qin, et al. (2017). Threatened Species List of China's Higher Plants. Biodiversity Science 25(7):696-747

IUCN. (2023). The IUCN Red List of Threatened Species. Version 2023.01.

Feng, Z.J., Li, Z.K., Li, B.T., Xue, C.G., Liu, J.B. & He, Y.Q. (2002). Study on Rare and Endangered Plants and National Key Protected Plants in Guangdong. Journal of South China Agricultural University 3:24-27

Wu, D.L. & Hu, C.X. (1988). Illustrations of Rare and Endangered Plants in Guangdong Province. China Environmental Science Press, Beijing. 46pp. (In Chinese only). 保護狀態根據：

受《林區及郊區條例》(第96章)保護。

受《保護瀕危動植物物種條例》(第586章)保護。

漁農自然護理處(2022)。香港稀有及珍貴植物。

國家重點保護野生植物名錄

傅立國(1992)。《中國植物紅皮書》(第一卷)。(中文版)

譚海寧等人(2017)。中國植物受高等威脅物種名錄。

國際自然保護聯盟(2023)。國際自然保護聯盟紅色名錄。版本2023-1。

馮志堅等人(2002)。廣東省國家重點保護野生珍稀瀕危植物資源與利用。

吳德輝、胡長富(1988)。廣東省珍稀瀕危植物。

(4) The species is artificially introduced to the habitat, thus it is not considered as species of conservation importance. 人工引入物種不作具重要保育價值物種考量

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland

環境簡稱：WC=水道; MWC=人工水道; IR=灌溉水塘; MWL=混合林地; PL=植林區; SL=灌木叢林; DAL=乾涸農地; V/O=村落 / 果園; DA=已發展地區 / 廢置土地

Code for Abundance 相對數量: +++++=Dominant 優勢; ++++=Abundant 豐富; +++=Frequent 常見; ++=Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in bold type face 調查中錄得的具重要保育價值物種將以粗體顯示

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Appendix 2.7.3
Fauna Species Recorded within 500m Study Area
附錄 2.7.3
500米研究範圍內記錄到的動物物種

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Appendix 2.7.3A: Avifauna Species Recorded within the 500m Study Area

附錄 2.7.3A: 500米研究範圍內記錄到的鳥類物種

Common Name 俗名 ⁽¹⁾	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽²⁾	Principal Status 香港居留狀況 ⁽⁴⁾	Level of Concern 受關注程度 ⁽⁵⁾	Protection Status in China 在中國的保育狀況 ⁽⁶⁾	China Red Data Book 中國瀕危動物紅皮書 ⁽⁷⁾	Red List of China's Vertebrates 中國脊椎動物紅色名錄 ⁽⁸⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁹⁾	Assessment Area 研究範圍										
									WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	IF	
Daurian Redstart 北紅尾鴝	<i>Phoenicurus auroreus</i>	Common winter visitor. Widely distributed in Hong Kong. 常見冬候鳥。廣泛分布於香港。	W	-	-	-	Least Concern 無危	Least Concern 無危					+	+			+	+	
Dusky Warbler 褐柳鶯	<i>Phylloscopus fuscatu</i>	Abundant winter visitor and migrant. Widely distributed in shrubland and waterside vegetation throughout Hong Kong. 大量冬候鳥及遷徙鳥。廣泛分布於香港近水的灌木林。	W	-	-	-	Least Concern 無危	Least Concern 無危					+				+		
Eurasian Tree Sparrow 樹麻雀	<i>Passer montanus</i>	Abundant resident, widely distributed in Hong Kong. 大量留鳥。廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+	+	+	++++	++++	
Fork-tailed Sunbird 叉尾太陽鳥	<i>Aethopyga christinae</i>	Common resident and winter visitor. Widely distributed in Hong Kong. 常見留鳥及冬候鳥。廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+					
Greater Necklaced Laughingthrush 黑領噪鶇	<i>Pterorhinus pectoralis</i>	Locally common resident. Widely distributed in shrubland and woodland throughout Hong Kong. 局部地區常見留鳥。廣泛分布於香港的樹林及灌木林。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	++					
Grey Wagtail 灰鶺鴒	<i>Motacilla cinerea</i>	Common passage migrant and winter visitor. Widely distributed in hill streams throughout Hong Kong. 常見過境遷徙鳥及冬候鳥。廣泛分布於香港的山麓。	W	-	-	-	Least Concern 無危	Least Concern 無危	+		+						+		
Swinhoe's White-eye 藍綠繡眼鳥	<i>Zosterops simplex</i>	Abundant resident, widely distributed in Hong Kong. 十分常見的留鳥。廣泛分布於香港。	R.?W	-	-	-	Least Concern 無危	Least Concern 無危					++	++++	++		+++	+++	
Large-billed Crow 大嘴烏鴉	<i>Corvus macrorhynchos</i>	Common resident, widely distributed in Hong Kong. 常見留鳥。廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	++	+				
Little Egret 小白鷺 ⁽¹⁰⁾	<i>Egretta garzetta</i>	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong. 常見留鳥、遷徙鳥及冬候鳥。廣泛分布於香港的海岸。	P	PRC (RC)	-	-	Least Concern 無危	Least Concern 無危											+
Masked Laughingthrush 黑臉噪鶇	<i>Pterorhinus perspicillatus</i>	Abundant resident, widely distributed in shrubland throughout Hong Kong. 常見留鳥。廣泛分布於香港的灌木林。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+		++	+	++	
Mountain Bulbul 綠翅短腳鶇	<i>Ixos mclellandii</i>	Uncommon resident. Found in Tai Po Kau, Ng Tung Chai. 少見留鳥。過往記錄地點包括大埔滘、橙樹寮等。	-	-	-	-	Least Concern 無危	Least Concern 無危						+					
Olive-backed Pipit 樹鶇	<i>Anthus hodgsoni</i>	Common passage migrant and winter visitor. Widely distributed in Hong Kong. 常見過境遷徙鳥及冬候鳥。廣泛分布於香港。	W	-	-	-	Least Concern 無危	Least Concern 無危					+		+	+			
Oriental Magpie-Robin 鶺鴒	<i>Copsychus saularis</i>	Abundant resident, widely distributed in Hong Kong. 大量留鳥。廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+		+	+		
Pallas's Leaf Warbler 黃腰柳鶯	<i>Phylloscopus proregulus</i>	Common winter visitor and migrant. Found in woodland throughout Hong Kong. 常見冬候鳥及遷徙鳥。常記錄於香港的樹林。	W	-	-	-	Least Concern 無危	Least Concern 無危					+	+					
Red-billed Blue Magpie 紅胸藍鶺鴒	<i>Urocissa erythroryncha</i>	Common resident, widely distributed in woodland edges throughout Hong Kong. 常見留鳥。廣泛分布於香港的樹林邊沿。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+++	+		+	+	
Red-whiskered Bulbul 紅耳鶇	<i>Pycnonotus jocosus</i>	Abundant resident, widely distributed in Hong Kong. 十分常見的留鳥。廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危		+			+++	++++	++	++	++++	+++	
Savanna Nightjar 林夜鶇	<i>Caprimulgus affinis</i>	Uncommon resident and passage migrant. 少見留鳥。廣泛分布於香港。	Su.?W	-	-	-	Data Deficient 數據缺乏	Least Concern 無危					+						

Appendix 2.7.3A: Avifauna Species Recorded within the 500m Study Area

附錄 2.7.3A: 500米研究範圍內記錄到的鳥類物種

Common Name 俗名 ⁽¹⁾	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽²⁾	Principal Status 香港居留狀況 ⁽⁴⁾	Level of Concern 受關注程度 ⁽⁶⁾	Protection Status in China 在中國的保育狀況 ⁽⁶⁾	China Red Data Book 中國瀕危動物紅皮書 ⁽⁷⁾	Red List of China's Vertebrates 中國脊椎動物紅色名錄 ⁽⁸⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁹⁾	Assessment Area 研究範圍											
									WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	IF		
Scarlet-backed Flowerpecker 朱背啄花鳥	<i>Dicaeum cruentatum</i>	Common resident, Widely distributed in wooded area throughout Hong Kong. 常見留鳥，廣泛分布於香港的樹林。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+	+					
Spotted Dove 珠頸斑鳩	<i>Spilopelia chinensis</i>	Abundant resident, Widely distributed in Hong Kong. 十分常見的留鳥，廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+		++	++	+++		
White Wagtail 白鶺鴒	<i>Motacilla alba</i>	Resident, common passage migrant and winter visitor. Widely distributed in Hong Kong. 留鳥，常見過境遷徙鳥及冬候鳥，廣泛分布於香港。	W,R	-	-	-	Least Concern 無危	Least Concern 無危			+	+						+		
White-breasted Waterhen 白胸苦惡鳥 ⁽¹⁰⁾	<i>Amaurornis phoenicurus</i>	Common resident, Widely distributed in wetland throughout Hong Kong. 常見留鳥，廣泛分布於香港的濕地。	R	-	-	-	Least Concern 無危	Least Concern 無危											+	
White's Thrush 懷氏地鶇	<i>Zoothera aurea</i>	Uncommon winter visitor and migrant, Widely distributed in woodland throughout Hong Kong. 少見冬候鳥及遷徙鳥，廣泛分布於香港的樹林。	W	-	-	-	Least Concern 無危	Least Concern 無危					+		+					
White-throated Kingfisher 白胸翡翠 ⁽¹⁰⁾	<i>Halcyon smyrnensis</i>	Common resident, Widely distributed in coastal areas throughout Hong Kong. 常見留鳥，廣泛分布於香港的海岸。	AM,P	(LC)	Class II 二級	-	Least Concern 無危	Least Concern 無危								+				+
Yellow-bellied Prinia 黃腰鶯鶯	<i>Prinia flaviventris</i>	Common resident, Widely distributed in Hong Kong. 常見留鳥，廣泛分布於香港。	R	-	-	-	Least Concern 無危	Least Concern 無危					+	+	+	+	+			
Yellow-browed Warbler 黃眉柳鶯	<i>Phylloscopus inornatus</i>	Abundant winter visitor and migrant, Widely distributed in woodland throughout Hong Kong. 大量冬候鳥及遷徙鳥，廣泛分布於香港的樹林。	W	-	-	-	Least Concern 無危	Least Concern 無危						+					+	
Total number of species 物種數量									1	2	2	27	25	16	11	20	11	3		

Note 備註：

- (1) All wild birds are Protected under Wild Animals Protection Ordinance (Cap. 170), 所有野生雀鳥受《野生動物保護條例》(第170章)保護。
 (2) Protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586), 受《保護瀕危動物植物物種條例》保護(第586章)。
 (3) AFCOD (2023), Hong Kong Biodiversity Information Hub, 漁農自然護理署(2023)。香港生物多樣性資訊站物種數據庫。
 (4) Carey, G.J., et al. (2001), The Avifauna of Hong Kong, Hong Kong Bird Watching Society, Hong Kong., R=resident 留鳥; W=winter visitor 冬候鳥; Su=summer visitor 夏候鳥; M=migrant 遷徙過境鳥; A=autumn 秋季; P=present all year, exact composition unknown 全年分布，確實狀況不明; ?W=extent of migration in winter is unclear 冬季遷徙過境，確實狀況不明。
 (5) Fellowes, J.R., et al. (2002), Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong, *Memoirs of the Hong Kong Natural History Society* 25:123-159, LC=Local Concern 本地關注; PRC=Potential Regional Concern 潛在區域性關注; RC=Regional Concern 區域性關注。
 Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence, 括號中的狀況表示評估是基於繁殖和/或棲息地的受限程度，而不是物種出現的情況。
 (6) List of Wild Animals Under State Protection (promulgated by the National Forestry and Grassland Administration in 2021), 列入《國家重點保護野生動物名錄》(由國家林業及草原局於2021年發佈)。
 (7) Zheng, G. M. & Wang, Q. S. (1998), China Red Data Book of Endangered Animals, Aves. (In Chinese only), 鄭光美及王岐山(1998)。中國瀕危動物紅皮書：鳥類。
 (8) Jiang et al. (2016), Red List of China's Vertebrates, 蔣志剛等人(2016)。中國脊椎動物紅色名錄。
 (9) International Union for the Conservation of Nature (IUCN) (2023), The IUCN Red List of Threatened Species, Version 2023-1, 國際自然保護聯盟(2023)。國際自然保護聯盟紅色名錄，版本2023-1
 (10) Wetland-dependent species (including wetland-dependent species and waterbirds), 濕地依存物種(包括濕地依存物種與水鳥)。

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland; IF=In-flight
 生境簡稱：WC=水徑; MWC=人工水徑; IR=灌溉水塘; MWL=混合林地; PL=造林區; SL=灌木叢林; DAL=乾濕農地; V/O=村落/果園; DA=已發展地區/廢置土地; IF=飛行中
 Code for Abundance 相對數量: ++++=Dominant 優勢; +++=Abundant 豐富; ++=Frequent 常見; +=Occasional 偶爾; =Scarce 稀少
 Species of conservation importance is in **bold type face** 調查中錄得的具重要保育價值物種將以**粗體**顯示

Appendix 2.7.3B: Mammal Species Recorded within the 500m Study Area

附錄 2.7.3B: 500米研究範圍內記錄到的哺乳動物物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽⁴⁾	Protection Status in China 在中國的保育狀況 ⁽⁶⁾	China Red Data Book 中國瀕危動物紅皮書 ⁽⁷⁾	Red List of China's Vertebrates 中國脊椎動物紅色名錄 ⁽⁸⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁹⁾	Assessment Area 研究範圍										
								WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA		
Red Muntjac 赤麂	<i>Muntiacus muntjak</i>	Very widely distributed in countryside areas throughout Hong Kong 非常廣泛分布於香港各郊區。	PRC	-	-	Near Threatened 近危	Least Concern 無危				+	+	+					
Small Indian Civet 小靈貓 ⁽¹⁾	<i>Viverricula indica</i>	Very widely distributed in countryside areas throughout Hong Kong, except for Lantau Island 非常廣泛分布於大嶼山以外之香港各郊區。	-	Class I 一級	-	Vulnerable 易危	Least Concern 無危				+	+	+					
Total number of species 物種數量								1	2	3	12	10	11	1	5	4		

Notes 備註:

(1) Protected under Wild Animals Protection Ordinance (Cap. 170), 受《野生動物保護條例》(第170章)保護。

(2) Protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586), 受《保護瀕危動植物物種條例》保護(第586章)。

(3) AFCD (2022), Hong Kong Biodiversity Information Hub, 漁農自然護理署(2022) · 香港生物多樣性資訊站物種數據庫。

(4) Felton, J.R., et al. (2002), Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong, Memoirs of the Hong Kong Natural History Society 25:123-159, LC=Local Concern 本地關注; PRC=Potential Regional Concern 潛在區域性關注; RC=Regional Concern 區域性關注; PGC=Potential Global Concern 潛在全球性關注。Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence, 括號中的狀況表示評估是基於繁殖和/或棲息地的受限程度，而不是物種出現的情況。

(5) List of Wild Animals Under State Protection (promulgated by the National Forestry and Grassland Administration in 2021), 列入《國家重點保護野生動物名錄》(由國家林業及草原局於2021年發佈)。

(6) Wang, S. (1998), China Red Data Book of Endangered Animals, Mammalia, (In Chinese only), 汪松(1998) · 中國瀕危動物紅皮書: 獸類。

(7) Jiang et al. (2016), Red List of China's Vertebrates, 蔣志剛等人(2016) · 中國脊椎動物紅色名錄。

(8) International Union for the Conservation of Nature (IUCN) (2023), The IUCN Red List of Threatened Species, Version 2023-1, 國際自然保護聯盟(2023) · 國際自然保護聯盟紅色名錄 · 版本2023-1

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland

生境簡稱: WC=水道; MWC=人工水道; IR=灌溉水塘; MWL=混合林地; PL=植林區; SL=灌木叢林; DAL=乾涸農地; V/O=村落 / 果園; DA=已發展地區 / 廢置土地

Code for Abundance 相對數量: +++++Dominant 優勢; ++++Abundant 豐富; +++Frequent 常見; ++Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in **bold type face**. 調查中錄得的具重要保育價值物種將以**粗體**顯示

Appendix 2.7.3C: Butterfly Species Recorded within the 500m Study Area

附錄 2.7.3C: 500米研究範圍內記錄到的蝴蝶物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	Protection Status in China 在中國的保育狀況 ⁽³⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁴⁾	Assessment Area 研究範圍								
						WC	MWC	IR	MWL	PL	DAL	SL	V/O	DA
-	<i>Catopsilia</i> spp.	-	-	-	-	+		+			+			+
-	<i>Eurema</i> spp.	-	-	-	-	+				++	+	++	+	+
Angled Castor 波蚨蝶	<i>Ariadne ariadne</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-						+		+	+
Baron 矛翠蛺蝶	<i>Euthalia aconthea</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	LC	-	-				+					
Blue Tiger 青斑蝶	<i>Tirumala limniace</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-								+	
Blue-spotted Crow 藍點紫斑蝶	<i>Euploea midamus</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-		+		+	+	+	+	+	+
Ceylon Blue Glassy Tiger 擬旖斑蝶	<i>Ideopsis similis</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-				+	+		+		
Chinese Dart 孔子黃室弄蝶	<i>Potanthus confucius</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-					+		+		
Chocolate Pansy 鉤翅眼蛺蝶	<i>Junonia iphita</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-		+						+	
Common Archduke 小豹律蛺蝶	<i>Lexias pardalis</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-	+		+	+					
Common Five-ring 雙眼蝶	<i>Ypthima baldus</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-				+	+				
Common Indian Crow 幻紫斑蝶	<i>Euploea core</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-	Least Concern 無危			+	+				
Common Mapwing 網絲蛺蝶	<i>Cyrestis thyodamas</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-		+						+	
Common Mime 斑鳳蝶	<i>Chilasa clytia</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-							+	+	
Common Mormon 玉帶鳳蝶	<i>Papilio polytes</i>	Widely distributed throughout Hong Kong 廣泛分布於全港。	-	-	-		+	+	+	++	+	+	+	+

Appendix 2.7.3C: Butterfly Species Recorded within the 500m Study Area

附錄 2.7.3C: 500米研究範圍內記錄到的蝴蝶物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	Protection Status in China 在中國的保育狀況 ⁽³⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁴⁾	Assessment Area 研究範圍								
						WC	MWC	IR	MWL	PL	DAL	SL	V/O	DA
Common Palmfly 翠袖鋸眼蝶	<i>Elymnias hypermnestra</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-								+	
Common Sailer 中環蛺蝶	<i>Neptis hylas</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+				
Common Tiger 虎斑蝶	<i>Danaus genutia</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	++	+	+	+	
Contiguous Swift 黃紋孔弄蝶	<i>Polytremis lubricans</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-								+	
Dark Cerulean 雅灰蝶	<i>Jamides bochus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-								+	
Dark-brand Bush Brown 小眉眼蝶	<i>Mycalesis mineus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-	+		+	++	+	+	+	+	+
Five-bar Swordtail 綠鳳蝶	<i>Pathysa antiphates</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-							+		
Five-dot Sergeant 殘鐳線蛺蝶	<i>Parathyma sulpitia</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+			+	
Forest Hopper 隱翅弄蝶	<i>Astictopterus jama</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	+		+		
Glassy Tiger 絹斑蝶	<i>Parantica aglea</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+				
Great Eggfly 幻紫斑蛺蝶	<i>Hypolimnas bolina</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-	+	+		+	+	+	+	+	
Great Mormon 美鳳蝶	<i>Papilio memnon</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-			+		+	+			
Great Orange Tip 鶴頂粉蝶	<i>Hebomoia glaucippe</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+		+	+	
Indian Cabbage White 東方菜粉蝶	<i>Pieris canidia</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-						+		+	+
Indian Red Admiral 大紅蛺蝶	<i>Vanessa indica</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-			+						
Lemon Emigrant 遷粉蝶	<i>Catopsilia pomona</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-	+			+	+		+	+	

Appendix 2.7.3C: Butterfly Species Recorded within the 500m Study Area

附錄 2.7.3C: 500米研究範圍內記錄到的蝴蝶物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	Protection Status in China 在中國的保育狀況 ⁽³⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁴⁾	Assessment Area 研究範圍									
						WC	MWC	IR	MWL	PL	DAL	SL	V/O	DA	
Lemon Pansy 蛇眼蛺蝶	<i>Junonia lemonias</i>	Wu Kau Tang, Shan Liu, Shui Long Wo, Tong Fuk, Pak Tam Chung	-	-	-									+	
Lime Blue 紫灰蝶	<i>Chilades lajus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-									+	
Long-tailed Blue 亮灰蝶	<i>Lampides boeticus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	+	+				
Pale Grass Blue 酢漿灰蝶	<i>Pseudozizeeria maha</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-						+			+	+
Paris Peacock 巴黎翠鳳蝶	<i>Papilio paris</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	+		+	+	+	+
Plum Judy 蛇目褐蛺蝶	<i>Abisara echerius</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-		+	+	+	+++		++	+	+	
Purple Sapphire 斜斑彩灰蝶	<i>Heliophorus epicles</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-										+
Red Helen 玉斑鳳蝶	<i>Papilio helenus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+	+	+			+
Red Ring Skirt 黑脈蛺蝶	<i>Hestina assimilis</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+	+				
Rustic 黃襟蛺蝶	<i>Cupha erymanthis</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	++					
Short-banded Sailer 柱菲蛺蝶	<i>Phaedyma columella</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+					
Southern Sullied Sailer 珂環蛺蝶	<i>Neptis clinia</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+					
Spangle 藍鳳蝶	<i>Papilio protenor</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-	+	+			+	+			+	+
Staff Sergeant 新月帶蛺蝶	<i>Athyma selenophora</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+					

Appendix 2.7.3C: Butterfly Species Recorded within the 500m Study Area

附錄 2.7.3C: 500米研究範圍內記錄到的蝴蝶物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	Protection Status in China 在中國的保育狀況 ⁽³⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁴⁾	Assessment Area 研究範圍								
						WC	MWC	IR	MWL	PL	DAL	SL	V/O	DA
Tailed Jay 統帥青鳳蝶	<i>Graphium agamemnon</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+		+		
Tawny Rajah 白帶螫蝶	<i>Charaxes bernardus</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-					+				
White-edged Blue Baron 尖翅翠蛺蝶	<i>Euthalia phemius</i>	Widely distributed throughout Hong Kong 廣泛分佈於全港。	-	-	-				+	+		+		
Total number of species 物種數量						9	7	5	18	30	15	18	24	12

Notes 備註：

(1) AFCD (2023). Hong Kong Biodiversity Information Hub. 漁農自然護理署 (2023) 。香港生物多樣性資訊站物種數據庫。

(2) Fellowes, J.R. et al. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25:123-159. LC=Local Concern 本地關注, Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence. 括號中的狀況表示評估是基於繁殖和/或棲息地的受限程度, 而不是物種出現的情況。

(3) List of Wild Animals Under State Protection (promulgated by the National Forestry and Grassland Administration in 2021). 列入《國家重點保護野生動物名錄》(由國家林業及草原局於2021年發佈)保護。

(4) IUCN (2023). The IUCN Red List of Threatened Species. Version 2023.01. 國際自然保護聯盟 (2023) 。國際自然保護聯盟紅色名錄。版本2023-1

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland
 生境簡稱: WC=水道; MWC=人工水道; IR=灌溉水塘; MWL=混合林地; PL=植林區; SL=灌木叢林; DAL=乾涸農地; V/O=村落 / 果園; DA=已發展地區 / 廢置土地

Code for Abundance 相對數量: +++++=Dominant 優勢; ++++=Abundant 豐富; +++=Frequent 常見; ++=Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in **bold type face** 調查中錄得的具重要保育價值物種將以**粗體**顯示

Appendix 2.7.3D: Odonate Species Recorded within the 500m Study Area

附錄 2.7.3D: 500米研究範圍內記錄到的蜻蜓物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽³⁾	Assessment Area 研究範圍									
					WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	
-	<i>Orthetrum sp.</i>	-	-	-						+				
Asian Amberwing 黃翅蜻	<i>Brachythemis contaminata</i>	Widely distributed in weedy ponds and sluggish streams; Scattered 廣泛分布於本港野草叢生的池塘和流動緩慢的溪流; 零散分布	-	Least Concern 無危	+									
Black Threadtail 烏微橋原蠅	<i>Prodasineura autumnalis</i>	Often perches on the plants near streams. Widely distributed in streams throughout Hong Kong; Widespread 喜歡在溪流附近的植物上停棲。廣泛分布於本港的溪流; 廣泛分布	-	Least Concern 無危	+		+							
Black-banded Gossamerwing 方帶溪蠅	<i>Euphaea decorata</i>	Widely distributed in all streams of Hong Kong; Very Widespread 廣泛分布於本港各處的溪流; 廣泛分布	-	Least Concern 無危	+		+	+	+	+				
Blue Percher 紋藍小蜻	<i>Diplacodes trivialis</i>	Widespread, especially in late summer, when it can be found almost everywhere in Hong Kong; Sparse 分布廣泛。於夏末時幾乎在香港所有地方出沒; 稀疏分佈	-	Least Concern 無危									+	
Common Blue Jewel 三斑陽鼻蠅	<i>Rhinocypha perforata perforata</i>	Widely distributed in fast flowing streams throughout Hong Kong; Very Widespread 廣泛分布於本港水流急速的溪流; 非常廣泛分布	-	Least Concern 無危	+									
Common Blue Skimmer 黑尾灰蜻	<i>Orthetrum glaucum</i>	Widely distributed in streams, conduits, drainage channels, seepages and road gutters throughout Hong Kong; Very Widespread 廣泛分布於本港的溪流、水管、排水道、有滲漏的地方和有水的排水溝; 非常廣泛分布	-	Least Concern 無危	+	+	+	+	+	+	+	+	+	+
Common Flangetail 霸王葉春蜓	<i>Ictinogomphus pertinax</i>	Widely distributed in ponds and still water throughout Hong Kong; Widespread 廣泛分布於本港的池塘或靜止的水域; 廣泛分布	-	Least Concern 無危			+							
Common Red Skimmer 赤褐灰蜻	<i>Orthetrum pruinosum neglectum</i>	Widely distributed in slow streams, ponds, rain puddles and irrigation conduits; Widespread 廣泛分布於本港緩慢的溪流、池塘、雨水窪和灌溉用的水溝; 廣泛分布	-	Least Concern 無危		+	+				+			
Common Shadow-emerald 黓中偽蜻	<i>Macromidia rapida</i>	Frequents stream ponds or riffles of well shaded streams, widely distributed throughout Hong Kong; Scattered 於有濃蔭的溪流中的水潭和淺灘上出沒。分布廣泛; 稀疏分布	-	Least Concern 無危	+									
Crimson Darter 紅蜻	<i>Crocothemis servilia servilia</i>	Widely distributed in cultivated areas, ponds and marshes throughout the New Territories; Scattered 廣泛分布於新界的耕地、池塘和沼澤; 稀疏分布	-	Least Concern 無危			+	+						
Crimson Drogwing 曉褐蜻	<i>Trithemis aurora</i>	Found in marshes, ponds, streams, and/or even ornamental ponds in urban areas. Widely distributed throughout Hong Kong; Very Widespread 於沼澤、池塘、溪流、甚至在市區中用作景觀美化的水池上出沒。幾乎遍布全港; 非常廣泛分布	-	Least Concern 無危	+	+	++++			+			+	
Dingy Dusk-darter 細腹開臂蜻	<i>Zyxomma petiolatum</i>	Widely distributed in thick undergrowth, tree foliage and shady spots near water courses throughout Hong Kong; Scattered 廣泛分布於本港近水邊茂盛的灌木叢、樹林和有遮蔽的地方; 稀疏分布	-	Least Concern 無危			+							

Appendix 2.7.3D: Odonate Species Recorded within the 500m Study Area

附錄 2.7.3D: 500米研究範圍內記錄到的蜻蜓物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分佈狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽³⁾	Assessment Area 研究範圍									
					WC	MWC	IR	MWL	PL	SL	DAL	V/O	DA	
Red-faced Skimmer 華麗灰蜻	<i>Orthetrum chrysis</i>	Widely distributed in pools and marshy areas adjacent to flowing streams throughout Hong Kong; Very Widespread 廣泛分佈於本港溪流旁的水池和沼澤地；非常廣泛分佈	-	Least Concern 無危	+	+	+				+			
Regal Pond Cruiser 閃藍麗大偽蜻	<i>Epopthalmia elegans</i>	Always patrols along the edge of large ponds with a regular path. Widely distributed in reservoirs and large ponds throughout Hong Kong; Scattered 廣泛分佈於本港的水塘和大池塘。喜歡環繞大型池塘巡弋；零散分佈	-	Least Concern 無危			+							
Russet Percher 網脈蜻	<i>Neurothemis fulvia</i>	Found in marshes, cultivated areas, streams, tanks and irrigation feeders, sometimes even found in nearly dried out marshy areas. Widely distributed throughout Hong Kong; Widespread 於沼澤、耕地、溪流、人工水池和灌溉水溝出沒。有時甚至於幾近乾的沼澤棲息。分佈廣泛；廣泛分佈	-	Least Concern 無危			+					+	+	
Variegated Flutterer 斑麗翅蜻	<i>Rhyothemis variegata arria</i>	Widely distributed in marshes, ponds and tanks throughout Hong Kong; Widespread 廣泛分佈於本港的沼澤、池塘和人工水池；廣泛分佈	-	Least Concern 無危			+		+			+		
Wandering Glider 黃蜻	<i>Pantala flavescens</i>	Widely distributed all over Hong Kong; Widespread 在香港隨處可見；廣泛分佈	-	Least Concern 無危	+	++	+	+	+	+	+	+	+++	++++
Yellow Featherlegs 黃狹尾蟳	<i>Copera marginipes</i>	Widely distributed in lowland streams, ditches, and weedy margins of pond throughout Hong Kong; Widespread 廣泛分佈於本港的低地溪流、水溝及野草叢生的池邊；廣泛分佈	-	Least Concern 無危	+									
Total number of species 物種數量					13	5	19	6	9	6	8	7	2	

Notes 備註：

(1) AFCD (2023). Hong Kong Biodiversity Information Hub. 漁農自然護理署 (2023)。香港生物多樣性資訊站物種數據庫。

Reels, G.T. (2019). An Annotated Check List of Hong Kong Dragonflies and Assessment of Their Local Conservation Significance. Faunistic Studies in South-east Asia and Pacific Island Odonata. *Journal of the International Dragonfly Fund* 30: 1-49.

(2) Fellowes, J.R. et al. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* 25:123-159.LC=Local Concern 本地關注; PGC=Potential Global Concern 潛在全球性關注。

(3) IUCN (2023). The IUCN Red List of Threatened Species. Version 2023.01. 國際自然保護聯盟 (2023)。國際自然保護聯盟紅色名錄。版本2023-1

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland

生境簡稱：WC=水道；MWC=人工水道；IR=灌溉水塘；MWL=混合林地；PL=植林區；SL=灌木叢林；DAL=乾涸農地；V/O=村落 / 果園；DA=已發展地區 / 廢置土地

Code for Abundance 相對數量: +++++=Dominant 優勢; ++++=Abundant 豐富; +++=Frequent 常見; ++=Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in **bold type face** 調查中錄得的具重要保育價值物種將以**粗體**顯示

Appendix 2.7.3E: Herpetofauna Species Recorded within the 500m Study Area

附錄 2.7.3E: 500米研究範圍內記錄到的兩棲爬蟲物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	Protection Status in China 在中國的保育狀況 ⁽³⁾	China Red Data Book 中國瀕危動物紅皮書 ⁽⁴⁾	Red List of China's Vertebrates 中國脊椎動物紅色名錄 ⁽⁵⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁶⁾	Assessment Area 研究範圍							
								WC	MWC	IR	MWL	PL	SL	V/O	DA
Amphibians 兩棲類															
Asian Common Toad 黑眶蟾蜍	<i>Duttaphrynus melanostictus</i>	Widely distributed in Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危				+	++	+	+	
Asiatic Painted Frog 花狹口蛙	<i>Kaloula pulchra pulchra</i>	Widely distributed in Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+		
Brown Tree Frog 斑腿泛樹蛙	<i>Polypedates megalcephalus</i>	Widely distributed throughout Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+	+	
Greenhouse Frog 溫室蟾	<i>Eleutherodactylus planirostris</i>	Widely distributed throughout Hong Kong 廣泛分布於香港	-	-	-	-	Least Concern 無危				++	++	+	+	
Gunther's Frog 沼蛙	<i>Sylvirana guentheri</i>	Widely distributed throughout Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危	+	+	++			+	+	
Hong Kong Cascade Frog 香港湍蛙 ⁽¹⁾	<i>Amolops hongkongensis</i>	Widely distributed in mountain streams in Hong Kong, except Lantau Island 廣泛分布於本港的山區河流、大嶼 山除外	PGC	Class II 二級	-	Endangered 瀕危	Endangered 瀕危	+							
Lesser Spiny Frog 小棘蛙	<i>Quasipaa exilispinosa</i>	Widely distributed in upland forest streams throughout Hong Kong 廣泛分布於香港山區的河流	PGC	-	-	Vulnerable 易危	Least Concern 無危	++							
Ornate Pygmy Frog 飾紋姬蛙	<i>Microhyla fissipes</i>	Widely distributed in Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危							+	
Paddy Frog 澤蛙	<i>Fejervarya limnocharis</i>	Widely distributed throughout Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危	+		+					
Reptiles 爬蟲類															
Bamboo Snake 白唇竹葉青	<i>Cryptelytrops albolabris</i>	Very common and widespread in Hong Kong 非常常見及廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+	+	
Blue-tailed Skink 四線石龍子	<i>Plestiodon quadrilineatus</i>	Distributed in woodlands on Lantau Island, Hong Kong Island, Po Toi, Lung Kwu Chau, 分布於大嶼山、索罟群島、長洲及 香港島的林地	-	-	-	Least Concern 無危	Least Concern 無危						+		
Bowring's Gecko 原尾蜥	<i>Hemidactylus bowringii</i>	Distributed throughout Hong Kong 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危				+	+	+	+	
Changeable Lizard 變色樹蜥	<i>Calotes versicolor</i>	Widely distributed throughout Hong Kong. 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+	+	
Chinese Gecko 壁虎	<i>Gekko chinensis</i>	Widely distributed throughout Hong Kong. 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+	+	
Grass Lizard 南草蜥	<i>Takydromus sexlineatus ocellatus</i>	Distributed in grassland and woodland through out Hong Kong 分布於香港的草地和林地	-	-	-	Least Concern 無危	Least Concern 無危						+		
Indo-Chinese Rat Snake 灰鼠蛇	<i>Ptyas korros</i>	Widely distributed throughout Hong Kong. 廣泛分布於香港	PRC	-	Endangered 瀕危	Vulnerable 易危	Near Threatened 近危				+				
Long-tailed Skink 長尾南蜥	<i>Eutropis longicaudata</i>	Widely distributed throughout Hong Kong. 廣泛分布於香港	-	-	-	Least Concern 無危	Least Concern 無危						+		
Red-eared Slider 紅耳龜	<i>Trachemys scripta elegans</i>	Widely distributed and commonly found in reservoirs or ponds in urban parks 廣泛分布於本港的水塘及公園的池 塘	-	-	-	-	Least Concern 無危			+	+				
Taiwan Kukri Snake 台灣小頭蛇	<i>Oligodon formosanus</i>	Widely distributed throughout Hong Kong. 廣泛分布於香港	-	-	-	Near Threatened 近危	Least Concern 無危						+		
Total number of species 物種數量								4	2	3	4	11	5	9	4

Notes 備註：

(1) AFCD (2023). Hong Kong Biodiversity Information Hub, 漁農自然護理署 (2023) 。香港生物多樣性資訊站物種數據庫。

(2) Fellowes, J.R., et al. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. Memoirs of the Hong Kong Natural History Society 25:123-159.PRC=Potential Regional Concern 潛在區域性關注; PGC=Potential Global Concern 潛在全球性關注。

(3) List of Wild Animals Under State Protection (promulgated by the National Forestry and Grassland Administration in 2021). 列入《國家重點保護野生動物名錄》(由國家林業及草原局於2021年發佈)。

(4) Zhao and Wang (1998). China Red Data Book of Endangered Animals, Amphibia and Reptilia. 趙澤忠及汪松 (1998) 。中國瀕危動物紅皮書: 兩棲類及爬行類。

(5) Jiang et al. (2016). Red List of China's Vertebrates. 蔣志剛等人 (2016) 。中國脊椎動物紅色名錄。

(6) IUCN (2023). The IUCN Red List of Threatened Species, Version 2023.01. 國際自然保護聯盟 (2023) 。國際自然保護聯盟紅色名錄。版本2023-1

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; DAL=Dry Agricultural Land; V/O=Village / Orchard; DA=Developed Area / Wasteland

生境簡稱: WC=水道; MWC=人工水道; IR=灌溉水塘; MWL=混合林地; PL=植林區; SL=灌木叢林; DAL=乾涸農地; V/O=村落 / 果園; DA=已發展地區 / 廢置土地

Code for Abundance 相對數量: +++++=Dominant 優勢; ++++=Abundant 豐富; +++=Frequent 常見; ++=Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in bold type face 調查中錄得的具重要保育價值物種將以粗體顯示

Appendix 2.7.3F: Aquatic Communities Species Recorded within the 500m Study Area

附錄 2.7.3F: 500米研究範圍內記錄到的水生群落物種

Common Name 俗名	Scientific Name 學名	Distribution in Hong Kong 香港境內的分布狀況 ⁽¹⁾	Level of Concern 受關注程度 ⁽²⁾	China Red Data Book 中國瀕危動物紅皮書 ⁽⁴⁾	Red List of China's Vertebrates 中國脊椎動物紅色名錄 ⁽⁵⁾	IUCN Red List (Version 2023.1) 國際自然保護聯盟瀕危物種紅色名錄 (版本 2023.1) ⁽⁶⁾	WC	MWC	IR	Freshwater Sampling Location 水生調查採樣點 ⁽⁶⁾								
										FS1	FS3	FS4	FS5	FS6	FS7	FS8	FS9	
Backswimmer 仰泳蝽	<i>Enithares sp.</i>	Very common 非常常見	-	-	-	-	+											+
Waterskater/Water strider 水餃剪	<i>Gerris sp.</i>	-	-	-	-	-	+						+					
-	<i>Metrocoris sp.</i>	Very common 非常常見	-	-	-	-	+							+				
Waterskater/Water strider 大水餃剪	<i>Ptilomera tigrina</i>	Very common 非常常見	-	-	-	-	+++	+			+		+	+	+	+		
-	<i>Rhagovelia sp.</i>	Common 常見	-	-	-	-	++						+	+	+	+		
Whirligig beetle 蚊甲	<i>Orectochilus sp.</i>	-	-	-	-	-	+						+					
Total number of species 物種數量							21	1	5	1	0	4	11	7	8	6	2	

Notes 備註：

(1) AFCD (2023), Hong Kong Biodiversity Information Hub, 漁農自然護理署 (2023) · 香港生物多樣性資訊站物種數據庫 ·

Dudgeon D. (2003), Hong Kong Field Guides: Hillstreams, 杜德俊 (2003) · 香港野外圖鑑: 山澗

Lee, L. F., et al. (2004), Field Guide to the Freshwater Fish of Hong Kong, Friends of the Country Parks, 李麗芬等 (2004) · 香港淡水魚圖鑑 · 郊野公園之友 ·

(2) Fellowes, J.R., et al. (2002), Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong, Memoirs of the Hong Kong Natural History Society 25:123-159.LC=Local Concern 本地關注; PGC=Potential Global Concern 潛在全球性關注; GC=Global Concern 全球性關注

(3) Yue P., and Chen Y. (1998), China Red Data Book of Endangered Animals: Pisces, 樂佩琦及陳宜瑜 (1998) · 中國瀕危動物紅皮書, 魚類 ·

(4) Jiang et al. (2016), Red List of China's Vertebrates, 蔣志剛等人 (2016) · 中國脊椎動物紅色名錄 ·

(5) IUCN (2023), The IUCN Red List of Threatened Species, Version 2023.01, 國際自然保護聯盟 (2023) · 國際自然保護聯盟紅色名錄 · 版本2023-1

(6) Refer to Figure 2.7.1 for locations of freshwater sampling locations, 水生調查採樣點的位置請參考圖2.7.1

Abbreviation for Habitats: WC=Watercourse; MWC=Modified Watercourse; IR=Irrigation Reservoir

生境簡稱: WC=水道; MWC=人工水道; IR=灌溉水壩

Code for Abundance 相對數量: +++++=Dominant 優勢; ++++=Abundant 豐富; +++=Frequent 常見; ++=Occasional 偶爾; +=Scarce 稀少

Species of conservation importance is in bold type face 調查中錄得的具重要保育價值物種將以**粗體**顯示

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Appendix 2.7.4A
Species of Conservation Importance Recorded within the
500m Study Area

附錄 2.7.4A
500米研究範圍內記錄到的具重要保育價物種

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Appendix 2.7.4A Species of Conservation Importance Recorded within the 500m Study Area

附錄 2.7.4A 500 米研究範圍內記錄到的具重要保育價值物種

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Flora 植物				
Purple Bulb Orchid <i>Ania hongkongensis</i> 香港安蘭	Stubb Road., Repulse Bay, Sha Tin, Ma On Shan, Castle Peak, Wong Lung Hang 司徒拔道, 淺水灣, 沙田, 馬鞍山, 青山, 黃龍坑	Cap. 96 ⁴ , Cap. 586 ³ 第 96 章 ⁴ , 第 586 章 ³	Shrubland ¹⁸ ; Plantation ¹⁷ ; Woodland ¹⁸ 灌木叢林 ¹⁸ ; 植林區 ¹⁷ ; 林地 ¹⁸	-
Incense Tree <i>Aquilaria sinensis</i> 土沉香	Common 常見	Cap. 586 ³ , VU ⁹ , Cat. 2 & 3 (NT) ¹⁰ , Cat. II ¹¹ , VU ¹² , NT ¹³ , VU ¹⁴ , 第 586 章 ³ , 易危 ⁹ ; 類別 2 及 3 (近危) ¹⁰ , 二級 ¹¹ , 易危 ¹² , 近危 ¹³ , 易危 ¹⁴ ,	Plantation ^{19 20 21} 植林區 ^{19 20 21}	Plantation 植林區
Bamboo Orchid <i>Arundina graminifolia</i> 竹葉蘭	Common 常見	Cap. 96 ⁴ , Cap. 586 ³ 第 96 章 ⁴ , 第 586 章 ³	Plantation ¹⁷ ; Irrigation Reservoir ²⁰ ²¹ 植林區 ¹⁷ ; 灌溉水塘 ^{20 21}	Irrigation Reservoir, Plantation 灌溉水塘, 植林區
Silver-back Artocarpus <i>Artocarpus hypargyreus</i> 白桂木	Common 常見	Vulnerable ⁹ , Cat. 2 & 3 (NT) ¹⁰ , NT ¹³ , EN ¹⁴ 易危 ⁹ , 類別 2 及 3 (近危) ¹⁰ , 近危 ¹³ , 瀕危 ¹⁴	Shrubland ¹⁸ 灌木叢林 ¹⁸	-
Cycad-fern <i>Brainea insignis</i> 蘇鐵蕨	-	Cat 2 (VU) ¹⁰ , Cat II ¹¹ , VU ¹⁴ 類別 2 (易危) ¹⁰ , 二級 ¹¹ , 易危 ¹⁴	-	Plantation 植林區
Dense-flowered Geodorum <i>Geodorum densiflorum</i> 地寶蘭	Wong Nai Chung, Aberdeen, Sai Kung 黃泥涌峽, 香港仔, 西貢	Cap. 96 ⁴ , Cap. 586 ³ 第 96 章 ⁴ , 第 586 章 ³	Plantation ²¹ 植林區 ²¹	-
Emarginate-leaved Ormosia <i>Ormosia emarginata</i> 凹葉紅豆	Common 常見	Cat II ¹¹ 二級 ¹¹	-	Plantation* 植林區*
Small Persimmon <i>Diospyros vaccinioides</i> 小果柿	Common 常見	Cap. 586 ³ , Cat. II ¹¹ 第 586 章 ³ , 二級 ¹¹	Plantation ^{17 18 20 21} 植林區 ^{17 18 20 21}	Mixed Woodland, Plantation 混合林地, 植林區
Pale Purple Eulophia <i>Eulophia graminea</i> 美冠蘭	-	Cap. 96 ⁴ , Cap. 586 ³ 第 96 章 ⁴ , 第 586 章 ³	-	Plantation 植林區
Pitcher Plant <i>Nepenthes mirabilis</i> 豬籠草	Tai Lam Chung, So Kwun Wat, Castle Peak, Lantau Island 大欖涌, 掃管笏, 青山, 大嶼山	Cap. 96 ⁴ , Cap. 586 ³ , VU ¹⁴ , Least Concern ⁹	Shrubland ^{17 18} ; Plantation ^{15 17 18 21} ; Irrigation Reservoir ¹⁸	Mixed Woodland, Watercourse*, Irrigation Reservoir, Plantation

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
		第 96 章 ⁴ , 第 586 章 ³ , 易危 ¹⁴ , 無危 ⁹	灌木叢林 ^{17 18} ; 植林區 ^{15 17 18 21} ; 灌溉水塘 ¹⁸	混合林地, 水道*, 灌溉水塘, 植林區
Lesser Platanthera <i>Platanthera minor</i> 小舌唇蘭	Tai Mo Shan, Shing Mun, Ma On Shan, Sunset Peak 大帽山, 城門, 馬鞍山, 大東山	Cap. 96 ⁴ , Cap. 586 ³ 第 96 章 ⁴ , 第 586 章 ³	Natural Watercourse ¹⁸ 天然水道 ¹⁸	-
Red Azalea <i>Rhododendron simsii</i> 紅杜鵑	Victoria Peak, Mount Collinson, Kowloon Peak and Lion Rock, Ma On Shan, Tai Mo Shan, Sharp Island, Castle Peak, Pat Sin Leng, Sai Kung Peninsula, Lantau 太平山, 歌連臣山, 飛鵝山及獅子山, 馬鞍山, 大帽山, 橋咀洲, 青山, 八仙嶺, 西貢半島, 大嶼山	Cap. 96 ⁴ 第 96 章 ⁴	Shrubland ^{15 21} ; Plantation ¹⁵ 灌木叢林 ^{15 21} ; 植林區 ¹⁵	Plantation*, Shrubland 植林區*, 灌木叢林
Avifauna 鳥類				
Black Kite <i>Milvus migrans</i> 黑鳶	Common resident and winter visitor 冬候鳥及留鳥	Cap.170 ² , (RC) ⁵ 第 170 章 ² , (區域性關注) ⁵	Shrubland ²¹ ; Mixed Woodland ¹⁹ ; Plantation ^{20 21} 灌木叢林 ²¹ ; 混合林地 ¹⁹ ; 植林區 ^{20 21}	-
Black-throated Laughingthrush <i>Garrulax chinensis</i> 黑喉噪鵲	Common resident 常見留鳥	Cap.170 ² , Class II ⁶ 第 170 章 ² , 二級 ⁶	Developed Area ¹⁹ ; Plantation ²¹ ; Village / Orchard ²¹ ; Mixed Woodland ²¹ 已發展地區 ¹⁹ ; 植林區 ²¹ ; 村落 / 果園 ²¹ ; 混合林地 ²¹	Mixed Woodland, Shrubland 混合林地, 灌木叢林
Chinese Francolin <i>Francolinus pintadeanus</i> 中華鷓鴣	Common resident 常見留鳥	Cap.170 ² , Near Threatened ⁸ 第 170 章 ² , 近危 ⁸	-	Shrubland* 灌木叢林*
Collared Scops Owl <i>Otus lettia</i> 領角鴞	Common resident 常見留鳥	Cap.170 ² , Cap.586 ³ , Class II ⁶ 第 170 章 ² , 第 586 章 ³ , 二級 ⁶	Plantation ¹⁸ 植林區 ¹⁸	Village / Orchard 村落 / 果園
Common Emerald Dove <i>Chalcophaps indica</i> 綠翅金鳩	Uncommon but widespread resident 不常見但廣泛分佈的留鳥	Cap.170 ² , Vulnerable ⁷ 第 170 章 ² , 易危 ⁷	-	Developed Area / Wasteland 已發展地區 / 廢置土地
Crested Goshawk <i>Accipiter trivirgatus</i> 鳳頭鷹	Common resident 常見留鳥	Cap.170 ² , Cap. 586 ³ , Class II ⁶ , Rare ⁷ , Near Threatened ⁸ 第 170 章 ² , 第 586 章 ³ , 二級 ⁶ , 稀有 ⁷ , 近危 ⁸	-	Mixed Woodland 混合林地
Chinese Sparrowhawk <i>Accipiter soloensis</i> 赤腹鷹	Uncommon passage migrant 不常見過境遷徙鳥	Cap.170 ² , Cap. 586 ³ , Class II ⁶ , 第 170 章 ² , 第 586 章 ³ , 二級 ⁶ ,	In Flight ¹⁵ 飛行中 ¹⁵	-

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Crested Serpent Eagle <i>Spilornis cheela</i> 蛇鵰	Common resident 常見留鳥	Cap.170 ² , Cap. 586 ³ , LC ⁵ , Class II ⁶ , Vulnerable ⁷ , Near Threatened ⁸ 第 170 章 ² , 第 586 章 ³ , 本地關注 ⁵ , 二級 ⁶ , 易危 ⁷ , 近危 ⁸	In Flight ¹⁵ ; Plantation ^{18 20} 飛行中 ¹⁵ ; 植林區 ^{18 20}	In Flight 飛行中
Greater Coucal <i>Centropus sinensis</i> 褐翅鴉鵂	Common resident 常見留鳥	Cap.170 ² , Vulnerable ⁷ , Class II ⁶ 第 170 章 ² , 易危 ⁷ , 二級 ⁶	Shrubland ²⁰ ; Mixed Woodland ²¹ 灌木叢林 ²⁰ ; 混合林地 ²¹	-
Grey Nightjar <i>Caprimulgus jotaka</i> 普通夜鷹	Scarce passage migrant 罕見過境遷徙鳥	Cap.170 ² , LC ⁵ 第 170 章 ² , 本地關注 ⁵	Shrubland ²⁰ 灌木叢林 ²⁰	-
Little Egret <i>Egretta garzetta</i> 小白鷺	Common resident 常見留鳥	Cap.170 ² , PRC (RC) ⁵ 第 170 章 ² , 潛在區域性關注 (區域 性關注) ⁵	Irrigation Reservoir ¹⁷ 灌溉水塘 ¹⁷	In Flight 飛行中
Rufous-capped Babbler <i>Cyanoderma ruficeps</i> 紅頭穗鵂	Common resident 常見留鳥	Cap.170 ² , LC ⁵ 第 170 章 ² , 本地關注 ⁵	Plantation ^{19 20 21} ; Mixed Woodland ^{20 21} 植林區 ^{19 20 21} ; 混合林地 ^{20 21}	-
White-bellied Sea Eagle <i>Haliaeetus leucogaster</i> 白腹海鵰	Uncommon resident 不常見留鳥	Cap.170 ² , Cap. 586 ³ , (RC) ⁵ , Class II ⁶ , Indeterminate ⁷ , Vulnerable ⁸ 第 170 章 ² , 第 586 章 ³ , (區域性關 注) ⁵ , 二級 ⁶ , 未定 ⁷ , 易危 ⁸	In Flight ¹⁵ 飛行中 ¹⁵	-
White-throated Kingfisher <i>Halcyon smyrnensis</i> 白胸翡翠	Common resident 常見留鳥	Cap.170 ² , LC ⁵ , Class II ⁶ 第 170 章 ² , 本地關注 ⁵ , 二級 ⁶	Irrigation Reservoir ^{19 20 21} ; Mixed Woodland ²⁰ 灌溉水塘 ^{19 20 21} ; 混合林地 ²⁰	Dry Agricultural Land, In Flight 乾涸農地, 飛行中
Mammal (Bats) 哺乳類 (蝙蝠)				
Chinese Horseshoe Bat <i>Rhinolophus sinicus</i> 中華菊頭蝠	Widely distributed 廣泛分布	Cap.170 ² 第 170 章 ²	Village / Orchard ¹⁶ 村落 / 果園 ¹⁶	Irrigation Reservoir, Plantation, Developed Area / Wasteland 灌溉水塘, 植林區, 已發展地區 / 廢置土地
Chinese Noctule <i>Nyctalus plancyi</i> 中華山蝠	Fairly widely distributed 頗為廣泛分布	Cap.170 ² , PRC (RC) ⁵ 第 170 章 ² , 潛在區域性關注 (區域 性關注) ⁵	Shrubland ¹⁷ ; Plantation ¹⁷ ; Irrigation Reservoir ¹⁷ ; Mixed Woodland ^{20 21} 灌木叢林 ¹⁷ ; 植林區 ¹⁷ ; 灌溉 水塘 ¹⁷ ; 混合林地 ^{20 21}	Mixed Woodland, Plantation, Shrubland, Village / Orchard 混合林地, 植林區, 灌木叢林, 村 落 / 果園
Himalayan Leaf-nosed Bat <i>Hipposideros armiger</i> 大蹄蝠	Widely distributed 廣泛分布	Cap.170 ² , (LC) ⁵ 第 170 章 ² , (本地關注) ⁵	-	Mixed Woodland, Plantation, Village / Orchard 混合林地, 植林區, 村落 / 果園
Intermediate Horseshoe Bat <i>Rhinolophus affinis</i> 中菊頭蝠	Widely distributed 廣泛分布	Cap.170 ² , (LC) ⁵ 第 170 章 ² , (本地關注) ⁵	-	Mixed Woodland 混合林地

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Japanese Pipistrelle <i>Pipistrellus abramus</i> 東亞家蝠	Widely distributed 廣泛分布	Cap.170 ² 第 170 章 ²	Developed Area / Wasteland ¹⁶ ; Shrubland ¹⁷ ; Plantation ¹⁷ ; Irrigation Reservoir ¹⁷ ; Mixed Woodland ^{20 21} 已發展地區 / 廢置土地 ¹⁶ ; 灌 木叢林 ¹⁷ ; 植林區 ¹⁷ ; 灌溉水 塘 ¹⁷ ; 混合林地 ^{20 21}	Watercourse, Modified Watercourse, Irrigation Reservoir, Mixed Woodland, Plantation*, Shrubland, Village / Orchard, Developed Area / Wasteland 水道, 人工水道, 灌溉水塘, 混合 林地, 植林區*, 灌木叢林, 村落 / 果園, 已發展地區 / 廢置土地
Least Horseshoe Bat <i>Rhinolophus pusillus</i> 小菊頭蝠	Widely distributed 廣泛分布	Cap.170 ² , PRC (RC) ⁵ 第 170 章 ² , 潛在區域性關注 (區域 性關注) ⁵	-	Mixed Woodland, Plantation*, Shrubland 混合林地, 植林區*, 灌木叢林
Lesser Bamboo Bat <i>Tylonycteris fulvida</i> 扁鼻蝠	Fairly widely distributed 頗為廣泛分布	Cap.170 ² , (LC) ⁵ , Rare ⁷ 第 170 章 ² , (本地關注) ⁵ , 稀有 ⁷	Plantation ¹⁶ ; Shrubland ¹⁷ 植林區 ¹⁶ ; 灌木叢林 ¹⁷	Modified Watercourse, Irrigation Reservoir, Mixed Woodland, Plantation, Shrubland, Village / Orchard, Developed Area / Wasteland 人工水道, 灌溉水塘, 混合林地, 植林區, 灌木叢林, 村落 / 果園, 已發展地區 / 廢置土地
Unknown Myotis Species Myotis spp. 未知的鼠耳蝠屬物種	-	Cap.170 ² 第 170 章 ²	-	Shrubland 灌木叢林
Unknown Vespertilionidae species 1 未知的蝙蝠科物種 1	-	Cap.170 ² 第 170 章 ²	Village / Orchard ¹⁶ ; Shrubland ¹⁷ ; Irrigation Reservoir ¹⁷ 村落 / 果園 ¹⁶ ; 灌木叢林 ¹⁷ ; 灌 溉水塘 ¹⁷	Mixed Woodland 混合林地
Unknown Vespertilionidae species 2 未知的蝙蝠科物種 2	-	Cap.170 ² 第 170 章 ²	Plantation ¹⁷ ; Shrubland ¹⁷ ; Irrigation Reservoir ¹⁷ 植林區 ¹⁷ ; 灌木叢林 ¹⁷ ; 灌溉 水塘 ¹⁷	Mixed Woodland, Plantation*, Shrubland, Developed Area / Wasteland 混合林地, 植林區*, 灌木叢林, 已 發展地區 / 廢置土地
Unidentified Bat 尚未確認的蝙蝠	-	Cap.170 ² 第 170 章 ²	Plantation ^{19 20} 植林區 ^{19 20}	-
Mammal (Non-flying Mammals) 哺乳類 (非飛行性哺乳類)				
East Asian Porcupine <i>Hystrix brachyura</i> 東亞豪豬	Very widely distributed, except for Lantau Island 非常廣泛分布, 大嶼山除外	Cap.170 ² , PGC ⁵ 第 170 章 ² , 潛在全球性關注 ⁵	Shrubland ¹⁵ ; Natural Watercourse ¹⁷ 灌木叢林 ¹⁵ ; 天然水道 ¹⁷	Mixed Woodland, Shrubland* 混合林地, 灌木叢林*
Pallas's Squirrel <i>Callosciurus erythraeus</i> 赤腹松鼠	Fairly widely distributed 頗為廣泛分布	Cap.170 ² 第 170 章 ²	-	Dry Agricultural Land, Village / Orchard 乾涸農地, 村落 / 果園

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Red Muntjac <i>Muntiacus muntjak</i> 赤麂	Very widely distributed 非常廣泛分布	Cap.170 ² , PRC ⁵ , Near Threatened ⁸ 第 170 章 ² , 潛在區域性關注 ⁵ , 近危 ⁸	Shrubland ¹⁵ ; Plantation ^{17 20 21} 灌木叢林 ¹⁵ ; 植林區 ^{17 20 21}	Mixed Woodland, Plantation*, Shrubland* 混合林地, 植林區*, 灌木叢林*
Small Indian Civet <i>Viverricula indica</i> 小靈貓	Very widely distributed, except for Lantau Island 非常廣泛分布, 大嶼山除外	Cap.170 ² , Vulnerable ⁸ , Class I ⁶ 第 170 章 ² , 易危 ⁸ , 一級 ⁶	-	Mixed Woodland, Plantation*, Shrubland* 混合林地, 植林區*, 灌木叢林*
Masked Palm Civet <i>Paguma larvata</i> 果子狸	Widely distributed 非常廣泛分布	Cap.170 ² , PRC ⁵ , Near Threatened ⁸ 第 170 章 ² , 潛在區域性關注 ⁵ , 近危 ⁸	Plantation ^{20 21} 植林區 ^{20 21}	-
Butterfly 蝴蝶				
Baron <i>Euthalia aconthea</i> 矛翠蛺蝶	Widely distributed 廣泛分布	LC ⁵ 本地關注 ⁵	-	Plantation* 植林區*
Danaid Eggfly <i>Hypolimnas misippus</i> 金斑蛺蝶	Ngau Ngak Shan, Lung Kwu Tan, Hong Kong Wetland Park, Mount Parker, Cloudy Hill, Lin Ma Hang 牛押山、龍鼓灘、香港濕地公園、 柏架山、九龍坑山及蓮麻坑	LC ⁵ 本地關注 ⁵	Shrubland ^{20 21} 灌木叢林 ^{20 21}	-
Forget-me-not <i>Catochrysops strabo</i> 咖灰蝶	Pui O, Tai Po Kau, Fung Yuen, Shing Mun, Sha Lo Wan 貝澳、大埔滘、鳳園、城門及沙螺 灣	Very rare; Species of conservation concern ¹ 非常稀有; 受保育關注的物種 ¹	Plantation ¹⁷ 植林區 ¹⁷	-
Green Skirt Baron <i>Euthalia niepelti</i> 綠裙蛺蝶	North New Territories 新界北部	Rare ¹ 稀有 ¹	Plantation ¹⁷ 植林區 ¹⁷	-
Metallic Cerulean <i>Jamides alecto alocina</i> 素雅灰蝶	Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo 太平山、鳳園、川龍及梅窩	Very Rare ¹ 非常稀有 ¹	Village / Orchard ¹⁷ 村落 / 果園 ¹⁷	-
Swallowtail <i>Papilio xuthus</i> 柑橘鳳蝶	Kap Lung, Ma On Shan, Tai Tam, Sha Lo Wan, Kat O, Lung Kwu Tan, Wu Kau Tang, Lung Kwu Chau 太平山、鳳園、川龍及梅窩	Rare ¹ 稀有 ¹	Shrubland ^{20 21} 灌木叢林 ^{20 21}	-
Tiny Grass Blue <i>Zizula hylax</i> 長腹灰蝶	Lung Kwu Tan, Fung Yuen, Sha Lo Wan 龍鼓灘、鳳園及沙螺灣	Very Rare; Species of Conservation Concern ¹ 非常稀有; 受保育關注的物種 ¹	Village / Orchard ¹⁷ 村落 / 果園 ¹⁷	-
Odonate 蜻蜓				

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Dingy Dusk-hawker <i>Gynacantha subinterrupta</i> 細腰長尾蜓	Hong Kong Wetland Park, Lantau Island, Ping Shan Chai, Sha Lo Tung and Tai Mo Shan; Sparse 香港濕地公園、大嶼山、平山仔、沙羅洞及大帽山; 稀疏分布	LC ⁵ 本地關注 ⁵	-	Dry Agricultural Land 乾涸農地
<i>Gynacantha</i> sp. 長尾蜓	-	LC ⁵ 本地關注 ⁵	Natural Watercourse ¹⁷ ; Plantation ¹⁷ 天然水道 ¹⁷ ; 植林區 ¹⁷	-
Dog-legged Clubtail <i>Burmagomphus vermicularis</i> 聯紋緬春蜓	Woodland streams of the East New Territories; Scattered 新界東各處的林地溪流; 零散分布	LC ⁵ 本地關注 ⁵	-	Irrigation Reservoir 灌溉水塘
Emerald Cascader <i>Zygonyx iris insignis</i> 彩虹蜻	Widely distributed in moderately clean, rapidly flowing forested streams throughout Hong Kong; Widespread 廣泛分布於本港急速流動而尚算潔淨的林地溪流; 廣泛分布	PGC ⁵ 潛在全球性關注 ⁵	Plantation ^{17 20 21} ; Modified Watercourse ¹⁶ 植林區 ^{17 20 21} ; 人工水道 ¹⁶	Irrigation Reservoir, Mixed Woodland, Plantation, Dry Agricultural Land, Village / Orchard 灌溉水塘, 混合林地, 植林區, 乾涸農地, 村落 / 果園
Hainan Hooktail <i>Lamelligomphus hainanensis</i> 海南環尾春蜓	Ng Tung Chai, Sha Lo Tung, Tai Lam Country Park and Tai Tong; Scattered 梧桐寨、沙羅洞、大欖郊野公園及大棠; 零散分布	LC ⁵ 本地關注 ⁵	-	Plantation 植林區
Herpetofauna (Amphibian) 兩棲爬蟲類 (兩棲類)				
Chinese Bullfrog <i>Hoplobatrachus chinensis</i> 虎紋蛙	Widely distributed in Lantau Island and New Territories 廣泛分布於大嶼山及新界	PGC ⁵ , Class II ⁶ , Endangered ⁸ 潛在全球性關注 ⁵ , 二級 ⁶ , 瀕危 ⁸	Natural Watercourse ¹⁹ ; Mixed Woodland ^{20 21} 天然水道 ¹⁹ ; 混合林地 ^{20 21}	-
Hong Kong Cascade Frog <i>Amolops hongkongensis</i> 香港湍蛙	Widely distributed in mountain streams in Hong Kong, except Lantau Island 廣泛分布於本港的山區河流, 大嶼山除外	PGC ⁵ , Class II ⁶ , Endangered ⁸ , Endangered ⁹ 潛在全球性關注 ⁵ , 二級 ⁶ , 瀕危 ⁸ , 瀕危 ⁹	Plantation ¹⁷ ; Natural Watercourse ^{18 21} 植林區 ¹⁷ ; 天然水道 ^{18 21}	Watercourse* 水道*
Lesser Spiny Frog <i>Quasipaa exilispinosa</i> 小棘蛙	Widely distributed in upland forest streams throughout Hong Kong 廣泛分布於香港山區河流	PGC ⁵ , Vulnerable ⁸ 潛在全球性關注 ⁵ , 易危 ⁸	Natural Watercourse ^{15 17 18 20 21} ; Plantation ^{17 20 21} 天然水道 ^{15 17 18 20 21} ; 植林區 ^{17 20 21}	Watercourse* 水道*
Two-striped Grass Frog <i>Hylarana taipehensis</i> 台北蛙	Distributed in Sai Kung, northern New Territories and Tai A Chau 分布於西貢、新界北部及大鴉洲	LC ⁵ 本地關注 ⁵	Irrigation Reservoir ²⁰ 灌溉水塘 ²⁰	-
Herpetofauna (Reptile) 兩棲爬蟲類 (爬蟲類)				
Banded Krait <i>Bungarus fasciatus</i> 金環蛇	Locally restricted in Hong Kong 零散分布於香港	RC ⁵ , Endangered ⁷ , Endangered ⁸ 區域性關注 ⁵ , 瀕危 ⁷ , 瀕危 ⁸	Mixed Woodland ²⁰ 混合林地 ²⁰	-

Species 物種	Distribution in Hong Kong ¹ 香港境內的分布狀況 ¹	Protection / Conservation Status 保育狀況	Habitat Recorded 相關物種記錄所在的生境	
			Previous Studies 過往研究	Recent Survey 本項目的調查
Indo-Chinese Rat Snake <i>Ptyas korros</i> 灰鼠蛇	Widely distributed 廣泛分布	PRC ⁵ , Endangered ⁷ , Vulnerable ⁸ 潛在區域性關注 ⁵ , 瀕危 ⁷ , 易危 ⁸	-	Mixed Woodland 混合林地
Many-banded Krait <i>Bungarus multicinctus</i> 銀環蛇	Widely distributed 廣泛分布	PRC ⁵ , Vulnerable ⁷ , Endangered ⁸ 潛在區域性關注 ⁵ , 易危 ⁷ , 瀕危 ⁸	Mixed Woodland ²¹ 混合林地 ²¹	
Taiwan Kukri Snake <i>Oligodon formosanus</i> 台灣小頭蛇	Widely distributed 廣泛分布	Near Threatened ⁸ 近危 ⁸	-	Plantation 植林區
Aquatic Community 水生群落				
Hong Kong Cascade Frog (Tadpole) <i>Amolops hongkongensis</i> 香港湍蛙 (蝌蚪)	Widely distributed in mountain streams 廣泛分布於香港山區的河流	PGC ⁵ , Class II ⁶ , Endangered ⁸ , Endangered ⁹ 潛在 global 關注 ⁵ , 二級 ⁶ , 瀕危 ⁸ , 瀕危 ⁹	Natural Watercourse ¹⁷ 天然水道 ¹⁷	Watercourse* 水道*
<i>Cryptopotamon anacoluthon</i> 鰓刺溪蟹	Common; Endemic to Hong Kong 常見; 香港特有	PGC ⁵ , Vulnerable ⁹ 潛在 global 關注 ⁵ , 易危 ⁹	Natural Watercourse ^{15 17 20 21} 天然水道 ^{15 17 20 21}	Watercourse* 水道*
Giant Hooktail (nymph) <i>Megalogomphus sommeri</i> 薩默碩春蜓 (稚蟲)	the Central and Northeast New Territories; Scattered 新界中及東北; 零散分佈	LC ⁵ 本地關注 ⁵	-	Watercourse* 水道*
Hong Kong Freshwater Crab <i>Nanhaipotamon hongkongense</i> 香港南海溪蟹	Common 常見	PGC ⁵ 潛在 global 關注 ⁵	Natural Watercourse ^{20 21} 天然水道 ^{20 21}	Watercourse 水道
Predaceous Chub <i>Parazacco spilurus</i> 異鱗	Common 常見	Vulnerable ⁷ 易危 ⁷	Natural Watercourse ^{17 20 21} 天然水道 ^{17 20 21}	Watercourse 水道
Lesser Spiny Frog (Tadpole) <i>Quasipaa exilispinosa</i> 小棘蛙 (蝌蚪)	Common 常見	PGC ⁵ , Vulnerable ⁸ 潛在 global 關注 ⁵ , 易危 ⁸	Natural Watercourse ¹⁷ 天然水道 ¹⁷	Watercourse* 水道*
<i>Somanniathelphusa zanklon</i> 鎌刀束腰蟹	Endemic to Hong Kong 香港特有	GC ⁵ , Endangered ⁹ 全球性關注 ⁵ , 瀕危 ⁹	Natural Watercourse ^{20 21} ; Irrigation Reservoir ^{20 21} 天然水道 ^{20 21} ; 灌溉水塘 ^{20 21}	Watercourse 水道*

Notes:

備註:

- Distribution of flora and fauna species in Hong Kong follows:
Flora: Hong Kong Herbarium (2007-2011), Wu and Lee (2000), Xing et al. (2000)
Fauna: AFCD (2023) and Reels (2019)
動植物物種於香港的分佈根據:
植物: 香港植物標本室(2007 - 2011)、Wu and Lee (2000)、Xing et al. (2000),
動物: 漁農自然護理署 (2023) 以及 Reels (2019)。
- Protected under the Wild Animals Protection Ordinance (Cap. 170)
受《野生動物保護條例》(第 170 章) 保護。

3 Protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)
受《保護瀕危動植物物種條例》(第 586 章)保護。

4 Protected under the Forests and Countryside Ordinance (Cap. 96)
受《林區及郊區條例》(第 96 章)保護。

5 Fellowes et al. (2002): GC = Global Concern; LC = Local Concern; RC = Regional Concern; PRC = Potential Regional Concern; PGC = Potential Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence.
Fellowes 等 (2002). 括號中的狀況表示評估是基於繁殖和/或棲息地的受限程度，而不是物種出現的情況。

6 List of Wild Animals Under State Protection.
列入《國家重點保護動物名錄》。

7 Zheng & Wang (1998) China Red Data Book of Endangered Animals
汪松 (1998)。《中國瀕危動物紅皮書》。

8 Jiang et al. (2016) Red List of China's Vertebrates
蔣志剛等人 (2016)。《中國脊椎動物紅色名錄》。

9 The International Union for the Conservation of Nature (IUCN) (2023), The IUCN Red List of Threatened Species (2023.1)
國際自然保護聯盟 (2023)。國際自然保護聯盟紅色名錄。版本 2023-1。

10 Hu et al. (2003): Rare and Precious Plants of Hong Kong. NT= Near Threatened, VU= Vulnerable
胡啓明等人 (2003)。《香港稀有及珍貴植物》。

11 Listed in the List of Wild Plants under State Protection (promulgated by the National Forestry and Grassland Administration in 2021)
列入《國家重點保護野生植物名錄》(由國家林業及草原局於 2021 年發佈)。

12 Fu (1992): China Plant Red Data Book. Vol. 1 - Rare and Endangered Plants. VU= Vulnerable
傅立國 (1992)。《中國植物紅皮書》(第一卷)。

13 Feng et al. (2002): Study on Rare and Endangered Plants and National Key Protected Plants in Guangdong. NT= Near Threatened
馮志堅等人 (2002)。《廣東省國家重點保護野生珍稀瀕危植物資源與利用》。

14 Qin et al. (2017): Threatened Species List of China's Higher Plants. VU= Vulnerable
覃海寧等人 (2017)。《中國植物受高等威脅物種名錄》。

15 CEDD (2022)
土木工程拓展署 (2022)。

16 CEDD (2021b)
土木工程拓展署 (2021b)。

17 CEDD (2020a)
土木工程拓展署 (2020a)。

18 CEDD (2021a)
土木工程拓展署 (2021a)。

19 HyD (2022)
路政署 (2022)。

20 HyD (2023a)
路政署 (2023a)。

21 HyD (2023b)
路政署 (2023b)。

22 Habitat types: Habitat with * = recorded within the Project boundary.
生境: 記錄所在的生境旁如有*號，即表示相關記錄位於項目範圍內。

Appendix 2.7.4B
Representative Photographs of the Species of Conservation
Importance Recorded within 500m Study Area

附錄 2.7.4B
500米研究範圍內具重要保育價物種的具代表性相片

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Plate 1 - Incense Tree (*Aquilaria sinensis*)
相片一 - 土沉香



Plate 2 - Bamboo Orchid (*Arundina graminifolia*)
相片二 - 竹葉蘭



Plate 3 - Cycad-fern (*Brainea insignis*)
相片三 - 蘇鐵蕨



Plate 4 - Small Persimmon (*Diospyros vaccinioides*)
相片四 - 小果柿



Plate 5 - Pale Purple Eulophia (*Eulophia graminea*)
相片五 - 美冠蘭



Plate 6 - Pitcher Plant (*Nepenthes mirabilis*)
相片六 - 豬籠草

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Agreement No. CE 51/2020 (GE)
Lam Tei Quarry (Development of Lam Tei Underground Quarry)
合約編號 CE 51/2020 (GE)
藍地石礦場 (藍地地下採石場發展)

Representative Photographs of the Species of Conservation
Importance Recorded within 500m Study Area
500米研究範圍內具重要保育價值物種的具代表性相片

SCALE	N.T.S.	DATE	Apr-24
CHECK	LAMCCG	DRAWN	YIPMLM
JOB NO.	60671716	Appendix No. 2.7.4B	Rev -



Plate 7 - Red Azalea (*Rhododendron simsii*)
相片七 - 紅杜鵑



Plate 8 - Collared Scops Owl (*Otus lettia*)
相片八 - 領角鴞



Plate 9 - East Asian Porcupine (*Hystrix brachyura*)
相片九 - 東亞豪豬



Plate 10 - Pallas's Squirrel (*Callosciurus erythraeus*)
相片十 - 赤腹松鼠



Plate 11 - Red Muntjac (*Muntiacus muntjak*)
相片十一 - 赤麂



Plate 12 - Small Indian Civet (*Viverricula indica*)
相片十二 - 小靈貓

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Agreement No. CE 51/2020 (GE)
Lam Tei Quarry (Development of Lam Tei Underground Quarry)
合約編號 CE 51/2020 (GE)
藍地石礦場 (藍地地下採石場發展)
Representative Photographs of the Species of Conservation
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500米範圍內具重要保育價值物種的具代表性相片

SCALE	N.T.S.	DATE	Apr-24
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JOB NO.	60671716	Appendix No.	Rev
		2.7.4B	-



Plate 13 - Hong Kong Cascade Frog (*Amolops hongkongensis*)
相片十三 - 香港湍蛙



Plate 14 - Lesser Spiny Frog (*Quasipaa exilispinosa*)
相片十四 - 小棘蛙



Plate 15 - (*Cryptopotamon anacoluthon*)
相片十五 - 鰓刺溪蟹



Plate 16 - Giant Hooktail (Larvae) (*Megalogomphus sommeri*)
相片十六 - 薩默碩春蜓 (稚蟲)



Plate 17 - Hong Kong Freshwater Crab (*Nanhaipotamon hongkongense*)
相片十七 - 香港南海溪蟹



Plate 18 - (*Somanniathelphusa zanklon*)
相片十八 - 鐮刀束腰蟹

AECOM

Agreement No. CE 51/2020 (GE)
Lam Tei Quarry (Development of Lam Tei Underground Quarry)
合約編號 CE 51/2020 (GE)
藍地石礦場 (藍地地下採石場發展)

Representative Photographs of the Species of Conservation
Importance Recorded within 500m Study Area
500米研究範圍內具重要保育價值物種的具代表性相片

SCALE

N.T.S.

DATE

Apr-24

CHECK

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DRAWN

YIPMLM

JOB NO.

60671716

Appendix No.

2.7.4B

Rev

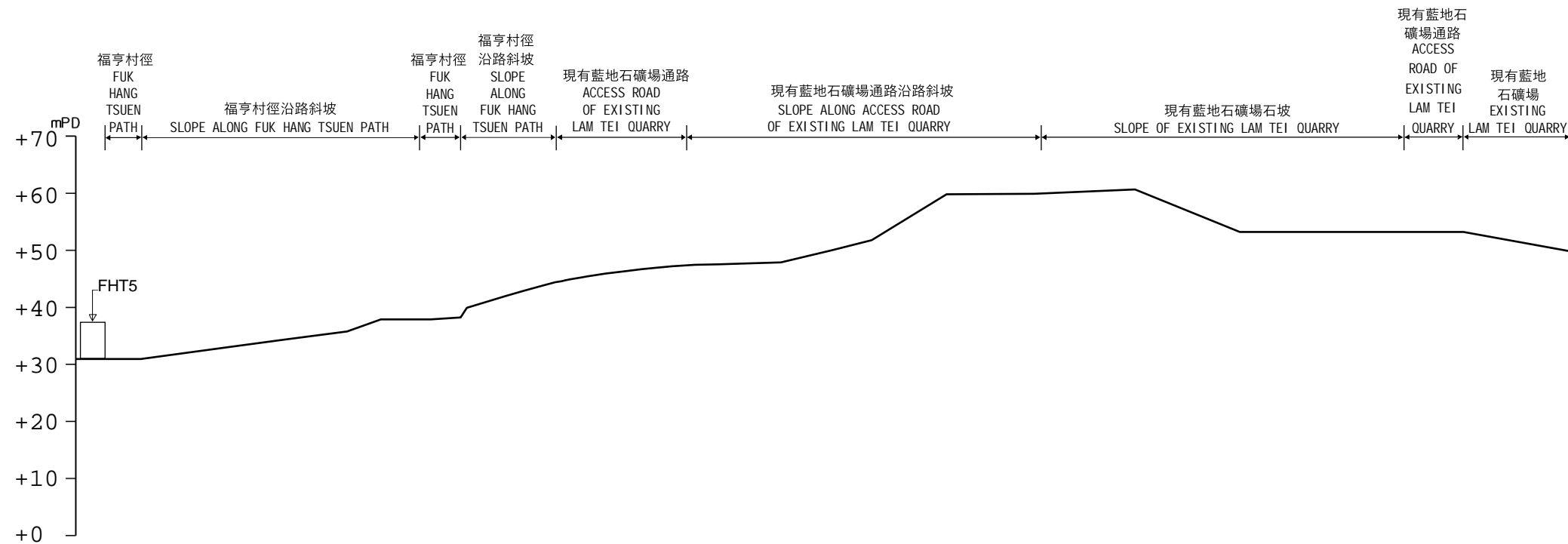
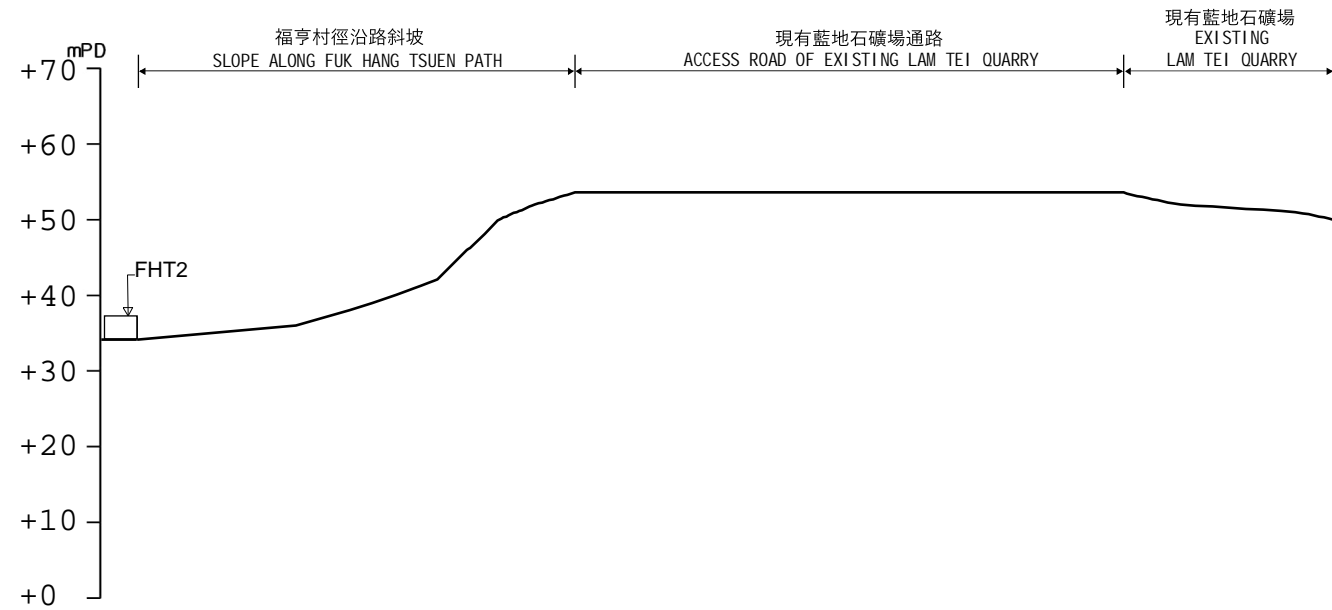
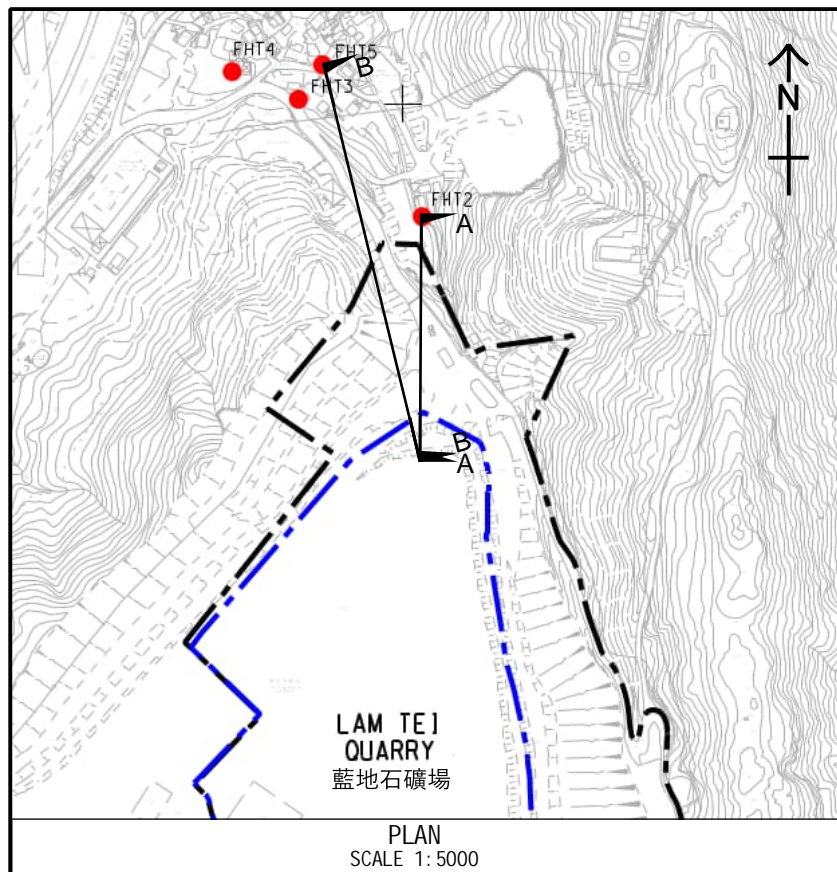
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Appendix 3.2.1
Cross Section between NSRs and the Project Site
附錄 3.2.1
噪音感應強的地方與項目工地之間的切面圖

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



0 10m 米

0 10m 米

AECOM

PROJECT

**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

CLIENT

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I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE DIMENSION UNIT

A3 AS SHOWN METRES

KEY PLAN

PROJECT NO. AGREEMENT NO.

60671716 CE 51/2020 (GE)

SHEET TITLE

CROSS SECTION BETWEEN NSRs
AND THE PROJECT SITE
噪音感應強的地方與工程項目工地
之間的切面圖

SHEET NUMBER

60671716/PP/APPENDIX 3.2.1
60671716/PP/附錄 3.2.1

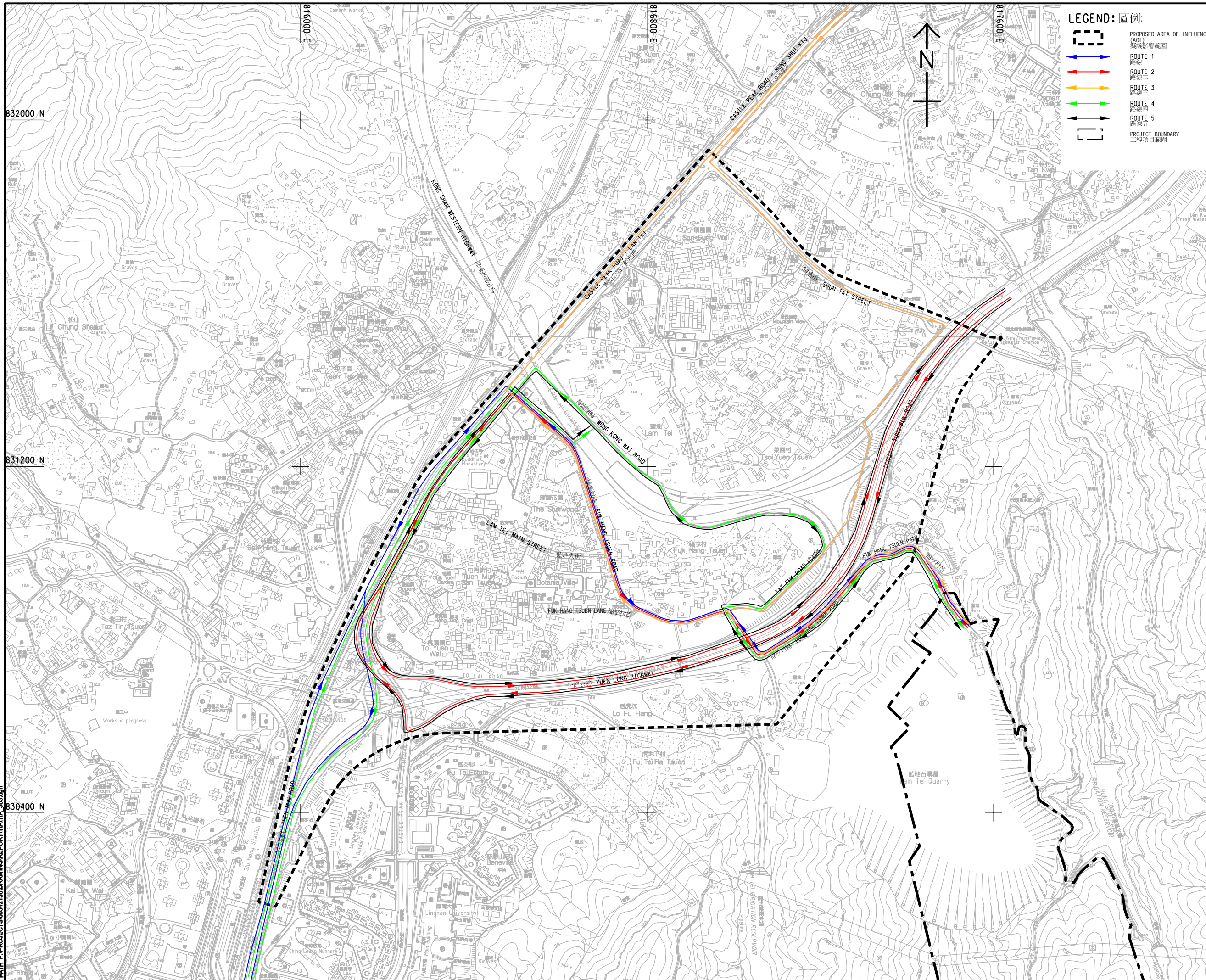
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Appendix 3.2.2
Traffic Routing during the Operational Phase of the Project
附錄 3.2.2
工程項目營運階段的運輸路線

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LEGEND: 圖例:

- PROPOSED AREA OF INFLUENCE (AUI) 擬定影響範圍
- ROUTE 1 路線一
- ROUTE 2 路線二
- ROUTE 3 路線三
- ROUTE 4 路線四
- ROUTE 5 路線五
- PROJECT BOUNDARY 工程項目範圍

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PROJECT
 LAM TEI QUARRY
 (DEVELOPMENT OF
 LAM TEI UNDERGROUND
 QUARRY)
 藍地石礦場 (藍地地下採石場
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批註

IR/ 批註	DATE 日期	DESCRIPTION 內容描述	CHK. 核對

STATUS
階段

SCALE
比例
A1 1 : 4000

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

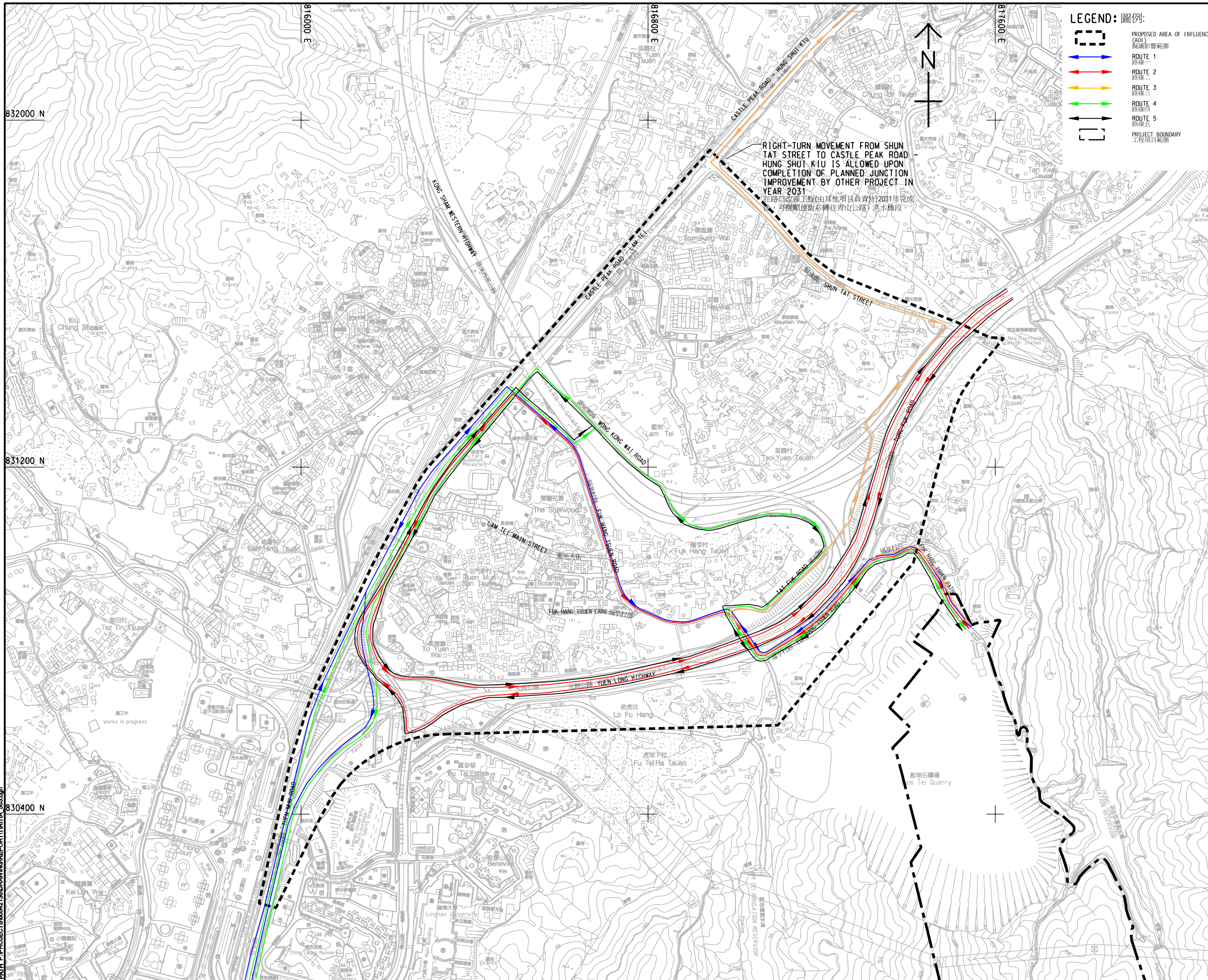
PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
TRAFFIC ROUTING DURING PROJECT
OPERATION BEFORE YEAR 2031
工程項目營運階段的運輸路線 (2031年之前)

SHEET NUMBER
圖紙編號
60671716/PP/APPENDIX 3.2.2.1
60671716/PP/附錄 3.2.2.1

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LEGEND: 圖例:

- PROPOSED AREA OF INFLUENCE (AOI) 擬議影響範圍
- ROUTE 1 路線一
- ROUTE 2 路線二
- ROUTE 3 路線三
- ROUTE 4 路線四
- ROUTE 5 路線五
- PROJECT BOUNDARY 工程項目範圍

ISSUE/REVISION 冊次

IR 冊次	DATE 日期	DESCRIPTION 內容摘要	CHK. 核實

STATUS 階段

SCALE 比例	DIMENSION UNIT 尺寸單位
A1 1:4000	METRES 公尺

KEY PLAN 索引圖

PROJECT NO. 項目編號	AGREEMENT NO. 協議編號
60671716	CE 51/2020 (GE)

SHEET TITLE 圖紙名稱
 TRAFFIC ROUTING DURING PROJECT OPERATION AFTER YEAR 2031
 工程項目營運階段的運輸路線 (2031年後)

SHEET NUMBER 圖紙編號

60671716/PP/APPENDIX 3.2.2.2
60671716/PP/附錄 3.2.2.2

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Appendix 3.2.3
Traffic Survey of Yuen Long Highway & Castle Peak Road -
Lam Tei Conducted in 2022

附錄 3.2.3
2022年元朗公路及青山公路 - 藍地段交通調查

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Appendix 3.2.2
附錄 3.2.2

Traffic Survey of Yuen Long Highway & Castle Peak Road - Lam Tei Conducted in 2022
2022年元朗公路及青山公路-藍地段交通調查

i. Yuen Long Highway 元朗公路

Hour 時間	2022 observed flow (veh/hr) 2022年觀察到的流量 (車輛/小時)		Quarry Traffic (veh/hr) 石礦場交通流量 (車輛/小時)		% of Induced Traffic from Existing Quarry 來自現有石礦場交通流量百分比	
	Direction 方向		Direction 方向		Direction 方向	
	Eastbound 東行	Westbound 西行	Eastbound 東行	Westbound 西行	Eastbound 東行	Westbound 西行
6 - 7	1403	1490	2	4	0.16%	0.24%
7 - 8	3392	3602	5	11	0.15%	0.31%
8 - 9 (AM Peak 上午繁忙時段)	3654	3881	19	17	0.51%	0.43%
9 - 10	3493	3709	14	9	0.39%	0.24%
10 - 11	3349	3556	18	12	0.54%	0.34%
11 - 12	3144	3339	14	13	0.46%	0.38%
12 - 13	3717	3182	16	14	0.44%	0.45%
13 - 14	3809	3260	16	13	0.42%	0.39%
14 - 15	4085	3496	15	15	0.36%	0.43%
15 - 16	4138	3542	17	10	0.40%	0.28%
16 - 17	4296	3677	14	12	0.33%	0.33%
17 - 18 (PM Peak 下午繁忙時段)	4523	3872	13	13	0.29%	0.32%
18 - 19	4215	3608	6	8	0.15%	0.22%
19 - 20	3290	2816	4	5	0.12%	0.18%
20 - 21	2536	2171	2	4	0.07%	0.16%
21 - 22	2311	1978	2	1	0.06%	0.05%

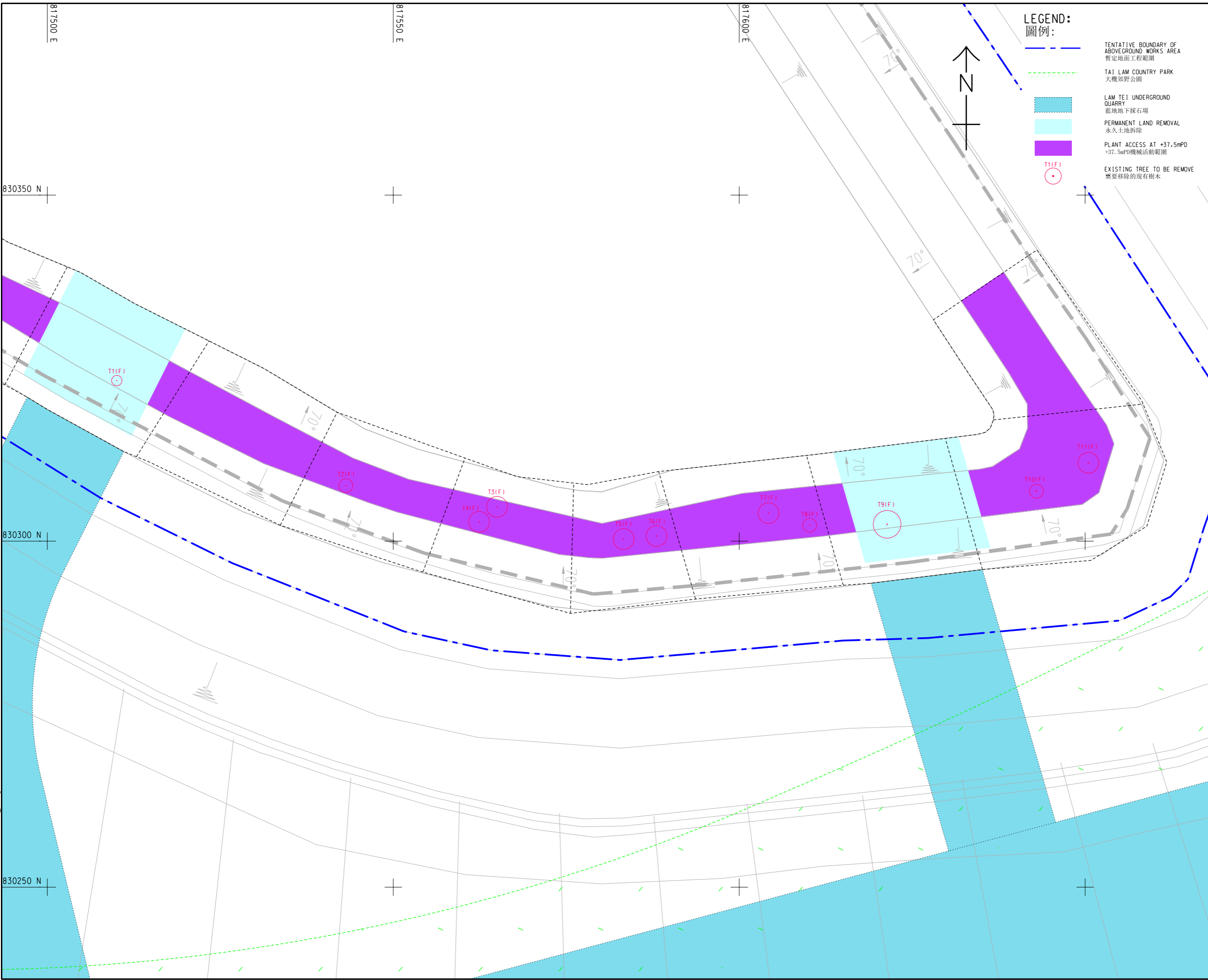
ii. Castle Peak Road - Lam Tei 青山公路-藍地段

Hour	2022 observed flow (veh/hr) 2022年觀察到的流量 (車輛/小時)		Quarry Traffic (veh/hr) 石礦場交通流量 (車輛/小時)		% of Induced Traffic from Existing Quarry 來自現有石礦場交通流量百分比	
	Direction 方向		Direction 方向		Direction 方向	
	Eastbound 東行	Westbound 西行	Eastbound 東行	Westbound 西行	Eastbound 東行	Westbound 西行
6 - 7	355	449	11	7	3.26%	1.63%
7 - 8	858	1084	35	16	4.28%	1.50%
8 - 9 (AM Peak 上午繁忙時段)	925	1168	53	59	6.06%	5.34%
9 - 10	884	1116	29	43	3.37%	4.03%
10 - 11	847	1070	38	58	4.75%	5.69%
11 - 12	796	1005	40	46	5.29%	4.75%
12 - 13	961	875	46	52	4.98%	6.32%
13 - 14	985	896	41	50	4.32%	5.96%
14 - 15	1056	961	48	47	4.76%	5.16%
15 - 16	1070	974	31	53	3.00%	5.73%
16 - 17	1110	1011	39	46	3.66%	4.72%
17 - 18 (PM Peak 下午繁忙時段)	1169	1064	40	42	3.54%	4.15%
18 - 19	1090	992	26	20	2.41%	2.06%
19 - 20	850	774	16	13	1.92%	1.68%
20 - 21	656	597	11	6	1.74%	0.95%
21 - 22	597	544	3	5	0.54%	0.89%

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Appendix 3.8
Locations of Affected Trees and Tree Study Schedule
附錄 3.8
受影響樹木的位置及樹木評估附表

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LEGEND:
圖例:

- - - TENTATIVE BOUNDARY OF ABOVEGROUND WORKS AREA
暫定地面工程範圍
- - - TAI LAM COUNTRY PARK
大欖郊野公園
- LAM TEI UNDERGROUND QUARRY
藍地地下採石場
- PERMANENT LAND REMOVAL
永久土地拆除
- PLANT ACCESS AT +37.5mPD
+37.5mPD機械活動範圍
- EXISTING TREE TO BE REMOVE
需要移除的現有樹木



PROJECT
項目
**LAM TEI QUARRY
(DEVELOPMENT OF
LAM TEI UNDERGROUND
QUARRY)**
藍地石礦場 (藍地地下採石場
發展)

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I/R	DATE	DESCRIPTION	CHK.

STATUS
階段

SCALE
比例
A3 1 : 500

DIMENSION UNIT
尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號
60671716

AGREEMENT NO.
協議編號
CE 51/2020 (GE)

SHEET TITLE
圖紙名稱
LOCATION OF AFFECTED TREES
受影響樹木的位置

SHEET NUMBER
圖紙編號
60671716/PP/APPENDIX 3.8
60671716/PP/附錄 3.8

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APPENDIX 3.8
Lam Tei Quarry (Development of Lam Tai Underground Quarry)

Tree Assessment Schedule (Individual Tree)
附錄3.8 個別樹木評估

Surveyed and Prepared by
調查和準備者 Au Pui Yan (CA: HK-1777A)
Field Survey was conducted on
調查於 於2023年9月18日和10月3日進行 18 Sep & 3 Oct 2023

Drawing No. 圖號	Tree No. 樹木編號	Photo No. 照片編號	Species 物種		Measurements 測量			Amenity Values 設施價值	Form 形狀	Health 健康	Structural Condition 結構狀況	Suitability for Transplanting 適合移植性		Conservation Status 保育狀態	Maintenance department to provide comments on TPRP 維護部門提供對TPRP的意見		Additional Remarks 附加備註
			Scientific Name 學名	Chinese Name 中文名稱	Height (m) 高度(米)	Trunk DBH (mm) 樹幹直徑(毫米)	Crown Spread (m) 樹冠(米)	(high(H)/medium(M)/low(L) 高(H)/中等(M)/低(L)	good(G)/average(A)/poor(P) 好(G)/平均(A)/差(P)	(high(H)/medium(M)/low(L) 高(H)/中等(M)/低(L)	Remarks 備註	Before 之前	After 之後				
60671716/PP/APPENDIX 3.8	T1	T1	<i>Eucalyptus</i> spp.	桉屬	2	95	1.5	L	P	A	A	L	a,b,f	Nil	CEDD	-	Bending trunk 彎曲的樹幹
60671716/PP/APPENDIX 3.8	T2	T2	<i>Eucalyptus</i> spp.	桉屬	3	105	2	M	A	A	A	L	a,b	Nil	CEDD	-	
60671716/PP/APPENDIX 3.8	T3	T3	<i>Casuarina equisetifolia</i>	木麻黃	3	95	3	L	P	A	P	L	a,b,f	Nil	CEDD	-	Exposed roots 暴露的根部
60671716/PP/APPENDIX 3.8	T4	T4	<i>Eucalyptus</i> spp.	桉屬	4	118	3	M	P	A	A	L	a,b	Nil	CEDD	-	Tilting at the top of the leader 在樹的頂端傾斜
60671716/PP/APPENDIX 3.8	T5	T5	<i>Eucalyptus</i> spp.	桉屬	4	120	3	M	A	A	A	L	a,b	Nil	CEDD	-	
60671716/PP/APPENDIX 3.8	T6	T6	<i>Eucalyptus</i> spp.	桉屬	4	115	3	L	P	A	A	L	a,b,f	Nil	CEDD	-	Broken branch 斷裂的樹枝
60671716/PP/APPENDIX 3.8	T7	T7	<i>Melia azedarach</i>	楝	3	110	3	L	A	P	A	L	a,b,f	Nil	CEDD	-	Low live crown ratio 低活冠比率
60671716/PP/APPENDIX 3.8	T8	T8	<i>Eucalyptus</i> spp.	桉屬	3	95	2	L	P	P	P	L	a,b,f	Nil	CEDD	-	Bending trunk; Heaved root plate 彎曲的樹幹, 隆起的根板
60671716/PP/APPENDIX 3.8	T9	T9	<i>Eucalyptus</i> spp.	桉屬	5	123	4	L	P	A	A	L	a,b,f	Nil	CEDD	-	Multiple trunks with poor stability 多根樹幹不穩定
60671716/PP/APPENDIX 3.8	T10	T10	<i>Melia azedarach</i>	楝	5	155	2	L	P	A	P	L	a,b,f	Nil	CEDD	-	Multi-trunks 多幹枝
60671716/PP/APPENDIX 3.8	T11	T11	<i>Melia azedarach</i>	楝	6	130	3	L	A	A	P	L	a,b,f	Nil	CEDD	-	Exposed roots; Codominant trunks 暴露的根部, 共主樹幹

Total Nos. of Trees to be Removed: 11 Nos.
需要移除的樹木總數: 11棵

Total Nos. of Trees to be Retained: 0 Nos.
需要保留的樹木總數: 0棵

Total Nos. of Surveyed Tree: 11 Nos.
已進行調查的樹木總數: 11棵

Remarks for Suitability for Transplanting

- (a) Low amenity value;
- (b) Irrecoverable form after transplanting (e.g. transplanting requires substantial crown and root pruning);
- (c) Low chance of survival upon transplanting;
- (d) Very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
- (e) With evidence of over-maturity and onset of senescence;
- (f) With poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits); or cavity/cracks/splits);
- (g) Undesirable species (e.g. *Leucaena leucocephala* which is an invasive exotic and self-seeding tree); or
- (h) Trees grown under poor conditions which have limited the formation of proper root ball necessary for transplanting (e.g. on steep slope)

適於移植的備註:

- (a) 低便利設施價值;
- (b) 移植後無法恢復的形式(例如·移植需要大量修剪冠層和根部);
- (c) 移植後存活率低;
- (d) 非常大的尺寸(除非在可行性階段已經考慮到在財務上合理且技術可行的情況下移植); (e) 有老化跡象和衰老開始的證據;
- (f) 健康狀況、結構或形態差(例如·不平衡的形態、傾斜、有重大空洞/裂縫/劈裂);
- (g) 不理想的物種(例如·白蓮木是一種侵入性外來種且能自播種的樹木);
- (h) 在惡劣條件下生長的樹木·根系球形成受限(例如·在陡坡上生長)。

Appendix 4.1
Consideration of Quieter Construction Methods / Equipment
附錄 4.1
較寧靜的施工方法 / 施工設備的考量

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Table A Considerations for Construction Phase

Construction Activities 施工活動	Conventional Practices 傳統作業模式	Alternative Quieter Construction Methods / Equipment 較寧靜的施工方法／施工設備	Applicable to the Project (Y/N/NA) 適用於本工程項目 (是/否/不適用)	Associated Reasons 相關原因
<i>Construction Phase 施工階段</i>				
Site formation (concrete or rock breaking) 工地平整（混凝土或岩石破碎）	<ul style="list-style-type: none"> - Drill and break method by excavator-mounted breaker 利用挖土機上裝配的破碎機進行鑽鑿 	<ul style="list-style-type: none"> - Use of hydraulic crusher / quieter type saw (e.g diamond wire saw, noise reducing diamond blade saw) 使用油壓破碎機／低噪音型鋸（例如：鑽石線鋸、降噪鑽石片鋸） - Use of hydraulic splitter 使用油壓分裂機 - Non-explosive chemical expansion agent (soundless chemical demolition agent) 非爆炸性化學膨脹劑（無聲破碎劑） - Pulse plasma rock fragmentation technology (e.g. Electro Power Impactor (EPI)) 脈衝等離子體岩石破碎技術（如：電動脈衝器（簡稱為 EPI）） 	<ul style="list-style-type: none"> N 否 Y 是 N 否 Y 是 	<ul style="list-style-type: none"> - The Project site is located at the existing Lam Tei Quarry (LTQ) with rock of high strength. As confirmed with the Project Engineer, the hydraulic crusher / quieter type saw are generally adopted in splitting concrete and rock with relatively lower strength, which are not the case at LTQ; hence, hydraulic crusher and quieter type saw are not powerful enough to break the rock at LTQ and are considered not practical for this Project. 本工程項目位於藍地石礦場，岩石強度相對較高。經項目工程師確認，油壓破碎機／低噪音型鋸一般用於鑽鑿強度相對較低的岩石和混凝土。故此，上述施工方法／施工設備不適用於本工程項目。 - Hydraulic splitter will be considered and adopted as far as practicable. 會盡量考慮和使用油壓分裂機。 - Use of non-explosive chemical expansion agents is considered not effective in rock breaking as it would require a greater amount of drilling and hydraulic breaking (closer spaced holes so therefore more holes to drill). Besides, chemical expansion only forms a few cracks and significant hydraulic breaking is subsequently required to loosen and further break up the cracked rock mass. Therefore, the efficiency of such method is very low that is considered not suitable to be adopted under the Project in terms of the programme implementation. 考慮到使用非爆炸性化學膨脹劑進行岩石破碎需要數量較多的鑽孔以放置化學膨脹劑，涉及更多的鑽孔工序，因為效率並不高。此外，化學膨脹的過程只能在岩石中形成少量裂縫，隨後還需要進行多次油壓破碎以進一步破碎有裂痕的岩石。故此，上述方法的效率非常低，不利於項目實施，不適用於本工程項目。 - Although the use of EPI does not involve technical issues, the construction cost of using these methods for rock breaking during site formation are considerably much higher than that for using excavator-mounted breaker. Unlike typical infrastructure projects, this Project is a self-financing project by the future operator, and thus, consideration of cost-effectiveness is very important. Adoption of EPI in this Project is considered cost ineffective. According to the latest design for blasting operation of the Project, the rock excavation volume will be approx. 750m³/per day. Due to technical limitations of EPI, the rock excavation volume is approx. 45m³/day, which is approx. 16 times fewer in excavation

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<i>Construction Phase 施工階段</i>				
				<p>volume as compared to that by drill and blast method per day. The differences in excavation volume will result in extension of the working periods and increase in labor force. Considering the labor force required for both methods are similar, the cost of would be approx. 16 times as well. Hence, EPI will only be considered for mitigating the excessive construction noise subject to the detailed design stage, if necessary.</p> <p>雖然在本工程項目下 EPI 的應用不涉及技術問題，但在工地平整期間應用 EPI 進行岩石破碎的施工成本遠高於使用破碎機。有別於典型的基礎設施項目，本工程項目是由未來運營商自費的項目，因此施工方法的成本效益尤其重要。在本工程項目中採用 EPI 並不符合成本效益。根據本工程項目有關爆破作業的最新設計，每天的岩石挖掘量為約 750 立方米。鑑於 EPI 的技術限制，每天的岩石挖掘量僅為約 45 立方米，比使用鑽爆法的挖掘量少約 16 倍。挖掘量的明顯差異將導致工期延長和工作人員數目增加。考慮到兩種施工方法所需的工作人員數目相似，成本也將相應增加約 16 倍。因此，視乎詳細設計階段而定，只有在需要緩降過度的不良建築噪音影響的情況下，才會考慮使用 EPI。</p>
Construction of main access tunnels and production cavern 建造連接隧道和岩洞	- Drill and break method 鑽鑿方法	<ul style="list-style-type: none"> - Non-explosive chemical expansion agent (soundless chemical demolition agent) 非爆炸性化學膨脹劑（無聲化學破碎劑） - Pulse plasma rock fragmentation technology (e.g. Electro Power Impactor (EPI)) 脈衝等離子體岩石破碎技術（如：電動脈衝器（簡 	<p>N 否</p> <p>Y 是</p>	<ul style="list-style-type: none"> - Use of non-explosive chemical expansion agents is considered not effective in rock breaking as it would require a greater amount of drilling and hydraulic breaking (closer spaced holes so therefore more holes to drill). Besides, chemical expansion only forms a few cracks and significant hydraulic breaking is subsequently required to loosen and further break up the cracked rock mass. Therefore, the efficiency of such method is very low that is considered not suitable to be adopted under the Project in terms of the programme implementation. 考慮到使用非爆炸性化學膨脹劑進行岩石破碎需要數量較多的鑽孔以放置化學膨脹劑，涉及更多的鑽孔工序，因為效率並不高。此外，化學膨脹的過程只能在岩石中形成少量裂縫，隨後還需要進行多次油壓破碎以進一步破碎有裂痕的岩石。故此，上述方法的效率非常低，不利於項目實施，不適用於本工程項目。 - Although the use of EPI does not involve technical issues, the construction cost of using these methods for rock breaking during site formation are considerably much higher than that for using excavator-mounted breaker. Unlike typical infrastructure projects, this Project is a self-financing project by the future operator, and thus, consideration of cost-effectiveness is very important. Adoption of EPI in this Project is considered cost ineffective.

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Construction Phase 施工階段		稱為 EPI))		<p>According to the latest design for blasting operation for the excavation of LTUQ, the rock excavation volume will be approx. 750m³/per day. Due to technical limitations of EPI, the rock excavation volume is approx. 45m³/day, which is approx. 16 times fewer in excavation volume as compared to that by drill and blast method per day. The differences in excavation volume will result in extension of the working periods and increase in labor force. Considering the labor force required for both methods are similar, the cost of would be approx. 16 times as well. Hence, EPI will only be considered for mitigating the excessive construction noise subject to the detailed design stage, if necessary.</p> <p>雖然在本工程項目下 EPI 的應用不涉及技術問題，但在工地平整期間應用 EPI 進行岩石破碎的施工成本遠高於使用破碎機。有別於典型的基礎設施項目，本工程項目是由未來運營商自費的項目，因此施工方法的成本效益尤其重要。在本工程項目中採用 EPI 並不符合成本效益。根據本工程項目有關爆破作業的最新設計，每天的岩石挖掘量為約 750 立方米。鑑於 EPI 的技術限制，每天的岩石挖掘量僅為約 45 立方米，比使用鑽爆法的挖掘量少約 16 倍。挖掘量的明顯差異將導致工期延長和工作人員數目增加。考慮到兩種施工方法所需的工作人員數目相似，成本也將相應增加約 16 倍。因此，視乎詳細設計階段而定，只有在需要緩降過度的不良建築噪音影響的情況下，才會考慮使用 EPI。</p>
Piling (sheet pile / H-beam pile) (for platform formation or slope works) 打樁（板樁／工字樁） （用於平台平整或斜坡工程）	- Percussive piling (e.g. percussive hammer, vibration hammer) 撞擊式打樁（如：打擊樁錘／振動樁錘）	- Use of silent piling such as hydraulic press-in method 使用無聲打樁技術，如油壓植樁法	NA 不適用	- No piling works will be proposed under this Project. 本工程項目將不涉及任何打樁工程。
Building / structure demolition or modification works (for Site Clearance)	- Excavator-mounted breaker 挖土機上裝配的破碎機	- Use of hydraulic crusher 使用油壓破碎機 - Non-explosive chemical expansion agent (soundless)	NA 不適用	- No building / structure demolition or modification works will be required under this Project. All the structures under the existing surface quarry contract (within the proposed aboveground works area) will be removed by the existing surface quarry operator before the commencement of the construction phase of the Project.

Construction Activities 施工活動	Conventional Practices 傳統作業模式	Alternative Quieter Construction Methods / Equipment 較寧靜的施工方法／施工設備	Applicable to the Project (Y/N/NA) 適用於本工程項目 (是/否/不適用)	Associated Reasons 相關原因
<i>Construction Phase 施工階段</i>				
	木製模板			quieter construction method will only be considered for mitigating the excessive construction noise subject to the detailed design stage, if necessary. 本工程項目施工階段涉及的現場施工工序相對於其他工程項目（如住宅和基礎設施開發）而言較少。在現場鑄件需求極低的情況下，使用模塊化模板並不具成本效益。因此，視乎詳細設計階段而定，只有在需要緩降過度的不良建築噪音影響的情況下，才會考慮使用這種施工方法。

Table B Considerations for Operational Phase

Construction Activities 施工活動	Conventional Practices 傳統作業模式	Alternative Quieter Construction Methods / Equipment 較寧靜的施工方法／施工設備	Applicable to the Project (Y/N/NA) 適用於本工程項目 (是/否/不適用)	Associated Reasons 相關原因
<i>Operational Phase 營運階段</i>				
Rock breaking 岩石破碎	- Drill and break method by excavator-mounted breaker 利用挖土機上裝配的破碎機進行鑽鑿	- Use of hydraulic crusher / quieter type saw (e.g diamond wire saw, noise reducing diamond blade saw) 使用油壓破碎機／低噪音型鋸（例如：鑽石線鋸、降噪鑽石片鋸） - Use of hydraulic splitter 使用油壓分裂機 - Non-explosive chemical expansion agent (soundless chemical demolition agent)	N 否 Y 是 N 否	- The Project site is located at the existing Lam Tei Quarry (LTQ) with rock of high strength. As confirmed with the Project Engineer, the hydraulic crusher / quieter type saw are generally adopted in splitting concrete and rock with relatively lower strength, which are not the case at LTQ; hence, hydraulic crusher and quieter type saw are not powerful enough to break the rock at LTQ and are considered not practical for this Project. 本工程項目位於藍地石礦場，岩石強度相對較高。經項目工程師確認，油壓破碎機／低噪音型鋸一般用於鑽鑿強度相對較低的岩石和混凝土。故此，上述施工方法／施工設備不適用於本工程項目。 - Hydraulic splitter will be considered and adopted as far as practicable. 會盡量考慮和使用油壓分裂機。 - Use of non-explosive chemical expansion agents is considered not effective in rock breaking as it would require a greater amount of drilling and hydraulic breaking (closer spaced holes so therefore more holes to drill). Besides, chemical expansion only forms a few cracks and

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Operational Phase 營運階段				
	-	<ul style="list-style-type: none"> - 非爆炸性化學膨脹劑（無聲破碎劑） - Pulse plasma rock fragmentation technology (e.g. Electro Power Impactor (EPI)) 脈衝等離子體岩石破碎技術（如：電動脈衝器（簡稱為 EPI）） 	Y 是	<p>significant hydraulic breaking is subsequently required to loosen and further break up the cracked rock mass. Therefore, the efficiency of such method is very low that is considered not suitable to be adopted under the Project in terms of the programme implementation.</p> <p>考慮到使用非爆炸性化學膨脹劑進行岩石破碎需要數量較多的鑽孔以放置化學膨脹劑，涉及更多的鑽孔工序，因為效率並不高。此外，化學膨脹的過程只能在岩石中形成少量裂縫，隨後還需要進行多次油壓破碎以進一步破碎有裂痕的岩石。故此，上述方法的效率非常低，不利於項目實施，不適用於本工程項目。</p> <ul style="list-style-type: none"> - Although the use of EPI does not involve technical issues, the construction cost of using these methods for rock breaking during site formation are considerably much higher than that for using excavator-mounted breaker. Unlike typical infrastructure projects, this Project is a self-financing project by the future operator, and thus, consideration of cost-effectiveness is very important. Adoption of EPI in this Project is considered cost ineffective. According to the latest design for blasting operation of the Project, the rock excavation volume will be approx. 750m³/per day. Due to technical limitations of EPI, the rock excavation volume is approx. 45m³/day, which is approx. 16 times fewer in excavation volume as compared to that by drill and blast method per day. The differences in excavation volume will result in extension of the working periods and increase in labor force. Considering the labor force required for both methods are similar, the cost of would be approx. 16 times as well. Hence, EPI will only be considered for mitigating the excessive construction noise subject to the detailed design stage, if necessary. <p>雖然在本工程項目下 EPI 的應用不涉及技術問題，但在工地平整期間應用 EPI 進行岩石破碎的施工成本遠高於使用破碎機。有別於典型的基礎設施項目，本工程項目是由未來運營商自費的項目，因此施工方法的成本效益尤其重要。在本工程項目中採用 EPI 並不符合成本效益。根據本工程項目有關爆破作業的最新設計，每天的岩石挖掘量為約 750 立方米。鑑於 EPI 的技術限制，每天的岩石挖掘量僅為約 45 立方米，比使用鑽爆法的挖掘量少約 16 倍。挖掘量的明顯差異將導致工期延長和工作人員數目增加。考慮到兩種施工方法所需的工作人員數目相似，成本也將相應增加約 16 倍。因此，視乎詳細設計階段而定，只有在需要緩降過度的不良建築噪音影響的情況下，才會考慮使用 EPI。</p>

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<i>Operational Phase 營運階段</i>				
Construction of main access tunnels and production cavern 建造連接隧道和岩洞	- Drill and break method 鑽鑿方法	<ul style="list-style-type: none"> - Non-explosive chemical expansion agent (soundless chemical demolition agent) 非爆炸性化學膨脹劑（無聲化學破碎劑） - Pulse plasma rock fragmentation technology (e.g. Electro Power Impactor (EPI)) 脈衝等離子體岩石破碎技術（如：電動脈衝器（簡稱為 EPI）） 	<p>N 否</p> <p>Y 是</p>	<ul style="list-style-type: none"> - Use of non-explosive chemical expansion agents is considered not effective in rock breaking as it would require a greater amount of drilling and hydraulic breaking (closer spaced holes so therefore more holes to drill). Besides, chemical expansion only forms a few cracks and significant hydraulic breaking is subsequently required to loosen and further break up the cracked rock mass. Therefore, the efficiency of such method is very low that is considered not suitable to be adopted under the Project in terms of the programme implementation. 考慮到使用非爆炸性化學膨脹劑進行岩石破碎需要數量較多的鑽孔以放置化學膨脹劑，涉及更多的鑽孔工序，因為效率並不高。此外，化學膨脹的過程只能在岩石中形成少量裂縫，隨後還需要進行多次油壓破碎以進一步破碎有裂痕的岩石。故此，上述方法的效率非常低，不利於項目實施，不適用於本工程項目。 - Although the use of EPI does not involve technical issues, the construction cost of using these methods for rock breaking during site formation are considerably much higher than that for using excavator-mounted breaker. Unlike typical infrastructure projects, this Project is a self-financing project by the future operator, and thus, consideration of cost-effectiveness is very important. Adoption of EPI in this Project is considered cost ineffective. According to the latest design for blasting operation for the excavation of LTUQ, the rock excavation volume will be approx. 750m³/per day. Due to technical limitations of EPI, the rock excavation volume is approx. 45m³/day, which is approx. 16 times fewer in excavation volume as compared to that by drill and blast method per day. The differences in excavation volume will result in extension of the working periods and increase in labor force. Considering the labor force required for both methods are similar, the cost of would be approx. 16 times as well. Hence, EPI will only be considered for mitigating the excessive construction noise subject to the detailed design stage, if necessary. 雖然在本工程項目下 EPI 的應用不涉及技術問題，但在工地平整期間應用 EPI 進行岩石破碎的施工成本遠高於使用破碎機。有別於典型的基礎設施項目，本工程項目是由未來運營商自費的項目，因此施工方法的成本效益尤其重要。在本工程項目中採用 EPI 並不符合成本效益。根據本工程項目有關爆破作業的最新設計，每天的岩石挖掘量為約 750 立方米。鑑於 EPI 的技術限制，每天的岩石挖掘量僅為約 45 立方米，比使用鑽爆法的挖掘量少約 16 倍。挖掘量的明顯差異將導致工期延長和工作人員數目增加。考慮到兩種

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Operational Phase 營運階段				
				施工方法所需的工作人員數目相似，成本也將相應增加約 16 倍。因此，視乎詳細設計階段而定，只有在需要緩降過度的不良建築噪音影響的情況下，才會考慮使用 EPI。
Piling (sheet pile / H-beam pile) (for platform formation or slope works) 打樁（板樁／工字樁） （用於平台平整或斜坡工程）	- Percussive piling (e.g. percussive hammer, vibration hammer) 撞擊式打樁（如：打擊樁錘／振動樁錘）	- Use of silent piling such as hydraulic press-in method 使用無聲打樁技術，如油壓植樁法	NA 不適用	- No piling works will be proposed under this Project. 本工程項目將不涉及任何打樁工程。
Building / structure demolition or modification works (for Site Clearance) 建築物／結構的拆除或修改工程 （用於場地清理）	- Excavator-mounted breaker 挖土機上裝配的破碎機	- Use of hydraulic crusher 使用油壓破碎機 - Non-explosive chemical expansion agent (soundless chemical demolition agent) 非爆炸性化學膨脹劑（無聲化學拆除劑） - Use of quieter type saw (e.g. diamond wire saw, noise reducing diamond blade saw) 低噪音型鋸（如：鑽石線鋸、降噪鑽石片鋸） - Robot-type hydraulic crusher or handheld concrete crusher 機械型油壓破碎機或手持式混凝土破碎機	NA 不適用	- No building / structure demolition or modification works will be conducted during the operational phase. 本工程項目營運階段將不涉及任何建築物／結構的拆除或修改工程。
Building works (Superstructure)	- In-situ construction 現場施工	- Use of pre-casting and prefabrication technology	NA 不適用	- No building works will be conducted during the operational phase. 本工程項目營運階段將不涉及任何建築工程。

Construction Activities 施工活動	Conventional Practices 傳統作業模式	Alternative Quieter Construction Methods / Equipment 較寧靜的施工方法／施工設備	Applicable to the Project (Y/N/NA) 適用於本工程項目 (是/否/不適用)	Associated Reasons 相關原因
<i>Operational Phase 營運階段</i>				
建築工程 (地面構築物)	- Vibratory Poker 震動機	採用預製組件技術 - Self-compacting Concrete or Rubber Head Poker Vibrator 自充填混凝土或橡膠頭震動機		
Formwork Installation 模板安裝	- Timber formwork by hammer and drilling 用錘子和電鑽安裝木製模板	- Modular lightweight formwork 模塊化輕型模板	NA 不適用	- No formwork installation works will be conducted during the operational phase. 本工程項目營運階段將不涉及任何模板安裝。

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