



The Government of the Hong Kong Special Administrative Region  
Civil Engineering and Development Department

**Agreement No. CE 33/2013 (GE)  
Landslip Prevention and Mitigation Programme, 2013, Package G  
Landslip Prevention and Mitigation Works -  
Investigation, Design and Construction**

**Project Profile  
for  
Landslip Prevention and Mitigation Works  
at Ng Tung Chai Along Lam Kam Road, Tai Po**

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**AECOM Asia Co. Ltd.**

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## **1 BASIC INFORMATION**

### **1.1 Project Title**

- 1.1.1.1. Landslip Prevention and Mitigation Works at Ng Tung Chai Along Lam Kam Road, Tai Po (hereinafter referred to as “the Project”).

### **1.2 Purpose and Nature of the Project**

- 1.2.1.1. The Government has commissioned the rolling *Post-2010 Landslip Prevention and Mitigation (LPMit) Programme* with the target annual outputs of upgrading 150 substandard Government man-made slopes, completing safety-screening studies of 100 private man-made slopes and implementing risk mitigation works for 30 natural hillside catchments. The LPMit Programme was commenced with the aim of further reducing the landslide risk posed to the public by the substandard man-made slopes and vulnerable natural hillside catchments.
- 1.2.1.2. The Project is the mitigation works at the natural hillside catchments to reduce the landslide risk posed to the community at Ng Tung Chai recommended under Natural Terrain Hazard Study (NTHS) for Study Area No. 7NW-C/SA2 at Ng Tung Chai, Lam Kam Road, Tai Po under Agreement No. CE 33/2013 (GE) Landslip Prevention and Mitigation Programme, 2013, Package G, Landslip Prevention and Mitigation Works - Investigation, Design and Construction.
- 1.2.1.3. Following the review of the background information, detailed aerial photograph interpretation, the findings from project-specific ground investigation and detailed field mapping, three of the hillside incised drainage catchments within Study Area No. 7NW-C/SA2 is considered to present potential channelised debris flow hazards along the drainage line to the at-risk facilities at-toe. Mitigation measures including the construction of deflector wall with gabion blocks and 2 nos. of reinforced concrete barriers are proposed to safeguard the populations and facilities at the toe of Study Area.

### **1.3 Name of Project Proponent**

- 1.3.1.1. Civil Engineering and Development Department (CEDD) is the project proponent of the Project.

### **1.4 Location and Scale of Project and History of Site**

- 1.4.1.1. The Project site is located at natural terrain in the vicinity of Man Tak Garden in Ng Tung Chai, Tai Po and is currently not covered by any Outline Zoning Plan. The Project site falls entirely within Ng Tung Chai Site of Special Scientific Interest (NTCSSI) but does not encroach onto Tai Mo Shan Country Park (TMSCP) or Ng Tung Chai Special Area (NTCSA). The scale of the Project is limited with a total site area of approximately 0.13ha. Location of the Project is shown in **Figure 1.1**.
- 1.4.1.2. The proposed landslip prevention and mitigation works under the Project comprise two rigid barriers (RB01 and RB02) and associated maintenance staircases, and one deflector wall with gabion blocks (DW01). Dimensions of the proposed rigid barriers would be approximately 8.7m wide x 20m long x 3.7m deep for RB01 and 8.3m wide x 20m long x 4.5m deep for RB02. An approximately 0.6m wide concrete maintenance staircase with handrail would be constructed for the rigid barriers. The dimension of the proposed deflector wall with gabion blocks DW01 would be approximately 2 m high x 20 m long x 0.5 m thick. General layout plan,

sections and previous examples of the proposed works are shown in **Figure 1.1** and **Appendix 1.1**, respectively.

- 1.4.1.3. The construction of rigid barriers would involve excavation, temporary installation of soil nails, formworks and reinforcement bar fixing and concreting. Since the worksite of proposed rigid barrier RB01 would encroach on around 13 m long of an existing watercourse (i.e. natural watercourse S2), temporary diversion of a short section of S2 (approx. 13 m) would be required prior to the construction works to ensure the construction would be conducted in dry condition and to prevent the transportation of suspended solids downstream, and the affected section would be reinstated as a surface channel, following DEVB TC(W) No. 9/2020 “*Blue-Green Drainage Infrastructure*”, on the rigid barrier. The construction of deflector wall with gabion blocks DW01 would involve pre-drilling, mini-pile reinforcement, formworks and concreting. No construction works would be undertaken within the nearby natural watercourse S1.
- 1.4.1.4. As described in **Section 1.2.1.3**, three of the hillside incised drainage catchments within Study Area No. 7NW-C/SA2 is considered to present potential channelised debris flow hazards from uphill along drainage line to the at-risk facilities at-toe. At an incised drainage catchment, when a landslide occurs, debris within the catchment enters the drainage line to form a channelised debris flow and tends to be more hazardous than open hillslope landslide as the debris is more mobile and therefore has a higher potential to reach developed areas. The drainage line governs the debris flow path. In view of the scale and impact of the potential landslip hazards, in addition to the provision of effective landslip prevention measures at the toe of catchment to protect the at-risk populations / facilities, two alternative options, including soil nailing the potential source areas and installation of multiple smaller rigid barriers along the drainage line / watercourse, were also considered during the option assessment stage under the NTHS for Study Area No. 7NW-C/SA2. The proposed works, i.e. provision of deflector wall with gabion blocks and reinforced concrete barriers (i.e. rigid barriers) at the toe of the catchment, is considered the most effective option to protect the population and facilities at risk and would also affect less extent of natural habitats (including natural watercourse and woodland) at upstream of the catchment, hence it is adopted for the Project.

## 1.5 Numbers and Types of Designated Projects to be Covered by this Project Profile

- 1.5.1.1. In accordance with Category Q.1, Part I, Schedule 2 of the *Environmental Impact Assessment Ordinance (EIAO)*, all projects involving earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a SSSI would be classified as a Designated Project (DP). Since the proposed Project involving earthworks falls wholly within Ng Tung Chai SSSI, it is classified as a DP under the *EIAO*.
- 1.5.1.2. Likewise, in accordance with Category I.1(b)(i) of Part I, Schedule 2 of *EIAO*, a drainage channel or river training and diversion works located less than 300m from the nearest boundary of an existing or planned SSSI would be classified as a DP. The construction of the rigid barrier RB01 would require temporary diversion of a small stream and the affected section would be reinstated as a surface channel on the rigid barrier. The affected stream is located within Ng Tung Chai SSSI that the proposed works would also be classified as a DP under the *EIAO*.

- 1.5.1.3. This Project Profile has been prepared in accordance with Annex 1 of *Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)*, and is to seek permission to apply directly for an Environmental Permit for the construction of the Project under Section 5(11) of the EIAO.

## **1.6 Public Consultation to Date, Public Interest and Political Sensitivity**

- 1.6.1.1. Consultations have been carried out with the stakeholder of Man Tak Garden, which is a key at-risk facility / population, in 2015, April 2021 and October 2022. The proposed landslip prevention and mitigation works are generally supported. Advice and suggestions from Man Tak Garden on refinement of detailed design to minimise visual impacts have been incorporated in the design.
- 1.6.1.2. Consultations have also been carried out with green groups in November 2021 and April 2022 to present the purpose and design of the Project and to seek their views on the Project. The Project is generally supported. Advice and suggestions from green groups, such as refinement of detailed design to ensure avoidance of direct impacts to natural watercourse and to further minimise visual impacts, training for construction workers on protection of vegetation and wildlife, and provision of surveillance system within works sites to enhance the control of proper implementation of the recommended mitigation measures, have been incorporated in the design and construction planning.

## **1.7 Name and Telephone Number of Contact Person(s)**

|                 |   |
|-----------------|---|
| Contact Person: | Mr. Willie W L Wong   |
| Post Title:     | Geotechnical Project Coordinator (GPC/CM72)   |
| Department:     | Civil Engineering and Development Department<br>(Geotechnical Engineering Office)               |
| Office Address: | LG1, Civil Engineering and Development Building, 101<br>Princess Margaret Rd, Homantin, Kowloon |
| Telephone:      | 2760 5748   |
| Facsimile:      | 2711 5726   |

## **2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **2.1 Project Planning and Implementation**

2.1.1.1. The Consultants, which was engaged by the Geotechnical Engineering Office (GEO) of CEDD under Agreement No. CE 33/2013 (GE) Landslip Prevention and Mitigation Programme, 2013, Package G, Landslip Prevention and Mitigation Works – Investigation, Design and Construction, to undertake the investigation, design and supervision of the mitigation works on NTHS for the Project. Lands Department would be responsible for routine maintenance of the completed works.

### **2.2 Project Timeline**

2.2.1.1. The planning and design of proposed works has been in progress since 2015. Construction of the Project would last for approximately 14 months, is scheduled to commence in Q3 2024 for completion in Q4 2025. The tentative construction programme is presented in **Appendix 2.1**.

### **2.3 Interactions with Other Projects**

2.3.1.1. According to the best information available at the time of preparation of this Project Profile, there are no existing / planned projects within 500m from the Project site. No cumulative environmental impacts is therefore expected.

### 3 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

#### 3.1 Major Elements of the Surrounding Environment and Existing and/or Relevant Past Land Use(s)

3.1.1.1. The Project site is located at the natural hillslopes at the hillside of Ng Tung Chai, Tai Po in the vicinity of Man Tak Garden. Photographs of the Project site are shown in **Appendix 3.1**. The proposed rigid barriers (RB01 and RB02) are uphill to the west of Man Tak Garden and surrounded by woodland at its surrounding. The proposed deflector wall with gabion blocks (DW01) is situated southeast to Man Tak Garden, aligning its existing masonry walls and bounded by the existing footpath to its northeast and natural watercourse to its southwest. The Project site and Man Tak Garden are mainly surrounded by hillside woodland, with Ng Tung Chai Village located at over 400 m downhill to the north of the Project site. Given that the Project site is on a natural slope of a hillside with no previous potentially contaminating land use / activities / sources within the works area (**Appendix 3.1** refers), no land contamination issues are anticipated.

#### 3.2 Existing and Planned Sensitive Receivers and Sensitive Parts of the Natural Environment

##### 3.2.1 Air Quality

3.2.1.1. No major air pollutant source was identified in the vicinity of the Project site.

3.2.1.2. Representative air sensitive receivers (ASRs) identified within 500 m from the Project site are tabulated in **Table 3.1** and illustrated in **Figure 3.1**.

**Table 3.1 Representative Air Sensitive Receiver**

| ID   | Location / Description | Nature / Land Use       | Number of Floors | Approximate Horizontal Distance from Nearest Project Site Boundary (m) |
|------|------------------------|-------------------------|------------------|--|
| ASR1 | Man Tak Garden         | Place of Public Worship | 1 – 2            | 5  |
| ASR2 | 43 Ng Tung Chai        | Residential             | 2                | 429  |

3.2.1.3. Tai Po air quality monitoring station (AQMS) is the nearest EPD monitoring station to the Project site. Air pollutants measured at Tai Po AQMS for the latest five years (2018 – 2022) are summarised in **Table 3.2**.

3.2.1.4. As detailed in **Section 4.2.1**, fugitive dust would be the major air pollutants to be generated during construction phase of the Project whilst fuel combustion from the use of powered mechanical equipment (PME) during construction works could be a potential source of air pollutants. As shown in **Table 3.2**, the measured concentrations of SO<sub>2</sub>, NO<sub>2</sub>, RSP and FSP in the past five-year all complied with the respective AQOs. The 10<sup>th</sup> highest 8-hour O<sub>3</sub> concentrations exceeded the prevailing AQO criteria in 2018 to 2022. High level of ambient O<sub>3</sub>, which is mainly influenced by the regional photochemical smog problem, is a regional air pollution problem. The HKSAR government has been strengthening its collaboration with the Guangdong Provincial Government to alleviate the photochemical smog and the associated O<sub>3</sub> problems in the region and continuing to restrict vehicular emission and implement other control measures to reduce local emissions.



**Table 3.2 Air Pollutants at EPD’s Tai Po Air Quality Monitoring Station (2018 – 2022)**

| Pollutant<br>[1]            | Parameter                          | Concentrations ( $\mu\text{g}/\text{m}^3$ ) |            |            |            |            | Prevailing AQO ( $\mu\text{g}/\text{m}^3$ ) [2] |
|-----------------------------|------------------------------------|---|------------|------------|------------|------------|---|
|                             |                                    | 2018  | 2019       | 2020       | 2021       | 2022       |   |
| RSP<br>(PM <sub>10</sub> )  | 10 <sup>th</sup> highest 24-hour   | 69  | 65         | 58         | 60         | 48         | 100 (9)   |
|                             | Annual                             | 31  | 31         | 24         | 26         | 21         | 50  |
| FSP<br>(PM <sub>2.5</sub> ) | 19 <sup>th</sup> highest 24-hour   | 38  | 41         | 33         | 32         | 30         | 50 (18) [3]                                     |
|                             | Annual                             | 19  | 20         | 15         | 16         | 14         | 25  |
| SO <sub>2</sub>             | 4 <sup>th</sup> highest 10-minutes | 24  | 20         | 19         | 15         | 12         | 500 (3)   |
|                             | 4 <sup>th</sup> highest 24-hour    | 8   | 10         | 7          | 9          | 5          | 50 (3)  |
| NO <sub>2</sub>             | 19 <sup>th</sup> highest 1-hour    | 125   | 142        | 106        | 115        | 93         | 200 (18)  |
|                             | Annual                             | 36  | 36         | 30         | 32         | 27         | 40  |
| O <sub>3</sub>              | 10 <sup>th</sup> highest 8-hour    | <b>167</b>                                  | <b>197</b> | <b>165</b> | <b>168</b> | <b>188</b> | 160   |
| CO [1]                      | 1 <sup>st</sup> highest 1-hour     | N.A.  | N.A.       | N.A.       | N.A.       | N.A.       | 30,000  |
|                             | 1 <sup>st</sup> highest 8-hour     | N.A.  | N.A.       | N.A.       | N.A.       | N.A.       | 10,000  |

Notes:

[1] CO concentration is not measured at Tai Po AQMS.

[2] The prevailing AQOs came into effect on 1 January 2022. Number of exceedance allowed under the AQO is shown in ( ).

[3] Under the prevailing AQOs, the number of exceedances allowed per year for daily FSP is 35 times. However, for new government projects, the number of exceedances allowed per year for daily FSP is 18 times only.

### 3.2.2 Noise

3.2.2.1. No major noise source was identified in the vicinity of the Project site.

3.2.2.2. Noise sensitive receiver (NSR) identified within 300 m from the Project site includes Man Tak Garden as summarised **Table 3.3** and illustrated in **Figure 3.2**. Tai Mo Shan Country Park is situated in vicinity of the Project site. However, only a short section of hiking trail and no camping site is located at Tai Mo Shan Country Park within 300m assessment area. In view of the transient nature of visitors to the Country Park, any potential construction noise impacts on the visitors would not be considered insurmountable and no adverse noise impact on Tai Mo Shan Country Park within 300m assessment area is anticipated. Hence, it was not identified as a NSR in the assessment.

**Table 3.3 Representative Noise Sensitive Receiver**

| ID   | Location / Description | Nature / Land Use       | Number of Floors | Approximate Horizontal Distance from Nearest Project Site Boundary (m) |
|------|------------------------|-------------------------|------------------|--|
| NSR1 | Man Tak Garden         | Place of Public Worship | 1-2              | 5  |

### 3.2.3 Water Quality

3.2.3.1. The Project site is contained within the Ng Tung Chai SSSI and Water Gathering Grounds that the Project area itself would be considered as a water sensitive receiver (WSR). Other WSRs identified within 500 m from the Project site include Tai Mo Shan Country Park, Ng Tung Chai Special Area, the upstream section of Lam Tsuen River, which is classified as an Ecologically Important Stream (EIS), as well as two small hillside watercourses (S1 and S2) as illustrated in **Figure 3.3** and summarised in **Table 3.4**.



- 3.2.4.3. The Surveyed Area comprises mainly woodland, natural watercourse, and developed area habitats. Representative photographs of the habitats are presented in **Appendix 3.2**. Majority of the recorded flora and fauna species are common or very common in Hong Kong. Species of conservation importance recorded within the Surveyed Area are described in **Table 3.5** and their locations are presented in **Figure 3.5**. Full lists of flora and faunal species recorded are given in **Appendices 3.3 and 3.4** respectively.
- 3.2.4.4. Developed area habitat comprising mainly Man Tak Garden, which is a monastery bounded by masonry wall, locates immediately outside the Project site. No species of conservation importance are recorded within developed area.
- 3.2.4.5. Woodland within the Project site was mature and well-established. It has a shaded canopy with a height of about 13 – 15 m, dominated by locally common native trees, such as *Machilus chekiangensis*, *Schefflera heptaphylla*, *Ficus variegata*. Other herb and shrub species such as *Microstegium ciliatum* and *Psychotria asiatica* were recorded at the understorey. Species of conservation importance were recorded in woodland, such as *Cibotium barometz* and *Aquilaria sinensis*. Clusters of *Cibotium barometz* were recorded within the proposed footprint of rigid barriers RB01 and RB02. An individual of *Aquilaria sinensis* (approximately 8 m tall) was also recorded within the footprint of RB02. A mature individual of *Aquilaria sinensis* was recorded on the indicative alignment of temporary access path, while two seedlings of *Aquilaria sinensis* were recorded near the proposed temporary access. Refer to **Table 3.5** for other species of conservation importance recorded in woodland.
- 3.2.4.6. Two natural watercourses, S1 and S2, are recorded within the Surveyed Area (**Figure 3.5** refers). Natural watercourse S1 is situated east to the proposed deflector wall with gabion blocks (DW01). It is a typical upland stream (approx. 2 m wide and 20 cm deep) with natural substrate (e.g. coarse sand and boulders) and steady flow and well-established riparian zone. It connects to a fall in the upstream section, and flows into Lam Tsuen River in the downstream section. Microhabitats such as cascades, pools and riffles are present in the stream. Riparian vegetation recorded included *Saurauia tristyla*, *Piper hancei*, *Pellionia scabra*, *Boehmeria nivea*, etc. A floral species of conservation importance, *Neottopteris nidus*, is recorded on a *Saurauia tristyla* (referred to as tree no. T202 in the *Tree Assessment Schedule*) within natural watercourse S1 nearby the Project site of the proposed deflector wall with gabion blocks. Refer to **Table 3.5** for other species of conservation importance recorded in natural watercourse S1. The downstream section of natural watercourse S2 is situated partly within the footprint of the proposed rigid barrier (RB01) (approx. 13 m). S2 is a small upland stream (approx. 1 m wide and 3 – 5 cm deep) with natural substrate (boulders) and observed to be seasonally dry. The downstream section connects to a box culvert that flows beneath Man Tak Garden. Riparian vegetation commonly recorded included *Osmunda vachellii*, *Boehmeria nivea*, *Piper hancei*, etc. No freshwater community or species of conservation importance were recorded within the natural watercourse S2 within the Surveyed Area.

**Table 3.5 Species of Conservation Importance recorded within the Surveyed Area**

| Common Name<br>(Scientific Name)                          | Distribution in<br>Hong Kong <sup>(1)</sup>   | Conservation Status  | Habitat<br>Recorded            |
|---|---|--|--------------------------------|
| <b>Flora</b>  |   |  |                                |
| Bird-nest Fern<br>( <i>Neottopteris nidus</i> )           | Restricted  | Cap. 96 <sup>(2)</sup>   | Natural<br>Watercourse<br>(S1) |
| Five-leaved Yam<br>( <i>Dioscorea<br/>pentaphylla</i> )   | Rare; Ma On<br>Shan Ha<br>Tsuen, Shing<br>Mun and Nam<br>Chung  | -  | Natural<br>Watercourse<br>(S1) |
| Luofushan Joint-fir<br>( <i>Gnetum luofuense</i> )        | Very common   | Near Threatened <sup>(3)</sup>   | Woodland                       |
| Incense Tree<br>( <i>Aquilaria sinensis</i> )             | Common  | Vulnerable <sup>(3) (7) (8)</sup> ; Cap. 586<br><sup>(4)</sup> ; Category 2 & 3 (Near<br>Threatened) <sup>(5)</sup> ; Category II<br><sup>(6)</sup> ; Near Threatened <sup>(9)</sup> ;<br>Recorded <sup>(10)</sup> | Woodland                       |
| Lamb of Tartary<br>( <i>Cibotium barometz</i> )           | Very common   | Cap. 586 <sup>(4)</sup> ; Category 2<br>Vulnerable <sup>(5)</sup> ; Category II <sup>(6)</sup>   | Woodland                       |
| <b>Fauna</b>  |   |  |                                |
| Yellow Rajah<br>( <i>Charaxes marmax</i> )                | Uncommon <sup>(11)</sup>  | Local Concern <sup>(12)</sup>  | Woodland                       |
| Futsing Wolf Snake<br>( <i>Lycodon futsingensis</i> )     | Distributed in<br>woodlands in<br>Tai Po Kau<br>Nature<br>Reserve, Tai<br>Mo Shan<br>Country Park<br>and Tai Lam<br>Country Park<br><sup>(11)</sup> | Local Concern <sup>(12)</sup>  | Natural<br>Watercourse<br>(S1) |
| Lesser Spiny Frog<br>( <i>Quasipaa<br/>exilispinosa</i> ) | Occurs<br>throughout<br>territory <sup>(11)</sup>   | Potential Global Concern <sup>(12)</sup>   | Natural<br>Watercourse<br>(S1) |

Notes:

- (1) Distribution in Hong Kong follows:  
 Wu, S.-H. & Lee, T.-C.W. (2000). Pteridophytes of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23:5-20.  
 Xing, F.-W., Ng, S.C. & Chau, L.K.-C. (2000). Gymnosperms and Angiosperms of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23:21-136.  
 Siu, L.-P.G. (2000). Orchidaceae of Hong Kong. *Memoirs of the Hong Kong Natural History Society* 23:137-148.
- (2) Protected under the Forests and Countryside Ordinance (Cap. 96)
- (3) IUCN Red List (ver.2022.2)
- (4) Protected by the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)
- (5) Hu, Q.M., Wu, T.L., Xia, N.H., Xing F.W., Lai, C.C.P. & Yip, K.W. (2003). Rare and Precious Plants of Hong Kong. Agriculture, Fisheries and Conservation Department, HKSAR, Hong Kong. 234pp.
- (6) "List of Wild Plants Under State Protection" (promulgated by the Ministry of Forestry in 1999).
- (7) Fu, K.L. (1992). China Plant Red Data Book. Vol. 1 - Rare and Endangered Plants. Science Press, Beijing. 736pp. (In Chinese only).
- (8) Qin, et al. (2017). Threatened Species List of China's Higher Plants. *Biodiversity Science* 25(7):696-747.

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### 3.2.5 Cultural Heritage

3.2.5.1. No declared monuments, proposed monuments, graded historic sites or buildings, Sites of Archaeological Interest and Government historic sites identified by Antiquities and Monuments Office (AMO) were identified within 500 m from the Project site. A historic building namely Ku Ancestral Hall, 10A Ng Tung Chai as identified and recorded by AMO is located at approximate 470 m north to the Project site in Ng Tung Chai Village. If there are any buildings / structures both at grade level and underground which were built in or before 1969, within and in the vicinity of the Project site, the project proponent is required to alert AMO in an early stage or once identified.

### 3.2.6 Landscape and Visual

3.2.6.1. The assessment area covers the woodland surrounding the Man Tak Garden and a portion of natural watercourse along the Ng Tung Waterfall Path. Tai Mo Shan Country Park is located at the eastern part of the assessment area. Key landscape resources (LRs), key landscape character area (LCA) and key public viewers (PVs), which will be potentially affected by the Project, with their sensitivity are described in **Table 3.6**. The assessment area constituted mainly Settled Valley Landscape LCA while key LR and PVs are mapped in **Figure 3.6**. No Registered Old and Valuable Trees (OVT) listed in the Register maintained by the Development Bureau is identified within the assessment area.

**Table 3.6 Key LR, LCA, PVs and their Sensitivity**

| ID  | Description   | Sensitivity |
|-----|---|-------------|
| LR1 | <p><u>Woodland</u><br/>                     Woodland area with trees grown densely at hillside of Ng Tung Chai. This hillside woodland is important in the landscape and visual context. It provides a tranquil greenery backdrop to the Man Tak Garden. This LR is intolerant to change and considered to have high sensitivity. Based on the tree survey under separate submission, the woodland is dominated by common native tree species in Hong Kong, such as <i>Machilus chekiangensis</i>, <i>Schefflera heptaphylla</i>, <i>Ficus variegata</i> and <i>Cratoxylum cochinchinense</i>. Three flora species of conservation importance, including the near threatened climber <i>Gnetum luofuense</i>, as well as seedlings and mature tree of <i>Aquilaria sinensis</i> and the herbaceous <i>Cibotium barometz</i>, which are protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586), were recorded. This LR is intolerant to change and considered to have high sensitivity.</p> | High        |

| ID   | Description   | Sensitivity |
|------|---|-------------|
| LR2  | <p><u>Landscape Area in Man Tak Garden</u><br/>                     Man Tak Garden comprised of traditional Chinese architecture, pavilion, pond and garden. Landscaped slope, garden and ornamental planting area can be found. The ability to accommodate change is medium and the sensitivity of this LR is medium.</p>  | Medium      |
| LR3  | <p><u>Natural Watercourse</u><br/>                     Two natural watercourses (S1 and S2) are identified, both of them are typical upland stream. One (S1) connects to a fall in the upstream and flows into Lam Tsuen River in the downstream. Two flora species of conservation importance, including the herbaceous <i>Neottopteris nidus</i> which is protected under the Forests and Countryside Ordinance (Cap. 96), as well as a rare climber <i>Dioscorea pentaphylla</i> were recorded from S1. The other one (S2) connects to a box culvert in the downstream and flows beneath Man Tak Garden. This LR is intolerant to change and the sensitivity of this resource is high.</p> | High        |
| LCA1 | <p><u>Settled Valley Landscape LCA</u><br/>                     This LCA is the settled valley landscape of Ng Tung Chai. The villages are located at the lower valley, hence the upper valley possesses a strong sense of enclosure with the valley sides thickly wooded. This LCA is intolerant to change and the sensitivity of this resource is high.</p>   | High        |
| PV1  | <p><u>Users at Man Tak Garden</u><br/>                     This PV1 is a religious users at Man Tak Garden is located at the valley which surrounded by the lush green hillside of Ng Tung Chai. The number of individuals is few with short to medium duration of view. The quality of existing view is good with alternative views available. In view of the full degree of visibility to the proposed works, the sensitivity of this PV is considered as high.</p>   | High        |
| PV2  | <p><u>Hikers along Ng Tung Waterfall Path</u><br/>                     This PV2 is a recreational PV along the Ng Tung Water Path. The number of individuals is few with short duration of view. The quality of existing view is good with alternative views available. The view to the proposed works are partially blocked by the buildings of Man Tak Garden. In view of the partial degree of visibility, the sensitivity of this PV is considered as medium.</p>   | Medium      |
| PV3  | <p><u>Visitors at Tai Mo Shan Country Park</u><br/>                     This PV3 is a recreational PV at Tai Mo Shan Country Park. The number of individuals is few with short duration of view. The quality of existing view is good with alternative views available. The view to the proposed works is partially blocked by the buildings of Man Tak Garden. In view of the partial degree of visibility, the sensitivity of this PV is considered as medium.</p>  | Medium      |

## 4 POTENTIAL IMPACTS ON THE ENVIRONMENT

### 4.1 Outline of Process Involved

- 4.1.1.1. The construction of the two rigid barriers would involve excavation to foundation level by a small excavator, followed by temporary installation of soil nails at the back wall of the rigid barriers by typical drill-and-grout method, formworks and reinforcement bar fixing. The temporary access for workers and construction materials (approximately 2 m wide) to the construction site of the proposed rigid barriers would be located adjacent to an existing slope maintenance access. No tree felling and only minimal vegetation removal would be required for the provision of temporary access. Temporary scaffolding would be erected, where necessary. Concreting would follow once the formworks and fixing of reinforcement bars have been confirmed. Temporary diversion of a short section of watercourse S2 (approx. 13 m) would be undertaken prior to excavation works at RB01 to ensure the construction would be conducted in dry condition and to prevent the transportation of suspended solids downstream. The flow direction of the affected watercourse would be resumed on the surface channel constructed on the rigid barrier. Due considerations would be given to DEVB TC(W) No. 9/2020 “*Blue-Green Drainage Infrastructure*” as appropriate, taking into account the site constraints, in the construction of surface channel. Biodegradable erosion control mat and wire mesh with planting of native species would be applied to the vicinity of the reinforced rigid barriers. Landscaping works and tree planting would be undertaken around the rigid barrier. The temporary access would be uninstalled and all works area would be reinstated upon the completion of the construction works.
- 4.1.1.2. The construction of deflector wall with gabion blocks would employ mini-pile for foundation. Pre-drilling is required prior to the commencement of piling works. Mini-pile reinforcement would be installed, followed by cement grouting and proof drilling. Reinforcement and form working of the proposed deflector wall with gabion blocks would be erected, followed by concreting and landscaping works. All works area would be reinstated upon the completion of the construction works. The construction of deflector wall with gabion blocks would avoid encroaching onto natural watercourse S1 that no works would be undertaken at the watercourse.

### 4.2 Possible Environmental Impacts during Construction Phase

#### 4.2.1 Air Quality

- 4.2.1.1. Potential air quality impacts during construction phase may arise from fugitive dust emissions generated mainly from excavation and wind erosion of the excavated areas. In the view of the limited site area of the proposed works, the potential air quality impact would be short-term and localised and could be well controlled through implementation of the dust suppression measures discussed in **Section 5.1.1**. With the implementation of the dust suppression measures, adverse air construction dust impacts is not anticipated.
- 4.2.1.2. Likewise, fuel combustion from the use of PMEs during construction works could be a potential source of air pollutants such as NO<sub>2</sub>, SO<sub>2</sub> and CO. To improve air quality and protect public health, EPD has introduced the *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* on 1 June 2015 and since 1 December 2015, only approved or exempted non-road mobile machinery are allowed to be used in construction sites. In addition, all construction plants are required to use ultra-low sulphur diesel (ULSD) (defined as diesel fuel containing not more than 0.005% sulphur by weight) as stipulated in Environment, Transport

and Works Bureau Technical Circular (ETWB-TC(W)) No. 19/2005 on Environmental Management on Construction Sites. Furthermore, given the localised and small scale of the Project, as well as the small number of PMEs involved, adverse air quality impacts due to emissions from the use of PMEs would be unlikely.

#### **4.2.2 Noise**

- 4.2.2.1. The major source of construction noise would be the use of powered mechanical equipment (PME) for the construction of the rigid barriers and deflector wall with gabion blocks. No construction activities is expected during restricted hours, i.e. the time between 1900 and 0700 hours on all days, and any time on general holidays, including Sundays. A Construction Noise Permit (CNP) is required under the *Noise Control Ordinance* (NCO) (Cap. 400) in case the construction works are to be carried out during restricted hours.
- 4.2.2.2. Man Tak Garden (NSR1) is only opened on Sunday<sup>3</sup> for worships and visit. Given that no construction activities of the Project would be conducted during restricted hours, i.e. any time on Sundays, no adverse noise impact would be anticipated from the construction of the Project.

#### **4.2.3 Water Quality**

- 4.2.3.1. During the construction phase, the main sources of potential water quality impacts would arise from uncontrolled surface runoff, accidental spillage of chemicals for construction and potential contamination of surface water as well as 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. Sewage effluent generated by on-site workforce could also cause disturbance to water quality of nearby WSR if not properly handled. Nevertheless, in view of the limited scale of the Project and with proper implementation of site practices and control measures as presented in **Section 5.1.3**, adverse water quality impact would not be anticipated.
- 4.2.3.2. Temporary diversion of a short section of watercourse (S2) (approx. 13 m) would be required prior to the excavation works of the proposed rigid barrier RB01 to ensure the construction would be conducted in dry condition and to prevent the transportation of suspended solids downstream. The diversion works would be carried out in dry condition before the commencement of excavation works at RB01. Upon completion of the construction of rigid barrier RB01, the flow of the diverted watercourse (S2) would be resumed on a surface channel following DEVB TC(W) No. 9/2020 on the rigid barrier. Given the small scale of the proposed works and with the implementation of the diversion arrangement, adverse water quality impact would not be anticipated.

#### **4.2.4 Waste Management**

- 4.2.4.1. The types of waste generated during construction phase of the Project include construction and demolition (C&D) materials, chemical waste, and general refuse.
- 4.2.4.2. C&D materials to be generated include both inert C&D materials (i.e. public fills)

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<sup>3</sup> <http://www.mantakcs.org/9directory3.html>



and the non-inert C&D materials (i.e. C&D wastes), such as excavated spoil (soil and rock), unusable concrete and grout, wood, metal scraps, equipment parts and plastics. Estimated quantities of the waste materials are summarised in **Table 4.1** below. With the implementation of the recommended measures in **Section 5.1.4**, adverse environmental impacts arising from the storage, handling, and transportation of C&D materials would not be anticipated.

**Table 4.1 Estimated Quantities of Different Types of C&D Materials**

| Type of C&D Materials   | Amount of Waste Generated <sup>[1]</sup> (m <sup>3</sup> ) |  |  | Total Volume (m <sup>3</sup> ) |
|---|--|--|--|--------------------------------|
|   | Rigid Barrier RB01 and associated maintenance access       | Rigid Barrier RB02 and associated maintenance access | Deflector Wall with gabion blocks DW01 |                                |
| All C&D materials   | 440  | 400  | 55                                     | 895                            |
| Inert C&D materials to be disposed of at public fill reception facilities (PFRF) <sup>[2]</sup> | 425  | 385  | 55                                     | 865                            |
| Non-inert C&D materials to be reused, recycled or disposed of at landfill                       | 15   | 15   | 0                                      | 30                             |

Notes:

<sup>[1]</sup> - As no tree felling and only minimal vegetation removal would be required for the provision of temporary access, the waste arising from the provision of temporary access is anticipated to be minimal.

<sup>[2]</sup> - Given that the nature of the proposed works, backfilling is unnecessary / minimal under this Project that on-site reuse of inert C&D materials prior to off-site disposal is not considered feasible.

- 4.2.4.3. General refuse comprising food scraps, wastepaper, empty containers, etc. would be generated from workers. However, the quantities would be insignificant due to the limited number of workers (less than 15 per day) required for such small scale of works and limited space at each work front. Based on the generation rate of 0.65 kg per worker per day, it is estimated no more than 9.75 kg general refuse per day would be generated from the construction of the Project. With the implementation of the mitigation measures recommended in **Section 5.1.4**, adverse environmental impacts arising from the storage, handling, and transportation of general refuse would not be anticipated.
- 4.2.4.4. Small amount of chemical waste would also be generated from the maintenance of construction plants / equipment. The amount of chemical waste cannot be accurately predicted at this stage since it largely depends on the Contractor's housekeeping measure. Nonetheless, given the small scale of the Project, the quantity of chemical waste is anticipated to be very small over the construction period and in the order of a few litres. Any chemical waste generated should be collected by licensed collectors and disposed of at the Chemical Waste Treatment Centre (CWTC) at Tsing Yi. All possible opportunities would be taken to reuse and recycle the materials. Provided the chemical wastes are handled and disposed of in accordance with the recommended measures and control requirements listed in **Section 5.1.4**, adverse environmental impacts would not be anticipated.

#### **4.2.5 Ecology**

- 4.2.5.1. The following sections discuss both direct and indirect ecological impacts due to the Project. A table showing the summary of ecological impacts during construction phase is given in **Table 4.2**.

##### Impacts on Sites of Conservation Importance

- 4.2.5.2. The proposed Project site is located entirely within NTCSSSI. Direct impacts (i.e. loss of habitats and vegetation) on NTCSSSI and the recorded species of conservation importance, including clusters of *Cibotium barometz* and an individual of *Aquilaria sinensis*, would be anticipated during construction phase. These direct impacts will be discussed in details in **sections 4.2.5.5 – 4.2.5.10** that follow.
- 4.2.5.3. Direct impacts to TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS have been avoided.
- 4.2.5.4. Potential indirect impacts on the sites of conservation importance nearby the Project site, e.g. NTCSSSI, TMSCP, NTCSA, Lam Tsuen River (Upper) EIS, as well as on the recorded flora species of conservation importance would also be anticipated from construction disturbances and potential deterioration of water quality. These indirect impacts will be discussed in details in **sections 4.2.5.13 – 4.2.5.14** that follow.

##### Loss of Habitat and Vegetation

- 4.2.5.5. The Project site encroaches upon approximately 0.13 ha of woodland habitat located within NTCSSSI, 0.054 ha of which would be subject to permanent loss due to the construction of rigid barriers and deflector wall with gabion blocks. Vegetation removal of 35 mature individuals of common tree species (e.g. *Schefflera heptaphylla*, *Machilus* sp., *Saurauia tristyla*, etc.) for the construction of the rigid barriers (31 individuals) and deflector wall with gabion blocks (four individuals), as well as clearance of understorey vegetation at the woodland for provision for construction activities and working space would be required. The temporary access would be located adjacent to an existing slope maintenance access where nearby vegetation coverage is relatively sparse. As such, no tree felling and only minimal vegetation removal would be required for the provision of temporary access. The temporary access would be uninstalled, and the area would be reinstated upon the completion of construction works. Given the limited scale of the Project, with the implementation of the recommend measures as detailed in **Sections 5.1.5.4, 5.1.5.6 and 5.1.7**, such as compensatory re-vegetation, no unacceptable ecological impact would be anticipated from woodland and vegetation loss within the SSSI due to the construction of the Project.

##### Removal of Riparian Vegetation at Natural Watercourse S1

- 4.2.5.6. While natural watercourse S1 would be avoided during construction phase and diversion is not required, direct impact to the riparian vegetation on the northern bankside of a short section (approx. 30m) of S1 (which is outside of the TMSCP and NTCSA) would be anticipated from the construction of deflector wall with gabion blocks DW01. Removal of herbaceous riparian vegetation and four mature individuals of common tree species (*Schefflera heptaphylla*, *Saurauia tristyla* and *Araucaria heterophylla*) would be required. The vegetation removal would be confined within the Project site outside of the TMSCP and NTCSA. Given the limited scale of the Project, with the implementation of the recommend measures as detailed in **Section 5.1.5.4**, no unacceptable ecological impact would be anticipated from the loss of riparian vegetation of natural watercourse S1 due to

the construction of the Project.

#### Temporary Diversion of Natural Watercourse S2

- 4.2.5.7. Direct impact to a short section (approx. 13 m) of natural watercourse S2 would be anticipated from the construction of the rigid barrier RB01. Temporary diversion of S2 with flexible drainage pipe would be required prior to the excavation works to ensure the construction would be conducted in dry condition and to prevent the transportation of suspended solids downstream. The original natural flow direction of S2 would be resumed on the surface channel constructed following DEVB TC(W) No. 9/2020 “Blue-Green Drainage Infrastructure” on rigid barrier RB01 upon the completion of the works. Given the limited scale of proposed works and affected area and that no freshwater communities were recorded from S2, no unacceptable ecological impact would be anticipated from the loss of natural watercourse habitat due to the construction of the Project.

#### Impacts on Flora Species of Conservation Importance

- 4.2.5.8. An individual of *Aquilaria sinensis* would be directly impacted as it conflicts with the installation of rigid barrier RB02. This individual is approximately 8m tall, grows on steep slope with poor health, structure or form. This individual is deemed to be unsuitable for transplantation as it would have irrecoverable form and low survival rate after transplanting.
- 4.2.5.9. Direct impacts on the flora species of conservation importance *Cibotium barometz* within / adjacent to the proposed RB01 and RB02 (**Figure 3.5** refers) would be anticipated that transplantation of the affected clusters is recommended. Given the limited scale of the Project, with the transplantation arrangement as detailed in **Section 5.1.5**, no unacceptable ecological impact would be anticipated.
- 4.2.5.10. While no removal of other flora species of conservation importance recorded within / nearby the Project site (including clusters of *Cibotium barometz*, two seedlings of *Aquilaria sinensis* near the proposed temporary access, a mature individual of *Aquilaria sinensis* located on the indicative alignment of temporary access path, as well as *Neottopteris nidus*, *Dioscorea pentaphylla*, and *Gnetum luofuense* near the deflector wall with gabion blocks DW01) is required for the construction of deflector wall with gabion blocks or provision of temporary access, mitigation measures recommended **Sections 5.1.5.5 – 5.1.5.8**, and **5.1.7**, such as adjustment of access alignment and provision of protection zone, should be undertaken to avoid any potential direct injury or disturbances on those species.

#### Impacts on Fauna Species of Conservation Importance

- 4.2.5.11. An individual of butterfly Yellow Rajah was recorded in woodland. Low abundance of *Croton tiglium*, Yellow Rajah’s host plant, was also recorded in woodland. Since both Yellow Rajah and its host plant was recorded in low abundance, and given the limited scale of the Project, ecological impact to Yellow Rajah is considered negligible.
- 4.2.5.12. An individual of Futsing Wolf Snake and Lesser Spiny Frog were recorded from midstream of natural watercourse S1 outside of the Project site. As detailed in **Section 5.1.5.10**, hoardings would be erected around the Project site to ensure that all construction works, the associated works area and stockpile area would be confined within the Project site and to demarcate the construction site with the natural habitat. As the aforementioned species of conservation importance are comparatively mobile, the species are anticipated to move away from the areas near Project site to utilise the alternative and available natural habitats and would

not enter the fenced and disturbed works site during the construction phase. Thus, minor direct impact to these species is anticipated during construction phase. Furthermore, training and general guidelines on protection of vegetation and wildlife would be given to workers and site staff as detailed **Section 5.1.5.11** that any potential direct impacts to these species would be further minimised. Indirect impacts, such as water quality deterioration, disturbances to nearby natural habitats (woodland, watercourses, etc.) and the associated fauna may arise from the proposed works during construction phase. Considering the temporary nature and limited scale of the proposed works, potential indirect impacts would be minor and would be minimised through effective implementation of mitigation measures (e.g. good site practices).

Impact on Water Quality to Habitats

- 4.2.5.13. Potential indirect water quality impacts to natural watercourses S1 and S2 and the downstream Lam Tsuen River (Upper) EIS would be anticipated from construction works within / in close proximity to watercourse, i.e. the rigid barrier RB01 across natural watercourse S2 and the deflector wall with gabion blocks DW01 adjacent to natural watercourse S1. In view of the limited scale of the Project, with the temporary diversion arrangement of S2 to prevent the transportation of suspended solids from construction works downstream, as well as the implementation of good site practices and site run-off control measures as presented in **Section 5.1.3 and 5.1.5**, no adverse indirect water quality impacts would be anticipated.

Noise and Dust Disturbance

- 4.2.5.14. Potential indirect impacts from construction disturbances (e.g. construction noise from the use of PME and dust emission) would be anticipated on habitats and wildlife in sites of conservation importance within / nearby the Project site, e.g. NTCSSSI, TMSCP, and NTCSA. Construction disturbances could potentially reduce the habitat quality and cause reduction of wildlife abundance. Nonetheless, given limited site area of each of the proposed works of the Project, the potential construction disturbances would be short-term and localised and could be well controlled through implementation of the dust suppression and noise mitigation measures recommended in **Sections 5.1.1 and 5.1.2**. As such, no unacceptable indirect ecological impacts from construction disturbances would be anticipated.

**Table 4.2 Summary of Ecological Impacts during Construction Phase**

| Ecological Impact  | Receiver(s) Concerned   |
|--|---|
| Impacts on Sites of Conservation Importance              | <ul style="list-style-type: none"> <li>• Direct impacts to TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS have been avoided.</li> <li>• Refer to the direct impacts to NTCSSSI described below</li> <li>• Refer to the indirect impacts to sites of conservation importance described below</li> </ul> |
| Loss of Habitat and Vegetation                           | <ul style="list-style-type: none"> <li>• 0.054 ha of woodland subject to permanent loss</li> <li>• 35 mature individuals of common tree species to be removed</li> <li>• Understorey vegetation in the woodland to be cleared</li> </ul>  |
| Removal of Riparian Vegetation at Natural Watercourse S1 | <ul style="list-style-type: none"> <li>• Four mature individuals of common tree species to be removed</li> <li>• Herbaceous riparian vegetation to be removed</li> </ul>  |

| Ecological Impact                                    | Receiver(s) Concerned   |
|--|---|
| Temporary Diversion of Natural Watercourse S2        | <ul style="list-style-type: none"> <li>Short downstream section of Natural Watercourse S2 (approx. 13 m)</li> </ul>   |
| Impacts on Floral Species of Conservation Importance | <ul style="list-style-type: none"> <li>An individual of <i>Aquilaria sinensis</i> in poor form and deemed unsuitable for transplantation to be removed due to its conflict with rigid barrier RB02</li> <li>Clusters of <i>Cibotium barometz</i> within the footprint of rigid barriers RB01 and RB02 to be transplanted</li> <li>Clusters of <i>Cibotium barometz</i>, two seedlings of <i>Aquilaria sinensis</i>, a mature individual of <i>A. sinensis</i>, <i>Neottopteris nidus</i>, <i>Dioscorea pentaphylla</i>, and <i>Gnetum luofuense</i> located within / nearby Project site to be preserved in-situ</li> </ul> |
| Impacts on Faunal Species of Conservation Importance | <ul style="list-style-type: none"> <li>Yellow Rajah (<i>Charaxes marmax</i>)</li> <li>Futsing Wolf Snake (<i>Lycodon futsingensis</i>)</li> <li>Lesser Spiny Frog (<i>Quasipaa exilispinosa</i>)</li> </ul>   |
| Impact on Water Quality of Habitats                  | <ul style="list-style-type: none"> <li>Tai Mo Shan Country Park (TMSCP)</li> <li>Ng Tung Chai Special Area (NTCSA)</li> <li>Lam Tsuen River (Upper) EIS</li> </ul>  |
| Noise and Dust Disturbance                           | <ul style="list-style-type: none"> <li>NTCSSSI</li> <li>TMSCP</li> <li>NTCSA</li> </ul>   |

#### 4.2.6 Cultural Heritage

4.2.6.1. No declared monuments, proposed monuments, graded historical sites or buildings, Sites of Archaeological Interest and Government historic sites identified by the AMO were identified within or in the vicinity of the Project site. No direct or indirect impacts on cultural heritage would be anticipated during the construction of the Project.

#### 4.2.7 Landscape and Visual

##### Landscape Aspect

4.2.7.1. The project will have predicted impact on the existing woodland (LR1) and natural watercourse (LR3) around the site. For LR1, the construction of the rigid barriers, deflector wall with gabion blocks and temporary maintenance access will inevitably affect the woodland area. A total of 35 nos. of existing trees are conflicted with the proposed works and proposed to be felled, including 1 no. of *Aquilaria sinensis* with conservation importance. Clearance of understorey vegetation at the woodland for the construction of temporary access path / provision for construction activities and working space would be required but no tree felling would be required. No Registered Old and Valuable Trees (OVT) listed in the Register maintained by the Development Bureau would be affected. The magnitude of impact is considered as intermediate for this change, and the impact under unmitigated condition is moderate. For LR3, a short section of watercourse (S2) would be affected by the proposed rigid barrier RB01. Temporary diversion during construction would be undertaken. Works area of the proposed deflector wall with gabion blocks would affect the riparian zone of the other watercourse (S1), including removal of herbaceous riparian vegetation and four mature individuals of common tree species (*Schefflera heptaphylla*, *Saurauia tristyla* and *Araucaria*

- heterophylla*), but would not encroach onto S1. The magnitude of changes is considered as intermediate and the unmitigated impact is considered as moderate.
- 4.2.7.2. Landscape Area in Man Tak Garden (LR2) would anticipate the magnitude of change to be negligible, and the impact under unmitigated condition is insubstantial.
- 4.2.7.3. Considering the Settled Valley Landscape LCA (LCA1), the proposed works would not alter the LCA of this area. Hence, the magnitude of change would be negligible, and it anticipated an insubstantial impact under unmitigated condition.
- 4.2.7.4. As summarised in **Table 4.3**, the resultant impact before mitigation is considered as moderate for LR1 and LR3. With the implementation of the proposed landscape mitigation measures detailed in **Section 5.1.7**, the residual impact will be reduced to insubstantial / slight during construction stage.

**Table 4.3 Magnitude of Changes and Impact Significance for Key LRs and LCA during Construction Phase**

| ID  | Potential Source and Description of Change  | Sensitivity | Magnitude of Changes (Large/ Intermediate / Small/ Negligible) | Impact Significance before Mitigation | Significance of Residual Impact |
|-----|---|-------------|--|---------------------------------------|---------------------------------|
| LR1 | <u>Woodland</u><br>The construction of the rigid barriers and associated maintenance access, as well as deflector wall with gabion blocks will involve 35 nos. of existing tree to be felled, including 1 no. of <i>Aquilaria sinensis</i> with conservation importance. Clearance of understorey vegetation at the woodland for construction of temporary access path / provision for construction activities and working space would be required. The temporary access would be uninstalled, and the affected area be reinstated upon completion of construction. | High        | Intermediate   | Moderate                              | Slight                          |
| LR2 | <u>Landscape Area in Man Tak Garden</u><br>Negligible   | Medium      | Negligible   | Insubstantial                         | Insubstantial                   |
| LR3 | <u>Natural Watercourse</u><br>A short section (approximately 13 m) of watercourse (S2) would be affected by the proposed rigid barrier. Temporary diversion during construction would be undertaken. Works area of the proposed deflector wall with gabion blocks would affect the riparian zone of the other watercourse (S1), including removal of herbaceous riparian vegetation and four mature individuals of common tree species, but would not encroach onto S1.   | High        | Intermediate   | Moderate                              | Slight                          |

#### Visual Aspect

- 4.2.7.5. The proposed rigid barrier and deflector wall with gabion blocks would partially block the view of PV1 and potentially cause intermediate magnitude of change while the proposed deflector wall with gabion blocks would slightly affect the view of PV2 and PV3 at a certain angle and potentially cause small magnitude of change.

Given the temporary nature of the construction works and with the implementation of standard good site practices and construction site management as summarised in **Section 5.1.7** to avoid / further minimise any potential visual impacts, no pronounced visual change from key public VPs or on existing visually sensitive areas and major visual resources enjoyed by the public being affected would be anticipated during construction phase. Further construction phase visual impact assessment is not required in accordance with Annex 18 of *EIAO-TM*.

### **4.3 Potential Environmental Impacts during Operational Phase**

4.3.1.1. No adverse environmental impacts would be expected with regard to air quality, noise, water quality, waste management and cultural heritage would be anticipated during the operation phase of the proposed landslip prevention and mitigation works.

#### **4.3.2 Ecology**

4.3.2.1. The proposed landslip prevention and mitigation works are located adjacent to Man Tak Garden. The building complex of Man Tak Garden is bounded by masonry walls and fences and is located inside NTCSSSI and to the immediate west of TMSCP and NTCSA that it has already posed certain habitat fragmentation to its surroundings. The building complex is unlikely to be utilised by fauna species as movement path nor ecologically linked to the sites of conservation importance, e.g. NTCSSSI, TMSCP and NTCSA, given the artificial settings of and physical barriers posed by building complex, masonry wall and fences. Considering the proposed works are minor in scale and are located immediately next to Man Tak Garden adjoining its existing masonry wall and fences, further habitat fragmentation affecting NTCSSSI, TMSCP and NTCSA or impact to ecological linkage within / to these recognised sites of conservation importance due to the proposed works is considered negligible. No unacceptable ecological impacts are anticipated during the operational phase.

#### **4.3.3 Landscape and Visual**

4.3.3.1. The magnitude and significance of the unmitigated landscape and visual impacts during the operation of the Project are assessed below.

##### Landscape Aspect

4.3.3.2. The proposed rigid barriers and associated maintenance access, as well as deflector wall with gabion blocks will affect the landscape around the site. The proposed rigid barriers are about 3.7m in height, vertical greening and landscape treatment on slope would be applied during operational phase. The deflector wall with gabion blocks would be approximately 2m in height, vertical greening would be applied on the structure. Areas which would be temporarily affected by construction activities would be reinstated / re-vegetated after completing the construction works. Considering that the impact would be mitigated through shrub and climber planting, as well as re-vegetation and reinstatement of works area shown in **Figure 5.1**, the magnitude of impact is considered as intermediate, and the impact significance is slight for the woodland (LR1) and natural water resources (LR3) during operational stage.

4.3.3.3. As mentioned above, considering that the proposed works would not alter the Landscape Area (LR2) and Settled Valley Landscape LCA of this area. Hence, the magnitude of changes would be negligible, and insubstantial impacts are anticipated.

Visual Aspect

- 4.3.3.4. While the proposed rigid barrier and deflector wall with gabion blocks would partially block the view of PV1 at Man Tak Garden, considering that Man Tak Garden is not frequently in use and the screening effect by proposed climbers, the magnitude of impact is considered as intermediate. With the implementation of the proposed landscape and visual mitigation measures detailed in **Section 5.2.3**, which full effect of the visual mitigation measures is expected to be realised after ten years of operation (including environmental sensitive and aesthetically pleasing design, vertical greening on structures, landscape treatments on slope and compensatory planting of native trees and shrubs), the residual impact during the operational phase would be slight in day 1 of operation and further reduced to insubstantial in year 10 of operation as summarised in **Table 4.4** when the proposed tree / shrub planting becomes mature.
- 4.3.3.5. For PV2 along the Ng Tung Waterfall Path and PV3 at Tai Mo Shan Country Park, since the proposed deflector wall with gabion blocks would only slightly affect the view of PV2 and PV3 at a certain angle and its landscape and visual impacts could be mitigated by the recommended climber plantings, the magnitude of change is considered as small. With the implementation of the proposed landscape and visual mitigation measures detailed in **Section 5.2.3**, insubstantial impact is anticipated during operational phase as summarised in **Table 4.4**.

**Table 4.4 Magnitude of Changes and Impact Significance for Key LRs, LCA and PVs during Operational Phase**

| ID  | Potential Source and Description of Change   | Sensitivity | Magnitude of Changes (Large/ Intermediate / Small/ Negligible) | Impact Significance before Mitigation | Significance of Residual Impact |                   |
|-----|--|-------------|--|---------------------------------------|---------------------------------|-------------------|
|     |  |             |  |                                       | Day 1 Operation                 | Year 10 Operation |
| LR1 | Woodland<br>Proposed rigid barriers and associated maintenance access, as well as deflector wall with gabion blocks. | High        | Intermediate   | Moderate                              | Slight                          | Insubstantial     |
| LR2 | Landscape Area in Man Tak Garden<br>Negligible   | Medium      | Negligible   | Insubstantial                         | Insubstantial                   | Insubstantial     |



| ID   | Potential Source and Description of Change  | Sensitivity | Magnitude of Changes (Large/ Intermediate / Small/ Negligible) | Impact Significance before Mitigation | Significance of Residual Impact |                   |
|------|---|-------------|--|---------------------------------------|---------------------------------|-------------------|
|      |   |             |  |                                       | Day 1 Operation                 | Year 10 Operation |
| LR3  | <p><u>Natural Watercourse</u><br/>                     A short section (approximately 13 m) of watercourse (S2) would be affected by the proposed rigid barrier. The original flow direction of S2 would be resumed on the surface channel constructed following DEVB TC(W) No. 9/2020 "Blue-Green Drainage Infrastructure" on rigid barrier RB01 upon the completion of the works.</p> <p>Works area of the proposed deflector wall with gabion blocks would affect the riparian zone of the other watercourse (S1), including removal of herbaceous riparian vegetation and four mature individuals of common tree species, but would not encroach onto S1.</p> | High        | Intermediate   | Moderate                              | Slight                          | Insubstantial     |
| LCA1 | <u>Settled Valley Landscape LCA</u><br>Negligible   | High        | Negligible   | Insubstantial                         | Insubstantial                   | Insubstantial     |
| PV1  | <p><u>Users at Man Tak Garden</u><br/>                     Proposed rigid barriers and deflector wall with gabion blocks would partially block the view of PV1.</p>   | High        | Intermediate   | Moderate                              | Slight                          | Insubstantial     |
| PV2  | <p><u>Hikers along Ng Tung Waterfall Path</u><br/>                     Proposed deflector wall with gabion blocks would slightly affect the view of PV2 at a certain angle.</p>   | Medium      | Small  | Slight                                | Insubstantial                   | Insubstantial     |
| PV3  | <p><u>Visitors at Tai Mo Shan Country Park</u><br/>                     Proposed deflector wall with gabion blocks would slightly affect the view of PV3 at a certain angle.</p>  | Medium      | Small  | Slight                                | Insubstantial                   | Insubstantial     |

## **5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATION**

### **5.1 Construction Phase**

#### **5.1.1 Air Quality**

5.1.1.1. Dust control and suppression measures stipulated in the *Air Pollution Control (Construction Dust) Regulation* should be implemented to control the dust emissions from the site including regular water spraying of exposed soil surfaces and during soil nailing, wheel washing and covering dusty material stockpiles with tarpaulin sheet, screen hoarding and provision of covers for all trucks would minimise dust emissions. Any stockpile of dusty materials should also avoid being placed next to the nearby ASRs, in particular Man Tak Garden (ASR1) to minimise the potential dust impacts as far as possible. The following relevant legislation, technical circulars and guidelines should be observed during construction phase to minimise air pollution from construction, including *Air Pollution Control (Construction Dust) Regulation*; *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation*; *Air Pollution Control (Fuel Restriction) Regulations* (i.e. using liquid fuel with a sulphur content of less than 0.005% by weight); *Recommended Pollution Control Clauses for Construction Contracts, DEVB TC(W) No. 13/2020* "Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts"; and *DEVB TC(W) No.1/2015* "Emissions Control of NRMM in Capital Works Contracts of Public Works".

#### **5.1.2 Noise**

5.1.2.1. As no adverse noise impact would be anticipated during the construction phase, no specific mitigation measure is required. Nonetheless, noise control measures stipulated in EPD's "*Recommended Pollution Control Clauses for Construction Contracts*" and the following good site practices and management should be implemented during construction phase to further minimise any construction noise nuisance:

- Only well-maintained plant should be operated on-site, and plant should be serviced regularly;
- Silencers or mufflers on construction equipment, if applicable, should be utilized and should be properly maintained;
- Mobile plant such as generator, if any, should be sited as far away from NSRs as possible.
- PME 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 directed away from the nearby NSRs; and
- Material stockpiles and other structures should be effectively utilized, wherever practicable, for screening noise from on-site construction activities.

#### **5.1.3 Water Quality**

5.1.3.1. In order to protect the water quality of the Water Gathering Grounds and SSSI, all site practices outlined in Water Services Department's *Conditions of Working within Water Gathering Ground* (**Appendix 5.1** refers) should be strictly followed during the construction phase. 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 *Water Pollution Control Ordinance (Cap. 358) (WPCO)* should also be observed.

- 5.1.3.2. All the site practices outlined in *ProPECC PN 2/23 “Construction Site Drainage”* should be implemented and followed diligently as appropriate during the construction phase in order to minimise the potential water quality impacts, including but not limited to the following measures to ensure all construction runoff are well controlled as well as to minimise surface runoff and the chance of erosion.

#### Construction Site Runoff and Drainage

- Sand / silt removal facilities (e.g. sand/silt traps and sediment basins) should be provided to remove sand/silt particles from runoff to meet the Technical Memorandum standard under the *WPCO*. Artificial channels such as earth bunds / sandbag 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 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 plant should be cleaned before leaving the construction site to ensure no earth, mud, debris and the like is 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.
- Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by 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.

#### Accidental Chemical Spillage

- The Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The *Waste Disposal Ordinance (Cap 354)* and its subsidiary regulations in particular the *Waste Disposal (Chemical Waste) (General) Regulation* should be observed and complied with for the control of chemical wastes.
- Any maintenance facilities for construction machinery and equipment should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.

#### Sewage from Construction Workers

- Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workers. A

licensed contractor would be responsible for the appropriate disposal of sewage and maintenance of these facilities.

5.1.3.3. The practices outlined in ETWB TC (Works) No. 5/2005 "*Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works*" should also be 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 stream / 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 stream 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.

#### **5.1.4 Waste Management Implications**

5.1.4.1. 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 Architect / Engineer for approval prior to commencement of construction works. The following good waste management plan and practices should be implemented 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;
- Provide sufficient waste disposal points;
- Collect waste regularly;
- 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.

5.1.4.2. All C&D materials generated will be sorted by the contractor into different categories for disposal at PFRF and designated strategic landfill or for recycling as

appropriate. 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”*.

- 5.1.4.3. All chemical wastes from equipment maintenance will be handled, stored, and disposed of properly in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.
- 5.1.4.4. General refuse will be stored in enclosed bins or compaction units, separated from C&D materials and chemical wastes. A reputable waste collector should 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 minimize odour, pest and litter impacts.
- 5.1.4.5. **Table 5.1** 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 methods.

**Table 5.1 Summary of Waste Handling Procedures and Disposal Outlets during Construction Phase**

| Waste Type      | Handling  | Disposal  |
|-----------------|---|---|
| C&D Materials   | Where possible should be reused on-site. If off-site disposal is required, should be separated into: <ul style="list-style-type: none"> <li>• Non-inert C&amp;D materials</li> <li>• Inert C&amp;D materials</li> </ul> | <ul style="list-style-type: none"> <li>• Strategic Landfill</li> <li>• PFRF</li> </ul>  |
| Chemical Wastes | To be collected and disposed of by licensed collector. Stored in compatible containers in designed area on site.  | CWTC  |
| General Refuse  | To be reused and recycled on-site prior to disposal as far as practicable. Provide on-site refuse collection facilities for remaining refuse.   | <ul style="list-style-type: none"> <li>• Refuse transfer station for compaction &amp; containerisation and then to Strategic Landfill</li> <li>• A reputable waste collector</li> </ul> |

### 5.1.5 Ecology

- 5.1.5.1. A table showing the summary of ecological mitigation measures during construction phase is given in **Table 5.2**.

#### Avoidance of TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS

- 5.1.5.2. As mentioned in **Section 4.2.5.3**, direct impacts to TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS have been avoided. No encroachment onto / tree felling / vegetation removal within these sites of conservation importance would be required. Furthermore, as detailed in **Sections 4.2.5.6 and 5.1.5.10**, all vegetation removal would be confined within the Project site and outside of the TMSCP, NTCSA and Lam Tsuen River (Upper) EIS and hoarding would be erected around the Project site to avoid impacts on any flora species of conservation importance / vegetation within these recognised sites of conservation importance.

#### Avoidance of Natural Watercourse S1

- 5.1.5.3. The construction of deflector wall with gabion blocks would avoid encroaching onto natural watercourse S1 that no works would be undertaken at the watercourse.

The foundation of deflector wall with gabion blocks will not be built in the streambed to avoid damaging the habitat.

#### Re-vegetation and Reinstatement of Works Area

- 5.1.5.4. As mentioned in **Section 4.2.5**, direct impact on woodland habitat (approximately 0.13ha) would be anticipated, 0.054ha of which are within the footprint of the rigid barriers and deflector wall with gabion blocks and hence would be subject to permanent clearance, including 35 individuals of common mature trees. Existing vegetation should be retained where possible within the remaining Project site. Areas which would be temporarily affected by construction activities should be reinstated after completing the construction works. For vegetation loss due to vegetation clearance for construction activities and provision of working space, compensatory re-vegetation is recommended. For example, hydroseeding with shrub planting would be applied as compensatory measure. Additionally, grass concrete system / shrub mix planting of native species with biodegradable erosion control mat and natural texture mimicking rock surface with native climbers (e.g. *Ficus pumila*) would be incorporated into the design of the rigid barriers and deflector wall with gabion blocks respectively with a view to compensate for the vegetation loss, and to enhance the biodiversity.

#### Avoidance of Floral Species of Conservation Importance

- 5.1.5.5. The alignment of the temporary access should be adjusted locally to avoid densely vegetated area in the woodland to minimise the extent of vegetation clearance required as far as practicable, and to avoid direct impact on the two flora species of conservation importance, namely *Cibotium barometz*, two seedlings of *Aquilaria sinensis* near the proposed temporary access, and a mature individual of *A. sinensis* located on the indicative alignment of temporary access path. The temporary access should be uninstalled, and the affected area should be reinstated upon completion of construction. Additionally, a recess would be opened in the base slab of the deflector wall with gabion blocks to avoid encroaching upon the protection zone of an individual of *Saurauia tristyla* (referred to as tree no. T202 in the *Tree Assessment Schedule*), on which the floral species of conservation importance *Neottopteris nidus* grows.

#### Compensatory Native Tree and Shrub Planting

- 5.1.5.6. While minor woodland loss would be unavoidable, given the small-scale of works, the impact is considered to be low and thus, habitat compensation is not typically required. Nonetheless, the provision of compensatory native tree and shrub planting as detailed in **Section 5.1.7** would further minimise the impacts identified.

#### Transplantation of and Protection Zone for *Cibotium barometz*

- 5.1.5.7. *Cibotium barometz* clusters directly affected by the construction of rigid barriers RB01 and RB02 should be preserved by on-site transplantation prior to the commencement of construction. It is recommended to locate the recipient site(s) within the Project site near areas to the western and southern sides of the rigid barrier RB01 as far as practicable. As *Cibotium barometz* is an understorey species which prefers shady environment, the recipient site(s) should be sheltered from strong wind and direct sunlight to increase its survival chance. Adequate space should be provided to avoid overcrowding. The conditions of the microhabitat, i.e. moist soil and shaded areas under tree canopy, of the recipient site(s) should be similar, if not the same, as the donor sites. A transplantation proposal describing the methodology, the location and quality of affected plants,

and location of the proposed recipient site(s) should be prepared by a qualified ecologist before transplantation commences. Protection zone with a radius of minimum 1.5m should be set up for the transplanted *Cibotium barometz* during construction phase. Transplantation of *Cibotium barometz* should be supervised by a qualified ecologist.

#### Protection Zone for Floral Species of Conservation Importance

- 5.1.5.8. Protection zone with a radius of minimum 1.5 m would be set up for the other flora species of conservation importance recorded within / near the Project site, including clusters of *Cibotium barometz*, *Neottopteris nidus*, *Dioscorea pentaphylla*, *Gnetum luofuense*, and *Aquilaria sinensis* as indicated in **Figure 3.5** in order to avoid any potential direct injury and to minimise the construction disturbances to the species.

#### Water Quality Control Measures

- 5.1.5.9. Construction works within / nearby natural watercourses, i.e. the rigid barrier RB01 and deflector wall with gabion blocks DW01, are recommended to be undertaken during dry season as far as practicable to minimise potential water quality impact to areas downstream of the natural watercourses, including the EIS. Mitigation measures detailed in **Section 5.1.3**, including all site practices outlined in ProPECC PN 2/23 "Construction Site Drainage" and ETWB TC (Works) No. 5/2005 "Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works" should be strictly followed to ensure all construction runoff are well controlled / contained (e.g. provision of barriers and sand/silt traps) as well as to minimise surface runoff to nearby watercourses and the chance of erosion.

#### Minimising Disturbances

- 5.1.5.10. Mitigation measures as detailed in **Sections 5.1.1** and **5.1.2** should be adopted to minimise construction disturbances to the habitats, such as standard good site practices (e.g. erection of hoardings around work sites and stockpiling at designated areas) and practical dust and noise control measures (e.g. regular watering, noise control measures stipulated in EPD's "Recommended Pollution Control Clauses for Construction Contracts" etc.). Hoarding should be also erected around the Project site during construction phase to ensure that all construction works, the associated works area and stockpile area would be confined within the Project site and to restrict access to natural habitats adjacent to works area by site workers such that human disturbance could be minimised.
- 5.1.5.11. Training and general guidelines on protection of vegetation and wildlife, including but not limited to the recorded species of conservation importance and any other wild birds, butterflies, snakes or amphibian etc., as well as on avoidance of trespassing any natural habitats, particularly natural watercourse or within TMSCP, should be given to workers and site staff by a qualified ecologist prior to commencement of construction.

**Table 5.2 Summary of Mitigation Measures for Ecology during Construction Phase**

| <b>Ecological Impacts during Construction Phase</b>      | <b>Mitigation Measures</b>   |
|--|--|
| Impacts on Sites of Conservation Importance              | <ul style="list-style-type: none"> <li>Avoidance of TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS</li> </ul>   |
| Loss of Habitat and Vegetation                           | <ul style="list-style-type: none"> <li>Re-vegetation and Reinstatement of Works Area;</li> <li>Compensatory Native Tree and Shrub Planting</li> </ul>  |
| Removal of Riparian Vegetation at Natural Watercourse S1 | <ul style="list-style-type: none"> <li>Re-vegetation and Reinstatement of Works Area</li> </ul>  |
| Temporary Diversion of Natural Watercourse S2            | <ul style="list-style-type: none"> <li>Water Quality Control Measures</li> </ul>   |
| Impacts on Flora Species of Conservation Importance      | <ul style="list-style-type: none"> <li>Avoidance of Floral Species of Conservation Importance;</li> <li>Transplantation and Protection Zone of <i>Cibotium barometz</i>;</li> <li>Protection Zone for Floral Species of Conservation Importance</li> </ul> |
| Impacts on Fauna Species of Conservation Importance      | <ul style="list-style-type: none"> <li>Water Quality Control Measures</li> <li>Minimising Disturbance</li> </ul>   |
| Impact on Water Quality of Habitats                      | <ul style="list-style-type: none"> <li>Water Quality Control Measures</li> </ul>   |
| Noise and Dust Disturbance                               | <ul style="list-style-type: none"> <li>Minimising Disturbance</li> </ul>   |

### 5.1.6 Cultural Heritage

- 5.1.6.1. As no cultural heritage impact would be anticipated during the construction phase, no mitigation measure is required.

### 5.1.7 Landscape and Visual

- 5.1.7.1. Mitigation measures recommended for landscape impacts in the construction phase and standard good site practices and construction site management relevant to avoidance / minimisation of potential visual impacts are listed in **Table 5.3** and mapped on **Figure 5.1**. With the implementation of the recommended mitigation measures for landscape impacts, the residual impact of LR1 and LR3 would be reduced from moderate to slight during the construction phase as summarised in . Likewise, given the temporary nature of the construction works and with the implementation of standard good site practices and construction site management to avoid / further minimise any potential visual impacts, construction of the Project would not cause any pronounced visual change from key public VPs or on existing visually sensitive areas and major visual resources enjoyed by the public being affected.



**Table 5.3 Proposed Landscape Mitigation Measures and Good Construction Site Management Practices during Construction Phase**

| ID No.                    | Proposed Landscape Mitigation Measures and Good Construction Site Management Practices   |
|---------------------------|--|
| <b>Construction Phase</b> |  |
| CM1                       | <p><u>Tree preservation during construction</u><br/>                     All existing trees to be retained shall be carefully protected during construction. The proposed works shall avoid affecting the tree species with conservation importance. Tree protection works shall be in accordance with <i>DEVB TC(W) No. 4/2020 – Tree Preservation and Tree Management Practice Note No. 1 – Tree Preservation during Construction</i>. If soil nailing within Tree Protection Zone is unavoidable, the drill holes should be adjusted on site to locate away from the major tree roots to minimize the impact.</p>   |
| CM2                       | <p><u>Minimize potential impact to watercourses</u><br/>                     Mitigation measures such as undertaking construction works during dry season as far as practicable, provision of sandbags as barriers to avoid surface runoff during excavation works and stockpiling of the works materials to minimize any adverse impact to the watercourses are proposed.</p>   |
| CM3                       | <p><u>Preservation and Protection of Floral Species of Conservation Importance</u><br/> <i>Cibotium barometz</i> clusters directly affected by the construction of rigid barriers RB01 and RB02 should be preserved by on-site transplantation prior to the commencement of construction. Protection zone with a radius of minimum 1.5 m would be set up for the transplanted clusters.</p> <p>Protection zone with a radius of minimum 1.5 m would be set up for the other flora species of conservation importance recorded within / near the Project site, including clusters of <i>Cibotium barometz</i>, <i>Neottopteris nidus</i>, <i>Dioscorea pentaphylla</i>, <i>Gnetum luofuense</i>, and <i>Aquilaria sinensis</i>.</p> |
| CM4                       | <p><u>Re-vegetation &amp; Reinstatement of Works Area</u><br/>                     Existing vegetation should be retained where possible within the Project site. Areas which would be temporarily affected by construction activities should be reinstated after completing the construction works. For vegetation loss due to vegetation clearance for construction activities and provision of working space, compensatory re-vegetation is recommended. For example, hydroseeding with shrub planting would be applied as compensatory measure.</p>  |

## 5.2 Operational Phase

5.2.1.1. As no environmental impacts with regard to air quality, noise, water quality, waste management and cultural heritage would be anticipated during the operation phase of the Project, no mitigation measure is required.

### 5.2.2 Ecology

5.2.2.1. No unacceptable ecological impacts are identified during the operational phase of the Project. Therefore, no mitigation measure is required.

### 5.2.3 Landscape and Visual

5.2.3.1. Mitigation measures recommended for landscape and visual impacts in the operational phase are listed in **Table 5.4** and mapped on **Figure 5.1**. With the implementation of mitigation measures in **Table 5.4**, the residual impact of LR1, LR3 and PV1 would be reduced from slight to insubstantial during the operational phase that the operation of the Project would not cause any pronounced visual change from key public VPs or on existing visually sensitive areas and major visual resources enjoyed by the public being affected.

**Table 5.4 Proposed Landscape and Visual Mitigation Measures during Operational Phase**

| ID No.                          | Proposed Landscape and Visual Mitigation Measures  |
|---------------------------------|--|
| <b><i>Operational Phase</i></b> |  |
| OM1                             | <u>Environmental sensitive and aesthetically pleasing design</u><br>Subdue colour would be used on the exposed concrete element of the rigid barrier to match with the countryside setting. The design of the deflector wall with gabion blocks would employ natural texture e.g. mimic of rock surface and subdue colour to blend with the countryside environment and reduce the visual impact to country park users.  |
| OM2                             | <u>Vertical greening on structures</u><br>Vertical greening in the form of climbers (e.g. <i>Ficus pumila</i> ) is proposed along the rigid barriers and deflector wall with gabion blocks in order to soften the concrete structures and provide greenery to blend with the countryside environment.  |
| OM3                             | <u>Landscape treatments on slope</u><br>Landscape treatments of native shrub mix planting (e.g. <i>Rhaphiolepis indica</i> , <i>Rhodomyrtus tomentosa</i> , <i>Ligustrum sinense</i> , <i>Melastoma candidum</i> and <i>Psychotria rubra</i> etc.) shall be incorporated on the slopes adjoining the proposed structures in accordance with <i>GEO Publication No. 1/2011 – Technical Guidelines on Landscape Treatment for Slopes</i> and the <i>Guiding Principles on Use of Native Plant Species in Public Works Projects</i> issued by DEVB. The greening on slope shall enhance the environment and the visual amenity value of the area. |
| OM4                             | <u>Compensatory Planting of Native Trees and Shrubs</u><br>Compensatory planting of native tree and shrub in accordance with <i>DEVB TC(W) No. 4/2020</i> within the site boundary.  |

### 5.3 Environmental Monitoring and Audit

5.3.1.1. With the implementation of recommended mitigation measures, no unacceptable adverse environmental impacts would be anticipated from the construction and operation of the Project. No environmental monitoring is therefore considered necessary. Regular environmental site audit should be conducted by an Independent Environmental Checker (IEC) at all work sites during the construction phase to ensure proper implementation of the recommended mitigation measures and to confirm full compliance of the environmental mitigation measures to EPD.

### 5.4 Severity, Distribution and Duration of Environmental Effects

5.4.1.1. In view of the nature of the Project, the associated environmental impacts would be small scale, localised and temporary. With the implementation of the recommended mitigation measures, no adverse residual impacts would be anticipated from this Project.

### 5.5 Further Implications

#### 5.5.1 History of Similar Projects

5.5.1.1. A review has been made to other projects of similar nature whereby permission was granted to apply directly for Environmental Permit as summarized in **Table 5.5**.

**Table 5.5 Summary of Previous Projects with Permission Granted to Apply Directly for Environmental Permit**

| Application No. | Date of Permission Granted | Project Profile Title  |
|-----------------|----------------------------|--|
| DIR-277/2020    | 3 Sep 2020                 | Agreement no. CE47/2014(GE) - Landslip Prevention and Mitigation Programme near Bride's Pool Road, Tai Po – 3SE-D/SA2  |
| DIR-262/2018    | 22 Jun 2018                | Slope Upgrading Works at Feature No. 11SW-A/R526, King's College, Bonham Road, Hong Kong   |
| DIR-261/2018    | 21 Jun 2018                | Slope Upgrading Works of Feature No. 12NW-C/C8 Along Ha Yeung and Leung Fai Tin Along Clear Water Bay Road, Sai Kung   |
| DIR-250/2016    | 26 Jul 2016                | Agreement No. CE 24/2012 (GE) Landslip Prevention and Mitigation Programme, 2012, Package A Landslip Prevention and Mitigation Works - Investigation, Design and Construction - Landslip Prevention and Mitigation Works at Feature Nos. 11SW-A/R94 and 11SW-A/FR218, Caine Lane, Mid-Levels |
| DIR-215/2011    | 1 Sep 2011                 | Landslip Preventive Works at Feature No. 7NE-C/C310 along Tai Po Road – Tai Po Kau   |
| DIR-162/2007    | 1 Feb 2008                 | Landslip Preventive Works at Feature No. 3SE-B/C156 Along Bride's Pool Road, Near Chung Mei Plover Cove Reservoir, Tai Po  |
| DIR-131/2005    | 28 Nov 2005                | Landslide Preventive Works at Po Shan, Mid-levels  |
| DIR-108/2004    | 4 Nov 2004                 | 10 - Year Extended LPM Project, Phase 3, Package D -Outlying Islands, Landslip Preventive Works on Government Slopes and Related Studies - Investigation, Design and Construction  |
| DIR-098/2004    | 22 Jul 2004                | 10-year Extended LPM Project Phase 3, Package C Kowloon & Northern New Territories Landslip Preventive Works on Government Slopes and Related Studies Investigation, Design & Construction   |
| DIR-093/2003    | 30 Dec 2003                | Landslide Mitigation Works at Pak Sha Wan and Tsing Shan Trail above Area 19 - Design and Construction (Pak Sha Wan Landslide Mitigation Works)  |
| DIR-079/2003    | 5 Mar 2003                 | Agreement No. CE 67/2001 (GE), Landslide Mitigation Works against Natural Terrain Hazards in Tung Wan and Shatin Heights - Design and Construction, Tung Wan Landslide Mitigation Works  |
| DIR-071/2002    | 6 Nov 2002                 | 10-Year Extended LPM Project, Phase 2, Package G - Outlying Islands Features in Sok Kwu Wan Lamma Island   |
| DIR-070/2002    | 3 Oct 2002                 | 10-Year Extended LPM Project, Phase 2, Package G - Outlying Islands, Investigation, Design and Supervision of Landslip Preventive Works on Government Slopes and Related Studies   |
| DIR-055/2001    | 7 Jun 2001                 | 10 Year Extended Landslip Preventive Measures Project, Phase 2, Package A - Lantau Island, Investigation, Design and Supervision of Landslip Preventive Works on Government Slopes   |

## 6 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1.1.1. The potential environmental impacts and proposed mitigation measures to be incorporated during construction and operational phases of the Project are summarized in **Table 6.1**, which would be included in the construction contract document. The project proponent would supervise and monitor the implementation of these measures by the Contractor.

**Table 6.1 Summary of Potential Environmental Impacts and Mitigation Measures**

| Potential Environmental Impacts | Mitigation Measures   | Implementation Agent | Relevant Section in Project Profile |
|---------------------------------|---|----------------------|-------------------------------------|
| <b>Construction Phase</b>       |   |                      |                                     |
| Construction Dust               | <ul style="list-style-type: none"> <li>Implement standard dust suppression measures as stipulated in <i>Air Pollution Control (Construction Dust) Regulation</i></li> <li>Any stockpile of dusty materials should also avoid being placed next to the nearby ASRs, in particular Man Tak Garden (ASR1) to minimise the potential dust impacts as far as possible.</li> </ul>  | Contractor           | 5.1.1                               |
| Air Quality Impacts             | <ul style="list-style-type: none"> <li>Observe relevant legislation, technical circulars and guidelines should be observed during construction phase to minimise air pollution from construction, including <i>Air Pollution Control (Construction Dust) Regulation</i>; <i>Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation</i>; <i>Air Pollution Control (Fuel Restriction) Regulations</i> (i.e. using liquid fuel with a sulphur content of less than 0.005% by weight; <i>Recommended Pollution Control Clauses for Construction Contracts, DEVB TC(W) No. 13/2020</i> "Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts"; and <i>DEVB TC(W) No.1/2015</i> "Emissions Control of NRMM in Capital Works Contracts of Public Works".</li> </ul> | Contractor           | 5.1.1                               |
| Construction Noise              | <ul style="list-style-type: none"> <li>Adopt noise mitigation measures stipulated in EPD's "Recommended Pollution Control Clauses for Construction Contracts" and good site practices</li> </ul>  | Contractor           | 5.1.2                               |
| Water Quality                   | <ul style="list-style-type: none"> <li>Carry out temporary diversion of watercourse S2 prior to construction of rigid barrier RB01 to allow a dry condition for works within the watercourses.</li> <li>Resume the natural flow of the diverted watercourse (S2) on the surface channel constructed following DEVB TC(W) No. 9/2020 on the rigid barrier RB01 upon completion of construction.</li> </ul>   | Contractor           | 4.2.3                               |
|                                 | <ul style="list-style-type: none"> <li>Strictly follow all site practices outlined in WSD's <i>Conditions of Working within Water Gathering Ground</i></li> </ul>   | Contractor           | 5.1.3                               |

| Potential Environmental Impacts | Mitigation Measures   | Implementation Agent           | Relevant Section in Project Profile |
|---------------------------------|---|--------------------------------|-------------------------------------|
|                                 | <ul style="list-style-type: none"> <li>Observe relevant discharge requirements (e.g. WQOs, TM-DSS) stipulated under WPCO.</li> <li>Implement and follow diligently as appropriate site practices outlined in <i>ProPECC PN 2/23</i> during construction phase</li> <li>The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for the control of chemical wastes.</li> <li>Provide temporary sanitary facilities on-site where necessary to handle sewage from workers.</li> <li>Adopt practices outlined in <i>ETWB TC (Works) No. 5/2005</i> where applicable (e.g. carry out construction works close to inland waters in dry season as far as practicable) during construction phase</li> </ul>  |                                |                                     |
| Waste Management                | <ul style="list-style-type: none"> <li>Prepare a Waste Management Plan (WMP) in accordance with <i>ETWB TC (Works) No. 19/2005 "Environmental Management on Construction Sites"</i> and submit to Architect / Engineer for approval prior to commencement of construction works</li> <li>Adopt good waste management plan and practices on minimizing, handling and disposal of waste</li> <li>Sort all inert and non-inert C&amp;D materials generated into different categories and reuse or recycle as far as practicable prior to disposal of at PFRF (inert C&amp;D materials) or designated strategic landfill (non-inert C&amp;D materials) as appropriate</li> <li>Proper storage, handling and disposal of chemical waste in accordance with the requirements for <i>Waste Disposal (Chemical Waste) (General) Regulation</i></li> <li>Store general refuse in enclosed bins or compaction units separate from C&amp;D materials and chemical wastes and reuse/ recycle on-site prior to disposal as far as practicable</li> </ul> | Contractor                     | 5.1.4                               |
| Ecology                         | <ul style="list-style-type: none"> <li>Avoidance of TMSCP, NTCSA, and Lam Tsuen River (Upper) EIS</li> </ul>  | Contractor & Project Proponent | 5.1.5.2                             |
|                                 | <ul style="list-style-type: none"> <li>Avoidance of natural watercourse S1</li> </ul>   | Contractor & Project Proponent | 5.1.5.3                             |
|                                 | <ul style="list-style-type: none"> <li>Compensatory re-vegetation such as hydroseeding with shrub planting</li> <li>Incorporate grass concrete system / shrub mix planting of native species with biodegradable erosion control mat into the design of the rigid barriers and natural texture mimicking rock</li> </ul>   | Contractor & Project Proponent | 5.1.5.4 –<br>5.1.5.5                |

| Potential Environmental Impacts | Mitigation Measures  | Implementation Agent | Relevant Section in Project Profile |
|---------------------------------|--|----------------------|-------------------------------------|
|                                 | surface with climbers (e.g. <i>Ficus pumila</i> ) into that of the rigid barriers and the deflector wall with gabion blocks. <ul style="list-style-type: none"> <li>Uninstall temporary access and reinstate affected area upon completion of construction.</li> </ul>   |                      |                                     |
|                                 | <ul style="list-style-type: none"> <li>Locally adjust alignment of temporary access during construction phase to minimise the extent of vegetation clearance required and to avoid direct impacts to the nearby <i>Cibotium barometz</i> and <i>Aquilaria sinensis</i>.</li> <li>Provision of a recess in the base slab of the deflector wall with gabion blocks to avoid encroaching upon the protection zone of <i>Saurauia tristyla</i> (tree no. T202) and the associated flora species of conservation importance <i>Neottopteris nidus</i>.</li> </ul> | Contractor           | 5.1.5.5                             |
|                                 | <ul style="list-style-type: none"> <li>Compensatory Native Tree and Shrub Planting</li> </ul>  | Contractor           | 5.1.5.6                             |
|                                 | <ul style="list-style-type: none"> <li>Transplant <i>Cibotium barometz</i> clusters directly affected by the construction of rigid barriers RB01 and RB02, with the potential recipient site(s) located within the Project site near areas to the western and southern sides of the proposed rigid barrier RB01.</li> <li>Protection zone with a radius of minimum 1.5m should be set up for the transplanted <i>Cibotium barometz</i> during construction phase</li> </ul>  | Contractor           | 5.1.5.7                             |
|                                 | <ul style="list-style-type: none"> <li>Set up protection zone with a radius of minimum 1.5 m for flora species of conservation importance recorded within / near the Project site, including clusters of <i>Cibotium barometz</i>, <i>Neottopteris nidus</i>, <i>Dioscorea pentaphylla</i>, <i>Gnetum luofuense</i> and <i>Aquilaria sinensis</i>.</li> </ul>  | Contractor           | 5.1.5.8                             |
|                                 | <ul style="list-style-type: none"> <li>Conduct construction works within / nearby natural watercourses (S1 and S2), i.e. the proposed rigid barrier RB01 and deflector wall with gabion blocks DW01, during dry season as far as practicable.</li> <li>Strictly follow all site practices outlined in <i>ProPECC PN 2/23</i> and <i>ETWB TC (Works) No. 5/2005</i> to minimise water quality impacts</li> </ul>  | Contractor           | 5.1.5.9                             |
|                                 | <ul style="list-style-type: none"> <li>Carry out temporary diversion of watercourse S2 prior to construction of rigid barrier RB01 to allow a dry condition for works within the watercourses and to prevent the transportation of suspended solids downstream.</li> <li>Resume the natural flow of the diverted watercourse (S2) on the surface channel constructed following DEVB TC(W) No. 9/2020 on the rigid barrier RB01 upon completion of construction.</li> </ul>   | Contractor           | 4.2.5.7                             |

| Potential Environmental Impacts | Mitigation Measures  | Implementation Agent           | Relevant Section in Project Profile |
|---------------------------------|--|--------------------------------|-------------------------------------|
|                                 | <ul style="list-style-type: none"> <li>Adopt standard good site practices and practical dust and noise control measures to minimise construction disturbances</li> <li>Erect hoarding around the Project site during construction phase to ensure that the proposed works and associated works / stockpiling area would be confined within the Project site and to restrict access to natural habitats adjacent to works area by site workers, so as to minimise human disturbance.</li> <li>Training and general guidelines on protection of vegetation and wildlife, including but not limited to the recorded species of conservation importance and any other wild birds, butterflies, snakes or amphibian etc., as well as on avoidance of trespassing any natural habitats, particularly natural watercourse or within TMSCP, should be given to workers and site staff by a qualified ecologist prior to commencement of construction.</li> </ul> | Contractor                     | 5.1.5.10 –<br>5.1.5.11              |
| Landscape and Visual            | <ul style="list-style-type: none"> <li>Tree Preservation during Construction (CM1)</li> <li>Minimize Potential Impact to Watercourses (CM2)</li> <li>Preservation and Protection of Flora Species of Conservation Importance (CM3)</li> <li>Re-vegetation &amp; reinstatement of Works Area (CM4)</li> </ul>   | Contractor                     | 5.1.7                               |
| <b>Operational Phase</b>        |  |                                |                                     |
| Landscape and Visual            | <ul style="list-style-type: none"> <li>Environmental sensitive and aesthetically Pleasing Design (OM1)</li> <li>Vertical Greening on Structures (OM2)</li> <li>Landscape Treatments on Slope (OM3)</li> <li>Compensatory Planting of Native Trees and Shrubs (OM4)</li> </ul>  | Contractor & Project Proponent | 5.2.3                               |

- 6.1.1.2. In order to help reduce carbon emission and pollution, timely application of temporary electricity and water supply would be made and electric vehicles would be adopted in accordance with *DEVB TC(W) No. 13/2020 “Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts”* in the Project. Surveillance system would be provided within works sites to establish an enhanced monitoring and control system of the construction site to ensure proper implementation of the recommended mitigation measures.

## **7 USE OF PREVIOUSLY APPROVED ENVIRONMENTAL IMPACT ASSESSMENT REPORTS/ DIRECT EP APPLICATIONS**

### **7.1 Use of Previously Approved Environmental Impact Assessment Reports**

7.1.1.1. No previous EIA Report has been submitted or approved for the Project.

## **8 CONCLUSION**

8.1.1.1. The predicted environmental impacts from the Project are unlikely to be adverse and the mitigation measures described in this Project Profile meet the requirements of the *EIAO-TM*.

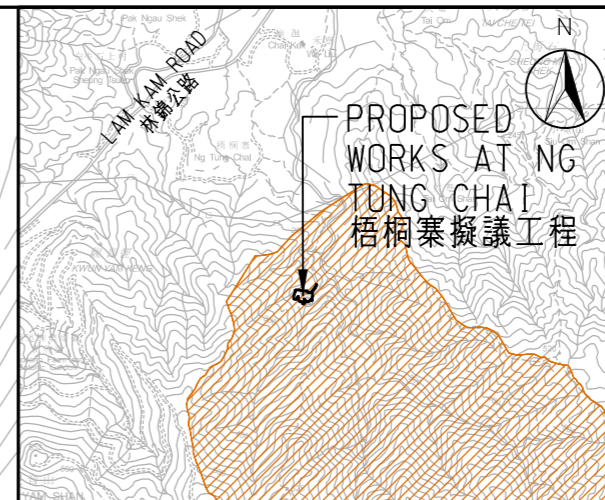
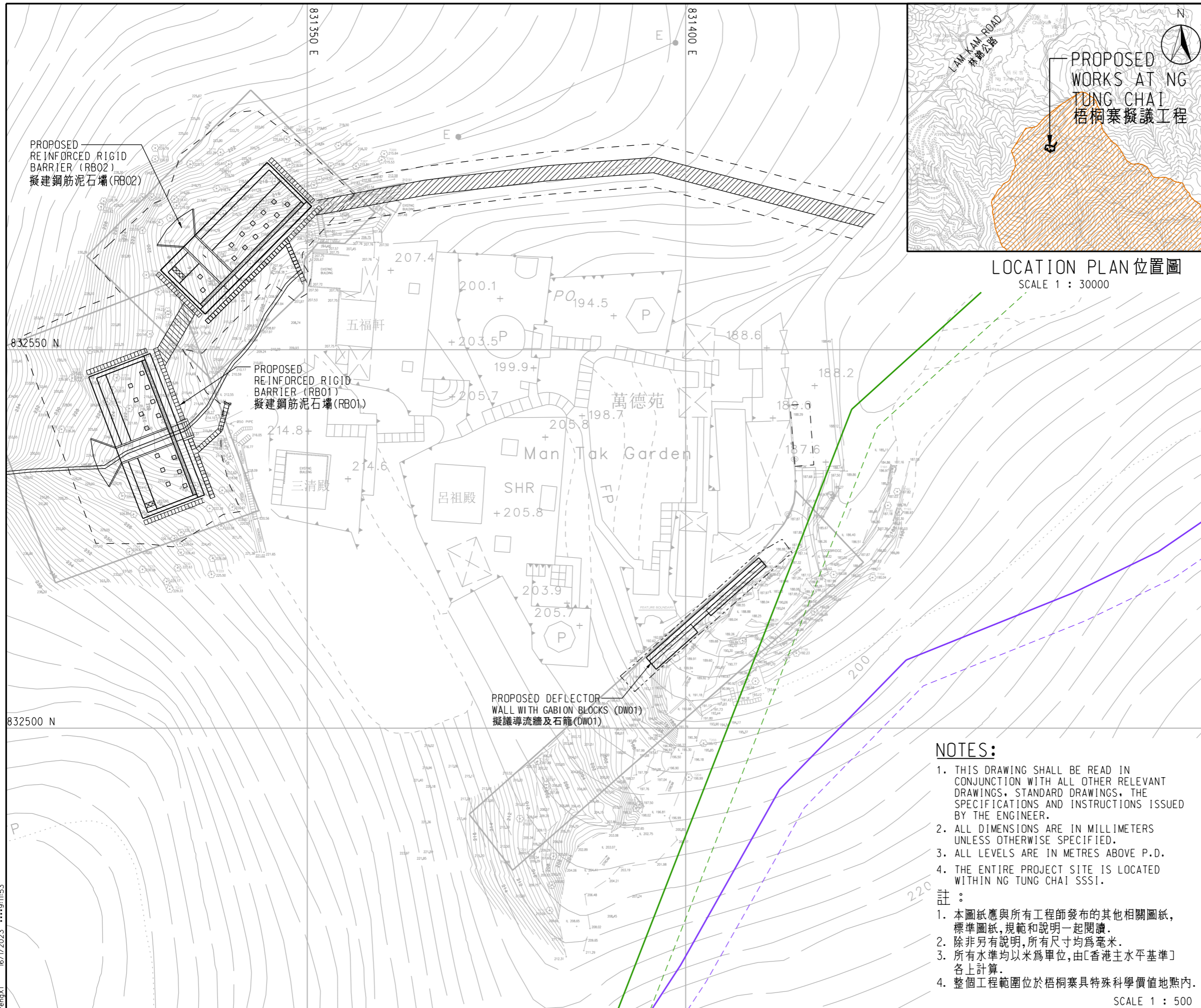
8.1.1.2. This Project Profile is prepared to seek permission from the Director of Environmental Protection under Section 5(11) of the EIAO to apply directly for an Environmental Permit.



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## FIGURES

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LOCATION PLAN 位置圖  
SCALE 1 : 30000

**LEGEND:**

- PROJECT SITE 工程範圍
- ▤ PROPOSED CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING 擬建單扶手混凝土維修樓梯
- ▥ PROPOSED STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING 擬建雙扶手鋼筋維修樓梯
- ▧ PROPOSED TEMPORARY ACCESS PATH 擬建臨時通道
- ▨ SITE OF SPECIAL SCIENTIFIC INTEREST 具特殊科學價值地點
- ▩ TAI MO SHAN COUNTRY PARK 大帽山郊野公園
- NG TUNG CHAI SPECIAL AREA 梧桐寨特別地區

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
| Drawn         |      | XDP                    | 06/20   |
| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 1.1 | 06/20   |

Sheet Title  
**GENERAL LAYOUT PLAN  
AT NG TUNG CHAI  
梧桐寨擬議工程總平面圖**

**GEOTECHNICAL ENGINEERING  
OFFICE 土力工程處**

**CEDD Civil Engineering and  
Development Department**

**AECOM**

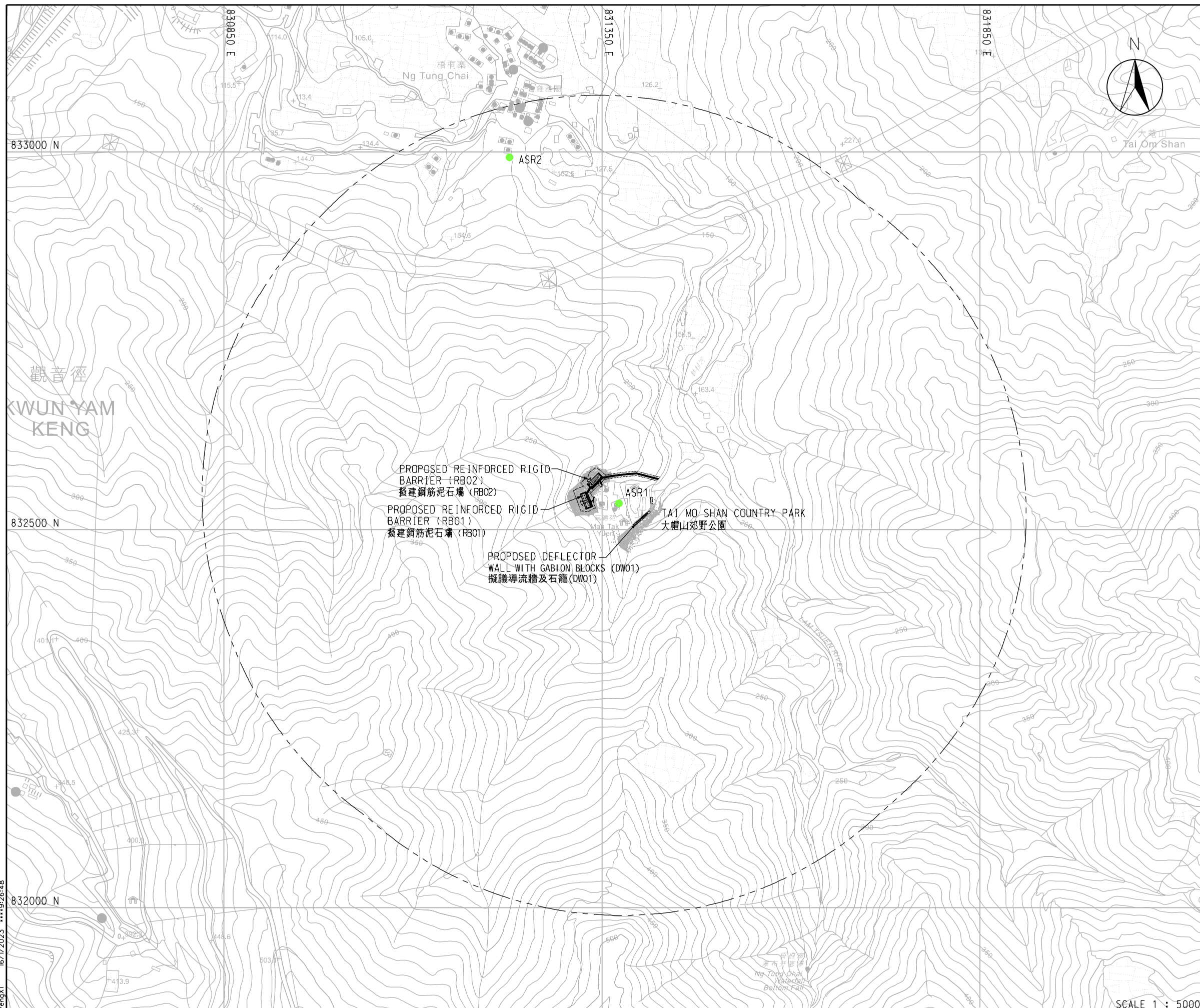
**NOTES:**

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2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE P.D.
4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.

**註:**

1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀.
2. 除非另有說明, 所有尺寸均為毫米.
3. 所有水準均以米為單位, 由[香港主水平基準]各上計算.
4. 整個工程範圍位於梧桐寨具特殊科學價值地點內.

SCALE 1 : 500



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4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

**LEGEND:**

- PROJECT SITE  
工程範圍
- PROPOSED TEMPORARY ACCESS PATH  
擬建臨時通道
- 500m ASSESSMENT AREA  
500米研究範圍
- REPRESENTATIVE AIR SENSITIVE RECEIVER  
具代表性空氣敏感受體

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
| Drawn         |      | XDP                    | 06/20   |
| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 3.1 | 06/20   |

Sheet Title  
**LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS  
具代表性空氣敏感受體的位置**

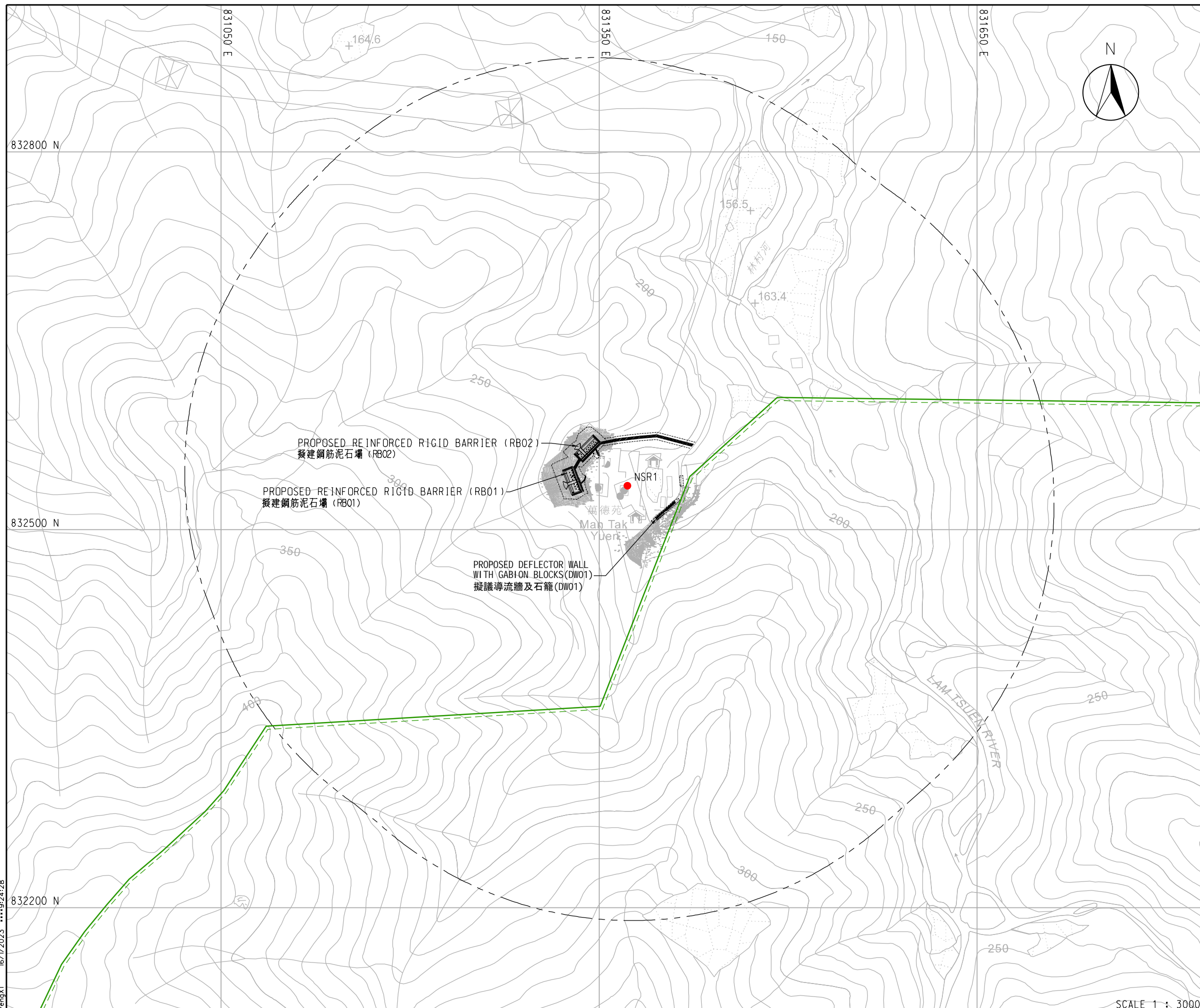
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3. ALL LEVELS ARE IN METRES ABOVE P.D.
4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.

**註:**

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3. 所有水準均以米為單位, 由「香港主水平基準」各上計算。
4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

**LEGEND:**

- PROJECT SITE  
工程範圍
- PROPOSED TEMPORARY ACCESS PATH  
擬建臨時通道
- 300m ASSESSMENT AREA  
300米研究範圍
- TAI MO SHAN COUNTRY PARK  
大帽山郊野公園
- REPRESENTATIVE NOISE SENSITIVE RECEIVER  
具代表性噪音敏感受體

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
| Drawn         |      | XDP                    | 06/20   |
| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 3.2 | 06/20   |

Sheet Title  
**LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS  
具代表性噪音敏感受體的位置**

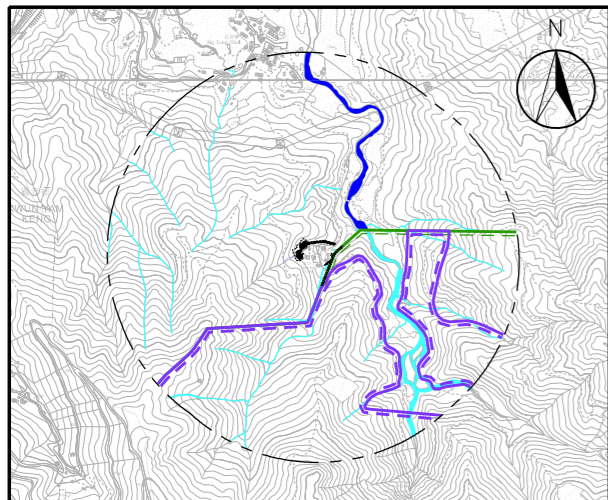
**GEOTECHNICAL ENGINEERING OFFICE 土力工程處**

**CEDD Civil Engineering and Development Department**

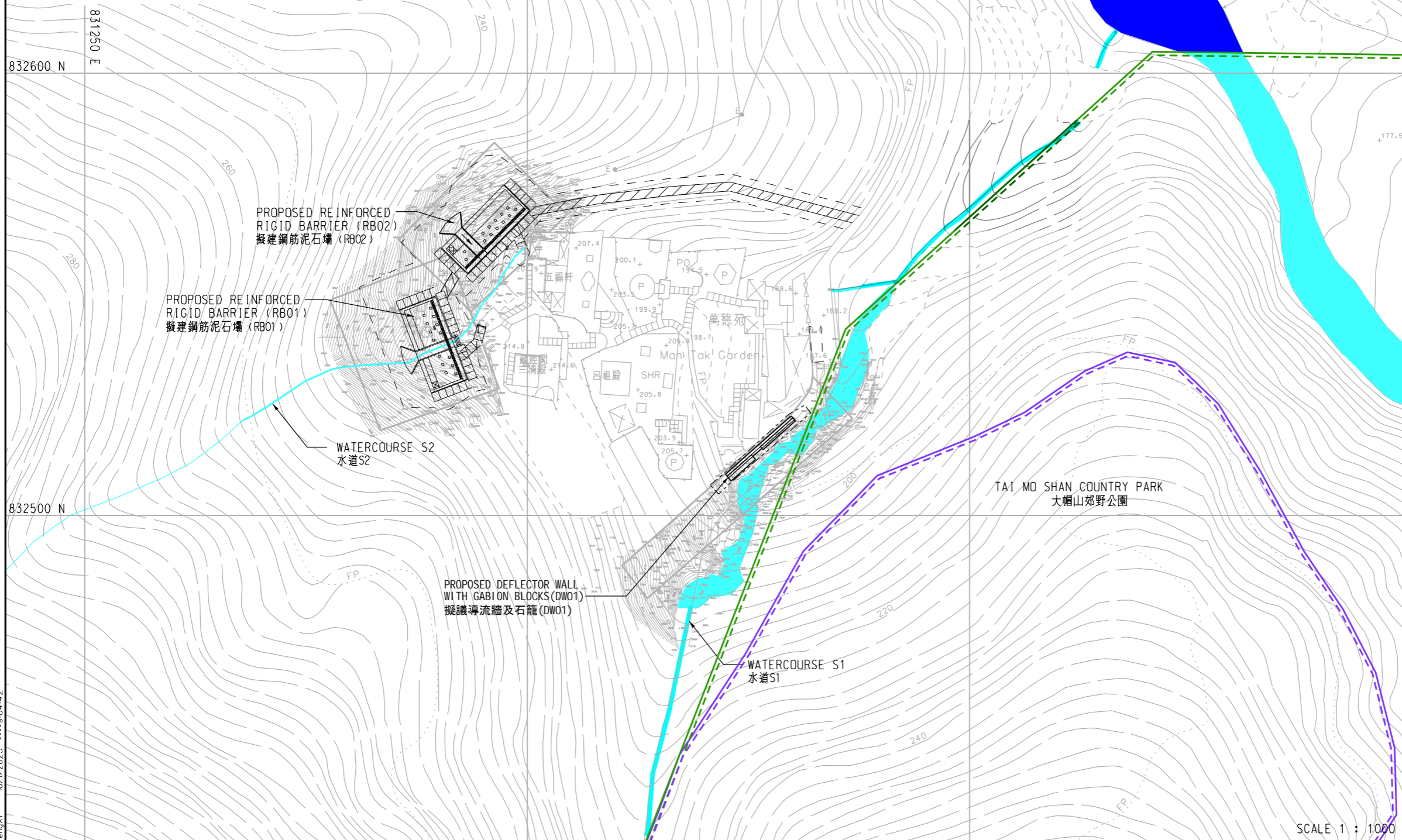


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LOCATION PLAN 位置圖  
SCALE 1 : 20000



- NOTES:**
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  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.
- 註:**
1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  2. 除非另有說明, 所有尺寸均為毫米。
  3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。
  4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

- LEGEND:**
- PROJECT SITE 工程範圍
  - 500m ASSESSMENT AREA 500米研究範圍
  - PROPOSED CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING 擬建單扶手維修混凝土樓梯
  - PROPOSED STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING 擬建雙扶手維修鋼筋樓梯
  - PROPOSED TEMPORARY ACCESS PATH 擬建臨時通道
  - TAI MO SHAN COUNTRY PARK 大帽山郊野公園
  - NG TUNG CHAI SPECIAL AREA 梧桐寨特別地區
  - ECOLOGICALLY IMPORTANT STREAM 具重要生態價值河溪
  - NATURAL WATERCOURSE 天然水道

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
| Drawn         |      | XDP                    | 06/20   |
| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 3.3 | 06/20   |

Sheet Title  
LOCATIONS OF REPRESENTATIVE WATER SENSITIVE RECEIVERS  
具代表性水質敏感受體的位置

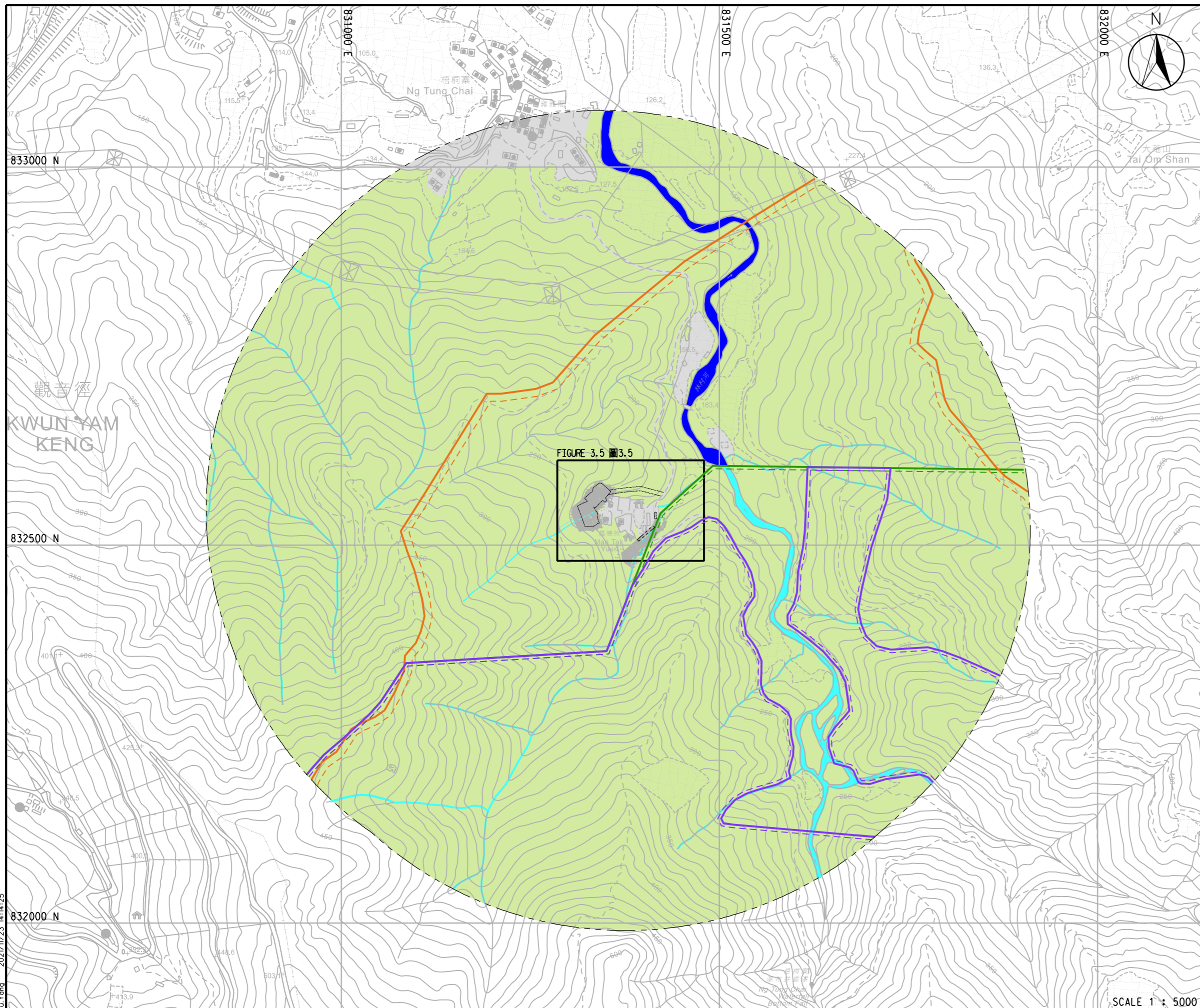
GEOTECHNICAL ENGINEERING OFFICE 土力工程處

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  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.

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  3. 所有水準均以米為單位，由[香港主水平基準]各上計算。
  4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

- LEGEND:**
- PROJECT SITE 工程範圍
  - 500m ASSESSMENT AREA 500米研究範圍
  - SITE OF SPECIAL SCIENTIFIC INTEREST 具特殊科學價值地點
  - TAI MO SHAN COUNTRY PARK 大帽山郊野公園
  - NG TUNG CHAI SPECIAL AREA 梧桐寨特別地區
  - ECOLOGICALLY IMPORTANT STREAM 具重要生態價值河溪
  - NATURAL WATERCOURSE 天然水道
  - WOODLAND 林地
  - DEVELOPED AREA 已發展地區

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
| Drawn         |      | XDP                    | 06/20   |
| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 3.4 | 06/20   |

Sheet Title  
**HABITAT MAP OF 500m ASSESSMENT AREA AND SITES OF CONSERVATION IMPORTANCE**  
 500米研究範圍生境地圖及具保育價值地點

**GEOTECHNICAL ENGINEERING OFFICE 土力工程處**

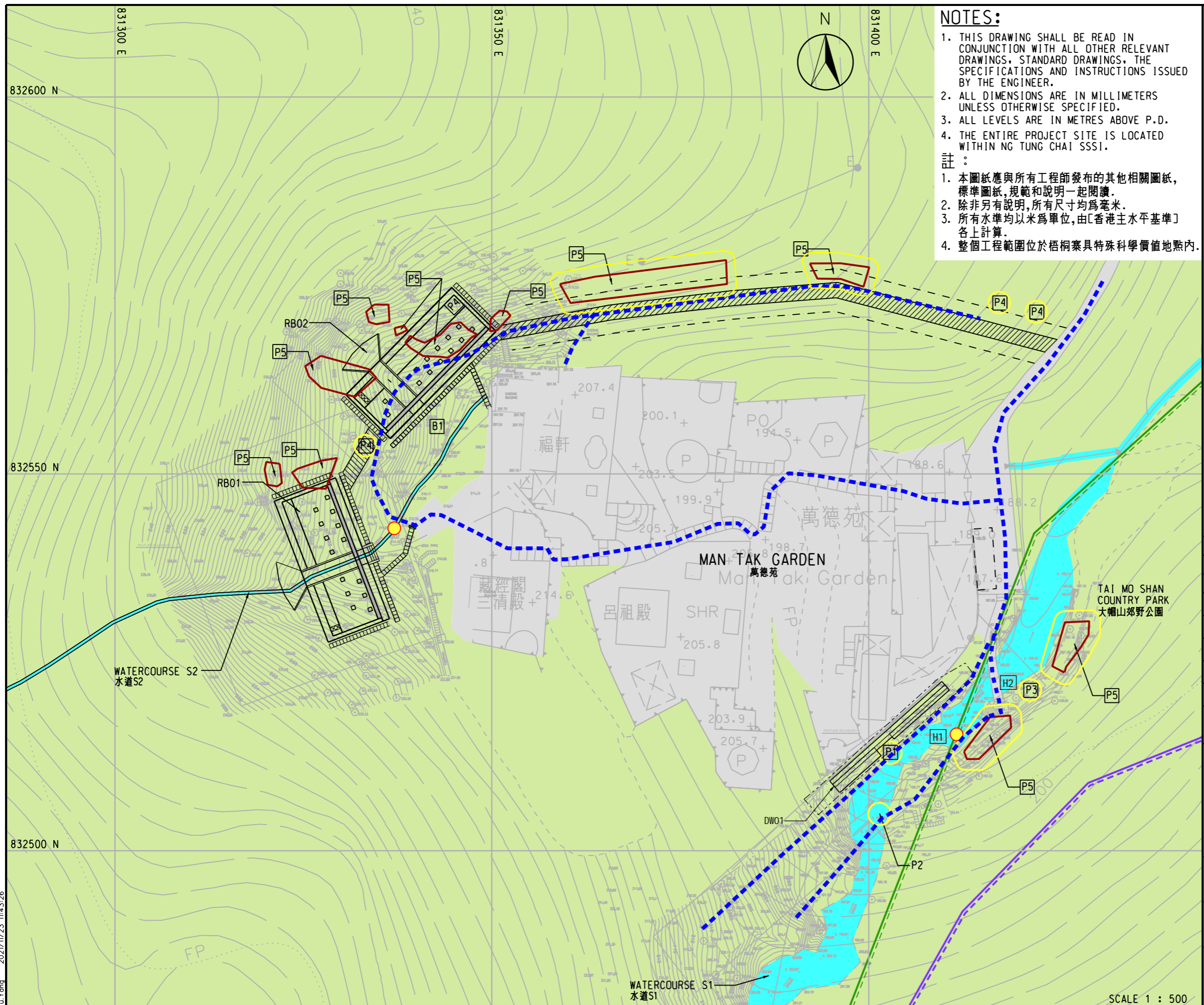
**CEDD Civil Engineering and Development Department**



PART PRINT OF SURVEY SHEET NO. : 7NWA, 7NWC

Fu.Yang 2021/11/23 14:14:25

SCALE 1 : 5000



**NOTES:**

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS. STANDARD DRAWINGS, THE SPECIFICATIONS AND INSTRUCTIONS ISSUED BY THE ENGINEER.
  2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.
- 註:
1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  2. 除非另有說明, 所有尺寸均為毫米。
  3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。
  4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

**LEGEND:**

- PROJECT SITE 工程範圍
  - ▤ PROPOSED CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING 擬建單扶手維修混凝土樓梯
  - ▥ PROPOSED STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING 擬建雙扶手維修鋼樓梯
  - ▧ PROPOSED TEMPORARY ACCESS PATH 擬建臨時通道
  - SURVEY TRANSECT 樣線
  - LOCATION OF FRESHWATER COMMUNITY SURVEY 淡水生物群落研究位置
  - TAI MO SHAN COUNTRY PARK 大帽山郊野公園
  - NG TUNG CHAI SPECIAL AREA 梧桐寨特別地區
  - NATURAL WATERCOURSE 天然水道
  - WOODLAND 林地
  - DEVELOPED AREA 已發展地區
- SPECIES OF CONSERVATION IMPORTANCE:**  
具保育價值物種
- |      |   |               |
|------|---|---------------|
| [B1] | <i>Charaxes marmax</i>                    | 藍蛺蝶           |
| [H1] | <i>Lycodon futsingensis</i>               | 黑背白環蛇         |
| [H2] | <i>Quasipaa exilispinosa</i>              | 小棘蛙           |
| [P1] | <i>Neottopteris nidus</i> on Tree No. 202 | 巢蕨(樹木編號T202上) |
| [P2] | <i>Dioscorea pentaphylla</i>              | 五葉薯蕷          |
| [P3] | <i>Gnetum luofuense</i>                   | 羅浮買麻藤         |
| [P4] | <i>Aquilaria sinensis</i>                 | 土沉香           |
| [P5] | <i>Cibotium barometz</i>                  | 金毛狗           |
- ▭ INDICATIVE LOCATION OF *CIBOTIUM BAROMETZ* COLONY 金毛狗群落的指示性位置
  - 1.5m PROTECTION ZONE (INDICATIVE) 1.5m 保護區 (指示性)

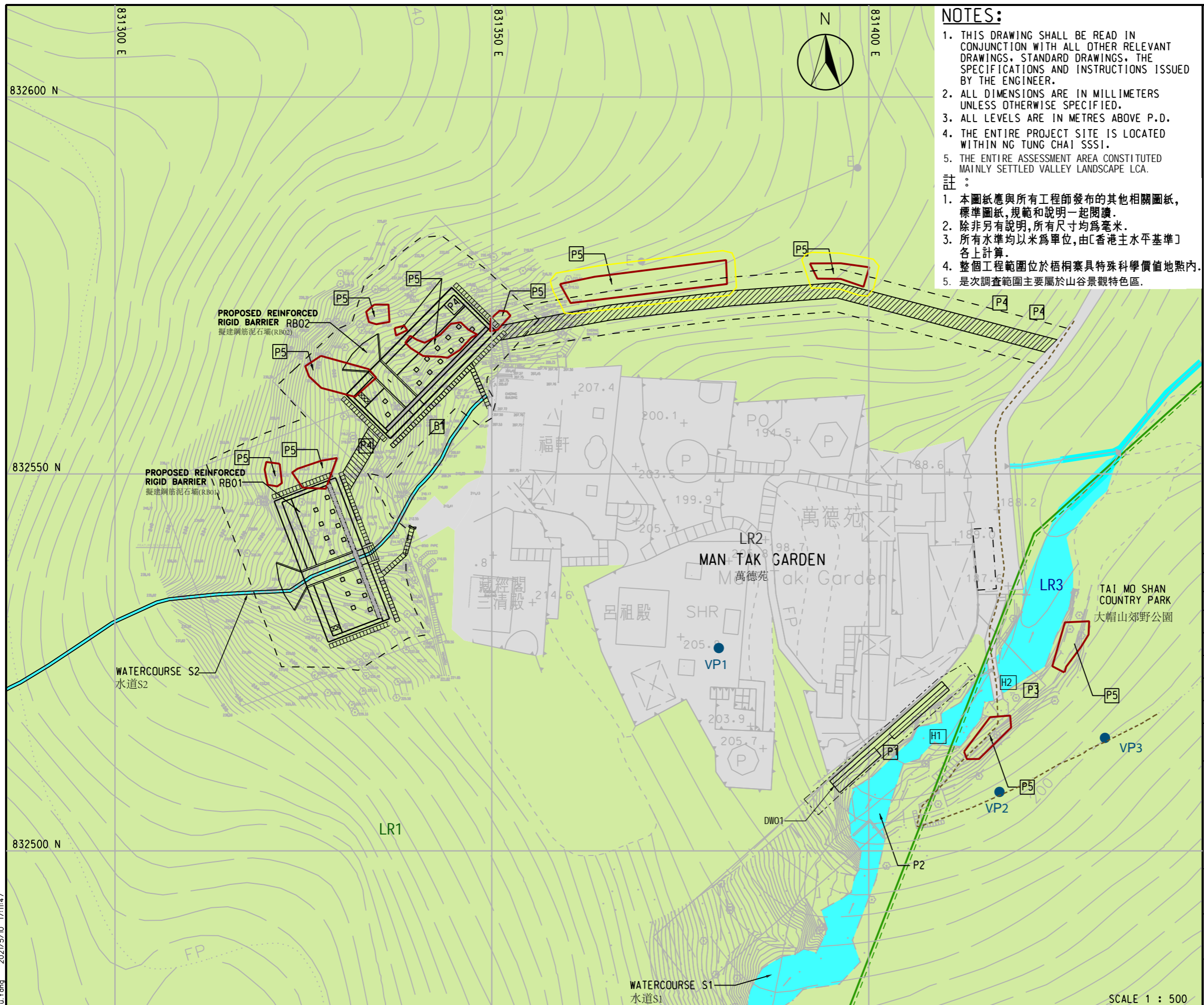
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| Approved      |                        | SLC         | 06/20   |
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| Sheet No.     | 60331720/PP/FIGURE 3.5 |             | 06/20   |

Sheet Title  
**HABITAT MAP FOCUSING ON WORKS AREA AND LOCATIONS OF SPECIES OF CONSERVATION IMPORTANCE**  
 工地範圍生境圖和具保育價值物種的位置  
**GEOTECHNICAL ENGINEERING OFFICE 土力工程處**

**CEDD Civil Engineering and Development Department**

**AECOM**

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**NOTES:**

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  2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.
  5. THE ENTIRE ASSESSMENT AREA CONSTITUTED MAINLY SETTLED VALLEY LANDSCAPE LCA.
- 註:
1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  2. 除非另有說明, 所有尺寸均為毫米。
  3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。
  4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。
  5. 是次調查範圍主要屬於山谷景觀特色區。

**LEGEND:**

- PROJECT SITE  
工程範圍
  - ▤ CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING  
單扶手維修混凝土樓梯
  - ▥ STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING  
雙扶手維修鋼筋樓梯
  - ▧ PROPOSED TEMPORARY ACCESS PATH  
擬建臨時通道
  - ▭ TAI MO SHAN COUNTRY PARK  
大帽山郊野公園
  - LR3 NATURAL WATERCOURSE  
天然水道
  - LR1 WOODLAND  
林地
  - LR2 LANDSCAPE AREA IN MAN TAK GARDEN  
萬德苑園景區
- SPECIES OF CONSERVATION IMPORTANCE:  
具保育價值物種
- B1 *Charaxes marmax* 藍蛱蝶
  - H1 *Lycodon futsingensis* 黑背白環蛇
  - H2 *Quasipaa exilispinosa* 小棘蛙
  - P1 *Neottopteris nidus* on Tree No.202 巢蕨(樹木編號T202.上)
  - P2 *Dioscorea pentaphylla* 五葉薯蕷
  - P3 *Gnetum luofuense* 羅浮買麻藤
  - P4 *Aquilaria sinensis* 土沉香
  - P5 *Cibotium barometz* 金毛狗

- INDICATIVE LOCATION OF *CIBOTIUM BAROMETZ* COLONY  
金毛狗群落的指示性位置
- VP1 USERS AT MAN TAK GARDEN  
公眾觀景點1 萬德苑使用者
  - VP2 HIKERS ALONG NG TUNG WATERFALL PATH  
公眾觀景點2 梧桐瀑布行山徑登山人士
  - VP3 VISITORS AT TAI MO SHAN COUNTRY PARK  
公眾觀景點3 大帽山郊野公園使用者

| No.           | Date                   | Description     | Initial |
|---------------|------------------------|-----------------|---------|
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|               |                        | Name            | Date    |
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| Checked       |                        | SLC             | 06/20   |
| Approved      |                        | CE 33/2013 (GE) | -       |
| Agreement No. |                        |                 |         |
| Sheet No.     | 60331720/PP/FIGURE 3.6 |                 | 06/20   |

Sheet Title  
 LOCATION OF LANDSCAPE RESOURCES,  
 LANDSCAPE CHARACTER AREA AND  
 PUBLIC VIEWING POINTS  
 景觀資源、景觀特色區及公眾觀景點的位置

GEOTECHNICAL ENGINEERING  
 OFFICE 土力工程處

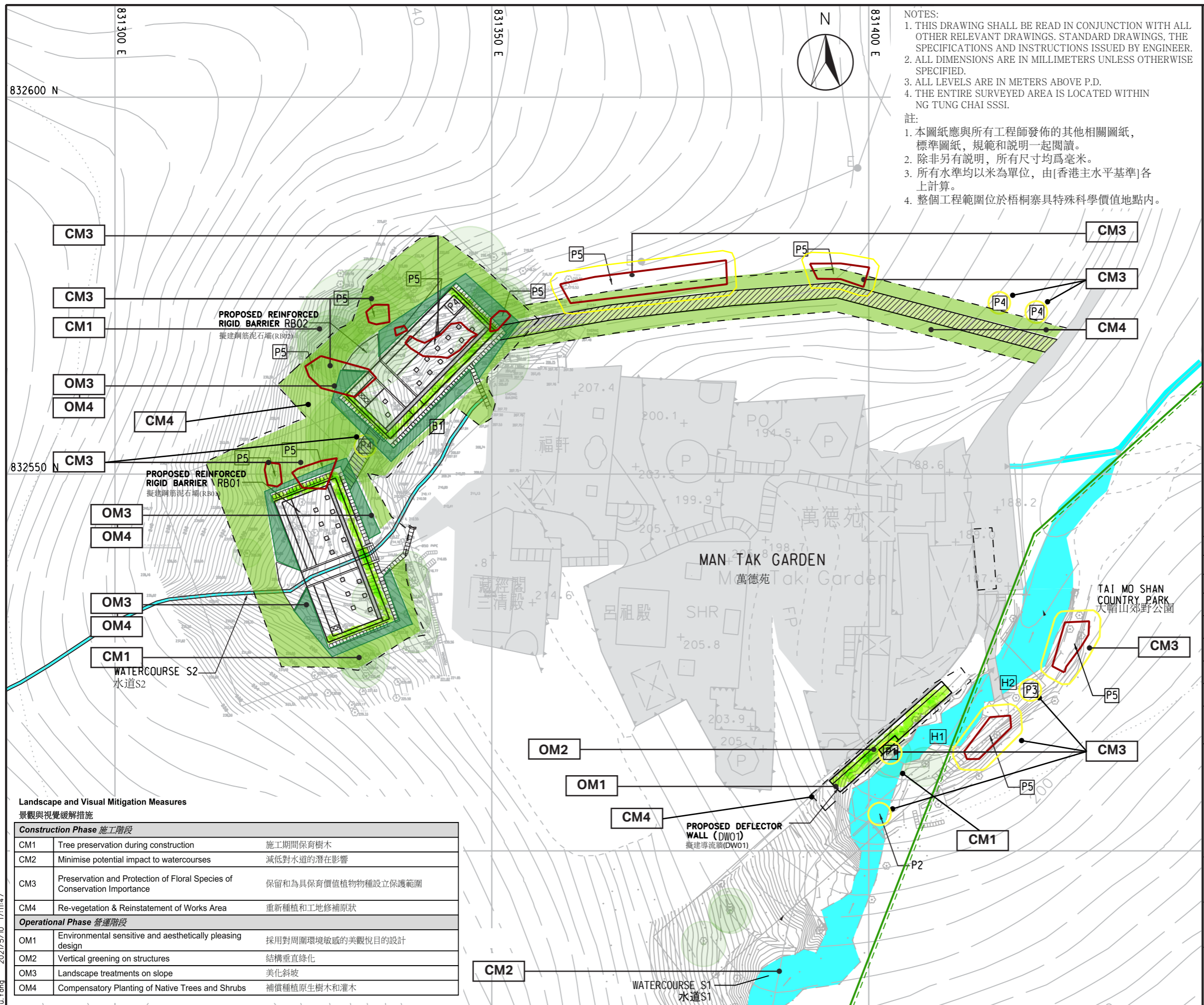
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 2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.  
 3. ALL LEVELS ARE IN METERS ABOVE P.D.  
 4. THE ENTIRE SURVEYED AREA IS LOCATED WITHIN NG TUNG CHAI SSSI.

註:  
 1. 本圖紙應與所有工程師發佈的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。  
 2. 除非另有說明, 所有尺寸均為毫米。  
 3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。  
 4. 整個工程範圍位於梧桐寨具特殊科學價值地點內。

**LEGEND:**

- WORKS BOUNDARY  
工程範圍
- ▤ CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING  
單扶手維修混凝土樓梯
- ▥ STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING  
雙扶手維修鋼筋樓梯
- ▧ PROPOSED TEMPORARY ACCESS PATH  
擬建臨時通道
- ▨ TAI MO SHAN COUNTRY PARK  
大帽山郊野公園
- NATURAL WATERCOURSE  
天然水道

**SPECIES OF CONSERVATION IMPORTANCE:**  
具保育價值物種

|    |  |       |
|----|--|-------|
| B1 | <i>Charaxes marmax</i>                                   | 藍蛺蝶   |
| H1 | <i>Lycodon futsingensis</i>                              | 黑背白環蛇 |
| H2 | <i>Quasipaa exilispinosa</i>                             | 小棘蛙   |
| P1 | <i>Neottopteris nidus</i> on Tree No. 202 巢蕨(樹木編號T202.上) |       |
| P2 | <i>Dioscorea pentaphylla</i>                             | 五葉薯蕷  |
| P3 | <i>Gnetum luofuense</i>                                  | 羅浮買麻藤 |
| P4 | <i>Aquilaria sinensis</i>                                | 土沉香   |
| P5 | <i>Cibotium barometz</i>                                 | 金毛狗   |

▭ INDICATIVE LOCATION OF *CIBOTIUM BAROMETZ* COLONY  
金毛狗群落的指示性位置

▭ 1.5m PROTECTION ZONE (INDICATIVE)  
1.5m保護區(指示性)

| No.           | Date | Description            | Initial |
|---------------|------|------------------------|---------|
| REVISION      |      |                        |         |
|               |      | Name                   | Date    |
| Designed      |      | CKL1                   | 06/20   |
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| Checked       |      | ACCK                   | 06/20   |
| Approved      |      | SLC                    | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)        | -       |
| Sheet No.     |      | 60331720/PP/FIGURE 5.1 | 06/20   |

Sheet Title  
 LANDSCAPE MITIGATION MEASURES PLAN  
 景觀緩解措施平面圖

GEOTECHNICAL ENGINEERING OFFICE 土力工程處

**CEDD Civil Engineering and Development Department**

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**Landscape and Visual Mitigation Measures**  
景觀與視覺緩解措施

| Construction Phase 施工階段 |  |                     |
|-------------------------|--|---------------------|
| CM1                     | Tree preservation during construction                                    | 施工期間保育樹木            |
| CM2                     | Minimise potential impact to watercourses                                | 減低對水道的潛在影響          |
| CM3                     | Preservation and Protection of Floral Species of Conservation Importance | 保留和為具保育價值植物物種設立保護範圍 |
| CM4                     | Re-vegetation & Reinstatement of Works Area                              | 重新種植和工地修補原狀         |
| Operational Phase 營運階段  |  |                     |
| OM1                     | Environmental sensitive and aesthetically pleasing design                | 採用對周圍環境敏感的美觀悅目的設計   |
| OM2                     | Vertical greening on structures  | 結構垂直綠化              |
| OM3                     | Landscape treatments on slope  | 美化斜坡                |
| OM4                     | Compensatory Planting of Native Trees and Shrubs                         | 補償種植原生樹木和灌木         |

Fu.Yong 2021/5/10 17:11:47

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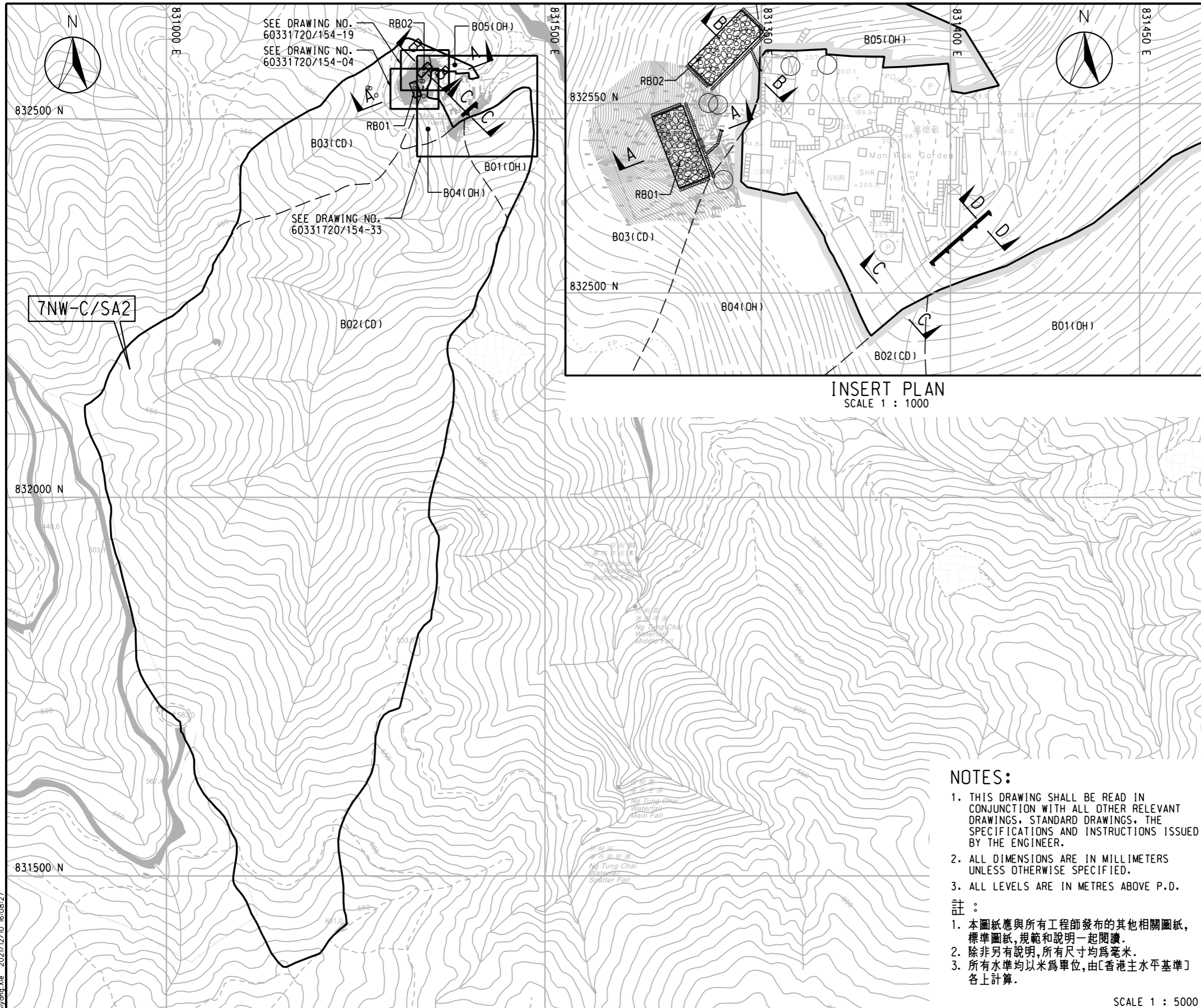
## APPENDICES

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**Appendix 1.1**  
**Sections Drawings of the Project**

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**LEGEND:**

- STUDY AREA BOUNDARY  
調查範圍
- HILLSIDE CATCHMENT  
天然山坡
- MAN MADE FEATURE BOUNDARY  
(FOR FEATURES FALL WITHIN STUDY AREA)  
人造斜坡範圍  
(天然山坡的調查範圍內)
- EXISTING CONTOUR LINE  
現有等高線
- EXISTING GROUND LEVEL  
現有地面標高
- EXISTING SLOPE  
現有人造斜坡
- PROPOSED REINFORCED RIGID BARRIER  
擬議泥石壩
- PROPOSED DEFLECTOR WALL  
擬議導流牆
- MIN. 600mm WIDE CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING (REFER TO CEDD STANDARD DRAWING NO. C2101D)  
擬議單扶手混凝土維修梯級  
(至少600毫米寬)
- IN-SITU STABILIZATION OF UNSTABLE BLOCKS REFER TO CEDD STANDARD DRAWING NOS. C2202D, 2203A AND 2204E  
參考土木工程拓展署標準圖圖號 C2202D, 2203A 及 2204E 就地加固不穩定石塊

**INSERT PLAN**  
SCALE 1 : 1000

| No.             | Date | Description     | Initial |
|-----------------|------|-----------------|---------|
| <b>REVISION</b> |      |                 |         |
|                 |      | Name            | Date    |
| Designed        |      | JLCW            | 03/17   |
| Drawn           |      | XDP             | 03/17   |
| Checked         |      | LS              | 03/17   |
| Approved        |      | WWL             | 03/17   |
| Agreement No.   |      | CE33/2013 (GE)  | -       |
| Drawing No.     |      | 60331720/SK3135 | 03/17   |

- NOTES:**
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, STANDARD DRAWINGS, THE SPECIFICATIONS AND INSTRUCTIONS ISSUED BY THE ENGINEER.
  - ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  - ALL LEVELS ARE IN METRES ABOVE P.D.
- 註:**
- 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  - 除非另有說明, 所有尺寸均為毫米。
  - 所有水準均以米為單位, 由[香港主水平基準] 各上計算。

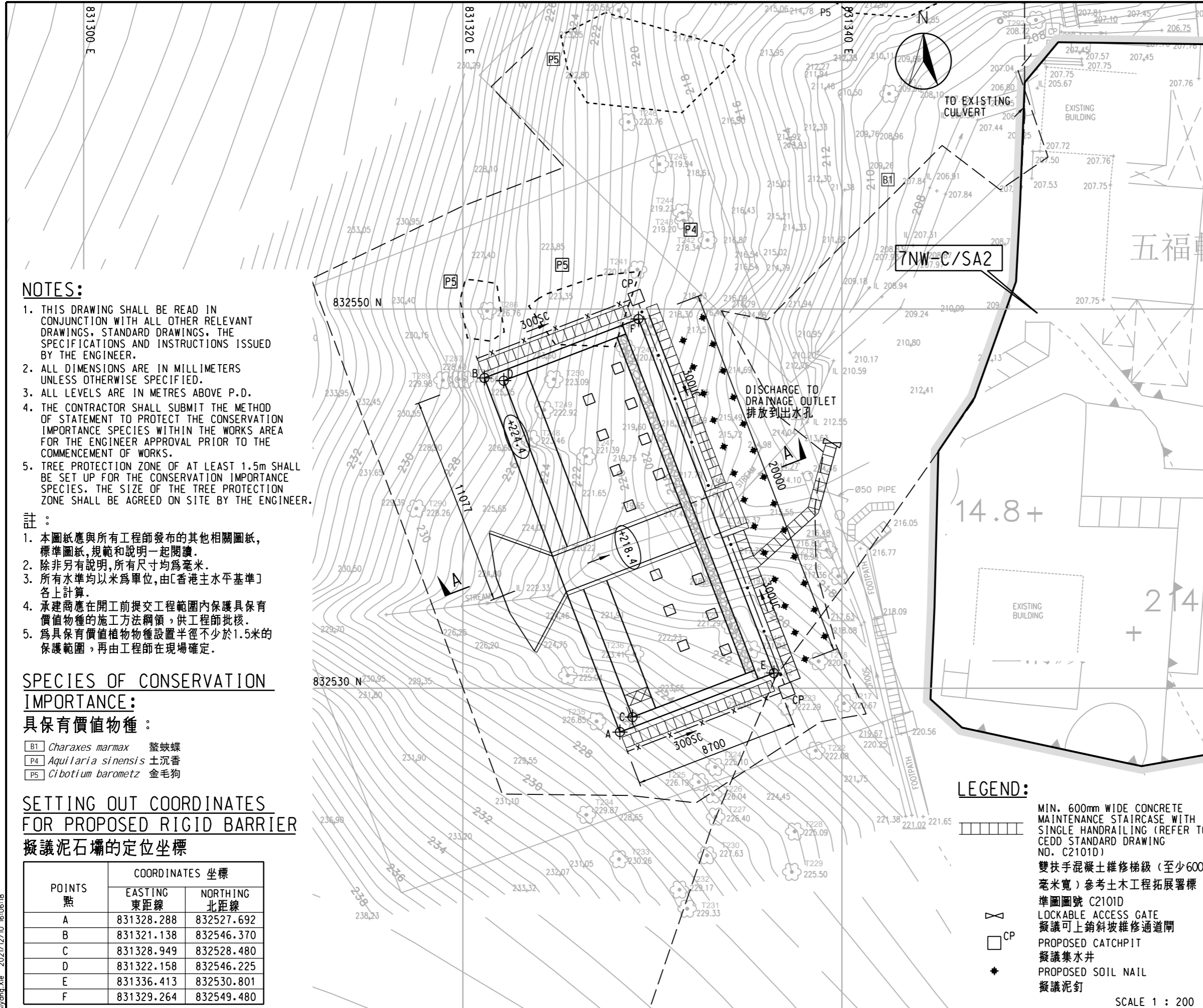
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**Study Area No. 7NW-C/SA2**  
**NG TUNG CHAI ALONG LAM**  
**KAM ROAD, TAI PO**  
**大埔林錦路梧桐寨的調查範圍7NW-C/SA2**  
**MASTER LAYOUT PLAN**  
**總平面圖**

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- NOTES:**
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS. STANDARD DRAWINGS, THE SPECIFICATIONS AND INSTRUCTIONS ISSUED BY THE ENGINEER.
  2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE CONTRACTOR SHALL SUBMIT THE METHOD OF STATEMENT TO PROTECT THE CONSERVATION IMPORTANCE SPECIES WITHIN THE WORKS AREA FOR THE ENGINEER APPROVAL PRIOR TO THE COMMENCEMENT OF WORKS.
  5. TREE PROTECTION ZONE OF AT LEAST 1.5m SHALL BE SET UP FOR THE CONSERVATION IMPORTANCE SPECIES. THE SIZE OF THE TREE PROTECTION ZONE SHALL BE AGREED ON SITE BY THE ENGINEER.

- 註:**
1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  2. 除非另有說明, 所有尺寸均為毫米。
  3. 所有水準均以米為單位, 由[香港主水平基準] 各上計算。
  4. 承建商應在開工前提交工程範圍內保護具保育價值物種的施工方法綱領, 供工程師批核。
  5. 為具保育價值植物物種設置半徑不少於1.5米的保護範圍, 再由工程師在現場確定。

**SPECIES OF CONSERVATION IMPORTANCE:**

- 具保育價值物種:
- [B1] *Charaxes marmax* 藍蛱蝶
  - [P4] *Aquilaria sinensis* 土沉香
  - [P5] *Cibotium barometz* 金毛狗

**SETTING OUT COORDINATES FOR PROPOSED RIGID BARRIER**

擬議泥石壩的定位坐標

| POINTS 點 | COORDINATES 坐標 |              |
|----------|----------------|--------------|
|          | EASTING 東距線    | NORTHING 北距線 |
| A        | 831328.288     | 832527.692   |
| B        | 831321.138     | 832546.370   |
| C        | 831328.949     | 832528.480   |
| D        | 831322.158     | 832546.225   |
| E        | 831336.413     | 832530.801   |
| F        | 831329.264     | 832549.480   |

- LEGEND:**
- STUDY AREA BOUNDARY 調查範圍
  - HILLSIDE CATCHMENT 天然山坡
  - EXISTING CONTOUR LINE 現有等高線
  - EXISTING GROUND LEVEL 現有地面標高
  - EXISTING SLOPE 現有人造斜坡
  - PROPOSED GABION WALL 擬建框式擋土牆
  - PROPOSED HYDROSEEDING 擬噴草範圍
  - PROPOSED DESIGN FINISHED TOP LEVEL 擬設計完成表面標高
  - PROPOSED 300mm U-CHANNEL 擬議300毫米寬U型渠道
  - PROPOSED 300mm STEPPED CHANNEL 擬議300毫米寬梯級渠
  - PROPOSED HANDRAILING (REFER TO CEDD STANDARD DRAWING NO. C2103J) 擬議扶手欄杆 (參考土木工程拓展署標準圖號 C2103J)
  - MIN. 600mm WIDE STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING (REFER TO CEDD STANDARD DRAWING NOS. C2102/1 AND 2) 單扶手混凝土維修梯級 (至少600毫米寬) 參考土木工程拓展署標準圖號 C2102/1 及 C2102/2

| No.           | Date | Description     | Initial |
|---------------|------|-----------------|---------|
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| Designed      |      | JLCW            | 03/17   |
| Drawn         |      | ZHJ             | 03/17   |
| Checked       |      | LS              | 03/17   |
| Approved      |      | WWL             | 03/17   |
| Agreement No. |      | CE33/2013 (GE)  | -       |
| Drawing No.   |      | 60331720/SK3136 | 03/17   |

Drawing Title  
 Study Area No. 7NW-C/SA2  
 NG TUNG CHAI ALONG LAM  
 KAM ROAD, TAI PO  
 大埔林錦路梧桐寮的調查範圍7NW-C/SA2  
 PLAN OF WORKS FOR  
 RIGID BARRIER RBO1  
 擬議泥石壩RBO1總平面圖

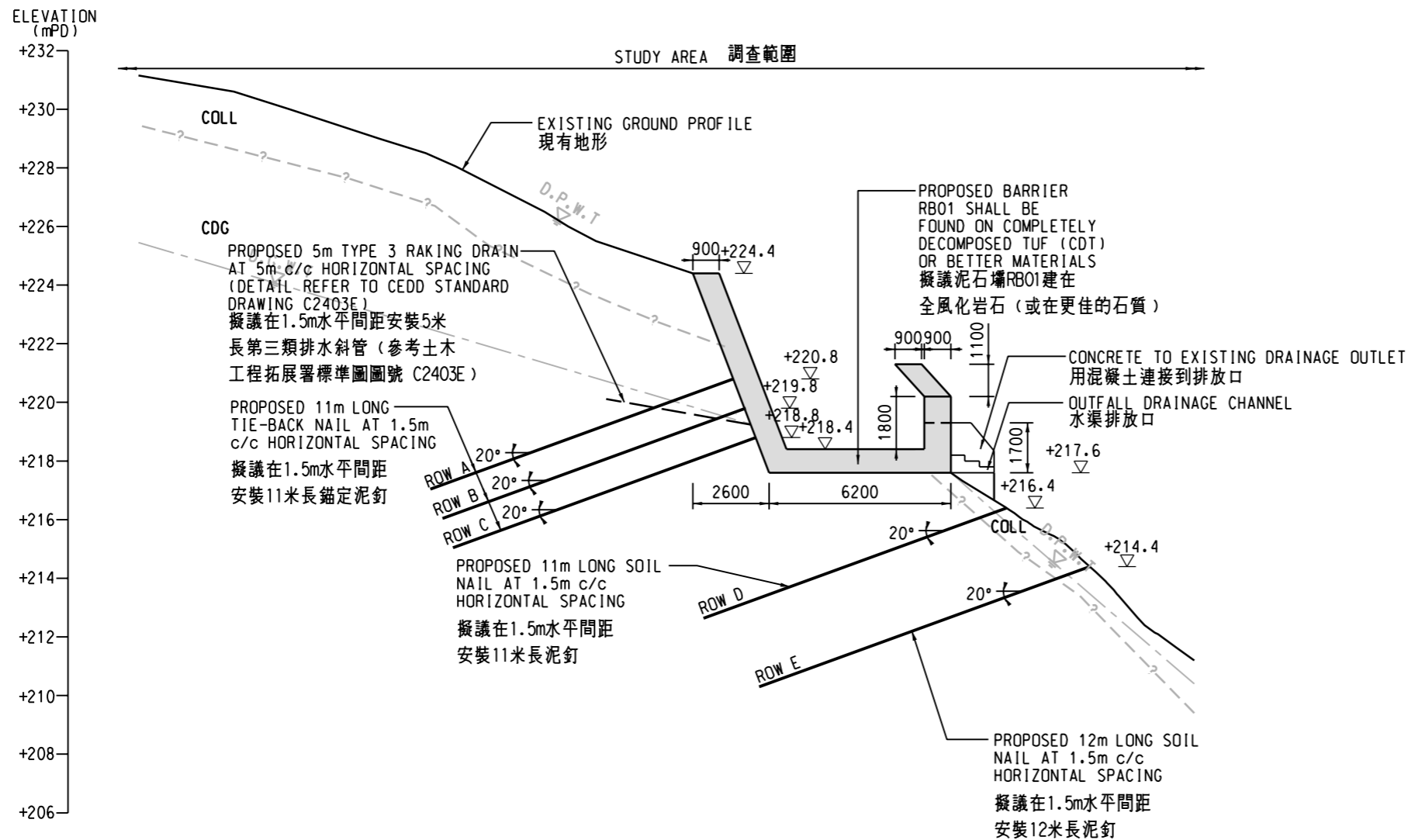
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**AECOM**

- LEGEND:**
- MIN. 600mm WIDE CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING (REFER TO CEDD STANDARD DRAWING NO. C2101D)
  - 雙扶手混凝土維修梯級 (至少600毫米寬) 參考土木工程拓展署標準圖號 C2101D
  - LOCKABLE ACCESS GATE 擬議可上鎖斜坡維修通道閘
  - PROPOSED CATCHPIT 擬議集水井
  - PROPOSED SOIL NAIL 擬議泥釘

SCALE 1 : 200



SECTION A - A  
SCALE 1 : 200

NOTES:

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3. ALL LEVELS ARE IN METRES ABOVE P.D.

註:

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2. 除非另有說明, 所有尺寸均為毫米。
3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。

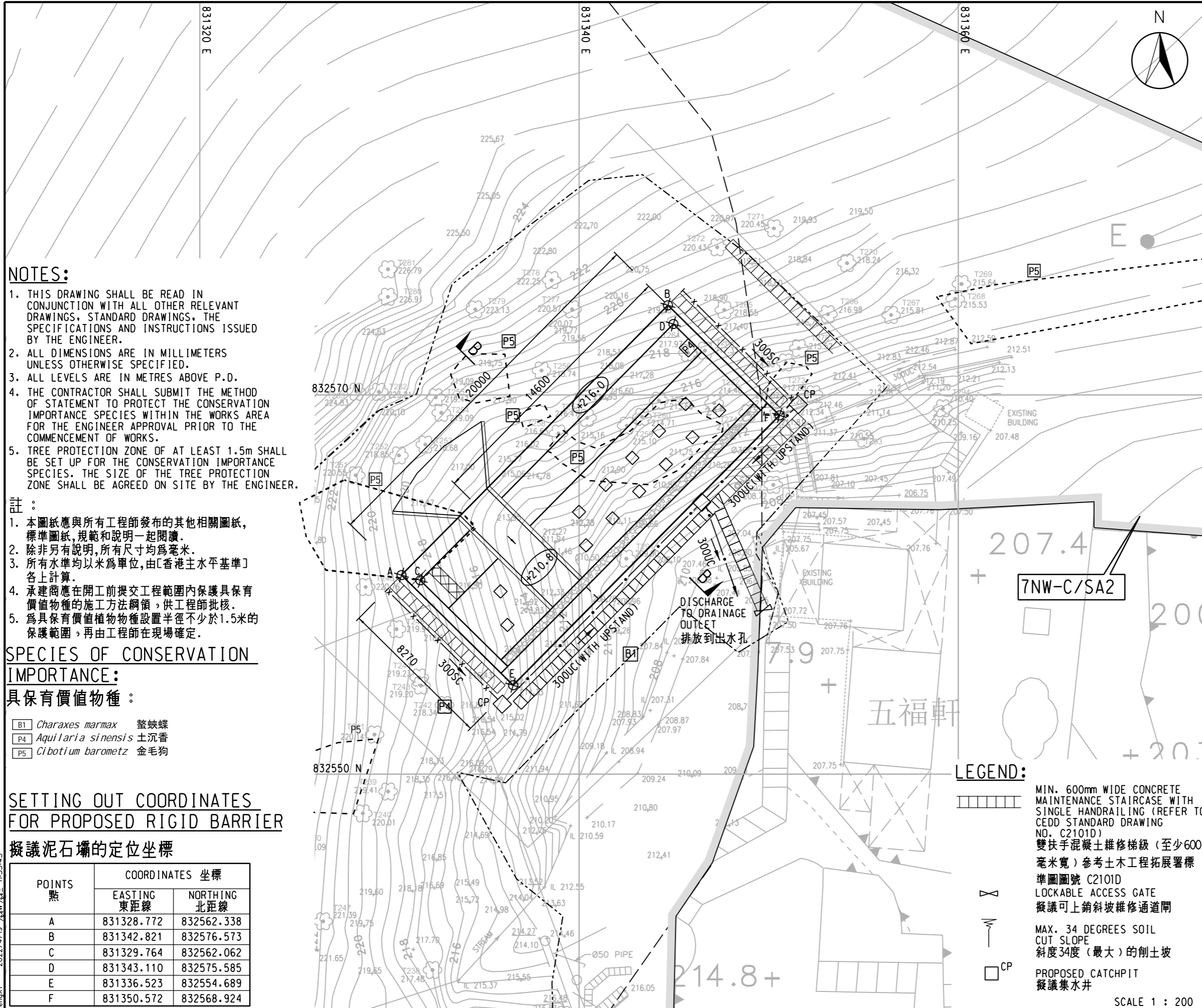
| No.           | Date | Description     | Initial |
|---------------|------|-----------------|---------|
| REVISION      |      |                 |         |
|               |      | Name            | Date    |
| Designed      |      | JLCW            | 03/17   |
| Drawn         |      | ZHJ             | 03/17   |
| Checked       |      | LS              | 03/17   |
| Approved      |      | WWL             | 03/17   |
| Agreement No. |      | CE33/2013 (GE)  | -       |
| Drawing No.   |      | 60331720/SK3137 | 03/17   |

Drawing Title  
Study Area No. 7NW-C/SA2  
NG TUNG CHAI ALONG LAM  
KAM ROAD, TAI PO  
大埔林錦路梧桐寨的調查範圍7NW-C/SA2  
SECTION FOR  
RIGID BARRIER RB01  
擬議泥石壩RB01剖面示意圖

GEOTECHNICAL ENGINEERING  
OFFICE 土力工程處

CEDD Civil Engineering and  
Development Department

AECOM



**NOTES:**

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2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
3. ALL LEVELS ARE IN METRES ABOVE P.D.
4. THE CONTRACTOR SHALL SUBMIT THE METHOD OF STATEMENT TO PROTECT THE CONSERVATION IMPORTANCE SPECIES WITHIN THE WORKS AREA FOR THE ENGINEER APPROVAL PRIOR TO THE COMMENCEMENT OF WORKS.
5. TREE PROTECTION ZONE OF AT LEAST 1.5m SHALL BE SET UP FOR THE CONSERVATION IMPORTANCE SPECIES. THE SIZE OF THE TREE PROTECTION ZONE SHALL BE AGREED ON SITE BY THE ENGINEER.

**註:**

1. 本圖紙應與所有工程師發布的其他相關圖紙、標準圖紙、規範和說明一起閱讀。
2. 除非另有說明，所有尺寸均為毫米。
3. 所有水準均以米為單位，由[香港主水平基準]各上計算。
4. 承建商應在開工前提交工程範圍內保護具有價值物種的施工方法綱領，供工程師批核。
5. 為具有價值植物物種設置半徑不少於1.5米的保護範圍，再由工程師在現場確定。

**SPECIES OF CONSERVATION IMPORTANCE:**

具保育價值物種:

- [B1] *Charaxes marmax* 螯蛱蝶
- [P4] *Aquilaria sinensis* 土沉香
- [P5] *Cibotium barometz* 金毛狗

**SETTING OUT COORDINATES FOR PROPOSED RIGID BARRIER**

擬議泥石壩的定位坐標

| POINTS 點 | COORDINATES 坐標 |              |
|----------|----------------|--------------|
|          | EASTING 東距線    | NORTHING 北距線 |
| A        | 831328.772     | 832562.338   |
| B        | 831342.821     | 832576.573   |
| C        | 831329.764     | 832562.062   |
| D        | 831343.110     | 832575.585   |
| E        | 831336.523     | 832554.689   |
| F        | 831350.572     | 832568.924   |

**LEGEND:**

- [Symbol] STUDY AREA BOUNDARY 調查範圍
- [Symbol] HILLSIDE CATCHMENT 天然山坡
- [Symbol] WORKS BOUNDARY 工程範圍
- [Symbol] 50 EXISTING CONTOUR LINE 現有等高線
- [Symbol] +17.9 EXISTING GROUND LEVEL 現有地面標高
- [Symbol] EXISTING SLOPE 現有人造斜坡
- [Symbol] PROPOSED GABION WALL 擬建框式擋土牆
- [Symbol] PROPOSED HYDROSEEDING 擬噴草範圍
- [Symbol] (+214.9) PROPOSED DESIGN FINISHED TOP LEVEL 擬設計完成表面標高
- [Symbol] 300UC PROPOSED 300mm U-CHANNEL 擬議300毫米寬U型渠道
- [Symbol] 300SC PROPOSED 300mm STEPPED CHANNEL 擬議300毫米寬梯級渠
- [Symbol] PROPOSED HANDRAILING (REFER TO CEDD STANDARD DRAWING NO. C2103J) 擬議扶手欄杆 (參考土木工程拓展署標準圖號 C2103J)
- [Symbol] MIN. 600mm WIDE STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING (REFER TO CEDD STANDARD DRAWING NOS. C2102/1 AND 2) 單扶手混凝土維修梯級 (至少600毫米寬) 參考土木工程拓展署標準圖號 C2102/1 及 C2102/2

| No.           | Date | Description     | Initial |
|---------------|------|-----------------|---------|
| REVISION      |      |                 |         |
|               |      | Name            | Date    |
| Designed      |      | JLCW            | 03/17   |
| Drawn         |      | ZHJ             | 03/17   |
| Checked       |      | LS              | 03/17   |
| Approved      |      | WWL             | 03/17   |
| Agreement No. |      | CE33/2013 (GE)  | -       |
| Drawing No.   |      | 60331720/SK3138 | 03/17   |

Drawing Title  
 Study Area No. 7NW-C/SA2  
 NG TUNG CHAI ALONG LAM  
 KAM ROAD, TAI PO  
 大埔林錦路稻桐寨的調查範圍7NW-C/SA2  
 PLAN OF WORKS FOR  
 RIGID BARRIER B02  
 擬議泥石壩B02總平面圖

GEOTECHNICAL ENGINEERING OFFICE 土力工程處

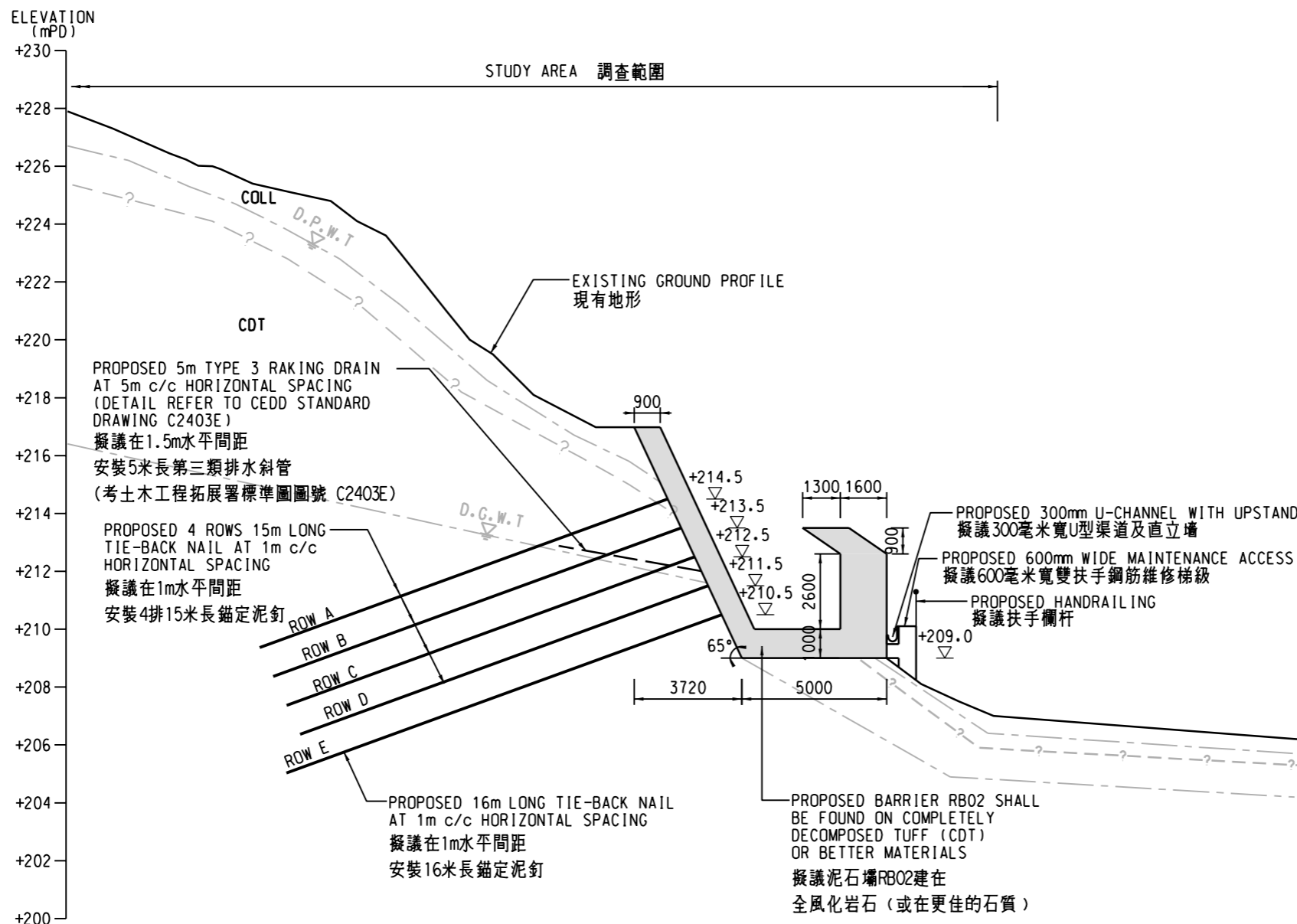
CEDD Civil Engineering and Development Department

**LEGEND:**

- [Symbol] MIN. 600mm WIDE CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING (REFER TO CEDD STANDARD DRAWING NO. C2101D) 雙扶手混凝土維修梯級 (至少600毫米寬) 參考土木工程拓展署標準圖號 C2101D
- [Symbol] LOCKABLE ACCESS GATE 擬議可上鎖斜坡維修通道閘
- [Symbol] MAX. 34 DEGREES SOIL CUT SLOPE 斜度34度(最大)的削土坡
- [Symbol] CP PROPOSED CATCHPIT 擬議集水井

SCALE 1 : 200

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**SECTION B - B**  
SCALE 1 : 200

- NOTES:**
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, STANDARD DRAWINGS, THE SPECIFICATIONS AND INSTRUCTIONS ISSUED BY THE ENGINEER.
  2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  3. ALL LEVELS ARE IN METRES ABOVE P.D.
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  2. 除非另有說明, 所有尺寸均為毫米.
  3. 所有水準均以米為單位, 由[香港主水平基準]各上計算.

| No.           | Date            | Description | Initial |
|---------------|-----------------|-------------|---------|
| REVISION      |                 |             |         |
|               |                 | Name        | Date    |
| Designed      |                 | JLCW        | 03/17   |
| Drawn         |                 | ZHJ         | 03/17   |
| Checked       |                 | LS          | 03/17   |
| Approved      |                 | WWL         | 03/17   |
| Agreement No. | CE33/2013 (GE)  |             | -       |
| Drawing No.   | 60331720/SK3139 |             | 03/17   |

Drawing Title  
 Study Area No. 7NW-C/SA2  
 NG TUNG CHAI ALONG LAM  
 KAM ROAD, TAI PO  
 大埔林錦路梧桐寨的調查範圍7NW-C/SA2  
 SECTION FOR  
 RIGID BARRIER RB02  
 擬議泥石壩RB02面示意圖

GEOTECHNICAL ENGINEERING  
 OFFICE 土力工程處





**NOTES:**

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3. ALL LEVELS ARE IN METRES ABOVE P.D.
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5. THE CONTRACTOR SHALL SUBMIT THE METHOD OF STATEMENT TO PROTECT THE CONSERVATION IMPORTANCE SPECIES WITHIN THE WORKS AREA FOR THE ENGINEER APPROVAL PRIOR TO THE COMMENCEMENT OF WORKS.

**註:**

1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
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3. 所有水準均以米為單位, 由[香港主水平基準]各上計算。
4. 承建商應在開工前提交工程範圍內保護具保育價值物種的施工方法綱領, 供工程師批核。
5. 為具保育價值植物物種設置半徑不少於1.5米的保護範圍, 再由工程師在現場確定。

**SPECIES OF CONSERVATION IMPORTANCE:**

**具保育價值物種:**

- [H1] *Lycodon futsingensis* 黑背白環蛇
- [H2] *Quasipaa exilispinosa* 小棘蛙
- [P1] *Neottopteris nidus* 巢蕨  
on Tree No. 202 (樹木編號T202上)
- [P2] *Dioscorea pentaphylla* 五葉薯蕷
- [P3] *Gnetum luofuense* 羅浮買麻藤
- [P5] *Cibotium barometz* 金毛狗

**SETTING OUT POINT 定位點**

| SETTING OUT 定位 | COORDINATES 坐標 |              |
|----------------|----------------|--------------|
|                | EASTING 東距線    | NORTHING 北距線 |
| DW01-A         | 831394.793     | 832509.315   |
| DW01-B         | 831396.098     | 832507.769   |
| DW01-C         | 831410.652     | 832521.382   |
| DW01-D         | 831409.664     | 832522.511   |

**LEGEND:**

- STUDY AREA BOUNDARY 調查範圍
- HILLSIDE CATCHMENT 天然山坡
- WORKS BOUNDARY 工程範圍
- EXISTING CONTOUR LINE 現有等高線
- EXISTING GROUND LEVEL 現有地面標高
- EXISTING SLOPE 現有人造斜坡
- DW01-A SETTING OUT POINT DW01-A定位點
- SST BOUNDARY 短期租約邊界
- PROPOSED DEFLECTOR WALL 擬議導流牆
- PROPOSED 500mm THICK GABION BLOCKS 擬建500毫米厚框式擋土牆
- TAI MO SHAN COUNTRY PARK 大帽山郊野公園
- NG TUNG CHAI SPECIAL AREA 梧桐寨特別地區

| No.           | Date | Description     | Initial |
|---------------|------|-----------------|---------|
| REVISION      |      |                 |         |
|               |      | Name            | Date    |
| Designed      |      | JLCW            | 03/17   |
| Drawn         |      | ZHJ             | 03/17   |
| Checked       |      | LS              | 03/17   |
| Approved      |      | WWL             | 03/17   |
| Agreement No. |      | CE33/2013 (GE)  | -       |
| Drawing No.   |      | 60331720/SK3140 | 03/17   |

Drawing Title  
 Study Area No. 7NW-C/SA2  
 NG TUNG CHAI ALONG LAM  
 KAM ROAD, TAI PO  
 大埔林錦路梧桐寨的調查範圍7NW-C/SA2  
 PLAN OF WORKS FOR  
 DEFLECTOR WALL DW01  
 擬議導流牆DW01總平面圖

GEOTECHNICAL ENGINEERING OFFICE 土力工程處

**CEDD Civil Engineering and Development Department**

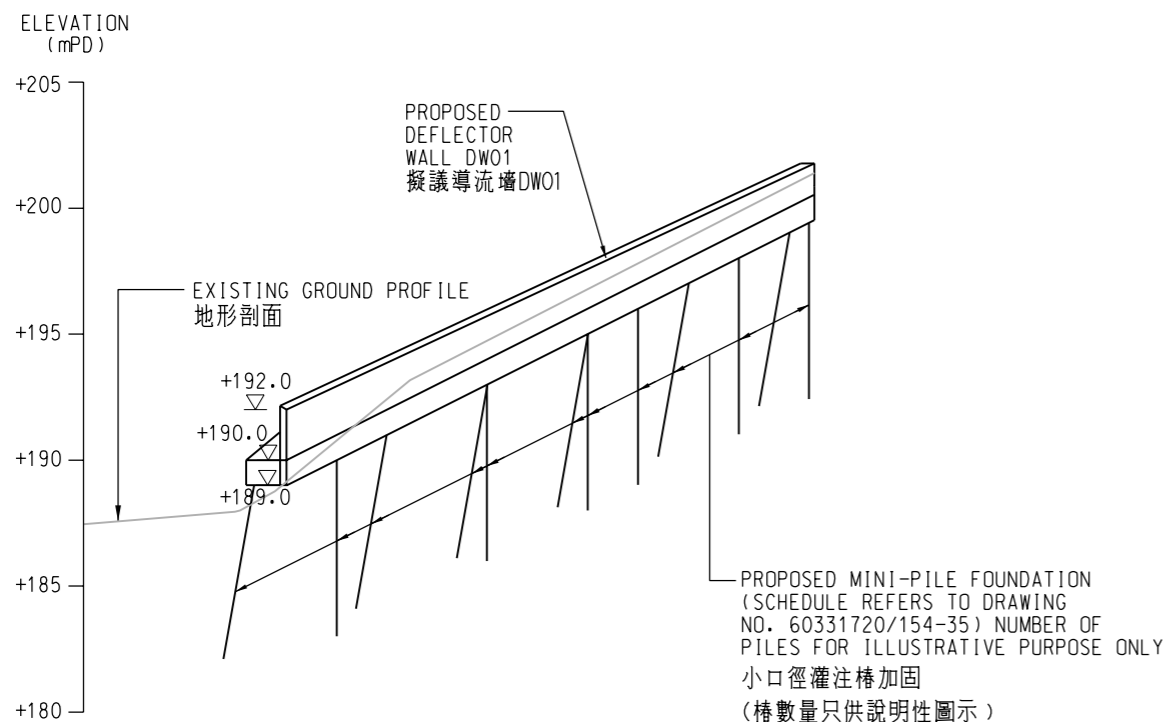
**AECOM**

SCALE 1 : 200

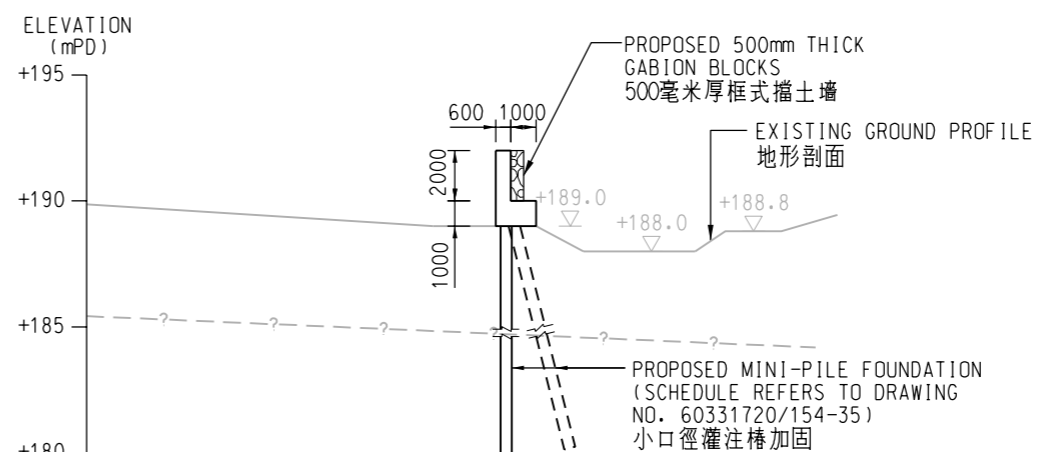
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ELEVATION  
SCALE 1 : 300



SECTION D - D  
SCALE 1 : 300

NOTES:

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3. 所有水準均以米為單位, 由[香港主水平基準]各上計算.

| No.           | Date            | Description | Initial |
|---------------|-----------------|-------------|---------|
| REVISION      |                 |             |         |
| Drawing Title | Name            | Date        |         |
| Designed      | JLCW            | 03/17       |         |
| Drawn         | XDP             | 03/17       |         |
| Checked       | LS              | 03/17       |         |
| Approved      | WWL             | 03/17       |         |
| Agreement No. | CE33/2013 (GE)  | -           |         |
| Drawing No.   | 60331720/SK3141 | 03/17       |         |

Drawing Title  
Study Area No. 7NW-C/SA2  
NG TUNG CHAI ALONG LAM  
KAM ROAD, TAI PO  
大埔林錦路梧桐寨的調查範圍7NW-C/SA2  
SECTION FOR DEFLECTOR  
WALL DW01  
擬議導流牆DW01剖面示意圖

GEOTECHNICAL ENGINEERING  
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PREVIOUS EXAMPLES OF RIGID BARRIER FOR NATURAL TERRAIN  
HAZARDS MITIGATION WORKS  
用於防治山泥傾瀉工程的泥石壩例子



PREVIOUS EXAMPLES OF DEFLECTOR WALL  
WITH GABION BLOCK FOR NATURAL TERRAIN  
HAZARDS MITIGATION WORKS  
用於防治山泥傾瀉工程導流牆及石籠例子

| REVISION      |                 |       |
|---------------|-----------------|-------|
| Drawing Title | Name            | Date  |
| Designed      | -               | 08/11 |
| Drawn         | LL              | 08/11 |
| Checked       | AL              | 08/11 |
| Approved      | CI              | 08/11 |
| Agreement No. | CE33/2013 (GE)  | -     |
| Drawing No.   | 60331720/PH7001 | 08/11 |

Drawing Title  
PREVIOUS EXAMPLES OF RIGID BARRIER AND  
DEFLECTOR WALL FOR NATURAL TERRAIN  
HAZARDS MITIGATION WORKS  
用於防治山泥傾瀉工程的泥石壩和導流牆例子

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**Appendix 2.1**  
**Tentative Construction Programme**

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| Act no.<br>工項  | Main construction elements<br>主要建築項目                         | Tentative Construction Period (Month)<br>暫定施工週期(月) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|--|--|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|  |  | 1st  | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th | 13th | 14th |
| <b>1. Construction of Rigid Barrier (RB01) 建造泥石壩(RB01)</b> |  |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| 1.1  | Site Clearance<br>場地清理                                       | ■  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| 1.2  | Initial survey & hoarding<br>施工前測量&臨時圍籬                      |  | ■   |     |     |     |     |     |     |     |      |      |      |      |      |
| 1.3  | Install soil nail<br>裝設泥釘                                    |  |     | ■   |     |     |     |     |     |     |      |      |      |      |      |
| 1.4  | Construciton of soil nail head<br>建造泥釘頭                      |  |     |     | ■   |     |     |     |     |     |      |      |      |      |      |
| 1.5  | Excavation for RB01*<br>RB01的挖掘工程*                           |  |     | ■   |     |     |     | ■   |     |     |      |      |      |      |      |
| 1.6  | Install tie back nails*<br>裝設錨定釘                             |  |     |     | ■   |     |     |     | ■   |     |      |      |      |      |      |
| 1.7  | Construciton of RB01 base*<br>建造RB01基底                       |  |     |     |     | ■   |     |     |     | ■   |      |      |      |      |      |
| 1.8  | Construciton of RB01 back wall and side wall*<br>建造RB01擋牆和側牆 |  |     |     |     |     | ■   |     |     |     | ■    |      |      |      |      |
| 1.9  | Construciton of RB01 front wall*<br>建造RB01頭牆                 |  |     |     |     |     |     | ■   |     |     |      | ■    |      |      |      |
| 1.10   | Construciton of Gabion wall<br>建造石籠護土牆                       |  |     |     |     |     |     |     |     |     |      |      | ■    |      |      |
| 1.11   | Maintenance staircase and drainage system<br>維修通道和排水系統       |  |     |     |     |     |     |     |     |     |      |      | ■    |      |      |
| 1.12   | Landscape works<br>環境美化工程                                    |  |     |     |     |     |     |     |     |     |      |      |      | ■    |      |
| 1.13   | Site Clearance and dismentle of hoarding<br>場地清理和拆卸臨時圍籬      |  |     |     |     |     |     |     |     |     |      |      |      |      | ■    |

Note:

\* Total length of RB01 is 20m. Construction of RB01 would be divided in two short section of work bay (~ 10 m each) and be undertaken in phases for activity nos. 1.5 to 1.9.

註：

\* RB01總長為20米。RB01的建造會分為2個較短（約10米）的工作區，並於工項1.5至1.9中分階段進行。

| Act no.<br>工項  | Main construction elements<br>主要建築項目                         | Tentative Construction Period (Month)<br>暫定施工週期(月) |     |     |     |     |     |     |     |     |      |      |      |      |      |
|--|--|--|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|
|  |  | 1st  | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th | 10th | 11th | 12th | 13th | 14th |
| <b>2. Construction of Rigid Barrier (RB02) 建造泥石壩(RB02)</b> |  |  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| 2.1  | Site Clearance<br>場地清理                                       | ■  |     |     |     |     |     |     |     |     |      |      |      |      |      |
| 2.2  | Initial survey & hoarding<br>施工前測量 & 設立臨時圍籬                  |  | ■   |     |     |     |     |     |     |     |      |      |      |      |      |
| 2.3  | Install soil nail<br>裝設泥釘                                    |  |     | ■   |     |     |     |     |     |     |      |      |      |      |      |
| 2.4  | Construction of soil nail head<br>建造泥釘頭                      |  |     |     | ■   |     |     |     |     |     |      |      |      |      |      |
| 2.5  | Excavation for RB02*<br>RB02的挖掘工程*                           |  |     | ■   |     |     |     | ■   |     |     |      |      |      |      |      |
| 2.6  | Install tie back nails*<br>裝設錨定釘                             |  |     |     | ■   |     |     |     | ■   |     |      |      |      |      |      |
| 2.7  | Construction of RB02 base*<br>建造RB02基底                       |  |     |     |     | ■   |     |     |     | ■   |      |      |      |      |      |
| 2.8  | Construction of RB02 back wall and side wall*<br>建造RB02擋牆和側牆 |  |     |     |     |     | ■   |     |     |     | ■    |      |      |      |      |
| 2.9  | Construction of RB02 front wall*<br>建造RB02頭牆                 |  |     |     |     |     |     | ■   |     |     |      | ■    |      |      |      |
| 2.10   | Construction of Gabion wall<br>建造石籠護土牆                       |  |     |     |     |     |     |     |     |     |      | ■    |      |      |      |
| 2.11   | Maintenance staircase and drainage system<br>維修通道和排水系統       |  |     |     |     |     |     |     |     |     |      | ■    |      |      |      |
| 2.12   | Landscape works<br>環境美化工程                                    |  |     |     |     |     |     |     |     |     |      |      |      | ■    |      |
| 2.13   | Site Clearance and dismentle of hoarding<br>場地清理和拆卸臨時圍籬      |  |     |     |     |     |     |     |     |     |      |      |      |      | ■    |

Note:

\* Total length of RB02 is 20m. Construction of RB02 would be divided in two short section of work bay (~ 10 m each) and be undertaken in phases for activity nos. 2.5 to 2.9.

註：

\* RB02總長為20米。RB02的建造會分為2個較短（約10米）的工作區，並於工項2.5至2.9中分階段進行。

| Act no.<br>工項   | Main construction elements<br>主要建築項目                              | Tentative Construction Period (Month)<br>暫定施工週期(月) |     |     |     |     |     |     |     |     |
|---|---|--|-----|-----|-----|-----|-----|-----|-----|-----|
|   |   | 1st  | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 9th |
| <b>3. Construction of Deflector Wall (DW01) 建造導流牆(DW01)</b> |   |  |     |     |     |     |     |     |     |     |
| 3.1   | Site Clearance & Protection of rare species<br>場地清理 & 為稀有品種進行保護工作 |  |     |     |     |     |     |     |     |     |
| 3.2   | Initial survey & hoarding<br>施工前測量 & 設立臨時圍籬                       |  |     |     |     |     |     |     |     |     |
| 3.3   | Ground investigation<br>地基勘探                                      |  |     |     |     |     |     |     |     |     |
| 3.4   | Construction of minipiles<br>建造小口徑灌注樁                             |  |     |     |     |     |     |     |     |     |
| 3.5   | Construction of DW01 Base<br>建造DW01基底                             |  |     |     |     |     |     |     |     |     |
| 3.6   | Construction of DW01 wall<br>建造DW01牆身                             |  |     |     |     |     |     |     |     |     |
| 3.7   | Painting of wall<br>牆面油漆  |  |     |     |     |     |     |     |     |     |
| 3.8   | Site Clearance and dismantle of hoarding<br>場地清理和拆卸臨時圍籬           |  |     |     |     |     |     |     |     |     |

## Notes:

- 1 Total length of deflector wall is 20m. Each bay is 10m long.
- 2 Two work front is assumed

## 註：

- 1 導流牆總長為20米。每個長10米。
- 2 假設有兩個工作區。

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**Appendix 3.1**  
**Photographs of Project Site**

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PLATE 1 - INDICATIVE LOCATION OF DEFLECTOR WALL DW01  
相片1 - 導流牆DW01的指示性位置



PLATE 2 - INDICATIVE LOCATION OF DEFLECTOR WALL DW01  
相片2 - 導流牆DW01的指示性位置



PLATE 3 - INDICATIVE LOCATION OF RIGID BARRIER RB01  
相片3 - 泥石流RB01的指示性位置



PLATE 4 - INDICATIVE LOCATION OF RIGID BARRIER RB02  
相片4 - 泥石流RB02的指示性位置

- NOTES:**
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, STANDARD DRAWINGS, THE SPECIFICATIONS AND INSTRUCTIONS ISSUED BY THE ENGINEER.
  2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
  3. ALL LEVELS ARE IN METRES ABOVE P.D.
  4. THE ENTIRE PROJECT SITE IS LOCATED WITHIN NG TUNG CHAI SSSI.
- 註:
1. 本圖紙應與所有工程師發布的其他相關圖紙, 標準圖紙, 規範和說明一起閱讀。
  2. 除非另有說明, 所有尺寸均為毫米。
  3. 所有水準均以米為單位, 由「香港主水平基準」各上計算。
  4. 整個工程範圍位於梧桐寨具特殊科學價值地熱內。

- LEGEND:**
- PROJECT SITE  
工程範圍
  - ▤ PROPOSED CONCRETE MAINTENANCE STAIRCASE WITH SINGLE HANDRAILING  
擬建單扶手混凝土維修樓梯
  - ▥ PROPOSED STEEL MAINTENANCE STAIRCASE WITH DOUBLE HANDRAILING  
擬建雙扶手鋼筋維修樓梯
  - ▨ PROPOSED TEMPORARY ACCESS PATH  
擬建臨時通道
  - Ⓟ LOCATION AND DIRECTION OF PHOTOGRAPH TAKEN PHOTO ID  
相片拍攝地點及方向/相片代號

| No.           | Date | Description           | Initial |
|---------------|------|-----------------------|---------|
| REVISION      |      |                       |         |
|               |      | Name                  | Date    |
| Designed      |      | CKL1                  | 06/20   |
| Drawn         |      | XDP                   | 06/20   |
| Checked       |      | ACCK                  | 06/20   |
| Approved      |      | SLC                   | 06/20   |
| Agreement No. |      | CE 33/2013 (GE)       | -       |
| Sheet No.     |      | 60331720/APPENDIX 3.1 | 06/20   |

Sheet Title

**PHOTOGRAPHS OF PROJECT SITE**  
工地相片

**GEOTECHNICAL ENGINEERING OFFICE** 土力工程處

**CEDD** Civil Engineering and Development Department

**AECOM**

SCALE 1 : 500

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**Appendix 3.2**  
**Representative Photographs of Habitats and Species of**  
**Conservation Importance**

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Plate 1  
Indicative location of Rigid Barrier (RB01)



Plate 2  
Indicative location of Rigid Barrier (RB02)



Plate 3  
Indicative location of Deflector Wall (DW01)



Plate 4  
Indicative location of the proposed temporary access

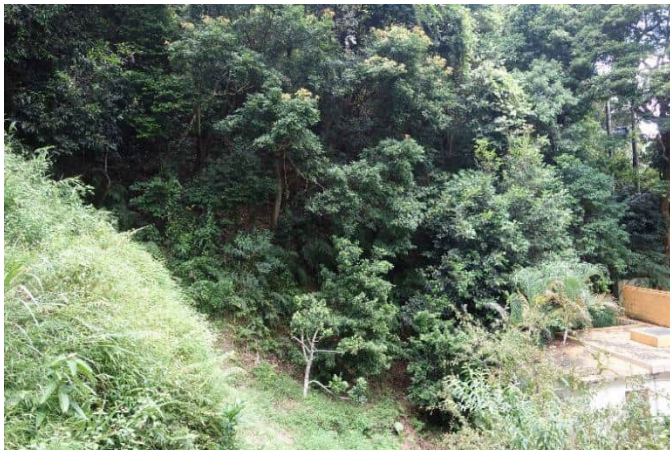


Plate 5  
Woodland in the Surveyed Area



Plate 6  
Developed Area in the Surveyed Area (Man Tak Garden)

|              |   |  |  |  |         |          |                     |          |
|--------------|---|--|--|--|---------|----------|---------------------|----------|
| <b>AECOM</b> | Agreement No. CE 33/2013 (GE) Landslip Prevention and Mitigation Programme, 2013, Package G,<br>Landslip Prevention and Mitigation Works - Investigation, Design and Construction |  |  |  | SCALE   | N.T.S.   | DATE                | May 2020 |
|              | <b>Representative Photographs of Habitats and Species of Conservation Importance</b>  |  |  |  | CHECK   | LAMCCG   | DRAWN               | YIPKYN   |
|              |   |  |  |  | JOB NO. | 60331720 | Appendix No.<br>3.2 | Rev<br>- |



Plate 7  
Natural Watercourse (S1) in the Surveyed Area



Plate 8  
Natural Watercourse (S2) in the Surveyed Area



Plate 9  
Natural Watercourse (S2) in the Surveyed Area



Plate 10  
*Cibotium barometz* recorded within woodland



Plate 11  
*Neottopteris nidus* recorded on Tree 202 at natural watercourse



Plate 12  
*Dioscorea pentaphylla* recorded at natural watercourse

|              |   |         |          |              |          |
|--------------|---|---------|----------|--------------|----------|
| <b>AECOM</b> | Agreement No. CE 33/2013 (GE) Landslip Prevention and Mitigation Programme, 2013, Package G,<br>Landslip Prevention and Mitigation Works - Investigation, Design and Construction | SCALE   | N.T.S.   | DATE         | May 2020 |
|              |   | CHECK   | LAMCCG   | DRAWN        | YIPKYN   |
|              | <b>Representative Photographs of Habitats and Species of Conservation Importance</b>  | JOB NO. | 60331720 | Appendix No. | 3.2      |



Plate 13  
*Gnetum luofuense* recorded within woodland

Plate 14  
*Aquilaria sinensis* seedling

|              |   |  |  |  |         |          |              |          |
|--------------|---|--|--|--|---------|----------|--------------|----------|
| <b>AECOM</b> | Agreement No. CE 33/2013 (GE) Landslip Prevention and Mitigation Programme, 2013, Package G,<br>Landslip Prevention and Mitigation Works - Investigation, Design and Construction |  |  |  | SCALE   | N.T.S.   | DATE         | May 2020 |
|              | <b>Representative Photographs of Habitats and Species of Conservation Importance</b>  |  |  |  | CHECK   | LAMCCG   | DRAWN        | YIPKYN   |
|              |   |  |  |  | JOB NO. | 60331720 | Appendix No. | Rev      |
|              |   |  |  |  |         | 3.2      | -            |          |

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**Appendix 3.3**  
**Plant Species Recorded within the Surveyed Area**

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Appendix 3.3: Plant Species Recorded within the Surveyed Area  
附錄3.3 調查範圍內記錄到的植物物種

| Common Name<br>名稱                   | Scientific Name                     | Growth Form<br>生長型態                    | Native / Exotic<br>to Hong Kong<br>來源(香港) | Distribution in Hong<br>Kong <sup>(1)</sup><br>香港境內現況 <sup>(1)</sup> | Protection Status<br>保育狀況   | Developed<br>Area<br>已發展地區 | Woodland<br>林地 | Natural<br>Watercourse<br>天然水道 |
|-------------------------------------|-------------------------------------|--|---|--|---|----------------------------|----------------|--------------------------------|
| Chinese Buttonbush<br>水團花           | <i>Adina pilulifera</i>             | tree or shrub<br>喬木或灌木                 | native 原生                                 | very<br>common 常見  | -   |                            |                | +                              |
| Chinese Alangium<br>八角楓             | <i>Alangium chinense</i>            | tree or shrub<br>灌木或喬木                 | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Giant Alocasia<br>海芋                | <i>Alocasia macrorrhizos</i>        | perennial herb<br>多年生草本植物              | native 原生                                 | very<br>common 很常見   | -   |                            | +              | +                              |
| <b>Incense Tree</b><br>土沉香          | <b><i>Aquilaria sinensis</i></b>    | tree<br>喬木                             | native 原生                                 | common 常見  | - Listed under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);<br>- List of Wild Plant under State Protection: "Category II";<br>- China Plant Red Data Book: "Vulnerable";<br>- IUCN Red List (ver. 2022.2): "Vulnerable";<br>- Rare and Precious Plants of Hong Kong: "Near Threatened";<br>- Recorded in China Plant Red Data Book and illustration of Rare & endangered plant in Guangdong Province.<br>- 受《動植物(瀕危物種保護)條例》(香港法例第586章)保護;<br>- 國家二級保護野生植物;<br>- 列入《中國植物紅皮書》: 易危;<br>- 列入《國際自然保護聯盟紅色名錄》(2022.2版本): 易危;<br>- 列入《香港稀有及珍貴植物》: 近危;<br>- 已載入《廣東省珍稀瀕危植物圖譜》 |                            | +              |                                |
| Hispid Amischotolype<br>穿鞘花         | <i>Amischotolype hispida</i>        | herb<br>草本植物                           | native 原生                                 | restricted 分佈局限  | -   |                            |                | +                              |
| Autumn Maple<br>秋楓                  | <i>Bischofia javanica</i>           | tree<br>喬木                             | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Oriental Blechnum<br>烏毛蕨            | <i>Blechnum orientale</i>           | herb<br>草本植物                           | native 原生                                 | very<br>common 很常見   | -   |                            | +              | +                              |
| Waxy Leaf<br>黑面神                    | <i>Breynia fruticosa</i>            | shrub<br>灌木                            | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| Common Centotheca<br>假淡竹葉           | <i>Centotheca lappacea</i>          | perennial herb<br>多年生草本植物              | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Chinese Chirita<br>唇柱苣苔             | <i>Chirita sinensis</i>             | herb<br>草本植物                           | native 原生                                 | common 常見  | -   |                            |                | +                              |
| <b>Lamb of Tartary</b><br>金毛狗       | <b><i>Cibotium barometz</i></b>     | large herb<br>草本植物                     | native 原生                                 | very<br>common 很常見   | - Listed under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586);<br>- in Wild Plant under State Protection: "Category II";<br>- Rare and Precious Plants of Hong Kong: "Vulnerable";<br>- 受《動植物(瀕危物種保護)條例》(香港法例第586章)保護;<br>- 國家二級保護野生植物;<br>- 列入《香港稀有及珍貴植物》: 近危   |                            | +++            | +                              |
| Purging Croton<br>巴豆                | <i>Croton tiglium</i>               | shrub<br>灌木                            | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Wood-fern<br>華南毛蕨                   | <i>Cyclosorus parasiticus</i>       | herb<br>草本植物                           | native 原生                                 | very<br>common 很常見   | -   |                            |                | +                              |
| <b>Five-leaved Yam</b><br>五葉薯蕷      | <b><i>Dioscorea pentaphylla</i></b> | climber<br>攀援                          | native 原生                                 | rare 罕見  | -   |                            |                | +                              |
| Woolly-flowered Persimmon<br>烏柿     | <i>Diospyros eriantha</i>           | tree or shrub<br>灌木或喬木                 | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| Japanese Superb Fig<br>華管榕          | <i>Ficus subpiscocarpa</i>          | tree<br>喬木                             | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Common Red-stem Fig<br>青果榕          | <i>Ficus variegata</i>              | tree<br>喬木                             | native 原生                                 | common 常見  | -   |                            | ++             |                                |
| <b>Luofushan Joint-fir</b><br>羅浮買麻藤 | <b><i>Gnetum luofuense</i></b>      | woody vine<br>攀援藤本植物                   | native 原生                                 | very<br>common 很常見   | IUCN Red List (ver. 2022.2): "Near Threatened"<br>列入《國際自然保護聯盟紅色名錄》(2022.2版本): 近危  |                            | +              |                                |
| White Ox Creeper<br>牛白藤             | <i>Hedyotis hedyotideae</i>         | climbing subshrub<br>攀援灌木              | native 原生                                 | very<br>common 很常見   | -   |                            |                | +                              |
| -<br>伏石蕨                            | <i>Lemmaphyllum microphyllum</i>    | herb<br>草本植物                           | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Common Lophantherum<br>淡竹葉          | <i>Lophantherum gracile</i>         | perennial herb<br>多年生草本植物              | native 原生                                 | very<br>common 很常見   | -   |                            |                | +                              |
| Climbing Fern<br>海金沙                | <i>Lygodium japonicum</i>           | climbing herb<br>草本藤本植物                | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| Chekiang Machilus<br>浙江潤楠           | <i>Machilus chekiangensis</i>       | tree<br>喬木                             | native 原生                                 | very<br>common 很常見   | -   |                            | ++++           |                                |
| Many-nerved Machilus<br>刨花潤楠        | <i>Machilus pauhoi</i>              | tree<br>喬木                             | native 原生                                 | -  | -   |                            |                | +                              |
| Thin Evodia<br>蜜茱萸                  | <i>Melicope pteleifolia</i>         | shrub or small tree<br>灌木或小喬木          | native 原生                                 | common 常見  | -   |                            | +              | +                              |
| Microcos<br>布渣葉                     | <i>Microcos nervosa</i>             | shrub or small tree<br>灌木或小喬木          | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Ciliate Microstegium<br>剛莠竹         | <i>Microstegium ciliatum</i>        | perennial procumbent herb<br>多年生匍匐草本植物 | native 原生                                 | very<br>common; 很常見;<br>common <sup>(2)</sup> 常見 <sup>(2)</sup>      | -   |                            | +++            |                                |
| <b>Bird-nest Fern</b><br>巢蕨         | <b><i>Neottopteris nidus</i></b>    | herb<br>草本植物                           | native 原生                                 | restricted 分佈局限  | Listed under Forests and Countryside Ordinance (Cap. 96)<br>已列入《林務規例》(香港法例第96章附例)附表中的植物   |                            |                | +                              |
| Tuberous Sword Fern<br>腎蕨           | <i>Nephrolepis auriculata</i>       | herb<br>草本植物                           | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Vachel's Osmunda<br>華南紫萁            | <i>Osmunda vachelii</i>             | herb<br>草本植物                           | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Chinese Fevervine<br>雞矢藤            | <i>Paederia scandens</i>            | climber: vine<br>攀援藤本植物                | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| Hance's Pepper<br>山蒟                | <i>Piper hancei</i>                 | climber: vine<br>攀援藤本植物                | native 原生                                 | very<br>common 很常見   | -   |                            |                | ++                             |
| Rock Vine<br>石柑                     | <i>Pothos chinensis</i>             | climbing herb<br>攀援草本                  | native 原生                                 | very<br>common 很常見   | -   |                            |                | +                              |
| Wild Coffee<br>九節                   | <i>Psychotria asiatica</i>          | tree or shrub<br>喬木或灌木                 | native 原生                                 | very<br>common 很常見   | -   |                            | ++             | +                              |
| Montana Kudzu<br>葛藤                 | <i>Pueraria lobata var. montana</i> | climber: vine<br>攀援藤本植物                | native 原生                                 | common 常見  | -   |                            | ++             | +                              |
| Little-leaved Rourea<br>小葉紅葉藤       | <i>Rourea microphylla</i>           | climbing shrub<br>攀援灌木                 | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Rusty-haired Raspberry<br>蛇泡勒       | <i>Rubus reflexus</i>               | climbing shrub<br>攀援灌木                 | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| -<br>水東哥                            | <i>Saurauia tristyla</i>            | small tree<br>小喬木                      | native 原生                                 | common 常見  | -   |                            |                | ++                             |
| Ivy Tree<br>雞掌柴                     | <i>Schefflera heptaphylla</i>       | tree<br>喬木                             | native 原生                                 | very<br>common 很常見   | -   |                            | ++             | +                              |
| Palm-grass<br>棕蓋狗尾草                 | <i>Setaria palmifolia</i>           | herb<br>草本植物                           | native 原生                                 | common 常見  | -   |                            |                | +                              |
| Hance's Syzygium<br>韓氏蒲桃            | <i>Syzygium hancei</i>              | tree<br>喬木                             | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Large-flowered Uvaria<br>大花紫玉盤      | <i>Uvaria grandiflora</i>           | woody climbing shrub<br>攀援灌木           | native 原生                                 | restricted 分佈局限  | -   |                            |                | +                              |
| Sweet Viburnum<br>珊瑚樹               | <i>Viburnum odoratissimum</i>       | shrub or small tree<br>灌木或小喬木          | native 原生                                 | very<br>common 很常見   | -   |                            | +              |                                |
| Nodding Wikstroemia<br>細輪蕘花         | <i>Wikstroemia nutans</i>           | shrub<br>灌木                            | native 原生                                 | common 常見  | -   |                            | +              |                                |
| Prickly Ash<br>刺楸花楸                 | <i>Zanthoxylum avicennae</i>        | tree<br>喬木                             | native 原生                                 | common 常見  | -   |                            | +              |                                |

Notes:

註:  
(1) Corlett, R., Xing, F., Ng, S. C., Chau, L., Wong, L. (2010). *Hong Kong Vascular Plants: Distribution and Status*. Memoirs of the Hong Kong Natural History Society. 23:1-3.  
(2) Yip, Y., Yip, K. L., Liu, K. U., Ngar Y. N., Lai, C. C. (2010). A Floristic Survey of Marshes in Hong Kong. *Hong Kong Biodiversity*. Issue No. 19.

Species of conservation importance is in bold type face.

粗體的名稱為具保育價值物種

Code for Abundance: ++++=abundant; +++=frequent; ++=occasional; +=scarce

豐富度: ++++=很常見; +++=常見; ++=偶爾; +=少見

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**Appendix 3.4**  
**Fauna Species Recorded within the Surveyed Area**

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Appendix 3.4: Fauna Species Recorded within the Surveyed Area  
 附錄3.4: 調查範圍內記錄到的動物物種

Avifauna 鳥類

| Common Name <sup>(1)</sup><br>名稱 <sup>(1)</sup> | Scientific Name<br>學名           | Distribution in<br>Hong Kong <sup>(2)</sup><br>香港分佈狀況 <sup>(2)</sup> | Principal<br>Status <sup>(3)</sup><br>香港居留狀況 <sup>(3)</sup> | Level of<br>Concern <sup>(4)</sup><br>受關注程度 <sup>(4)</sup> | Protection<br>Status in<br>China <sup>(5)</sup><br>國家重點保護物<br>種 <sup>(5)</sup> | China Red<br>Data<br>Book <sup>(6)</sup><br>中國瀕危動<br>物紅皮書 <sup>(6)</sup> | Red List of<br>China's<br>Vertebrates <sup>(7)</sup><br>中國脊椎動物紅色<br>名錄 <sup>(7)</sup> | IUCN Red List<br>(Version 2022.2) <sup>(8)</sup><br>世界自然保護聯盟瀕危<br>物種紅色名錄 <sup>(8)</sup> | Developed<br>Area<br>已發展地區 | Woodland<br>林地 | Natural<br>Watercourse<br>天然水道 |
|---|---------------------------------|--|---|--|--|--|---|---|----------------------------|----------------|--------------------------------|
| Chestnut Bulbul<br>栗背短腳鴨                        | <i>Hemixos<br/>castanonotus</i> | Common<br>常見   | R,W   | -  | -  | -  | Least Concern<br>無危   | -   |                            | +              |                                |
| Mountain Tailorbird<br>金頭縫葉鶯                    | <i>Orhotosmus<br/>cuculatus</i> | Uncommon<br>不常見  | -   | -  | -  | -  | -   | -   |                            | +              |                                |
| Japanese White-eye<br>暗綠繡眼鳥                     | <i>Zosterops<br/>japonicus</i>  | Abundant<br>大量   | R,?W  | -  | -  | -  | Least Concern<br>無危   | -   |                            | +              |                                |
| Scarlet-backed Flowerpecker<br>朱背啄花鳥            | <i>Dicaeum<br/>cruentatum</i>   | Common<br>常見   | R   | -  | -  | -  | Least Concern<br>無危   | -   |                            | +              |                                |
| Fork-tailed Sunbird<br>叉尾太陽鳥                    | <i>Aethopyga<br/>christinae</i> | Common<br>常見   | R   | -  | -  | -  | Least Concern<br>無危   | -   |                            | +              |                                |

Notes:

註:

- (1) All wild birds are Protected under Wild Animals Protection Ordinance (Cap. 170).  
所有野生雀鳥都受野生動物保護條例 (香港法例第170章) 保護
- (2) AFCD (2021). Hong Kong Biodiversity Database.  
漁農自然護理署(2021) 香港生物數據庫
- (3) Carey *et al.* (2001): R=resident; W=winter visitor; ?W=extent of migration in winter is unclear.  
Carey *et al.* (2001): R=留鳥; W=冬候鳥; ?W=冬季遷徙確實狀況不明
- (4) Fellowes *et al.* (2002)
- (5) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 14 January, 1989).  
國家林業局(1989) 國家重點保護野生動物名錄(1989年1月14日林業局及農業部發佈施行)
- (6) Zheng, G. M. and Wang, Q. S. (1998). China Red Data Book of Endangered Animals: Aves. First Edition. Beijing: Science Press.  
鄭光美, 王岐山 (1998) 中國瀕危動物紅皮書: 鳥類. 北京: 科學出版社
- (7) Jiang, Z.G., *et al.* (2016). Red List of China's Vertebrates. *Biodiversity Science* 24(5): 500-551.  
蔣志剛等 (2016) 中國脊椎動物紅色名錄. 生物多样性, 24(5), 500.
- (8) IUCN (2023). IUCN Red List of Threatened Species. Version 2022.2.  
國際自然保護聯盟 (2023). 國際自然保護聯盟瀕危物種紅色名錄. 2022.2版本

Code of Abundance: +=Rare

豐富度: +=少見

Appendix 3.4: Fauna Species Recorded within the Surveyed Area  
 附錄3.4: 調查範圍內記錄到的動物物種

Butterfly 蝴蝶

| Common Name<br>名稱                 | Scientific Name<br>學名             | Distribution in<br>Hong Kong <sup>(1)</sup><br>香港分佈狀況 <sup>(1)</sup> | Level of<br>Concern <sup>(2)</sup><br>受關注程度 <sup>(2)</sup> | Protection<br>Status in China <sup>(3)</sup><br>國家重點保護物種 <sup>(3)</sup> | IUCN Red List<br>(Version 2022.2) <sup>(4)</sup><br>世界自然保護聯盟<br>瀕危物種紅色名錄 <sup>(5)</sup> | Developed<br>Area<br>已發展地區 | Woodland<br>林地 | Natural<br>Watercourse<br>天然水道 |
|-----------------------------------|-----------------------------------|--|--|---|---|----------------------------|----------------|--------------------------------|
| Common Bluebottle<br>青鳳蝶          | <i>Graphium sarpedon sarpedon</i> | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Common Mormon<br>玉帶鳳蝶             | <i>Papilio polytes polytes</i>    | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Great Mormon<br>美鳳蝶               | <i>Papilio memnon agenor</i>      | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Spangle<br>藍鳳蝶                    | <i>Papilio protenor protenor</i>  | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Chinese Peacock<br>碧鳳蝶            | <i>Papilio bianor bianor</i>      | Common<br>常見   | -  | -   | -   |                            | +              |                                |
| Paris Peacock<br>巴黎翠鳳蝶            | <i>Papilio paris paris</i>        | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Common Grass Yellow<br>寬邊黃粉蝶      | <i>Eurema hecabe hecabe</i>       | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Common Hedge Blue<br>鈕灰蝶          | <i>Acytolepis puspa gisca</i>     | Common<br>常見   | -  | -   | -   |                            | +              |                                |
| Common Five-ring<br>雙眼蝶           | <i>Ypthima baldus baldus</i>      | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| <b>Yellow Rajah</b><br><b>螯蛱蝶</b> | <b><i>Charaxes marmax</i></b>     | Uncommon<br>不常見  | LC<br>本地關注   | -   | -   |                            | +              |                                |
| Common Sailer<br>中環蛱蝶             | <i>Neptis hylas hylas</i>         | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |
| Glassy Tiger<br>絹斑蝶               | <i>Parantica aglea melanoides</i> | Common<br>常見   | -  | -   | -   |                            | +              |                                |
| Ceylon Blue Glassy Tiger<br>擬旖斑蝶  | <i>Ideopsis similis similis</i>   | Very common<br>非常常見  | -  | -   | -   |                            | +              |                                |

Notes:

註:

(1) AFCD (2021). Hong Kong Biodiversity Database.

漁農自然護理署(2021) 香港生物數據庫

(2) Fellowes *et al.* (2002): LC=Local Concern.

Fellowes *et al.* (2002): LC =本地關注

(3) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 14 January, 1989).

國家林業局(1989) 國家重點保護野生動物名錄(1989年1月14日林業局及農業部發佈施行)

(4) IUCN (2023). IUCN Red List of Threatened Species. Version 2022.2.

國際自然保護聯盟 (2023). 國際自然保護聯盟瀕危物種紅色名錄. 2022.2版本

Species of conservation importance is in bold type face.

粗體的名稱為具保育價值物種

Code of Abundance: +=Rare

豐富度: +=少見

Appendix 3.4: Fauna Species Recorded within the Surveyed Area

附錄3.4: 調查範圍內記錄到的動物物種

Dragonfly 蜻蜓

| Scientific Name<br>學名    | Common Name                 | Distribution in Hong Kong <sup>(1)</sup><br>香港分佈狀況 <sup>(1)</sup> | Level of Concern <sup>(2)</sup><br>受關注程度 <sup>(2)</sup> | Protection Status in China <sup>(3)</sup><br>國家重點保護物種 <sup>(3)</sup> | IUCN Red List (Version 2022.2) <sup>(4)</sup><br>世界自然保護聯盟瀕危物種紅色名錄 <sup>(4)</sup> | Developed Area<br>已發展地區 | Woodland<br>林地 | Natural Watercourse<br>天然水道 |
|--------------------------|-----------------------------|---|---|--|--|-------------------------|----------------|-----------------------------|
| <i>Orthetrum glaucum</i> | Common Blue Skimmer<br>黑尾灰蜻 | Abundant<br>大量  | -   | -  | -  |                         | +              |                             |

Herpetofauna 兩棲及爬蟲類

| Scientific Name<br>學名         | Common Name                  | Distribution in Hong Kong <sup>(1)</sup><br>香港分佈狀況 <sup>(1)</sup>  | Level of Concern <sup>(2)</sup><br>受關注程度 <sup>(2)</sup> | Protection Status in China <sup>(3)</sup><br>國家重點保護物種 <sup>(3)</sup> | IUCN Red List (Version 2022.2) <sup>(4)</sup><br>世界自然保護聯盟瀕危物種紅色名錄 <sup>(4)</sup> | Developed Area<br>已發展地區 | Woodland<br>林地 | Natural Watercourse<br>天然水道 |
|-------------------------------|------------------------------|--|---|--|--|-------------------------|----------------|-----------------------------|
| <i>Lycodon futsingensis</i>   | Futsing Wolf Snake<br>黑背白環蛇  | Distributed in woodlands in Tai Po Kau Nature Reserve, Tai Mo Shan Country Park and Tai Lam Country Park<br>分佈於大埔滢自然保護區、大帽山郊野公園及大欄郊野公園的林地                  | Local Concern<br>本地關注                                   | -  | -  |                         |                | +                           |
| <i>Opisthotropis balteata</i> | Banded Stream Snake<br>橫紋后稜蛇 | Distributed in streams in Lam Tsuen, Pat Sin Leng Country Park, Sai Kung East Country Park, Sai Kung West Country Park<br>分佈於林村·八仙嶺郊野公園、西貢東郊野公園及西貢西郊野公園的溪澗 | -   | -  | -  |                         |                | +                           |
| <i>Quasipaa exilispinosa</i>  | Lesser Spiny Frog<br>小棘蛙     | Occurs throughout territory<br>全港各區均有分佈  | Potential Global Concern<br>潛在全球性關注                     | -  | Vulnerable   |                         |                | +                           |

Mammal 哺乳類動物

No mammalian species were recorded during the surveys. 在調查期間沒有記錄到哺乳類動物。

Freshwater Community 水生動物

| Scientific Name             | Common Name<br>名稱 | Distribution in Hong Kong <sup>(6)</sup><br>香港分佈狀況 <sup>(6)</sup> | Level of Concern <sup>(2)</sup><br>受關注程度 <sup>(2)</sup> | Protection Status in China <sup>(3)</sup><br>國家重點保護物種 <sup>(3)</sup> | IUCN Red List (Version 2022.2) <sup>(4)</sup><br>世界自然保護聯盟瀕危物種紅色名錄 <sup>(4)</sup> | Developed Area<br>已發展地區 | Woodland<br>林地 | Natural Watercourse<br>天然水道 |
|-----------------------------|-------------------|---|---|--|--|-------------------------|----------------|-----------------------------|
| <b>Snail 螺</b>              |                   |   |   |  |  |                         |                |                             |
| <i>Brotia hainanensis</i>   | -                 | Common<br>常見  | -   | -  | -  |                         |                | +++                         |
| <b>Crustacean 甲殼類</b>       |                   |   |   |  |  |                         |                |                             |
| <i>Caridina cantonensis</i> | -                 | Common<br>常見  | -   | -  | -  |                         |                | ++                          |
| <b>Insect 昆蟲</b>            |                   |   |   |  |  |                         |                |                             |
| <i>Ptilomera tigrina</i>    | -                 | Common<br>常見  | -   | -  | -  |                         |                | +                           |

Notes:

(1) AFCD (2021). Hong Kong Biodiversity Database.

漁農自然護理署(2021) 香港生物數據庫

(2) Fellowes *et al.* (2002)

(3) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 14 January, 1989).

國家林業局(1989) 國家重點保護野生動物名錄(1989年1月14日林業局及農業部發佈施行)

(4) IUCN (2023). IUCN Red List of Threatened Species. Version 2022.2.

國際自然保護聯盟 (2023). 國際自然保護聯盟瀕危物種紅色名錄. 2022.2版本

(6) Dudgeon, D. *et al.* (2004). Hong Kong Field Guides 2 - Hillstreams

杜德俊等(2004) 香港野外圖鑑2 - 山澗

Code of Abundance: +=Rare; ++=Occasional; +++=Common

豐富度: +=少見; ++=偶見; +++=常見

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**Appendix 5.1**  
**Conditions of Working within Water Gathering Ground**

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### **Conditions of Working within Water Gathering Ground**

- (a) Adequate measures shall be taken to ensure that no pollution or siltation occurs to the catchwater and catchments.
- (b) No earth, building materials, fuel oil or toxic materials and other materials which may cause contamination to the water gathering grounds are allowed to be stocked or stored on site.
- (c) All surplus spoil shall be removed from water gathering ground as soon as possible.
- (d) Temporary drains with silt traps shall be constructed at the boundary of the site prior to the commencement of any earthwork.
- (e) Regular cleaning of the silt traps shall be carried out to ensure that they function properly at all time.
- (f) All excavated or filled surfaces which have the risk of erosion shall be protected from erosion at all time.
- (g) Facilities for washing the wheels of vehicles before leaving the site shall be provided.
- (h) Any construction plant which causes pollution to catchwater or catchment due to leakage of oil or fuel shall be removed off site immediately.
- (i) Any soil contamination with fuel leaked from plant shall be removed off site and the voids arising from removal of contaminated soil shall be replaced by suitable material to the approval of the Director of Water Supplies.
- (j) Provision of temporary toilet facilities is to be subject to the approval of the Director of Water Supplies.
- (k) All waterworks access roads must be maintained unobstructed at all time.
- (l) Site formation plans shall be submitted to W.S.D. for approval prior to commencement of work.

- (m) No structure or temporary works shall be erected in the catchwaters without prior approval of W.S.D.
- (n) The Contractor shall be responsible for cleaning frequently any waterworks roads and associated drainage works of mud and debris.
- (o) The Contractor shall limit the gross weight of the vehicles imposed on the waterworks access along catchwaters to 5 tonnes and the axle load to 3 tonnes. He shall apply to W.S.D. with details of his vehicles for using the access.
- (p) The approval for using the access may be withdrawn on written notice to the Contractor by W.S.D. at their absolute discretion.
- (q) The Contractor shall recover immediately his vehicle which fall into the catchwater or stream bed or pay to Government on demand the cost of recovery that may be necessary through the occurrence of any incident caused by the Contractor.
- (r) The Contractor shall carry out repair or reinstatement works to the satisfaction of W.S.D. or pay to Government on demand the cost of repair and reinstatement to any waterworks installations that shall or may be necessary at any time as a result of damage caused by the Contractor or others under his charge.
- (s) No chemicals including fertilizers shall be used without the prior approval from W.S.D.
- (t) Use of pesticides is not allowed within the water gathering grounds. The storage and discharge of pesticide or toxicant, flammable or toxic solvents, petroleum oil or tar and other toxic substances are strictly prohibited within the water gathering ground.