Section 16 Planning Application

Proposed Filling of Land/Pond for Site Formation Works for Permitted Agricultural Use

Planning Statement

EXECUTIVE SUMMARY

(In case of discrepancy between English and Chinese versions, English shall prevail)

This Planning Statement is submitted to the Town Planning Board (hereinafter referred to as "the Board") in support of a planning application (hereinafter referred to as "the application") for the **Proposed Filling of Land/Pond for Site Formation Works for Permitted Agricultural Use** (hereinafter referred to as "the proposed land/pond filling") at a site designated as "KTN-2" at Kwu Tung North, Sheung Shui, New Territories (hereinafter referred to as "the Application Site"). The Planning Statement serves to provide background information and planning justifications in support of the proposed land/pond filling in order to facilitate the consideration by the Board.

The Government has been taking forward various projects with a view to pressing ahead with the development of the Northern Metropolis. With the increasing number of projects being implemented, there is a rising number of livestock farms being affected. With the policy of the Environment and Ecology Bureau to maintain a steady number of livestock supply in Hong Kong, there is a need to ensure the continuous operation of existing livestock farms affected by the development of the Northern Metropolis. In order to provide a proper site for subsequent development of livestock farms, site formation works will have to be carried out involving land/pond filling at the Application Site of an area of approximately 12 400 m^2 with a filling depth ranging from about 0m to 5.8m.

The Application Site falls within an area zoned "Agriculture (1)" ("AGR (1)"), "Open Space" ("O"), and area shown as "Road" on the approved Kwu Tung North Outline Zoning Plan No. S/KTN/4 ("KTN OZP"). The future development of the multi-storey livestock farm will only fall within the "AGR (1)" zone where "Agricultural use" is always permitted. Yet, according to the Notes of the OZP, land/pond filling in "AGR (1)" requires planning permission from the Board. There are no restrictions on filling of land or pond within the "O" zone. In the area designated as 'Road', the existing road will be preserved, both during and after the construction. Any filling within the 'Road' area will be limited to the minimum required to bring the surface up to the level of the adjacent, established road. Hence, planning permission is solely sought for the filling of land/ pond in "AGR (1)" zone. As detailed throughout this Planning Statement, the proposed land/pond filling is well justified on the grounds that:-

a) The proposed land/pond filling is supportive to the Government's policy intention to facilitate the relocation of the livestock farms affected by the Government's development projects;

b) The proposed fill depth has been optimised;

c) No adverse impacts on geotechnical, traffic, environment, ecological, drainage, sewerage, water supply, tree and landscape aspects are envisaged at the Application Site and its surrounding areas of the proposed land/pond filling activity by providing adequate protection and mitigation measures; and

d) Policy support has been obtained for carrying out technical assessments and detailed designs for the proposed land/pond filling.

EXECUTIVE SUMMARY (Cont'd)

To enable the Government to timely implement proposed developments at the sites of the existing affected livestock farms, it is targeted to commence the site formation works at the Application Site in 2024 Q3 for completion in 2025/2026 to be followed by immediate handover of the formed site to Agriculture, Fisheries and Conservation Department for follow-up with the livestock farm trade to provide livestock farms therein for the relocation.

In view of the above and the list of detailed planning justifications in the Planning Statement, it is sincerely hoped that members of the Board will give favourable consideration to approve the current application for the proposed land/pond filling.

行政摘要

（如英文和中文版本有差異，以英文版本為準）

此規劃報告書提交給城市規劃委員會（以下簡稱「城規會」），以支持在新界上水古洞北涉及指定地點「KTN-2」（以下簡稱「申請地點」）提出的擬議填土或填塘以作土地平整工程作准許的農業用途（以下簡稱「擬議的填土或填塘」）的規劃申請（以下簡稱「當前申請」）。此規劃報告書旨在提供背景信息和規劃理據，以支持擬議工程，以便城規會進行考慮。

政府一直在推行各項項目，以推動北部都會區的發展。隨著實施項目數量的增加，受影響的禽畜農場數量也在增加。根據環境及生態局的政策，為了維持香港禽畜供應的穩定，必須確保北部都會區的發展不會影響現有禽畜農場的運作。為了禽畜農場的發展提供適當的土地，本規劃需要在涉及面積約 12 400 平方米的申請地點進行填土或填塘工程，填土或填塘深度約為 0 至 5.8 米。

申請地點位於古洞北分區計劃大綱核准圖編號 S/KTN/4 （下稱「大綱圖」)上劃定為「農業（1）」、「休憩用地」和「道路」的區域內。未來發展的禽畜農場將僅限於「農業（1）」區域內，而「農業用途」屬經常准許的用途。然而，根據「大綱圖」的說明，在「農業（1）」區域內的填土或填塘工程需要城規會的規劃許可。在「休憩用地」區域內，沒有對填土或填塘工程的限制。而在「道路」的區域內，現有道路將會在施工期間和之後得以保留，任何填土或填塘工程都將被限制在使表面達到鄰近已建道路的水平所需的最小程度。因此，本申請僅涉及在「農業（1）」區域內進行填土或填塘工程的規劃許可。擬議的填土或填塘工程在以下幾個方面得到了充分的理據支持：

一. 擬議的填土或填塘工程支持政府促進受政府發展項目影響的禽畜農場遷移的政策意圖;

二. 所擬議的填土或填塘深度已獲最優化;

三. 通過提供足夠的保護及緩解措施，工程不會對土力、交通、環境、生態、排水、排污、供水、樹木和園境方面產生不良影響;以及

四. 就當前申請所提出的填土或填塘工程所進行的技術評估和詳細設計已獲得政策支持。

為了使政府能夠及時在現有受影響的禽畜農場地點發展，當前申請計劃在 2024 年第三季度開始在申請地點進行土地平整工程，預計於 2025/2026 年完成，然後將平整後的土地交給漁農自然護理署與禽畜業界作跟進，以供禽畜農場遷移之用。

鑒於上述及本規劃報告書中的詳細規劃理據，誠摯希望城規會成員能就批准當前申請的填土或填塘工程給予積極考慮。

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1. INTRODUCTION

1.1 Purpose

1.1.1 This Planning Statement is submitted to the Town Planning Board (hereinafter referred to as "the Board") in support of a planning application (hereinafter referred to as "the current application") for the Proposed Land/Pond Filling for Site Formation Works for Permitted Agricultural Use (hereinafter referred to as "the proposed land/pond filling") at a government land, designated as "KTN-2", at Kwu Tung North, Sheung Shui, New Territories (hereinafter referred to as "the Application Site"). The Planning Statement serves to provide background information and planning justifications in support of the proposed land/pond filling in order to facilitate the consideration by the Board. The Application Site has a total area of approximately 12 400 m^2 with a filling depth ranging from about 0m[1] to 5.8m. **Appendix A** indicates the location and layout of the Application Site as well as the zoning of the local area in which the Application Site is located. The Application Site is generally covered by vegetation and, in the centre of the southern area of the Application Site, there appears to be a dried-up pond beneath the vegetation. However, a desk-top review suggests that no surface water has been present since 1999 and the dried-up pond has been obscured by vegetation since 2002, making it difficult to ascertain its precise dimensions or extent.

1.1.2 The Application Site falls within an area zoned "Agriculture (1)" ("AGR (1)"), "Open Space" ("O"), and area shown as "Road" on the approved Kwu Tung North Outline Zoning Plan ("KTN OZP") No. S/KTN/4 (please refer to **Appendix A** for the zoning). According to the Notes of the KTN OZP, permission from the Board is required for land/pond filling in "AGR(1)" zone. Therefore, this Section 16 planning application is submitted. Whilst the proposed land/pond filling involves three zones, i.e. "AGR(1)", "O" and area shown as "Road", the future development of the multi-storey livestock farm will only fall within the "AGR(1)" zone.

1.1.3 The purpose of this planning application is to seek approval from the Board under Section 16 of the Town Planning Ordinance (Cap. 131) to allow the proposed land/pond filling at the Application Site.

[1] Within the Application Site, there are inclined surfaces sloping downwards from near the boundary of the site towards the inner part of the site. The locations with 0m filling are where the soil filling of the proposed land/pond filling works will match with the highest part of such sloping surfaces near the site boundary.

1.2 Background

1.2.1 The Government has been taking forward various projects with a view to pressing ahead with the development of the Northern Metropolis. With the increasing number of projects being implemented, there is a rising number of livestock farms being affected. With the policy of the Environment and Ecology Bureau ("EEB") to maintain a steady number of livestock supply in Hong Kong, there is a need to ensure the continuous operation of existing livestock farms. As committed publicly, Development Bureau ("DEVB"), EEB, Agriculture, Fisheries and Conservation Department of Hong Kong ("AFCD") and the relevant departments formed an inter-departmental working group ("WG") in 2022 to, *inter alia*, formulate measures to facilitate the relocation of livestock farms concerned. The WG decided that the government should assist the affected livestock farmers by identifying suitable government sites and making them ready with provision of basic infrastructure such as site formation, water supply, electricity supply, road access and sewerage, etc. for relocation of livestock farms.

1.2.2 The Policy Address 2023 announced that the EEB, in collaboration with the trade, would publish the Blueprint for the Sustainable Development of Agriculture and Fisheries ("the Blueprint") by the end of 2023. The Blueprint was published in December 2023, of which a target was to embrace the opportunities arising from the development of the Northern Metropolis and encourage all local livestock farms to switch completely to modernised operation in multi-storey buildings with a view to producing quality branded livestock products.

1.2.3 The Application Site, situated in close proximity to Ho Sheung Heung Road ("HSH Road"), is considered suitable[2] as one of the relocation sites ("RS") to be taken forward to facilitate relocation of livestock farms to be displaced in the form of multi-storey livestock farm in light of EEB's policy initiative to switch livestock farms to modernised operation in multi-storey settings.

1.2.4 DEVB invited Civil Engineering and Development Department ("CEDD") as works agent for carrying out the technical assessments to support the s16 application for the proposed land/pond filling at the Application Site. CEDD will also be responsible for the subsequent design and construction of the proposed land /pond filling and associated site formation works for the Application Site. Upon completion of the site formation works, the site will be handed over to the AFCD for follow-up with the livestock industry on the development of the multi-storey livestock farm. AFCD will invite relevant Government departments to include various appropriate requirements in the

[2] The Application Site is suitable for the multi-storey livestock farm development for the following points:
- i. within the Livestock Waste Control Area stipulated in Cap. 354;
- ii. within land use zoning where "Agricultural Use" is a permitted use;
- iii. no sensitive uses in the buffer distance stated in the Hong Kong Planning Standards and Guidelines;
- iv. no development pressure foreseen in the next 20 years or more;
- v. with adequate road access, electrical and water infrastructure, and potential connection to the existing (or planned) public sewerage system; and
- vi. no other livestock farms within 500 m buffer distance for animal health and biosecurity reasons.

tenancy agreement for the future tenant to ensure proper control and management of the future development of the multi-storey livestock farm.

1.2.5 The proposed multi-storey pig farm tentatively consists of a six-storey high livestock farming building. The proposed building has a height of 22.5m, with each floor being 3.75m high. The total gross floor area ("GFA") is around 21,473 m^2, with a plot ratio of 2.361. The maximum number of animals that can be housed is approximately 18,385 pigs. In terms of staff and vehicles, due to the shift system for employees and the use of fully automated processes in certain farm operations, there will be no more than 10 people present at any one time and 26 vehicles movements per day.

1.2.6 Among the 26 vehicles traveling to and from the site, 9 are light vans, 5 are medium trucks, 2 are heavy goods vehicles, and the rest are private cars of the staff. Also, the farm will take steps to streamline the transport process to avoid peak hours, meal times and overnight periods. Furthermore, the trucks transporting the animals will be leak-proof, enclosed, and thoroughly cleansed when entering and leaving the farm. Therefore, the frequency and number of vehicles entering and leaving the site and the transport of animals will not cause any significant nuisance to neighbouring facilities.

1.2.7 As for the permitted multi-storey livestock farm use, with its indicative scheme for illustrative purpose at **Appendix B**, the final design of the multi-storey livestock farm would be subject to review by the relevant Government Departments at a later stage through a variety of means including, but not limited to, conditions imposed by the relevant Government Departments to be included in the tenancy agreement and funding agreement, and licence conditions to be imposed in relation to livestock keeping, public health and environmental protection. According to AFCD, it is tentatively tended to provide six storeys for the multi-storey livestock farm for the following reason:

> "*A six-storey building height is most suitable for the vertical farm project in KTN-2, as it can meet the anticipated production needs envisioned. At the same time, when considering construction and operational costs, the six-storey design has been proven to be more cost-effective than a three-storey design. This design allows for the utilization of vertical space to increase yield, while still maintaining structural stability and manageability, which is crucial for long-term maintenance.*"

1.2.8 It is worth noting that the multi-storey livestock farm development does not form any part of this Section 16 planning application which relates to the proposed land/pond filling only. All information about the multi-storey livestock farm development mentioned in this Planning Statement are indicative, non-binding and subject to change in the detailed design stage.

1.3 Objectives

1.3.1 The current application strives to achieve the following objectives: -

a) The support the Government's policy intention to facilitate the relocation of the livestock farms affected by the Government's development projects;

b) To induce no adverse geotechnical, traffic, environmental, ecological, drainage, water supply, drainage, sewerage, tree and landscape impacts to the Application Site and its surrounding areas of the proposed land/pond filling activity by providing adequate protection and mitigation measures.

1.4 Structure of the Planning Statement

1.4.1 This Planning Statement is divided into 5 chapters. **Chapter 1** is the above introduction outlining the purpose, background and objectives of the current application. **Chapter 2** gives details of the Application Site in terms of current condition, land status, zoning and surrounding land-use characteristics. **Chapter 3** provides details of the current application as well as the design and technical assessments for the proposed land/pond filling whilst planning justifications are given in **Chapter 4**. **Chapter 5** summarizes the concluding remarks for the proposed land/pond filling.

2. SITE PROFILE

2.1 Location

2.1.1 The Application Site located between the east of Lo Wu Correctional Institution and the west of Sheung Yue River, has a total site area of approximately 12 400 m^2. It consists of two sites aligning north and south, separated by an unnamed road connecting to Ho Sheung Heung ("HSH") Road. Some registered and unregistered fill slopes are present within the site boundaries. The location and extent of the Application Site is shown in **Appendix A**.

2.2 Current Condition of the Application Site

2.2.1 The Application Site, currently vacant, is mostly covered in vegetation. In the northern part, there is an electricity pole and overhead power lines. These conditions within the Application Site are shown in the layout plan at **Appendix C**.

2.2.2 About 15 meters away from the southern boundary of the Application Site, towards the south, there is a pylon and overhead power lines. Laying of watermains is currently taking place on the road between the southern and northern parts of the Application Site and at two locations to the southwest of the Application Site. These characteristics outside the Application Site are shown in the layout plan at **Appendix C**.

2.2.3 The Application Site is wholly on government land. A layout plan showing the land status around the Application Site is at **Appendix D**.

2.2.4 The Application Site KTN-2 will be accessible to vehicular traffic commuting to and from Fanling Highway. One of such vehicular traffic routes is shown in **Appendix E**.

2.2.5 The northern part (Site A) of the Application Site is gently sloping towards northwest and the existing ground level slightly drops from +8mPD to +4mPD approximately. The southern part (Site B) of the Application Site is a slightly depressed area. The existing ground level varies from approximately +6mPD to -2mPD. A layout plan showing the existing levels of the Application Site is at **Appendix F**.

2.3 The Current OZP

2.3.1 The site falls within an area zoned "Agriculture (1)" ("AGR (1)"), "Open Space" ("O") and area shown as "Road" on the approved KTN OZP No. S/KTN/4 (the aforesaid zoning in shown in A**ppendix A**). Whilst the proposed land/pond filling involves three zones such as "AGR (1)", "O" and area shown as "Road", the future development of the multi-storey livestock farm will only fall within the "AGR(1)" zone. According to the Notes of the KTN OZP, permission from the Board is required for land/pond filling in "AGR (1)" zone. Therefore, this Section 16 planning application is submitted.

2.4 Surrounding Land-use Characteristics

2.4.1 The area to the east of the Application Site is designated as “Open Space” ("O"), as indicated in the approved KTN OZP No. S/KTN/4. The area to the north of the Application Site is designated as a “Green Belt” ("GB") zone, as specified in the approved Ma Tso Lung and Hoo Hok Wai Outline Zoning Plan (“MTLHHW OZP”) No. S/NE-MTL/3. The area to the south of the Application Site is designated as a “Green Belt” (“GB”) zone, as specified in the approved KTN OZP. The area to the west of the Application Site is designated as a “Government, Institution or Community” (“G/IC(1)”) zone, as specified in the approved KTN OZP, where the Lo Wu Correctional Institution is located. These zonings are shown in **Appendix A**.

3. THE LAND/POND FILLING PROPOSAL

3.1 Site Configuration

3.1.1 The Application Site has a total site area of approximately 12 400 m^2 and the proposed land/pond filling under this application is to provide a formed platform at a level of approximately +7.8mPD with a filling depth ranging from about 0m to 5.8m for the multi-storey livestock farm to be developed. The proposed level of approximately +7.8mPD for the proposed land/pond filling can avoid flooding at the Application Site (see para. 3.5.2 for further details). Moreover, the said proposed level matches the existing road level immediately outside the proposed ingress/egress for the future development in the Application Site so that the land within the Application Site can be utilised efficiently. A layout plan showing the formation levels of the proposed land/pond filling is at **Appendix G**. It is planned to allocate the land of the site, upon completion of the site formation works therein, to AFCD, who will make suitable arrangements for the livestock farm trade to develop the multi-storey livestock farm thereon.

3.1.2 To accommodate the level differences between the formed platform and the adjoining ground outside the site at some locations, part of the formed platform will be laterally supported by retaining walls at locations where the adjoining ground outside the site is below +7.8mPD in level.

3.1.3 The estimation of long-term settlement is carried out based on the available ground information. The total settlement is estimated to be 195.62mm in 50 years of design life. Moreover, the time required for primary consolidation is approximately 3.7 months. In view of the result of settlement assessment, removal of that thin layer of soft material was proposed to be carried out to minimize the long-term settlement.

3.1.4 From the layout plans in **Appendices F** and **G**, the key parameters of the proposed land/pond filling are summarised in **Table 1**:

Table 1: Key Parameters of the Proposed Land/Pond Filling (subject to detailed design)

Key Parameters (Proposed Land/Pond Filling for Site Formation)		
	Northern Portion	Southern Portion
Area of Filling (m^2)	1800	10,600
Depth of Filling (m)	0 - 3.8	1.8 - 5.8
Type of Filling Materials	Compact fill	Compact fill
Existing Ground Level (mPD)	+4.0 - +8.0	+2.0 - +6.0 (locally down to -2mPD)
Proposal Ground Level (mPD)	+7.8	+7.8

3.2 Geotechnical Aspect

3.2.1 The proposed land/pond filling works would have interface with two existing slopes, or registered man-made features nos. 2SE-B/F103 and 2SE-B/FR106. A Geotechnical

Planning Review ("GPR") for the proposed land/pond filling has been conducted with details presented in the GPR Report in **Appendix H**. In gist, the GPR Report concludes that the proposed land/pond filling under this planning application is feasible from the geotechnical perspective.

3.3 Construction Traffic Aspect

3.3.1 To avoid over-congestion of traffic during peak hour, the number of construction vehicles will be restricted and such vehicles will be operated at day-time off-peak [i.e. 10:00 am to 4:00 pm (Mondays to Saturdays)] only. A total volume of construction vehicle of a maximum of 5 Medium Goods Vehicle/hr/direction (i.e. 30 trips of Medium Goods Vehicles ("MGV") per day) (or 10 passenger car unit/hr/direction) is anticipated.

3.3.2 Swept path analysis has been conducted to ensure safe and smooth manoeuvring of construction trucks to the site from HSH Road during construction stage, as shown in **Appendix I**.

3.3.3 As safety precaution measures, "slow" traffic sign, revolving lanterns and banksman will be provided near the site access to ensure pedestrian safety at the local access near the site.

3.3.4 Given the insignificant volume of construction vehicles and pedestrian demand of the existing HSH Road, potential conflict between vehicular and pedestrian traffics will be minimal.

3.3.5 The HSH Road is a single-2-way carriageway where there is a short section of single track access road at the end of the HSH Road near the Application Site. Given the minimal volume of construction vehicle (i.e. 5 MGV/hr/direction during construction of the proposed land/pond filling) plus the capacity of a single track road of accommodating 2-way traffic flows of 100 vehicles per hour based on the Transport Planning and Design Manual ("TPDM") Volume 2 Chapter 3.11, no capacity issue is anticipated at the critical section of the access road.

3.3.6 Given the above, the construction traffic impact of the proposed land/ pond filling is insignificant and upgrading works at HSH Road is not necessary.

3.4 Environmental and Ecological Aspects

3.4.1 An Environmental Assessment and Ecological Impact Assessment ("EA&EcoIA") has been carried out to examine the potential impacts associated with the proposed land/pond filling. Potential environmental impacts including water quality and ecology have been assessed. The details are presented in the EA&EcoIA Report in **Appendix J**. The findings of the EA&EcoIA are summarised in the ensuing paragraphs.

3.4.2 As far as water quality is concerned, potential impacts from general construction activities, construction site runoff, construction works near watercourses, removal / filling of wet area, accidental spillage and sewage from construction workforce are identified. Given the ordinary nature and minor scale of the proposed land/pond filling

works, with the adoption of recommended mitigation measures (e.g. good site practices, Best Management Practices, provision of proper drainage facilities, etc.) during the course of the proposed land/pond filling works, no adverse water quality impact to the identified water sensitive receiver is anticipated.

3.4.3 As far as ecological impact is concerned, potential direct impacts arising from the proposed land/pond filling works may include loss of habitats within recognised sites of conservation importance and key ecological resource (i.e. Long Valley and Ho Sheung Heung Priority Site and Important Bird and Biodiversity Area), habitat loss in marsh / reed, plantation and developed area / wasteland habitats, and potential direct harm to the recorded species of conservation importance of lower mobility (i.e. Taiwan Kukri Snake), within the Application Site . A detailed fauna survey to ascertain the presence of the species of conservation importance within the Application Site would be conducted before commencement of works, and appropriate mitigation measures would be proposed, approved and implemented if individuals of the species are recorded during the survey. On the other hand, indirect impacts arising from the proposed land/pond filling works may include disturbance impacts (i.e. glare, noise, air / dust) and water quality impact on habitats in vicinity and the associated wildlife. However, given that the majority of recorded habitats are developed area or plantation, and recorded species within the assessment area are generalist species which are habituated to disturbed habitats, the disturbance impact is considered as minor to moderate. Nonetheless, good site practices and appropriate mitigation measures according to relevant guidelines including provision of screening and use of quality powered mechanical equipment ("QPME") would be implemented as appropriate to minimise the disturbance impacts. Hence, no adverse indirect impacts would be anticipated.

3.4.4 Precautionary and mitigation measures such as pre-construction egretry and night roost surveys, monthly egretry and Ho Sheung Heung Ardeid Night Roost monitoring, good site practices, proper scheduling of construction activities as far as practicable and provision of screening, etc. would be implemented. With the adoption of the recommended precautionary and mitigation measures, no adverse ecological impact would be anticipated to arise from the proposed site formation works at Application Site .

3.4.5 As far as air and noise impacts are concerned, given the ordinary nature and minor scale of the proposed land/pond filling works, with the implementation of general good sites practices and appropriate mitigation measures according to relevant guidelines including provision of screening and use of QPME, no adverse air quality and noise impact from the proposed works will be anticipated.

3.5 Drainage Aspect

3.5.1 A Drainage Impact Assessment ("DIA") has been conducted, with details presented in **Appendix K**. In gist, the DIA concludes that the proposed land/pond filling will not cause adverse drainage impact by causing additional runoff.

3.5.2 The DIA has reviewed the water levels and the existing drainage system near the Application Site. Having regard to the adverse drainage effect due to climate change at the end of the 21st century, a minimum site formation level of +7.44 mPD is suggested for the Application Site from flood prevention point of view. The proposed formation level of the proposed land/pond filling at the Application Site is +7.80 mPD, which is above the minimum flood prevention level of +7.44 mPD.

3.6 Sewerage Aspect

3.6.1 No sewerage demand will be generated by the proposed land/pond filling. Therefore, there is no sewerage impact arising from the proposed land/pond filling.

3.7 Water Supply Aspect

3.7.1 No water supply demand will be generated by the proposed land/pond filling. Therefore, there is no water supply impact arising from the proposed land/pond filling

3.8 Tree Survey and Landscape Review

3.8.1 A landscape review, including a tree survey, relating to the proposed land/pond filling have been conducted with findings presented in landscape review report at **Appendix L**. This also includes the approved Tree Preservation and Removal Proposal ("TPRP") under Agreement No. CE 19/2019 (CE) (i.e. Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction), with the compensatory planting proposal approved by CEDD's Tree Works Vetting Panel.

3.8.2 No old and valuable tree or protected species have been identified in the Application Site. A total of approximately 237 trees within the Application Site have been surveyed, including 190 nos. of undesirable species – *Leucaena leucocephala* (銀合歡). 1 no. of tree of particular interest (*Ficus microcarpa* (細葉榕), DBH>1000mm) is identified within the Application Site, which would be retained together with 2 other trees. The rest of the trees, which would be inevitably affected by the construction works and not suitable for transplantation, are of common species and would be felled and compensated in a ratio of 1:1 in terms of number. The compensation of the 44 nos. of trees to be removed is in accordance with the Approved TPRP by CEDD's Tree Works Vetting Panel.

3.8.3 Given that the whole area of the Application Site would be almost fully occupied by the multi-storey development, and as advised by AFCD, the provision of tall trees or other similar features in a livestock farm would potentially attract wild birds, which may carry unknown pathogens and would therefore inevitably increase the risk of transmission of various animal diseases to the animals in the farm. Therefore, the majority of the compensatory trees will be planted in an area near the Application Site as shown in the layout plan at Appendix M.

4. PLANNING JUSTIFICATIONS

4.1 The proposed land/pond filling is supportive to Government's Policy Intention

4.1.1 The Government has been taking forward various projects with a view to pressing ahead with the development of the Northern Metropolis. With the increasing number of projects being implemented, there is a rising number of livestock farms being affected. With the policy of the EEB to maintain a steady number of livestock supply in Hong Kong, there is a need to ensure the continuous operation of existing livestock farms. As committed publicly, DEVB, EEB, AFCD and the relevant departments formed an inter-departmental WG in 2022 to, *inter alia*, formulate measures to facilitate the relocation of livestock farms concerned. The WG decided that the government should assist the affected livestock farmers by identifying suitable government sites and making them ready with provision of basic infrastructure such as site formation, water supply, electricity supply, road access and sewerage, etc. for relocation of livestock farms. Therefore, the proposed land/pond filling is supportive to the Government's policy intention to facilitate the relocation of the livestock farms concerned and to assist the livestock farmers affected by the Government's development projects. The proposed livestock farm in the form of multi-storey building, will adopt modernised, and environmentally friendly operation for livestock rearing, with enhanced farming efficiency and biosecurity levels. This initiative is highlighted as one of the policy initiatives in the Government's "Blueprint for the Sustainable Development of Agriculture and Fisheries" published in December 2023 and announced in the Policy Address 2023.

4.2 Fill Depth Optimised

4.2.1 The proposed land/pond filling is essential solely to facilitate permitted uses and to accommodate livestock farms affected by Government projects. The proposed fill depth has been optimised having regard to flood prevention and site utilisation efficiency as supported by the outcomes of technical assessments.

4.3 Technical Assessments Demonstration of No Adverse Impacts in terms of Geotechnical, Traffic, Environment, Ecology, Water Supply, Sewerage, Drainage, Tree and Landscape

4.3.1 Various technical assessments are conducted, including Geotechnical Planning Review, Traffic Impact Assessment*, Environmental Assessment and Ecological Impact Assessment, Drainage Impact Assessment, Sewerage Impact Assessment*, Water Supply Impact Assessment*, and Landscape Review including tree survey, in support of this application. From the findings of the assessments, it has been concluded that the proposed arrangements abovementioned have addressed key technical concerns and the proposed land/pond filling is sustainable with no adverse impacts. Government projects would still be subject to scrutiny of concerned ordinances/regulations in case relevant technical assessments do not form part of this s.16 application.

---

*Assessments that are not included in the Appendices. However, the findings of such assessment have been summarised in Chapter 3 of this planning statement.

4.4 Policy Support

4.4.1 Policy support has been obtained from DEVB in consultation with EEB and AFCD for carrying out technical assessments and detailed designs for the proposed land/pond filling.

5. CONCLUSION

5.1 This Planning Statement is submitted to the Board in support of the application for the proposed land/pond filling at the Application Site in Kwu Tung North. The Planning Statement serves to provide background information and planning justifications in support of the proposed land/pond filling in order to facilitate the consideration by the Board.

5.2 The Application Site is of an area of approximately 12 400 m^2. This Application Site is intended to serve as a relocation site for livestock farms located within or on the periphery of the boundaries of New Development Areas, Potential Development Areas, and new lands under the Northern Metropolis. These farms are expected to be progressively affected by land clearance over the next 20 years.

5.3 The Application Site falls within an area zoned "AGR (1)", "O" and area shown as 'Road' on the approved KTN OZP. Yet, according to the Notes of the OZP, land/pond filling in "AGR (1)" requires planning permission from the Board. There are no restrictions on filling of land or pond within the "O" zone. In the area designated as 'Road', the existing road will be preserved, both during and after the construction. Any filling within the 'Road' area will be limited to the minimum required to bring the surface up to the level of the adjacent, established road. Hence, planning permission is solely sought for the filling of land/ pond in "AGR (1)" zone. As detailed throughout this Planning Statement, the proposed use is well justified on the grounds that:-

a) The proposed land/pond filling is supportive to the Government's policy intention to facilitate the relocation of the livestock farms concerned and to assist the livestock farmers affected by the Government's developments;

b) The proposed fill depth has been optimised;

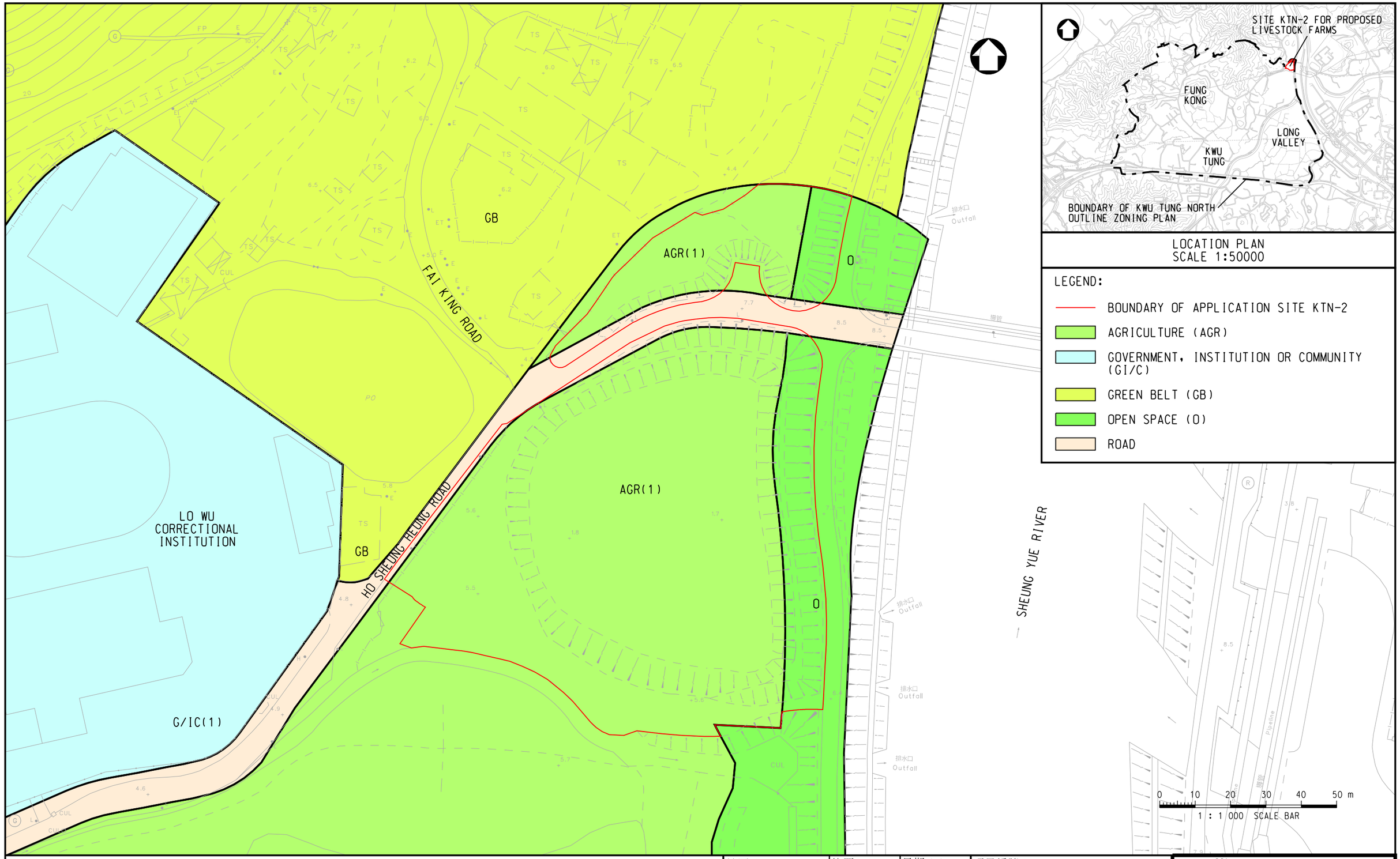
c) No adverse impacts on geotechnical, traffic, environment, ecology, drainage, sewerage, water supply, tree and landscape aspects are envisaged at the Application Site and its surrounding areas as revealed by technical assessments. Government projects would still be subject to scrutiny of concerned ordinances/regulations in case relevant technical assessments do not form part of this s.16 application; and

d) Policy support has been obtained for carrying out technical assessments and detailed designs for the proposed land/pond filling.

5.4 In view of the above and the detailed planning justifications in the Planning Statement, it is sincerely hoped that members of the Board will give favourable consideration to approving the proposed land/pond filling at the Application Site KTN-2 in Kwu Tung North.

Appendix A

Location and Layout Plan of the Application Site with Zoning



LOCATION PLAN
SCALE 1:50000

LEGEND:

- BOUNDARY OF APPLICATION SITE KTN-2
- AGRICULTURE (AGR)
- GOVERNMENT, INSTITUTION OR COMMUNITY (GI/C)
- GREEN BELT (GB)
- OPEN SPACE (O)
- ROAD

圖則名稱 drawing title

LAYOUT PLAN OF APPLICATION SITE KTN-2

繪圖 drawn	簽署 initial	日期 date	項目編號 item no.	辦事處 office
K S WONG		23.04.24		北拓展處 NORTH DEVELOPMENT OFFICE
核對 checked	簽署 initial	日期 date	比例 scale	
K Y LEE		23.04.24	1:1000	
核准 approved	簽署 initial	日期 date	圖則編號 drawing no.	
S LAM		23.04.24	CDNKFNZ0442	土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

R:\Drawing\CSWP\KFN\DRAWING_NDO\CDNKFNZ0442_KTN_PC5\CDNKFNZ0442.dgn

A3 420MM X 297MM

Appendix B

Indicative Scheme of Multi-storey Livestock Farm

Boundary of Application site KTN-2
(Provided by CEDD)

Boundary of MSB site

N

FAI KING ROAD

HOSHEUNG ROAD

NG TUNG GE RIVER

SHEUNG YUE RIVER

ANCILLARY OFFICE
(3 STOREY)

CONTROL RM.

DISINFECT SERVICE AREA

7.3M

4.5M

DRIVEWAY/E.V.A.

7.3M

7.3M

PROPOSED BUILDING BLOCK

DRIVEWAY/E.V.A.

DRIVEWAY/E.V.A.

GRAIN STORAGE
(1 STOREY)

WASTE TREATMENT & E&M RM.
(1 STOREY)

7.3M

FEED STORAGE

LOADING & UNLOADING BAY

DRIVEWAY/E.V.A.

7.3M

SITE 1-MASTER LAYOUT PLAN

SCALE=1:600

REV.	DESCRIPTION	DATE

TONY IP GREEN ARCHITECTS LTD.
葉頌文環保建築師事務所
Unit 328, Mega Cube , 8 Wang Kwong Road,
Kowloon Bay, Hong Kong
T (852) 3596 7800 F (852) 3612 4916
E green@tonyip.green

Check all measurements on site.
Do not scale off drawings.

This drawing is to be read in conjunction with the specification and any discrepancies are to be immediately reported to the Architect.

This drawing remains the copyright property of the Architect and is not to be reproduced in whole or in part without permission of the Architect.

PROJECT TITLE
--

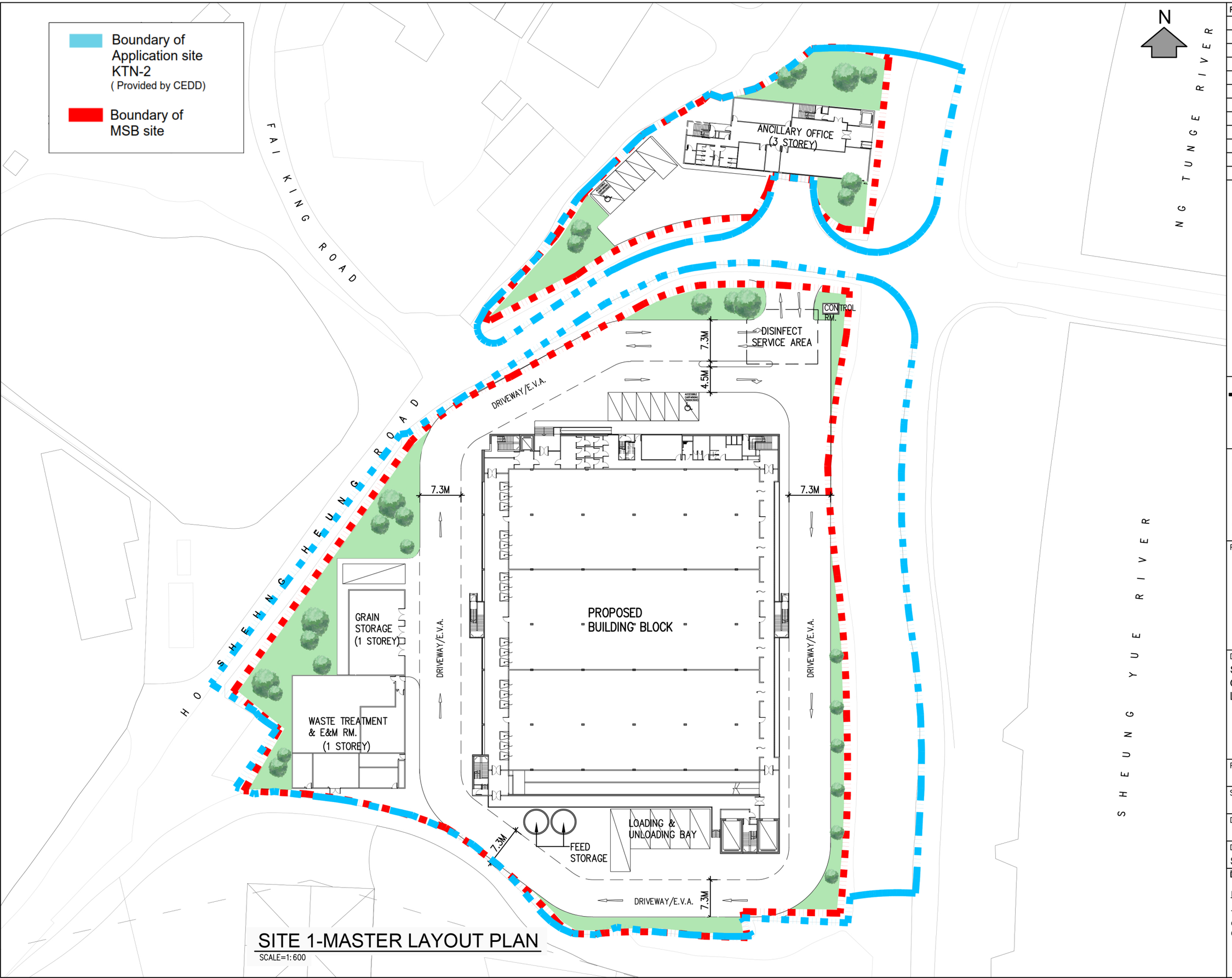
DRAWING TITLE
SITE 1 -
GROUND FLOOR
LAYOUT PLAN

PROJECT NO.	DRAWN BY
	--
SCALE: 1 : 600 @ A3	CHECKED BY: --
DATE	APPROVED BY: --
DRAWING NO.: SK-SITE 1_GROUND FL LAYOUT R2	REV. NO.: --

DRAWING PURPOSE

Remarks:

This indicative layout plan is for reference only. Details are subject to change at the detailed design stage.



SITE 1-MASTER LAYOUT PLAN

SCALE=1:600

REV.	DESCRIPTION	DATE

TONY IP GREEN ARCHITECTS LTD.
葉頌文環保建築師事務所
Unit 328, Mega Cube , 8 Wang Kwong Road, Kowloon Bay, Hong Kong
T (852) 3596 7800 F (852) 3612 4916
E green@tonyip.green

Check all measurements on site.
Do not scale off drawings.

This drawing is to be read in conjunction with the specification and any discrepancies are to be immediately reported to the Architect.

PROJECT TITLE
--

DRAWING TITLE
SITE 1 -
GROUND FLOOR
LAYOUT PLAN

PROJECT NO.	DRAWN BY
	--
SCALE 1 : 600 @ A3	CHECKED BY --
DATE	APPROVED BY --
DRAWING NO. SK-SITE 1_GROUND FL	REV. NO. --

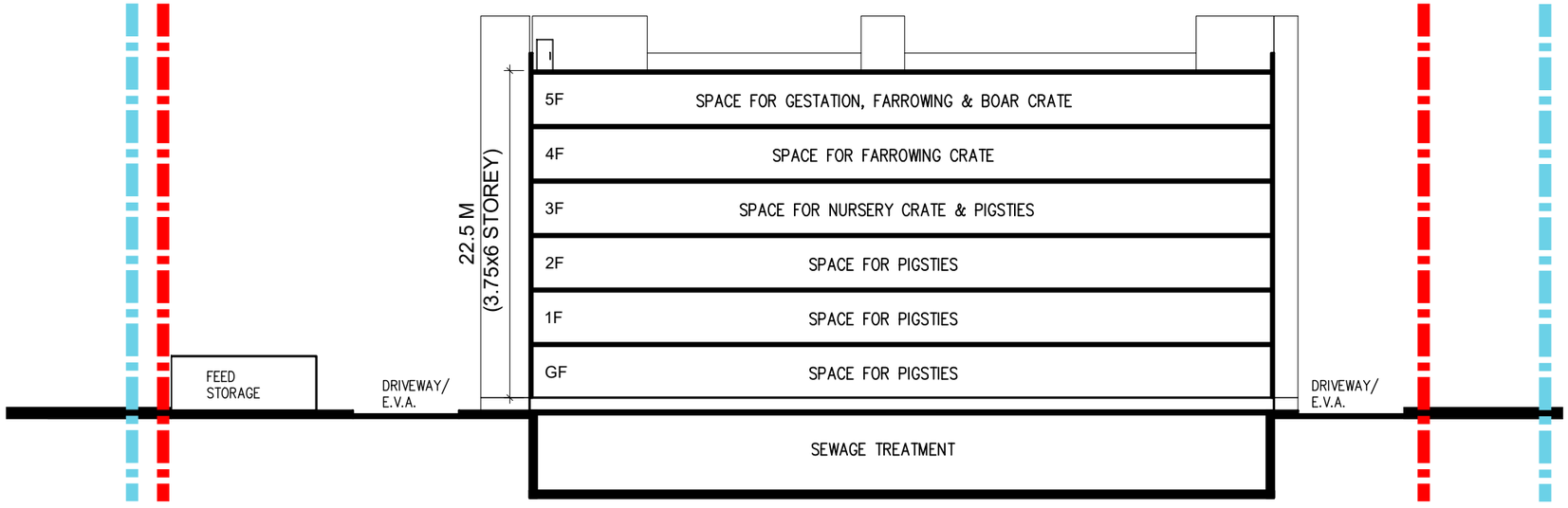
DRAWING PURPOSE
LAYOUT R2

Remarks:

This indicative layout plan is for reference only. Details are subject to change at the detailed design stage.

Boundary of Application site KTN-2
(Provided by CEDD)

Boundary of MSB site



SCHEMATIC SECTION FOR PIGSTY 6 STOREY

SCALE=1:400

REV.	DESCRIPTION	DATE

TONY IP GREEN ARCHITECTS LTD.
葉頌文環保建築師事務所
Unit 328, Mega Cube , 8 Wang Kwong Road, Kowloon Bay, Hong Kong
T (852) 3596 7800 F (852) 3612 4916
E green@tonyip.green

Check all measurements on site.
Do not scale off drawings.

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PROJECT TITLE
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DRAWING TITLE
MAIN BUILDING - SCHEMATIC SECTION FOR PIGSTY

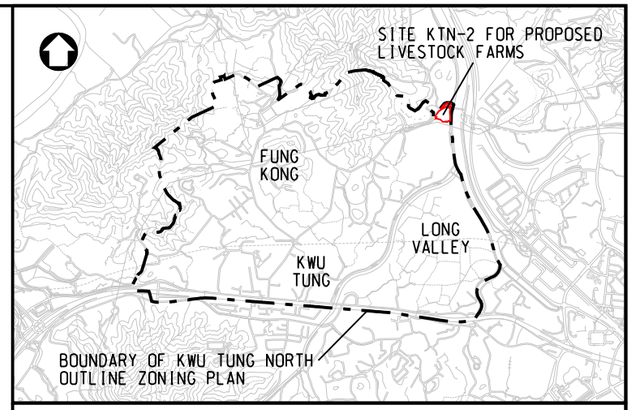
PROJECT NO.	DRAWN BY
	--
SCALE: 1 : 400 @ A3	CHECKED BY: --
DATE	APPROVED BY: --
DRAWING NO.: SK-TYPICAL PIGSTY SECTION_6STOREY	REV. NO.: --

Remarks:

This indicative layout plan is for reference only. Details are subject to change at the detailed design stage.

Appendix C

Layout Plan Showing the Current Condition within / near the Application Site



LOCATION PLAN
SCALE 1:50000

LEGEND:

- BOUNDARY OF APPLICATION SITE KTN-2
- VEGETATION AREA
- ELECTRICITY POLE
- CONSTRUCTION AREA FOR WATER PIPES

FAI KING ROAD

HO SHEUNG HEUNG ROAD

LO WU CORRECTIONAL INSTITUTION

SHEUNG YUE RIVER

0 10 20 30 40 50 m

1 : 1 000 SCALE BAR

圖則名稱 drawing title

LAYOUT PLAN SHOWING THE CURRENT CONDITION WITHIN / NEAR THE APPLICATION SITE

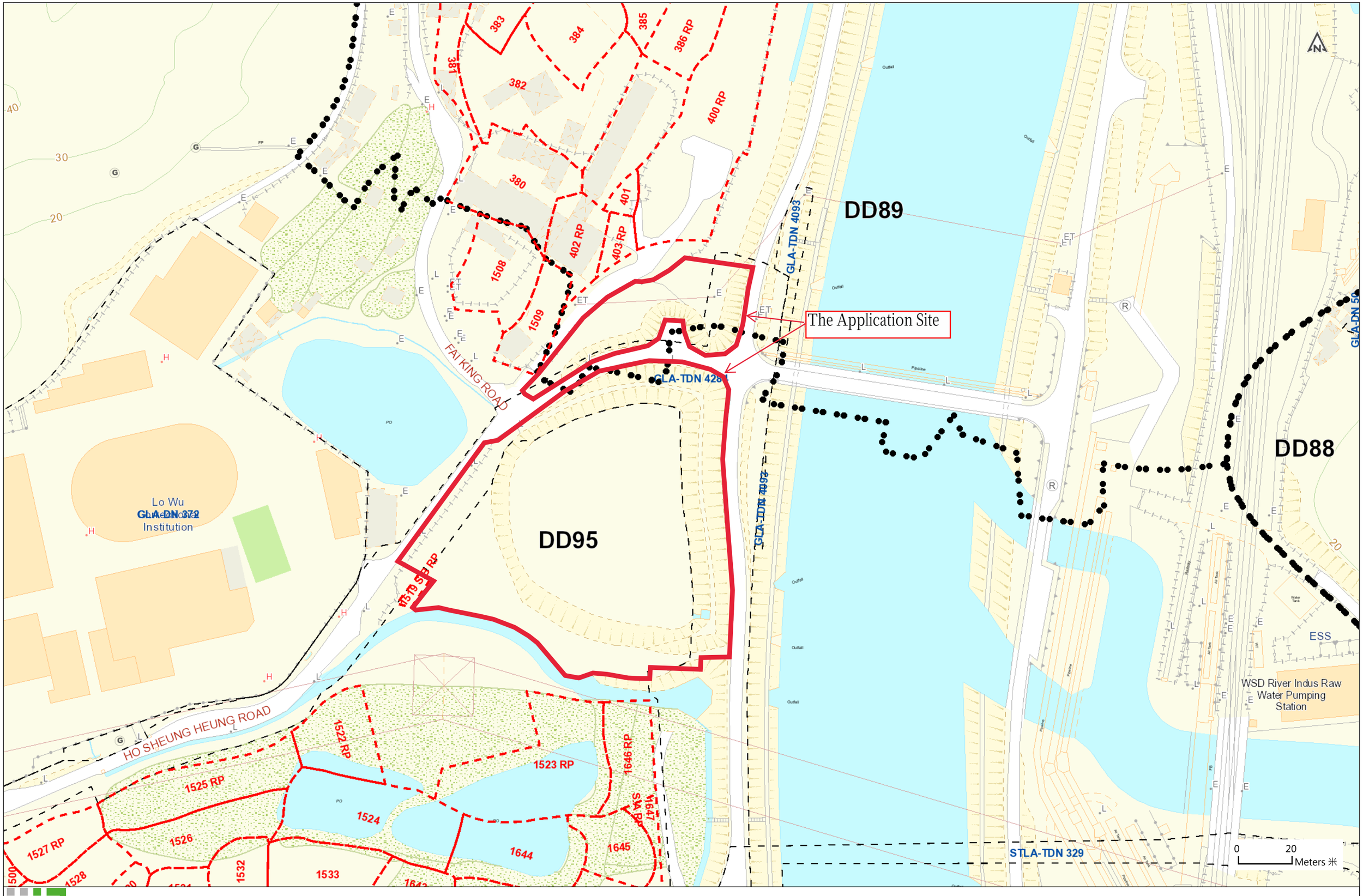
繪圖 drawn: K S WONG	簽署 initial	日期 date: 26.04.24	項目編號 item no.	辦事處 office: 北拓展處 NORTH DEVELOPMENT OFFICE
核對 checked: K Y LEE	簽署 initial	日期 date: 26.04.24	比例 scale: 1:1000	
核准 approved: S LAM	簽署 initial	日期 date: 26.04.24	圖則編號 drawing no.: CDNKFNZ0445	土木工程拓展署 CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

R:\Drawing\CSWP\KFN\DRAWING_NDO\CDNKFNZ0445_KTN_PC5\CDNKFNZ0445.dgn

A3 420MM X 297MM

Appendix D

Land Status Plan around Application Site



Print Date
列印日期 : 16 / 04 / 2024

Legend
圖例

Lot

地段

Demarcation District / Survey District Boundary
丈量約份 / 測量約份界線

Lot Boundary
地段界線

Stratum Lot Boundary
內層地段

GLA

政府撥地

G.L.A.
政府撥地

Stratum G.L.A.
內層政府撥地

Topographic Map

地形圖

Boulder
大石

Buildings
建築物

Burial urn
骨殖甕

Catchwater
引水道

Cliff
峭壁

Contour Line
等高線

Cultivated Land
耕地

Electrical Transformer
電力變壓器

Electricity Pole
電線杆

Fence
柵

Football Field
足球場

Free Standing Wall in Tenement Block / Free Standing Wall
牆

Fresh Water Fire Hydrant / Salt Water Fire Hydrant
淡水消防栓 / 鹹水消防栓

Gate
閘

Grave
墳墓

Lamp Post
燈柱

Mangrove
沼林 / 紅樹林

Pond / River
池塘 / 河流

Power Line / Pylon
電纜 / 塔架

Railway Station Area
鐵路站範圍

Railway Station Exit
鐵路站出口

Restricted Access
限制通道

Road
道路

Ruin
頹垣

Sand Beach
沙灘

Slope
斜坡

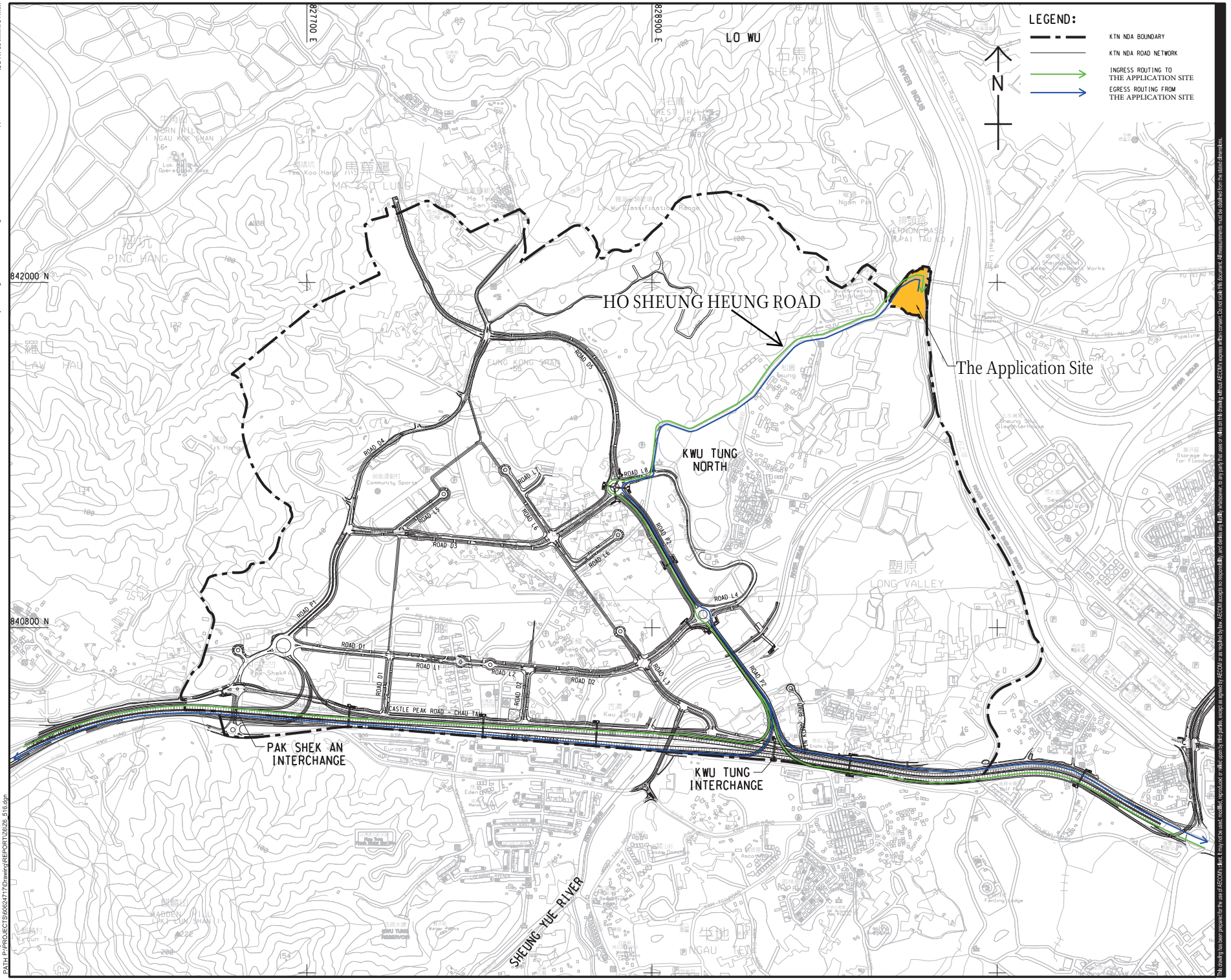
Swamp / Marsh
沼澤

Swimming Pool / Fountain
泳池 / 噴水池

Print Date
列印日期 : 16 / 04 / 2024

Appendix E

Vehicular Access to the Application Site



ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: LIUH9

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1/30/2024

AECOM

PROJECT

DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

CLIENT

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

CONSULTANT

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS

ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE **DIMENSION UNIT**

KEY PLAN

PROJECT NO. 60624717

CONTRACT NO. CE 19/2019 (CE)

SHEET TITLE

VEHICLE ROUTING FOR OPERATION TRAFFIC OF THE APPLICATION SITE

SHEET NUMBER

60624717/Z6/FIGURE 2.1

Appendix F

Layout Plan of Existing Levels

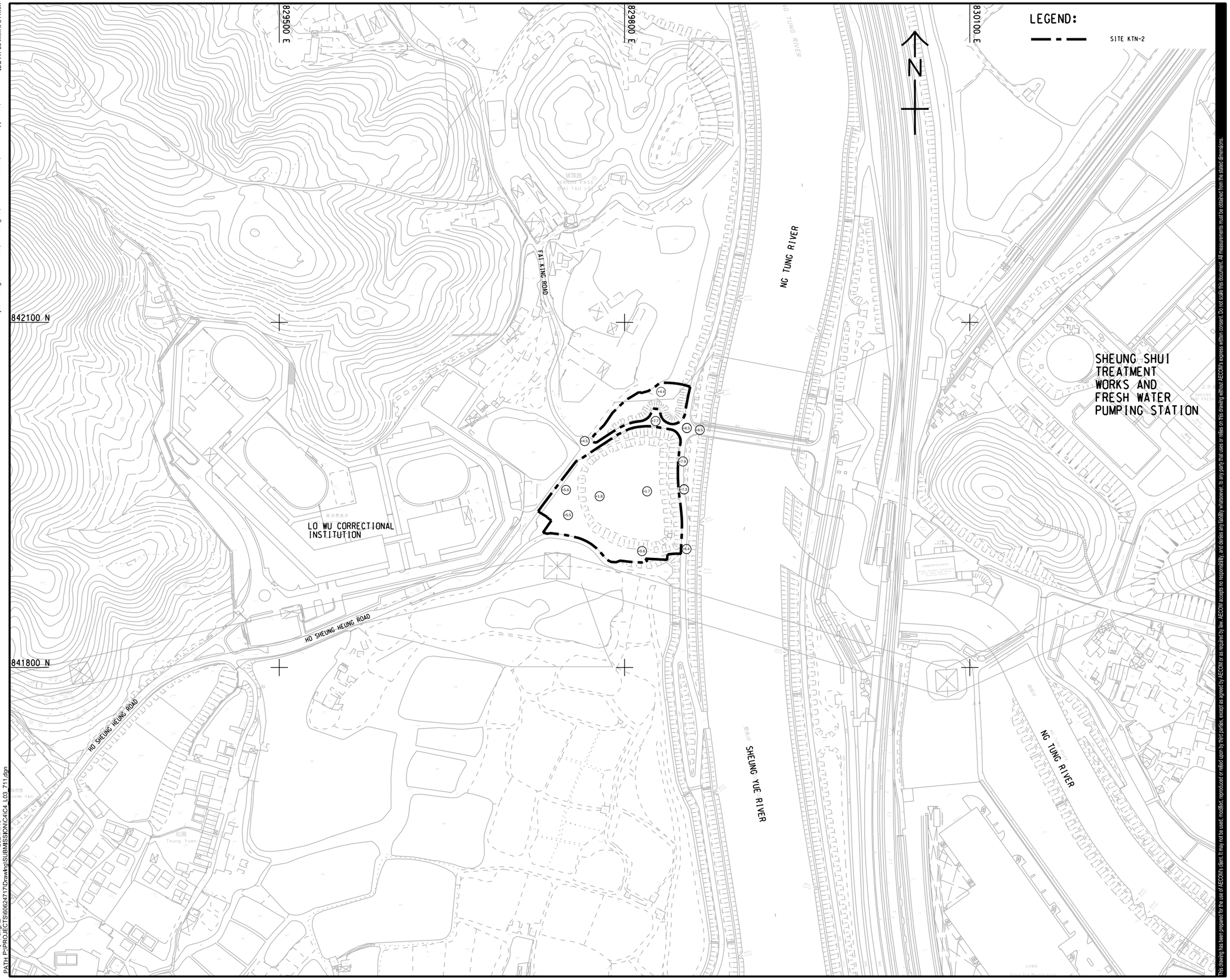
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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2024/4/16

AECOM

PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT
業主

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

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

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

STATUS
狀況

SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

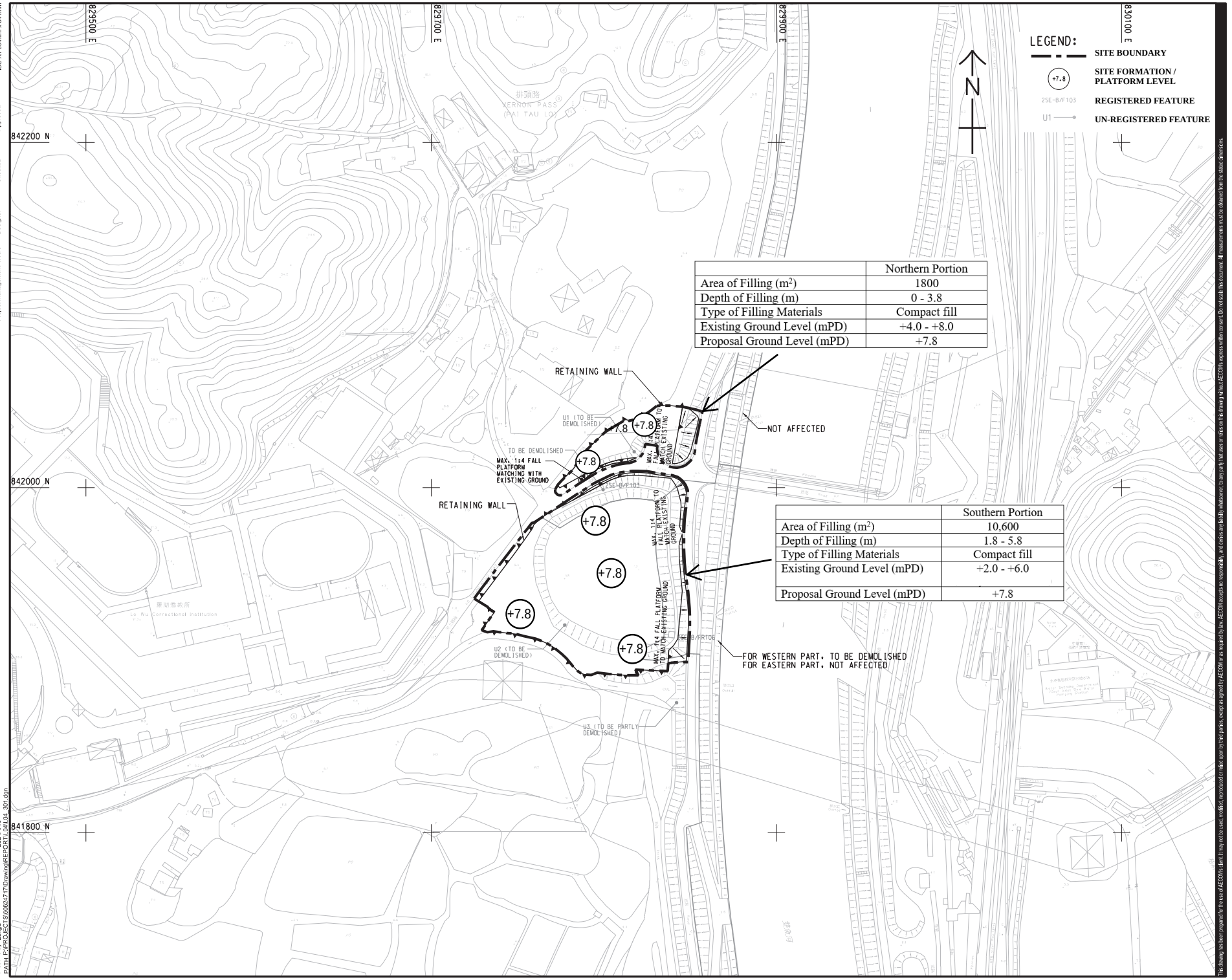
EXISTING LEVELS OF SITE

SHEET NUMBER
圖紙編號

60624717/L04/Figure 3.5

Appendix G

Layout Plan of the Proposed Land/Pond Filling



	Northern Portion
Area of Filling (m^2)	1800
Depth of Filling (m)	0 - 3.8
Type of Filling Materials	Compact fill
Existing Ground Level (mPD)	+4.0 - +8.0
Proposal Ground Level (mPD)	+7.8

	Southern Portion
Area of Filling (m^2)	10,600
Depth of Filling (m)	1.8 - 5.8
Type of Filling Materials	Compact fill
Existing Ground Level (mPD)	+2.0 - +6.0
Proposal Ground Level (mPD)	+7.8

AECOM

PROJECT
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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

CONSULTANT
AECOM Asia Company Ltd.
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SUB-CONSULTANTS

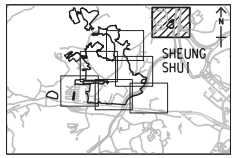
ISSUE/REVISION

I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 1000
DIMENSION UNIT: METRES

KEY PLAN A1 1 : 50000



PROJECT NO. 60624717
CONTRACT NO. CE 19/2019 (CE)

SHEET TITLE
PROPOSED SITE FORMATION

SHEET NUMBER
60624717/L04/Figure 3.6

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:
Plot File by: LangS
PATH: P:\PROJECTS\60624717\Drawing\REPORT\L04\L04_301.dgn
2024/4/16

Appendix H

Geotechnical Planning Review Report

Geotechnical Planning Review Report

March 2024

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 To provide appropriate support for livestock farms affected by the development of Northern Metropolis, Development Bureau (DEVB) and the relevant departments have set up an inter-departmental working group to draw up plans that will assist the affected livestock farmers, including identification of suitable government sites. The identified sites will be made ready with provision of basic infrastructure such as water supply, electricity supply, road access and sewerage, etc. to facilitate the relocation of livestock farms.

1.1.2 A site near the north-east boundary of Kwu Tung North New Development Area (KTN NDA) near Lo Wu Correctional Institution (i.e. Site KTN-2), inter alia, is identified as suitable to be used as multi-storey livestock farms by the industry for relocation of the affected livestock farms.

1.1.3 Considering that Site KTN-2 is located within KTN NDA, DEVB invited Civil Engineering and Development Department (CEDD) as works agent for the technical assessments to support the s16 application of land/pond filling. CEDD will also be responsible for the subsequent design and construction of the land/pond filling and associated infrastructure works for Site KTN-2. The formed site would be handed over to Agriculture, Fisheries and Conservation Department (AFCD) by end 2025 for further development.

1.2 Objectives of this Report

1.2.1 The boundary of Site KTN-2 contains or is close to some man-made slope features, which may affect or be affected by the proposed site formation works. Thus, there is a requirement to carry out a Geotechnical Planning Review Report (GPRR) to support the s16 application, according to the following requirements from GEO:

- where a slope steeper than 30^{o}, or retaining wall, or combination of the two with a height greater than 6m exists on the site or within 6m of the site

1.2.2 The scope of this GPRR comprises a review of how man-made slope features shown on plan may affect or be affected by the proposed site formation works and in relation to this an assessment of the geotechnical feasibility of the proposed works, including an outline of any further studies that may be required. The components of this review include:

- Desk Study of existing information, including Aerial Photograph Interpretation (API);
- Plans and maps showing the above features in relation to the proposed development.

2 SITE DESCRIPTION

2.1 General

2.1.1 The Site KTN-2 is approximately 12,400m^2 in total, located between the east of Lo Wu Correctional Institution and the west of Sheung Yue River. The Site is situated between Ng Tung River and Lo Wu Correctional Institution and is divided into two patches by Ho Sheung Heung Road. Some registered and unregistered fill slopes are present within the site boundaries. The location and extent of the Site KTN-2 is shown in **Figure 2.1**.

2.1.2 The Site KTN-2 is generally covered by vegetation. In the centre of the southern Site KTN-2, it appears to be a dried-up pond beneath the vegetation. Construction of water pipe works is in progress at southern to southwestern part of the Site at the time of report writing. An electricity pole and overhead power lines are observed in the northern Site KTN-2, while a pylon and overhead power lines are located at around 15m away from the nearest site boundary of the southern Site KTN-2 in the south.

2.2 Site Topography

2.2.1 The northern Site KTN-2 is gently sloping towards northwest and the existing ground level slightly drops from approximately +8mPD to +4mPD. The southern Site KTN-2 is a slightly depressed area where a dried-up pond is in the centre. The existing ground level varies from approximately +6mPD to +2mPD, and locally down to -2mPD within the dried-up pond. The topographical plan of the Site KTN-2 is shown in **Figure 2.2** based on the data from the 2020 LiDAR survey.

3 DESK STUDY REVIEW

3.1 Desk Study Extent

3.1.1 A review of the existing available geotechnical and geological information has been carried out. A number of sources covering a range of information have been consulted:

- Geotechnical Information Unit (GIU);
- Geotechnical Information Infrastructure (GInfo);
- Surveying Office - Lands Department;
- Relevant Companies & Government Departments; and
- Existing data including published geological data, existing ground investigation (GI) data and airborne Light Detection and Ranging (LiDAR) data.

3.1.2 The as-built drawing issued in November 1998 showing the river training works carried out under Contract No. FL 22/98 “Main Drainage Channels for Fanling, Sheung Shui and Hinterland – River Training Works for Lower River Indus and River Beas” within and adjacent the Site KTN-2. A grass concrete access track was built across the northern Site, connecting to a maintenance access between the northern and southern Sites.

3.2 Geology

3.2.1 According to the Hong Kong Geological Survey (HKGS) Scale 1:20,000 Solid and Superficial Geology Map Sheet No. 2 Edition I – San Tin (GCO, 1989), the Site KTN-2 is situated on a low-lying floodplain area where it is overlain by Holocene alluvium (Qa). The Holocene alluvium (Qa) incises into the surrounding Pleistocene terrace alluvium (Qpa). The site is located at the hanging wall of the San Tin Fault and predominantly underlain by mylonitized coarse ash crystal tuff of the Tai Mo Shan Formation (Jtm) of Upper Jurassic age. The published superficial and solid geology are presented in **Figures 3.1 and 3.2**

3.2.2 A layer of fill is expected within the Site KTN-2 as the area was largely modified in 1999 to accommodate the river training works at the Sheung Yue River on the east. Fill was also placed on sloping areas of unregistered and registered slopes along the site boundaries.

3.3 Existing Ground Investigation Records

3.3.1 A search for existing Ground investigation (GI) records in the vicinity of the Site KTN-2 has been carried out. The existing GI information is very limited in the study extent and no GI was conducted within the Site KTN-2. Locations of the archival GI are shown in **Figure 3.3**.

3.3.2 Based on GI record from adjacent drillhiles along the site boundary, the ground profile is typically fill to 3m depth, overlying alluvial clay and sand to 13.5m depth, overlying saprolite to a depth of 29m, where rockhead is encountered.

3.4 Existing Man-made Feature and Incident Records

3.4.1 According to the Slope Information System, there are three registered man-made features identified in the vicinity of the Site. Fill slope feature No. 2SE-B/F103 is within the Site, fill slope with retaining wall feature No. 2SE-B/FR106 is partially within the Site and fill slope with retaining wall feature No. 2SE-B/FR20 is just outside the Site. The location of the registered man-made features is presented in **Figure 3.4**.

3.4.2 No past instabilities were occurred and recorded for all features in vicinity to the site area.

3.5 Aerial Photograph Interpretation

3.5.1 Aerial photographs from 1924 to 2022 are reviewed for the overall development history of the Site KTN-2 with the finding summarized as below. The API report and selected annotated aerial photographs for overall history are presented in **Annex A**.

3.5.2 The earliest aerial photograph in 1924 indicates that the Site and its vicinity appeared to be occupied by agricultural land. The meandering Sheung Yue River and Ng Tung River were visible. In 1964, construction of bridge and weir across the Sheung Yue River were in progress. An unpaved road, traversing in the southern Site, was observed connecting to the construction site. To the west of the Site, structures belonging to the Lo Wu Saddle Club, which was relocated in association with the construction of the Lo Wu Correctional Institution in 2008, was visible.

3.5.3 By 1973, the northern Site was traversed by Ho Sheung Heung Road and straddled by a smaller pond whilst the southern Site was largely occupied by a larger pond. By 1976, a great deal of agricultural land to the south of the southern Site had been converted into ponds. By 1985, the small pond, straddling in the northern Site, was filled. Another elongated-shape pond was also filled to the northwest of the northern Site. North of the northern Site, some land had been converted into ponds. River training work on Ng Tung River had been carried out to the north of the bridge which was constructed during 1964 to 1973.

3.5.4 By 1990, to the north of the northern Site, all the ponds, which was first identified in 1985, had been filled. They were either abandoned or used as agricultural land. Some squatter structures were observed in the northwest of the northern Site. To the south of the southern Site, a pylon had been constructed. In 1999, river training work for Sheung Yue River and Ng Tung River were in progress. Surface water is believed to be drained away in the pond in the southern Site in association with the river training work. The pond area appeared to be dark and rather smooth.

3.5.5 By 2002, river training work for Sheung Yue River and Ng Tung River were completed. Unregistered Slope No. U1, U3 as well as Slope No. 2SE-B/F103 and 2SE-B/FR106 had been constructed. The pond was covered by vegetation in the southern Site. By 2004, a footpath and electricity pole had been erected in the northern Site.

3.5.6 Construction work for Lo Wu Correctional Institution was ongoing between 2008 and 2010. The Lo Wu Saddle Club was relocated in association with the construction work. A parcel of land had been used as a temporary storage site in the southern Site. The land previously used as a temporary storage site became abandoned in 2011. Unregistered Slope U2 had been formed in 2011.

3.5.7 Since 2021, construction work was visible along the southern boundary of southern Site.

4 METHODOLOGY

4.1 Site Formation

4.1.1 Site formation works are required for forming the land for future development. Level platform at approximately +7.8mPD will be formed with retaining walls along the perimeter to bridge the level difference with adjacent ground. At some local areas, maximum 1:4 gradient falling platform will be formed to match with adjacent ground. The existing level and schematic site formation layout are presented in **Figures 3.5 and 3.6**.

4.2 Registered Man-made Features

4.2.1 As outlined in Section 3.4, three registered man-made features are identified in the vicinity of the Site and their details are given below.

Feature No. 2SE-B/F103

4.2.2 The feature is maintained by LandsD. It is located at the northern side of the Southern Site. The height, length and slope angle of the feature are 3.2m, 90m and 33 degree, respectively. The current Consequence-to-life (CTL) is classified as Category 3. In accordance with the development plan, this feature will be completely removed by the site formation work.

Feature No. 2SE-B/FR106

4.2.3 The feature is maintained by DSD. It is located at the eastern side of the Southern Site. The feature is divided into western and eastern portions by an existing road. The height, length and slope angle of the slope portion are 6.2m, 865m and 33 degree, and those for the wall portion are 2.4m, 15m and 90 degree, respectively. The current Consequence-to-life (CTL) is classified as Category 3. In accordance with the development plan, the western portion of the feature will be completely removed by the site formation work.

Feature No. 2SE-B/FR20

4.2.4 The feature is maintained by DSD. It is located at the eastern side of the Northern Site. The height, length and slope angle of the slope portion are 6.2m, 820m and 33 degree, and those for the wall portion are 2.1m, 15m and 90 degree, respectively. The current Consequence-to-life (CTL) is classified as Category 3. The slope is located at 14.5m away from the site and in accordance with the development plan, this feature is unlikely to be affected by the development.

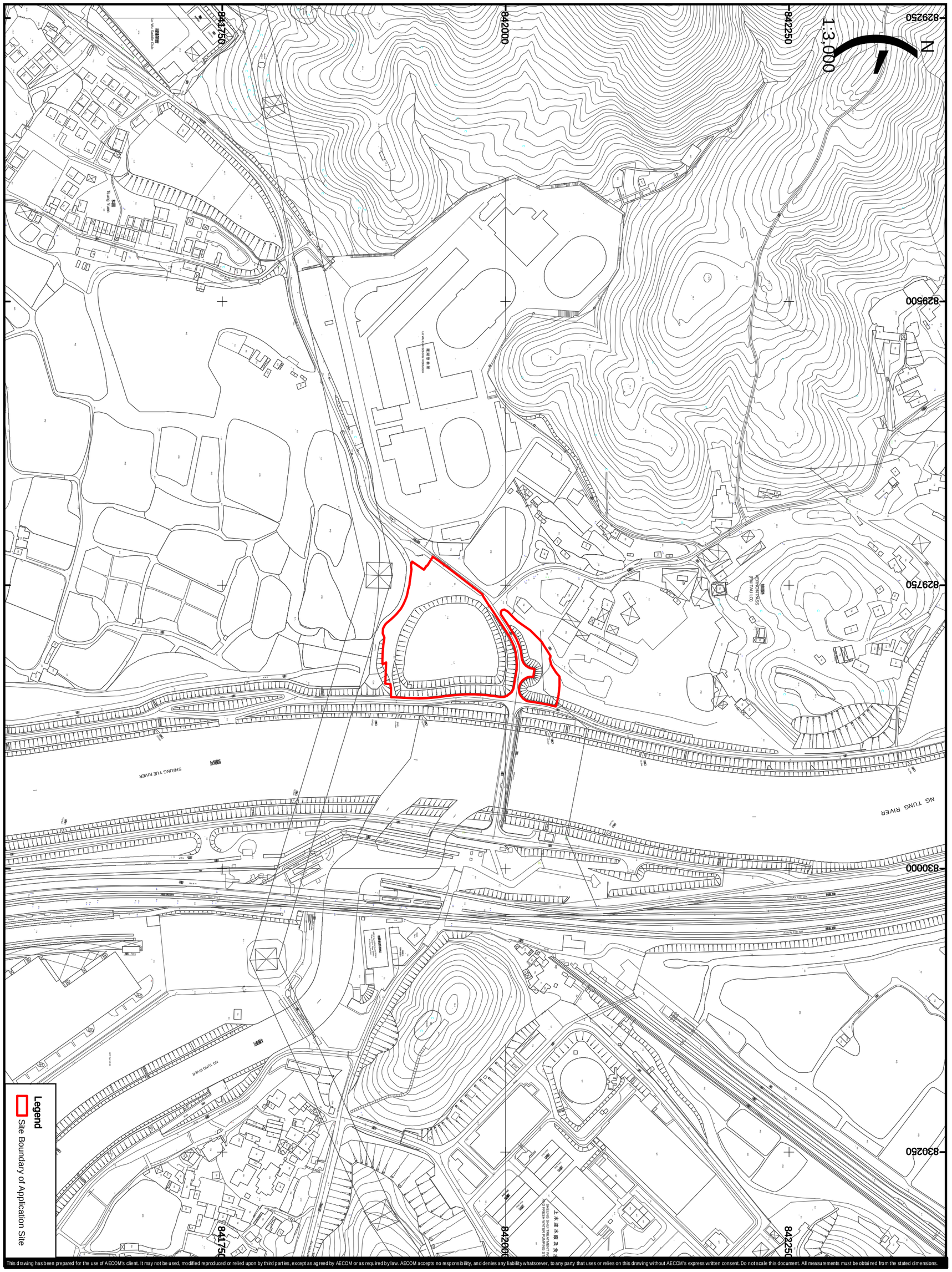
5 CONCLUSION

5.1.1 In this Report, the geotechnical aspects of the proposed site formation works have been reviewed. For man-made features within the proposed site works, two features may be modified/removed. Should there be any modification to these features, further assessment, upgrading works and registration may be required.

5.1.2 New retaining walls should be required along the application perimeter for platform formation. Further assessment and detailed design of the retaining wall will be required.

5.1.3 In summary, it is considered that the proposed development is feasible in terms of potential geotechnical constraints.

Figures



AGREEMENT NO. CE19/2019 (CE)

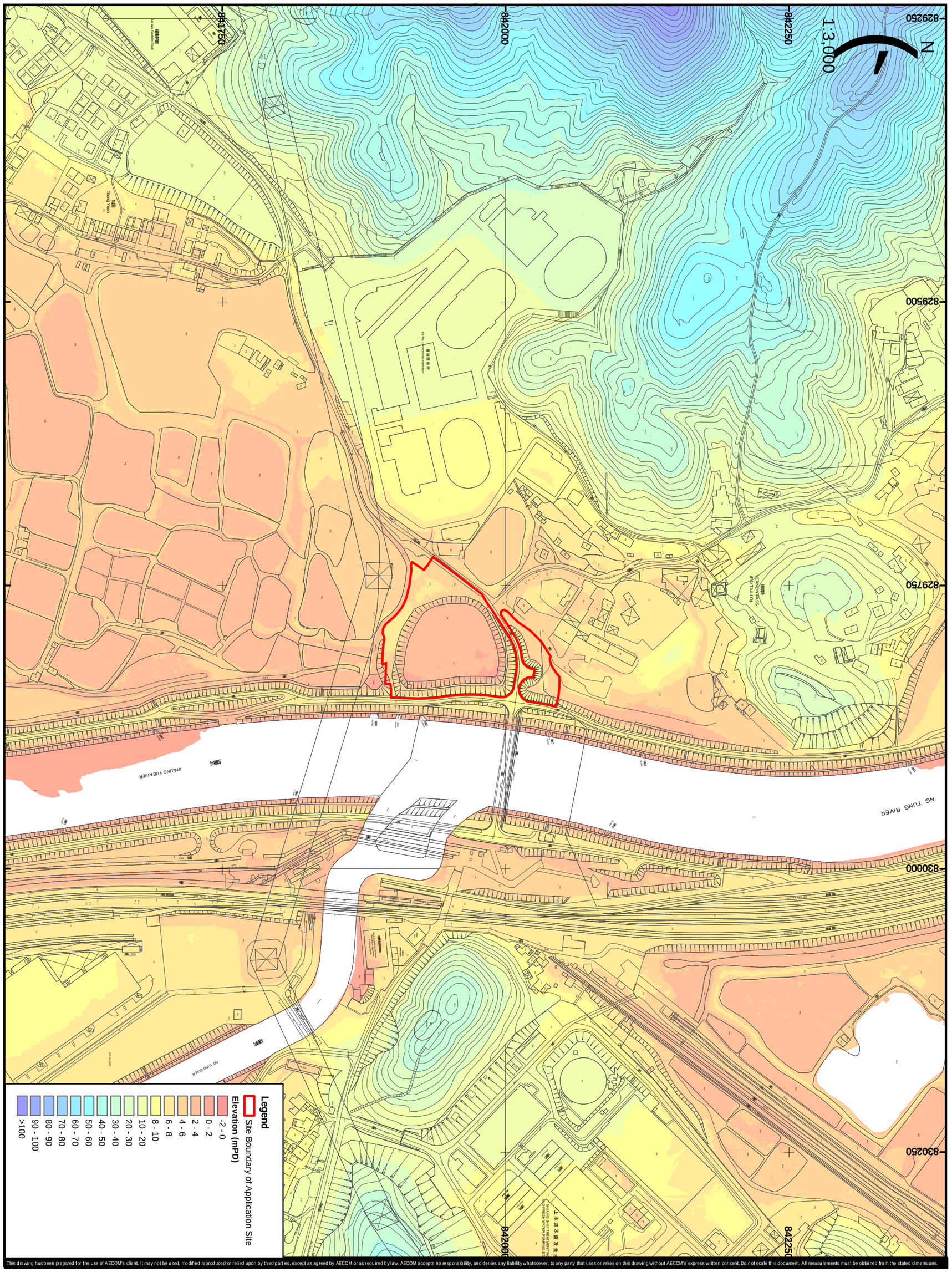
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

Project No.:60624717 Date: APRIL 2024

SITE LOCATION PLAN

AECOM

60624717/L04/FIGURE 2.1



AGREEMENT NO. CE19/2019 (CE)

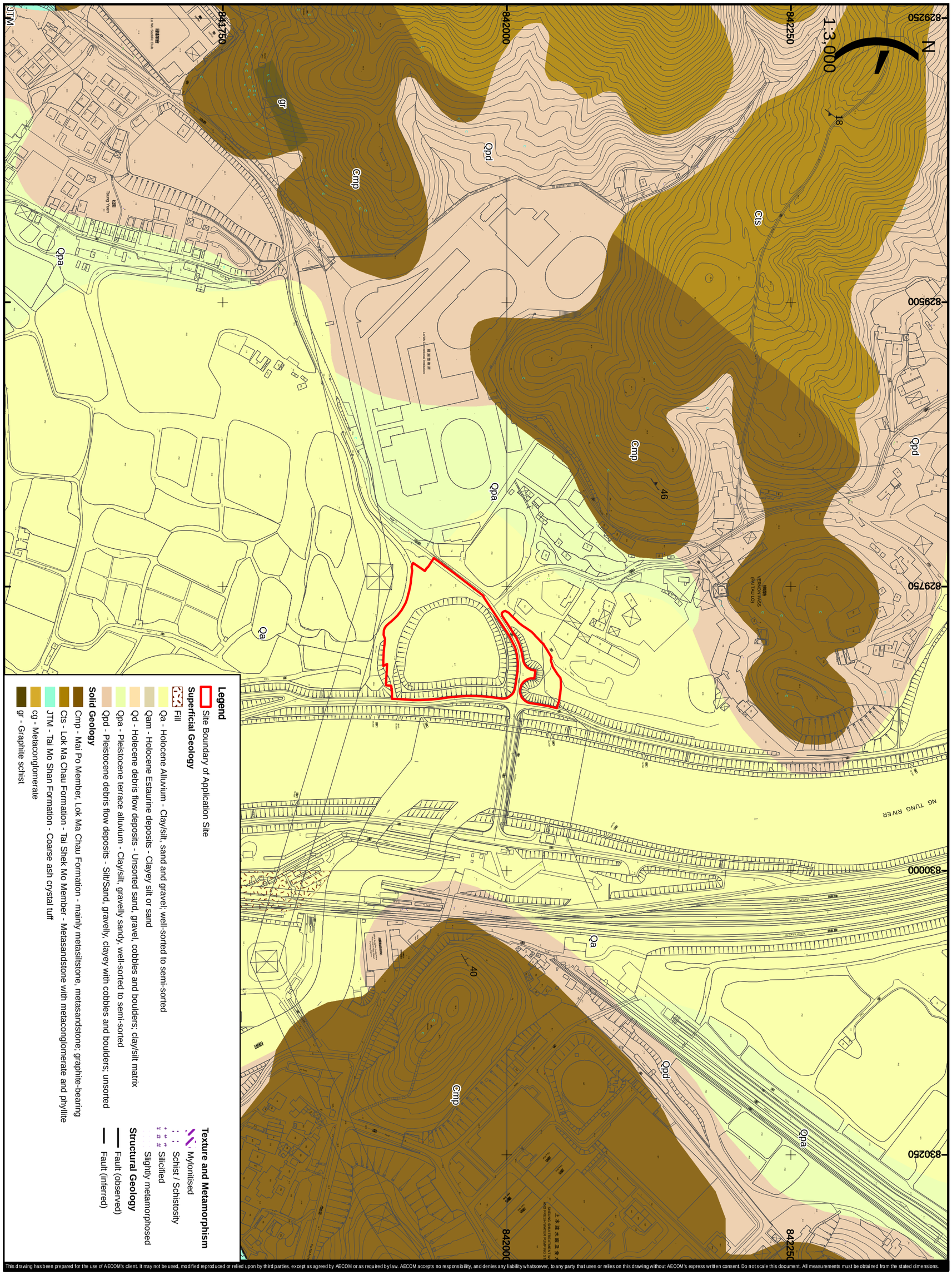
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

TOPOGRAPHICAL PLAN

Project No.:60624717 Date: APRIL 2024

AECOM

60624717/L04/FIGURE 2.2



AGREEMENT NO. CE19/2019 (CE)

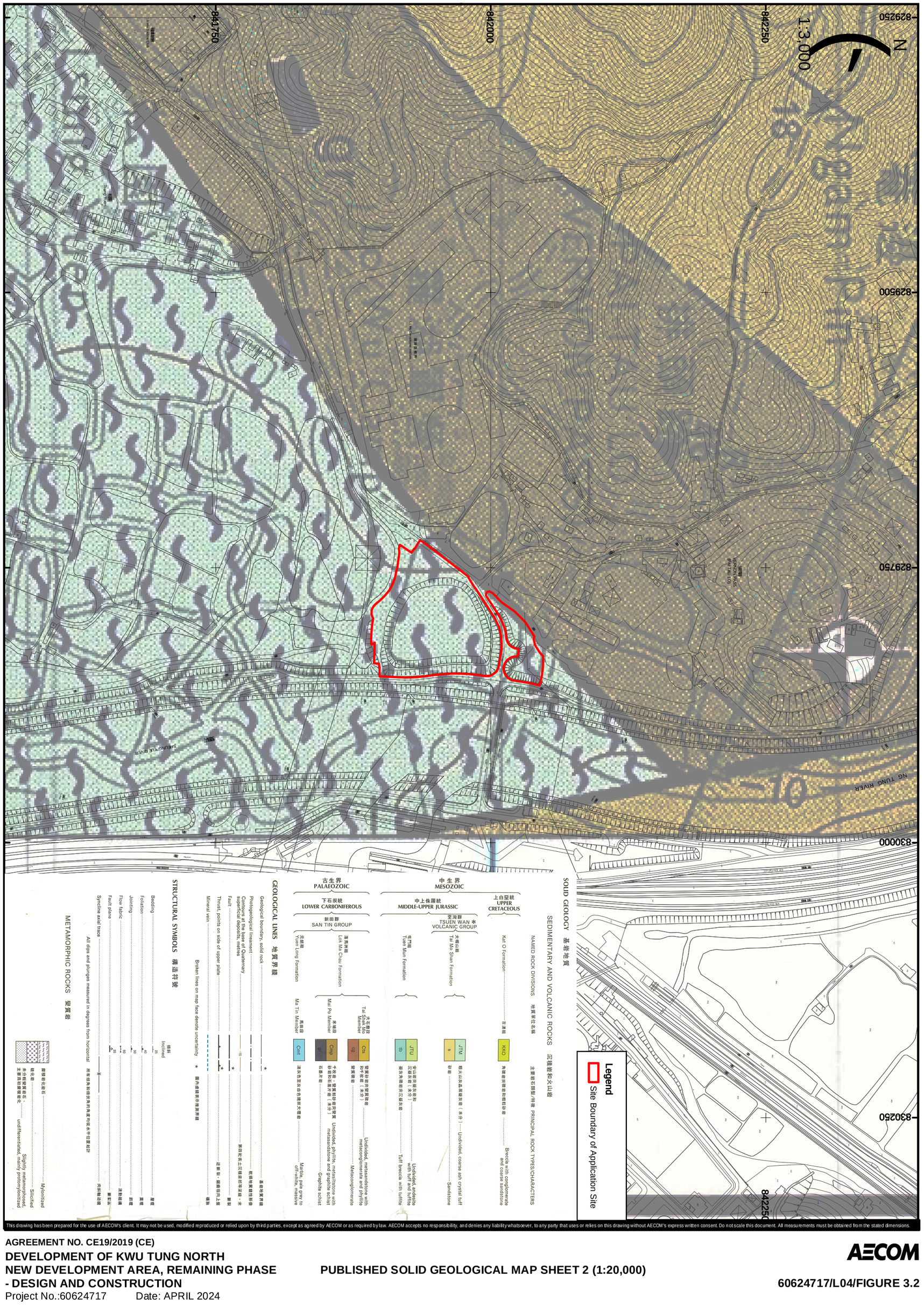
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

Project No.:60624717 Date: APRIL 2024

PUBLISHED SOLID AND SUPERFICIAL GEOLOGICAL MAP SHEET 2 (1:20,000)

AECOM

60624717/L04/FIGURE 3.1



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DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

Project No.:60624717 Date: APRIL 2024

PUBLISHED SOLID GEOLOGICAL MAP SHEET 2 (1:20,000)

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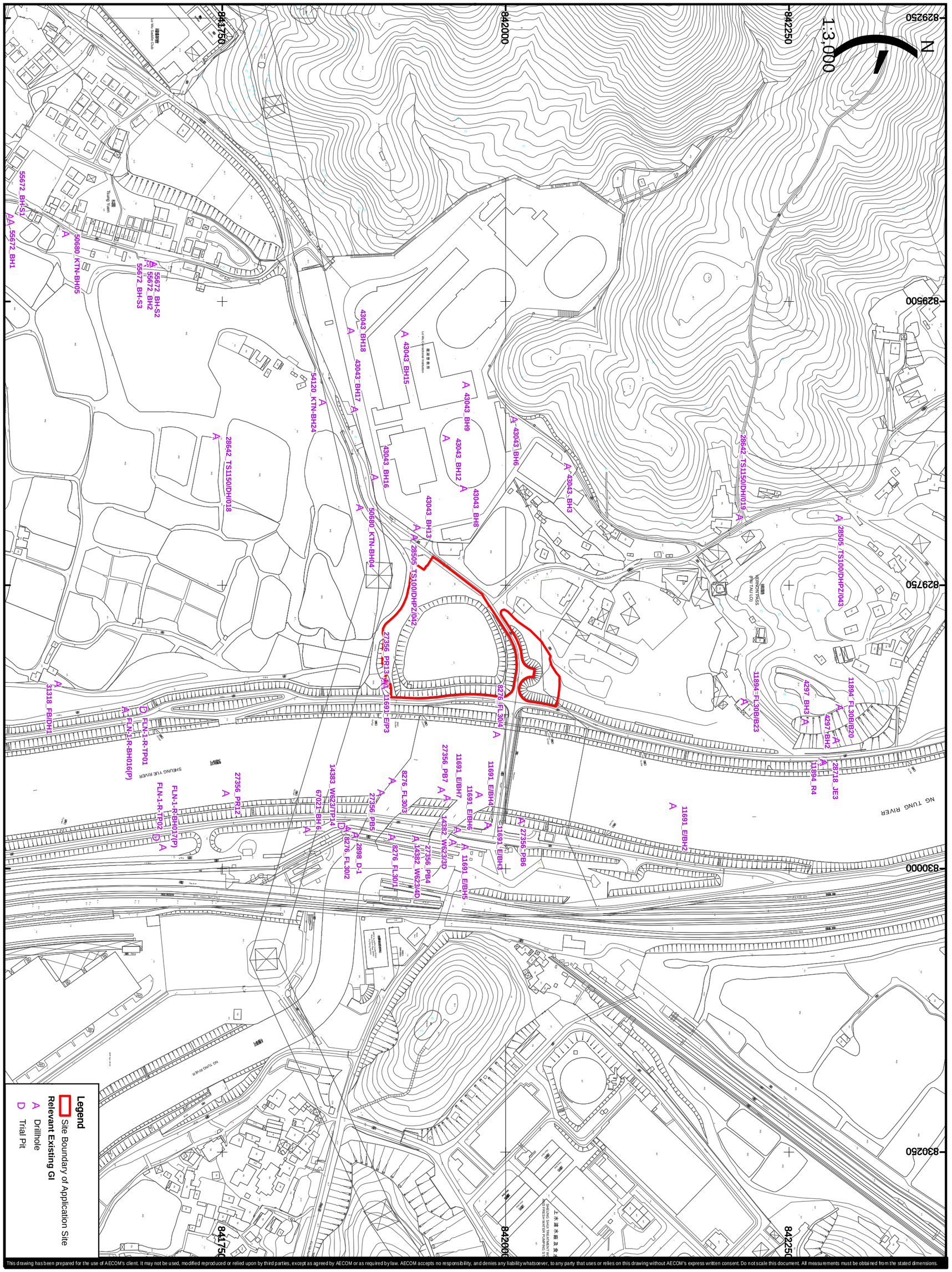
60624717/L04/FIGURE 3.2



Legend

Site Boundary of Application Site

Relevant Existing GI

A Drillhole

D Trial Pit

AGREEMENT NO. CE19/2019 (CE)

DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

Project No.:60624717 Date: APRIL 2024

EXISTING GROUND INVESTIGATION LOCATION PLAN

AECOM

60624717/L04/FIGURE 3.3

ISO A3 297mm x 420mm

Checked: JCTY

Project Management Initials:

Plot File by: CWYL APR 2024

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829250 829500 829750 830000 830250

842250 842000 841750

NG TUNG RIVER

VERNON PASS (PAI TAU LO)

SHEUNG YUE RIVER

Lo Wu Correspondence Institution

Lo Wu Saddle Club

Tsung Yuan

2NE-D/C 127
28505_TS100/DHPZ/043
11894_FL30B/B20
2NE-D/CR 120
4297_BH2
4297_BH3
28718_JE3
11894_R4
3NW-C/F 74
2NE-D/F 3
2NE-D/CR 128
28642_TS1150/DH/019
2NE-D/C 130
11894_FL30B/B23
2NE-D/C 129
2NE-D/C 121
2NE-D/FR 20
11691_E/BH2
2NE-D/ND 1
2NE-D/R 14
2NE-D/R 11
43043_BH3
2NE-D/C 134
43043_BH6
U1
27356_PB6
2NE-D/FR 28
2NE-D/R 13
2SE-B/F 103
2NE-D/F 19
3NW-C/C 71
3NW-C/C 68
2NE-D/R 12
2SE-B/R 96
43043_BH9
43043_BH8
8276_FL30/4
11691_E/BH4
11691_E/BH3
11691_E/BH6
3NW-C/C 70
2SE-B/NL 2
2SE-B/R 101
43043_BH12
2SE-B/R 97
11691_E/BH7
11691_E/BH5
3SW-A/C 6
U2
27356_PB7
14382_W623/3D
2SE-B/FR 106
2SE-B/F 117
27356_PB4
3SW-A/C 44
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28505_TS100/DHPZ/042
3SW-A/C 16
2SE-B/FR 123
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14382_W623/4D
8276_FL30/1
27356_PB13
11691_E/P3
43043_BH16
50680_KTN-BH04
27356_PB5
2SE-B/R 67
3SW-A/CR 45
3SW-A/R 6
3SW-A/F 76
U3
43043_BH18
43043_BH17
2898_D-1
3SW-A/R 139
3SW-A/R 148
2SE-B/R 98
8276_FL30/2
3SW-A/R 138
2SE-B/R 100
14383_W623/4P14
3SW-A/R 149
3SW-A/C 4
2SE-B/R 99
54120_KTN-BH24
67021_BH6
3SW-A/R 147
3SW-A/R 150
3SW-A/CR 4
2SE-B/C 225
3SW-A/R 146
2SE-B/C 227
2SE-B/C 226
2SE-B/C 228
28642_TS1150/DH/018
27356_PB12
55672_BH-S2
55672_BH2
55672_BH-S3
FLN-1-R-BH017(P)
FLN-1-R-TP02
2SE-B/F 105
FLN-1-R-TP01
FLN-1-R-BH016(P)
50680_KTN-BH05
31318_FB/DH1
55672_BH-S1
55672_BH1

Legend

- Site Boundary of Application Site

Relevant Existing GI

- A Drillhole
- D Trial Pit

Existing man-made feature

- Cut slope with/without retaining wall
- Fill slope with/without retaining wall
- Natural terrain stabilization measures
- Wall
- Unregistered man-made feature

AECOM

60624717/L04/FIGURE 3.4

REGISTERED FEATURE LOCATION PLAN

AGREEMENT NO. CE19/2019 (CE)

DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN AND CONSTRUCTION

Project No.:60624717 Date: APRIL 2024

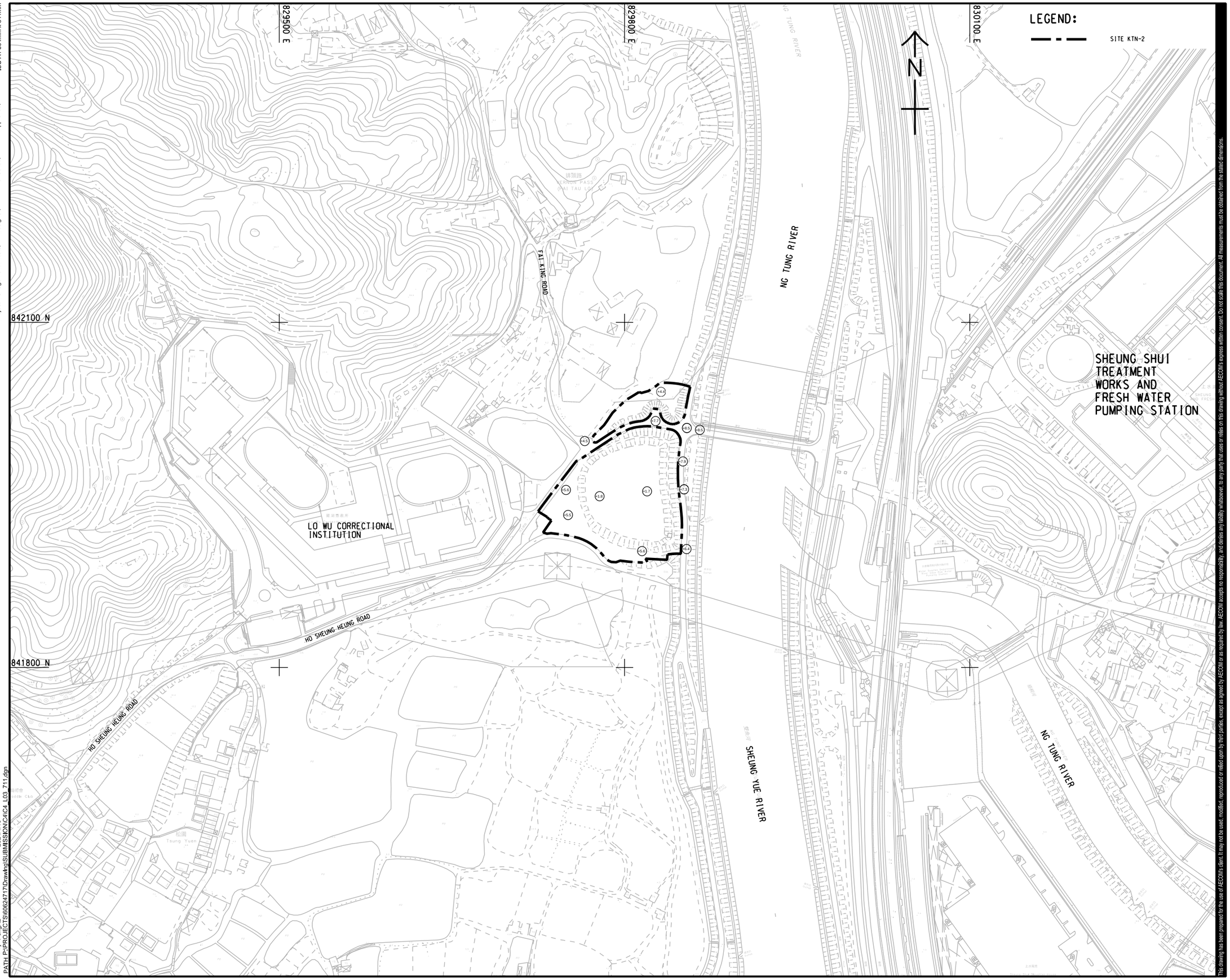
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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2024/4/16

AECOM

PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT
業主

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

CONSULTANT
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ISSUE/REVISION
修訂

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

STATUS
狀況

SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

EXISTING LEVELS OF SITE

SHEET NUMBER
圖紙編號

60624717/L04/Figure 3.5

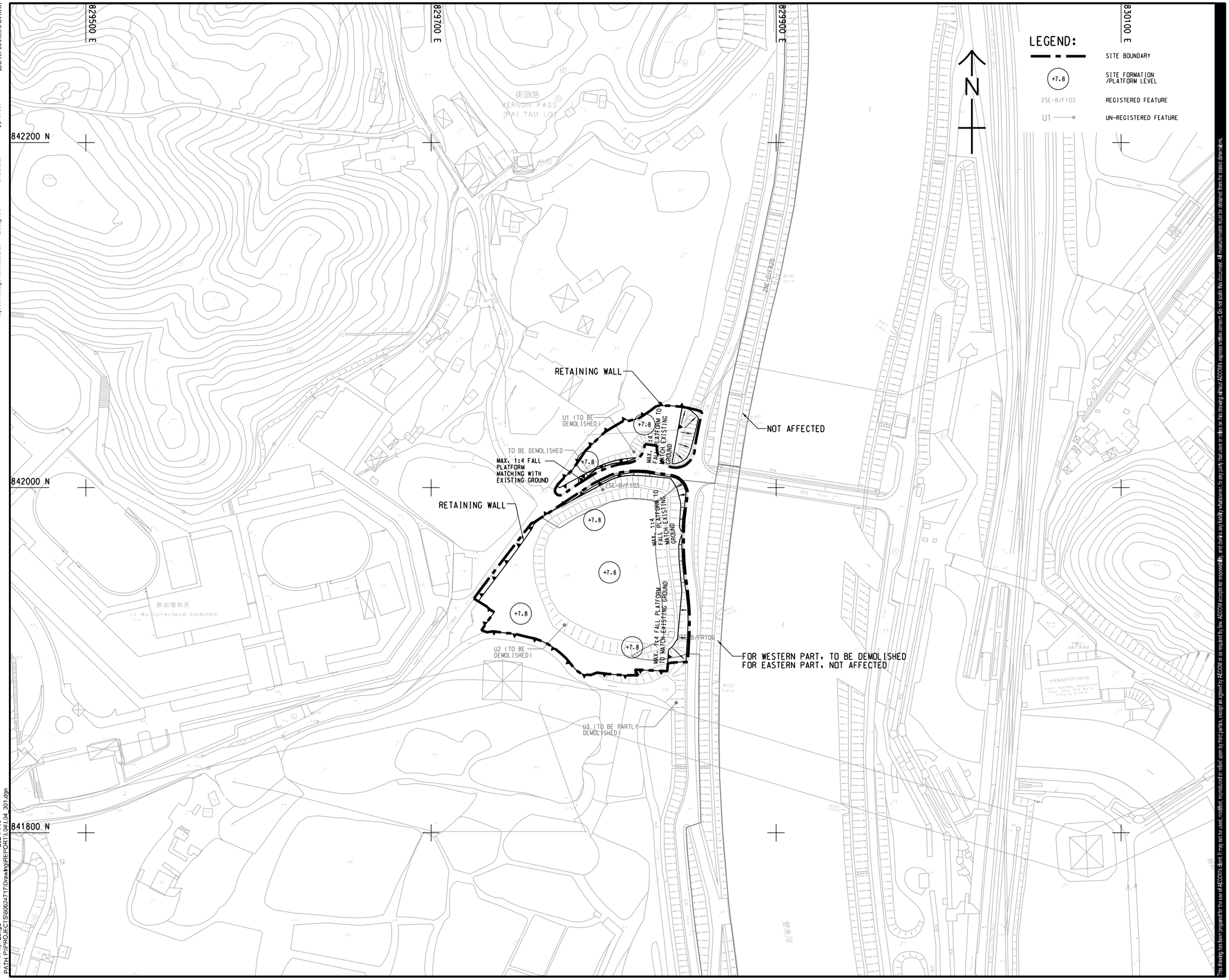
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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2024/4/16

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PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

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客戶

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

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

STATUS
狀況

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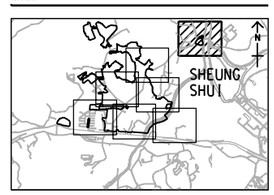


PROJECT NO. 項目號碼: 60624717

CONTRACT NO. 合約號碼: CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

PROPOSED SITE FORMATION

SHEET NUMBER
圖紙編號

60624717/L04/Figure 3.6

Annex A

B1 DETAILED OBSERVATIONS

Site KTN-2

A review of the available aerial photographs from 1924 to 2022 (supplemented by orthophotographs in the most recent years) has been carried out to determine the site development history of the Site KTN-2. The key observations from the year 1945, 1964,1973, 1976, 1985, 1990, 1999, 2002, 2004, 2008, 2010, 2012, 2021 and 2022 aerial photographs are highlighted in Plates B1 to B14.

AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
1924 Y00167-18 11,500’	High-flight aerial photographs, which are of relatively poor resolution, precluded detailed interpretation. • The Site and its vicinity appeared to be occupied by agricultural land. The meandering Sheung Yue River and Ng Tung River were visible.
1945* Y934-5 20,000’	High-flight aerial photographs, which are of relatively poor resolution, precluded detailed interpretation. • No significant changes to the Site were evident.
1954 Y02908-09 29,200’	High-flight aerial photographs, which are of relatively poor resolution, precluded detailed interpretation. • No significant changes to the Site were evident.
1956 Y04354-55 16,700’	High-flight aerial photographs, which are of relatively poor resolution, precluded detailed interpretation. • No significant changes to the Site were evident.
1961 Y05537-38 3,0000’	High-flight aerial photographs, which are of relatively poor resolution, precluded detailed interpretation. • No significant changes to the Site were evident.
1963 V81A_857-0016R 13,500’	High-flight and single aerial photograph, which is of relatively poor resolution, precluded detailed interpretation. • No significant changes to the Site were evident.
1964* Y12249-50 1,800’	Low-flight aerial photographs of excellent resolution. • The Site and its vicinity appeared to be occupied by agricultural land. • The meandering Sheung Yue River and Ng Tung River were visible. • Construction of bridge and weir were in progress. • An unpaved road was visible in the southern Site. • Structures belonging to the Lo Wu Saddle Club, which was relocated in association with the construction of the Lo Wu Correctional Institution in 2008, was visible.
1973*	Low-flight aerial photographs of excellent resolution.

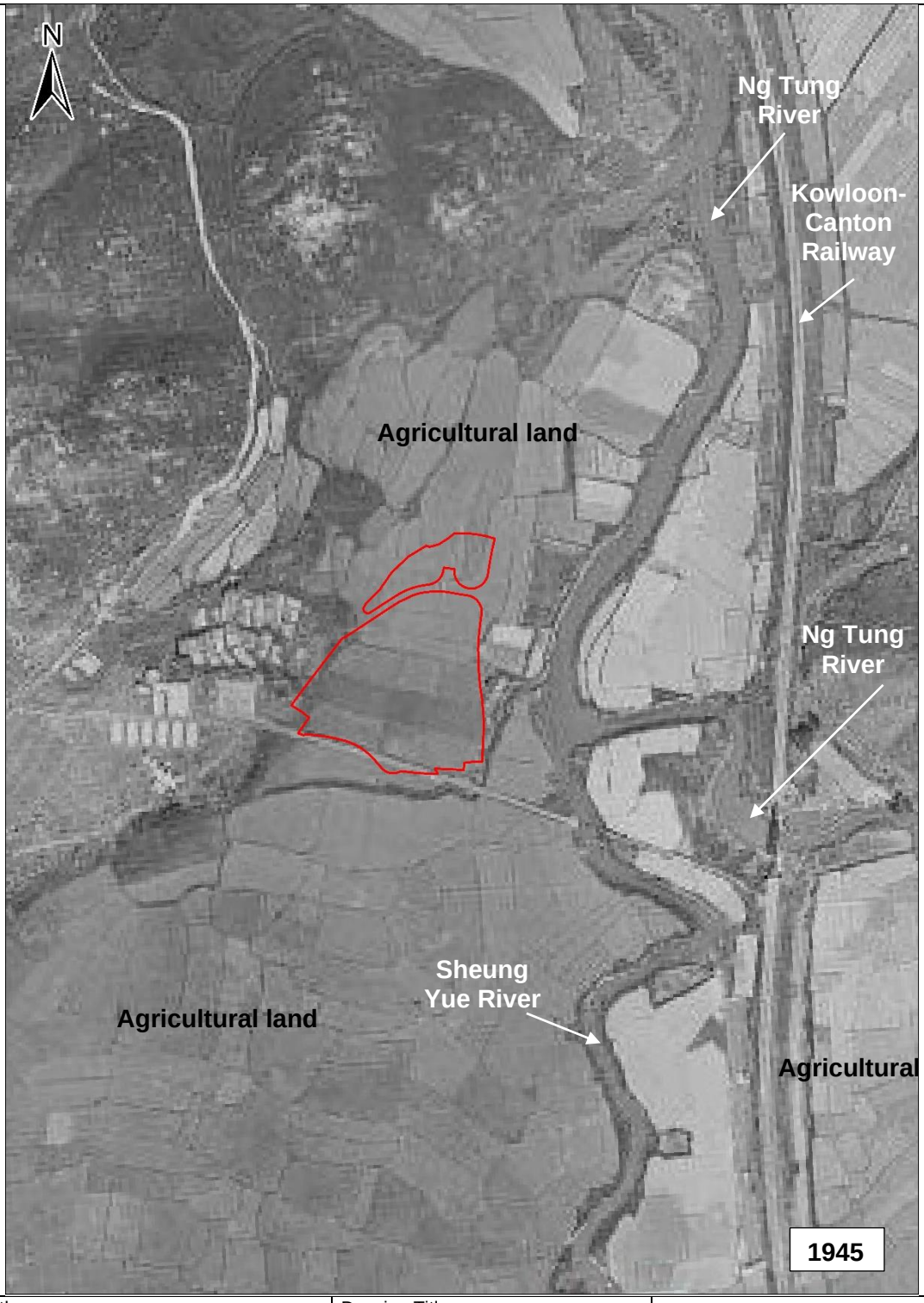
AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
07748-49 2,000’	• Some agricultural land had been converted into ponds. The northern Site was traversed by Ho Sheung Heung Road and straddled by a smaller pond whilst the southern Site was largely occupied by a larger pond. • The bridge and weir across the Sheung Yue River had been completed.
1974 10017-18 12,500’	High-flight aerial photograph precludes detailed interpretation • No significant changes to the Site were evident.
1975 11904-05 12,500’	High-flight aerial photograph precludes detailed interpretation • No significant changes to the Site were evident.
1976* 16701-02 2,000’	High-flight aerial photographs preclude detailed interpretation. • A great deal of agricultural land to the south of the southern Site had been converted into ponds.
1977 20510-11 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1978 23412-13 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1979 27048-49 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1980 30373-74 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1981 39392-93 5,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1982 44149-50 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1983 52038-39 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1984 55873-74 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1985* 66651-52 4,000’	Low-flight aerial photographs of excellent resolution.

AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
	• The small pond, straddling in the northern Site, was filled. Another elongated-shape pond was also filled to the northwest of the northern Site. • North of the northern Site, some land had been converted into ponds. • River training work on Ng Tung River had been carried out to the north of the bridge. • The weir had been demolished.
1986 A4644-45 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1987 A09759-60 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1988 A11673-74 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1989 A18166-67 20,000’	High-flight aerial photographs of good resolution. • No significant changes to the Site were evident.
1990* A22487-88 2,000’	Low-flight aerial photographs of excellent resolution. • To the north of the northern Site, all the ponds, which was first identified in 1985, had been filled. They were either abandoned or used as agricultural land. Some squatter structures were observed in the northwest of the northern Site. • To the south of the southern Site, a pylon had been constructed.
1991 A25873-74 2,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1992 A32118-19 4,000	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1993 A36434-35 4,000	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1994 CN8656-57 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1995 CN10514-15 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1996 CN15327-28	Low-flight aerial photographs of excellent resolution.

AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
3,000’	• No significant changes to the Site were evident.
1997 CN16995-96 3,500’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1998 CN19612-13 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
1999* CN23758-59 3,500’	Low-flight aerial photographs of excellent resolution. • River training work for Sheung Yue River and Ng Tung River were in progress. Some haul roads were visible. • No surface water was observed in the pond in the southern Site. The pond area appeared to be dark and rather smooth.
2000 CN27690-91 3,000’	Low-flight aerial photographs of excellent resolution. • River training work for Sheung Yue River and Ng Tung River were in progress.
2001 CW33966-67 4,000’	Low-flight aerial photographs of excellent resolution. • River training work for Sheung Yue River and Ng Tung River were in progress.
2002* CW41534-35 3,000’	Low-flight aerial photographs of excellent resolution. • River training work for Sheung Yue River and Ng Tung River were in completed. • Unregistered slope U1 had been formed in the northern Site in association with the river training work. • Site clearance was visible in the northern Site. • Unregistered slopes U3 as well as Slope Nos. 2SE-B/F103 and 2SE-B/FR106 had been formed in the southern Site in association with the river training work. The pond was covered by vegetation in the southern Site.
2003 CW46677-78 3,500’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2004* CW58066-67 2,500’	Low-flight aerial photographs of excellent resolution. • Vegetation was re-established in the northern Site. • Footpath and electricity pole were observed in the northern Site.
2005 CW65218-19 2,500’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2006 CW71041-42 4,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.

AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
2007 CW78319-20 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2008* CS18416-17 6,000’	Low-flight aerial photographs of excellent resolution. • To the west of the southern Site, construction work for Lo Wu Correctional Institution was in progress. A parcel of land had been used as a temporary storage site in the southern Site. The Lo Wu Saddle Club was relocated in association with the construction work.
2009 CW82972-73 3,000’	Low-flight aerial photographs of excellent resolution. • Construction work for Lo Wu Correctional Institution was in progress.
2010* CW86574-75 3,000’	Low-flight aerial photographs of excellent resolution. • Construction work for Lo Wu Correctional Institution was completed.
2011 CS34237-38 6,000’	Low-flight aerial photographs of excellent resolution. • The land previously used as a temporary storage site became abandoned.
2012* CW93753-54 1,000’	Low-flight aerial photographs of excellent resolution. • The land previously used as a temporary storage site became abandoned. Unregistered Slope U2 had been formed.
2013 CW102046-47 2,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2014 CS48287-88 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2015 CS57098-99 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2016 E005858C-59C 2,500’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2017 E015697-98 2,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2018 E039963C-64C 6,900’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2019 E059208C-09C 3,000’	Low-flight aerial photographs of excellent resolution. • No significant changes to the Site were evident.
2020	Low-flight aerial photographs of excellent resolution.

AERIAL PHOTOS Year/Photo No./Altitude(ft)	DETAILED OBSERVATIONS
E092967C-68C 6,900’	• No significant changes to the Site were evident.
2021* E124098C-99C 6,900’	Low-flight aerial photographs of excellent resolution. • Construction work was visible along the southern boundary of southern Site.
2022* E175121C-22C 6,900’	Low-flight aerial photographs of excellent resolution. • Construction work was visible along the southern boundary of southern Site.



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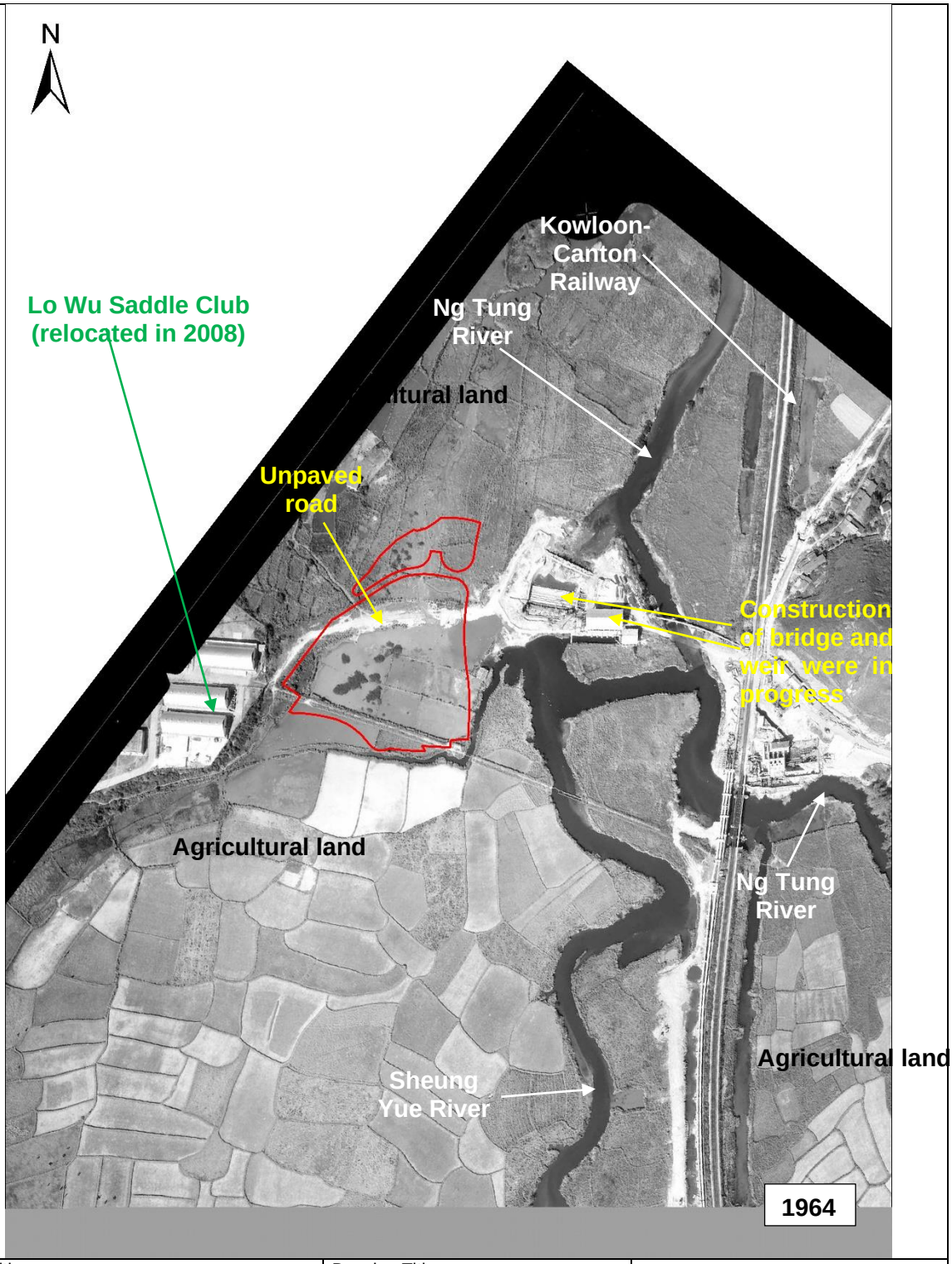
Agreement No. CE 19/2019 (CE) Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction	Aerial Photograph Interpretation of Site KTN-2	AECOM	
		Drn. By JYCT	Drn. By THLM
		Scale -	Date 16/04/2024
		Job No. 60624717	Plate. No. B1



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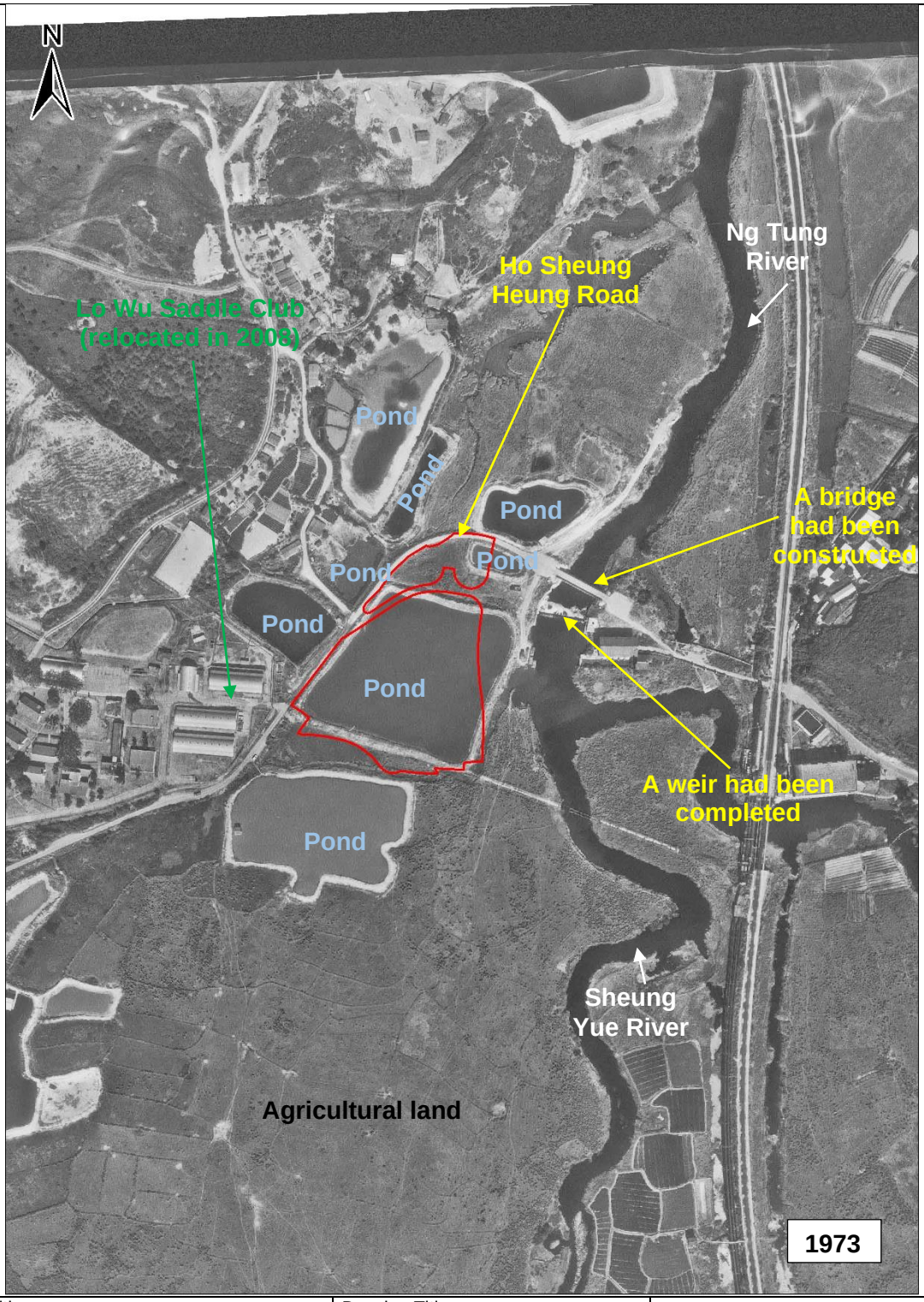

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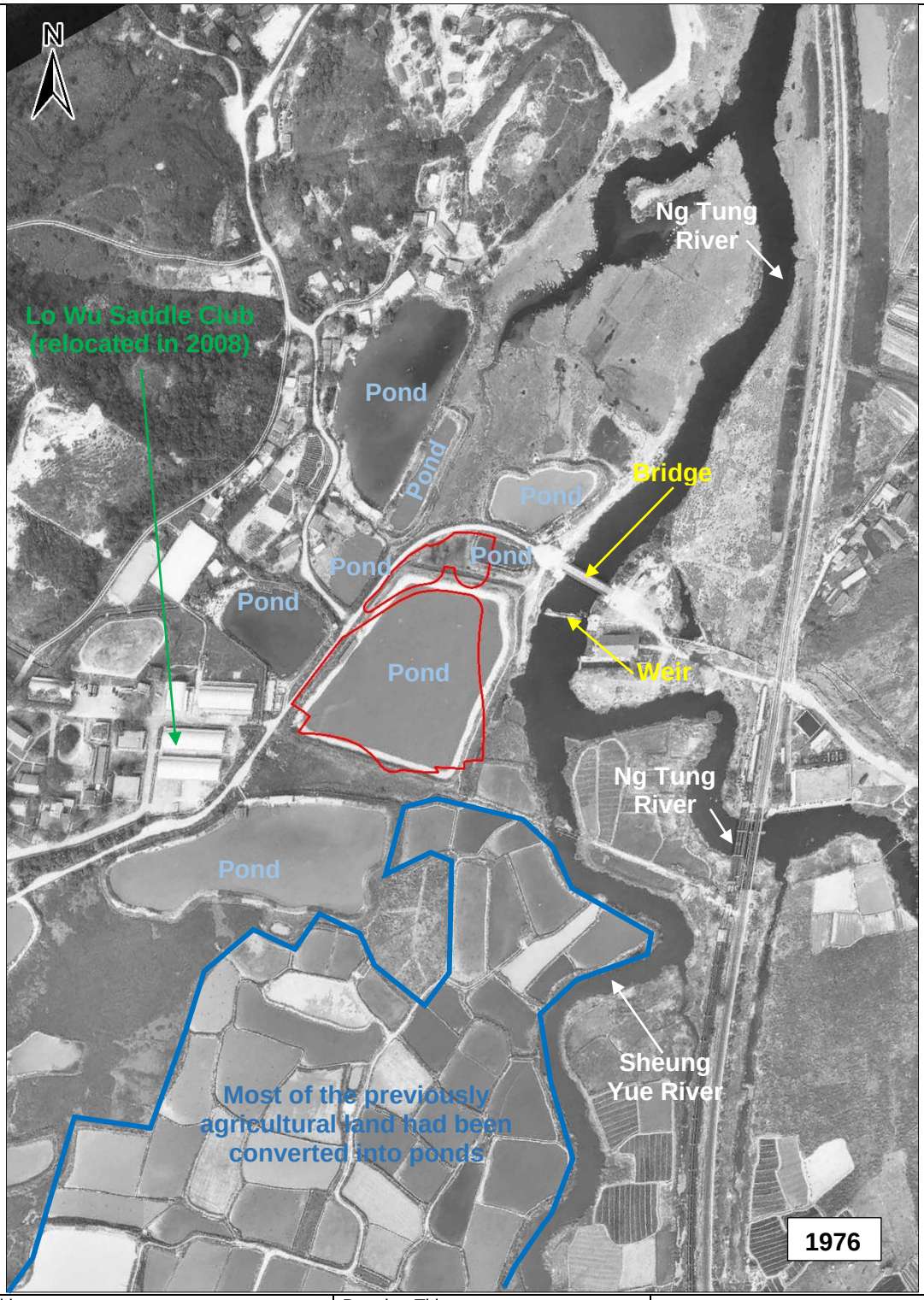

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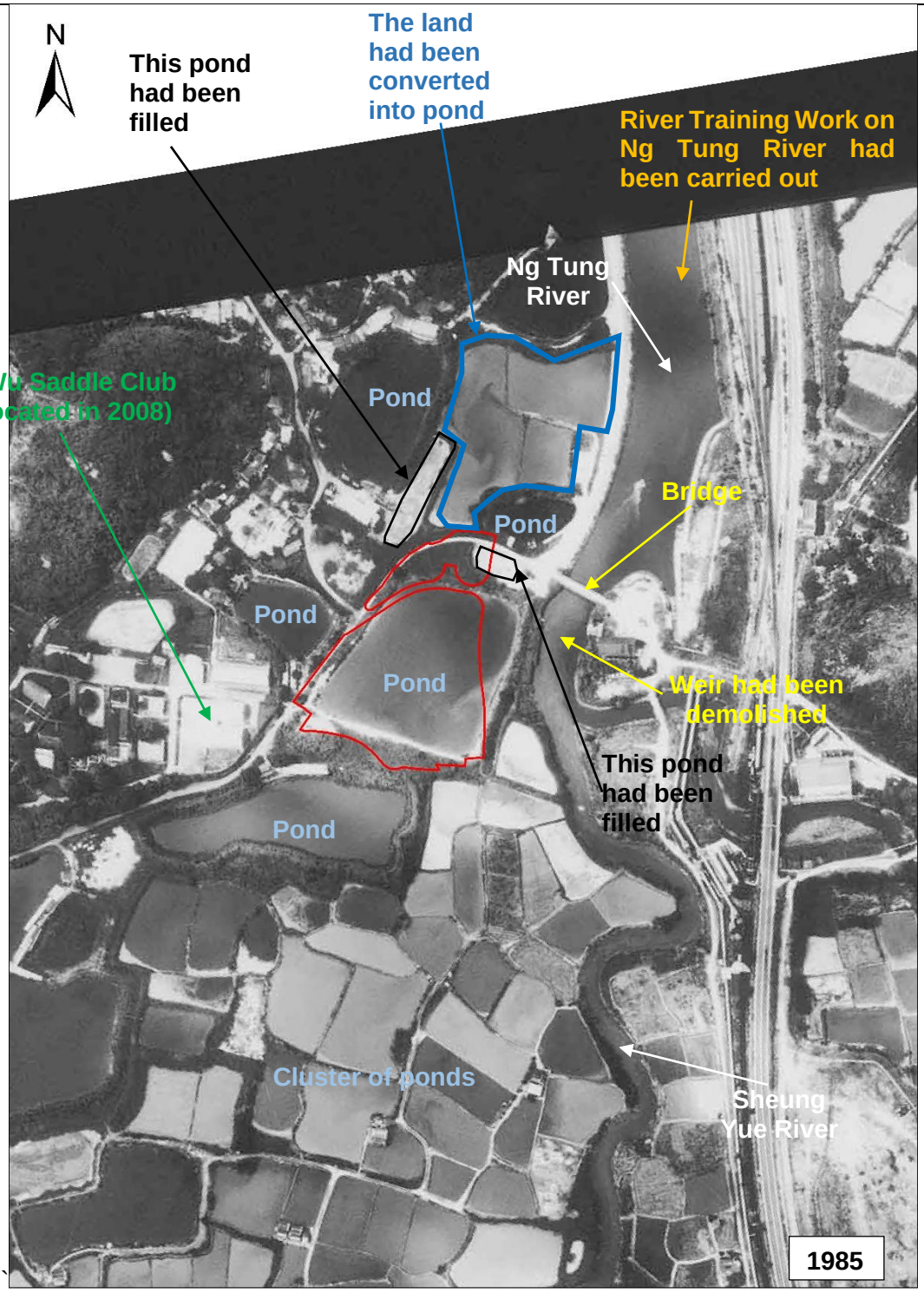

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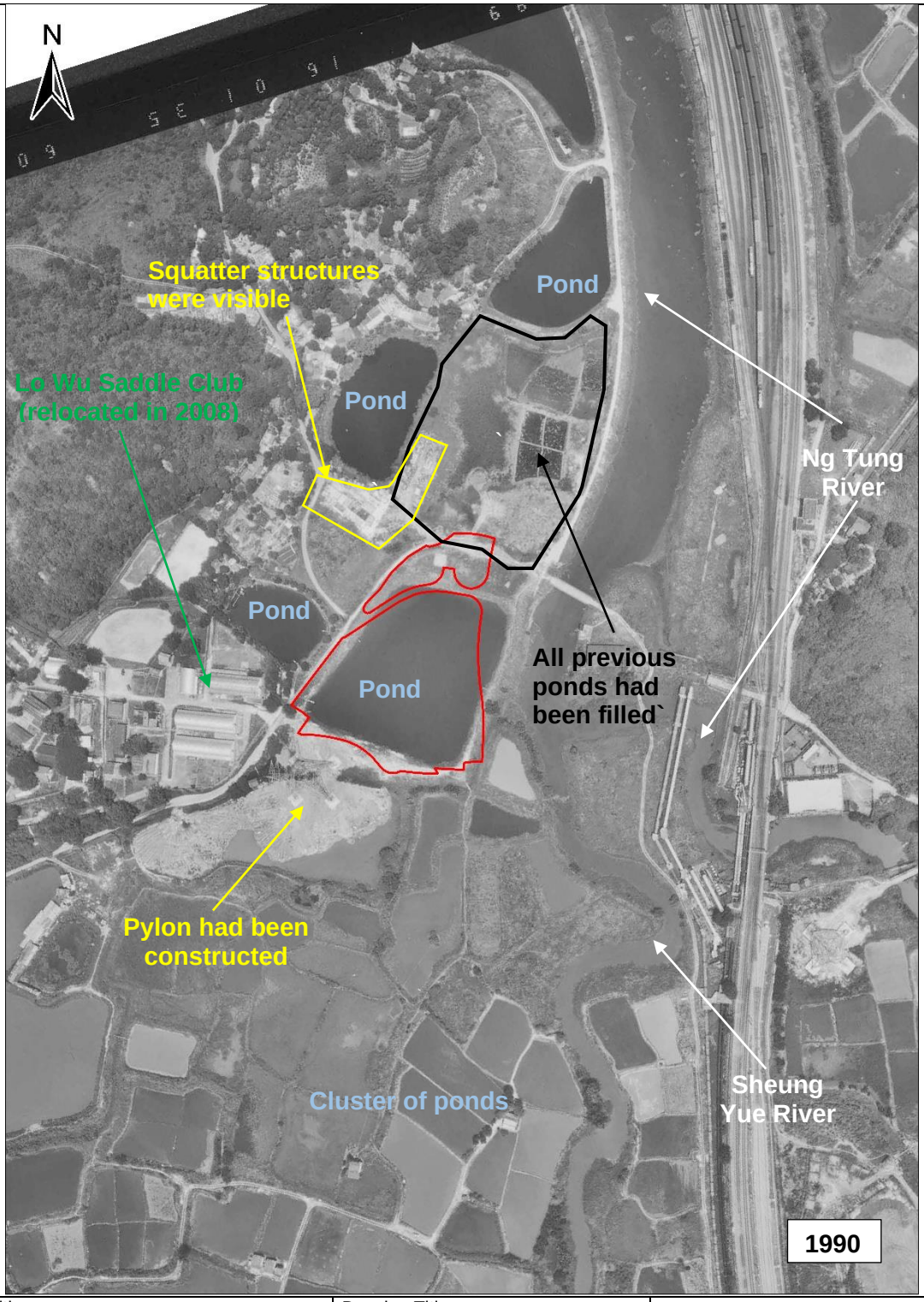

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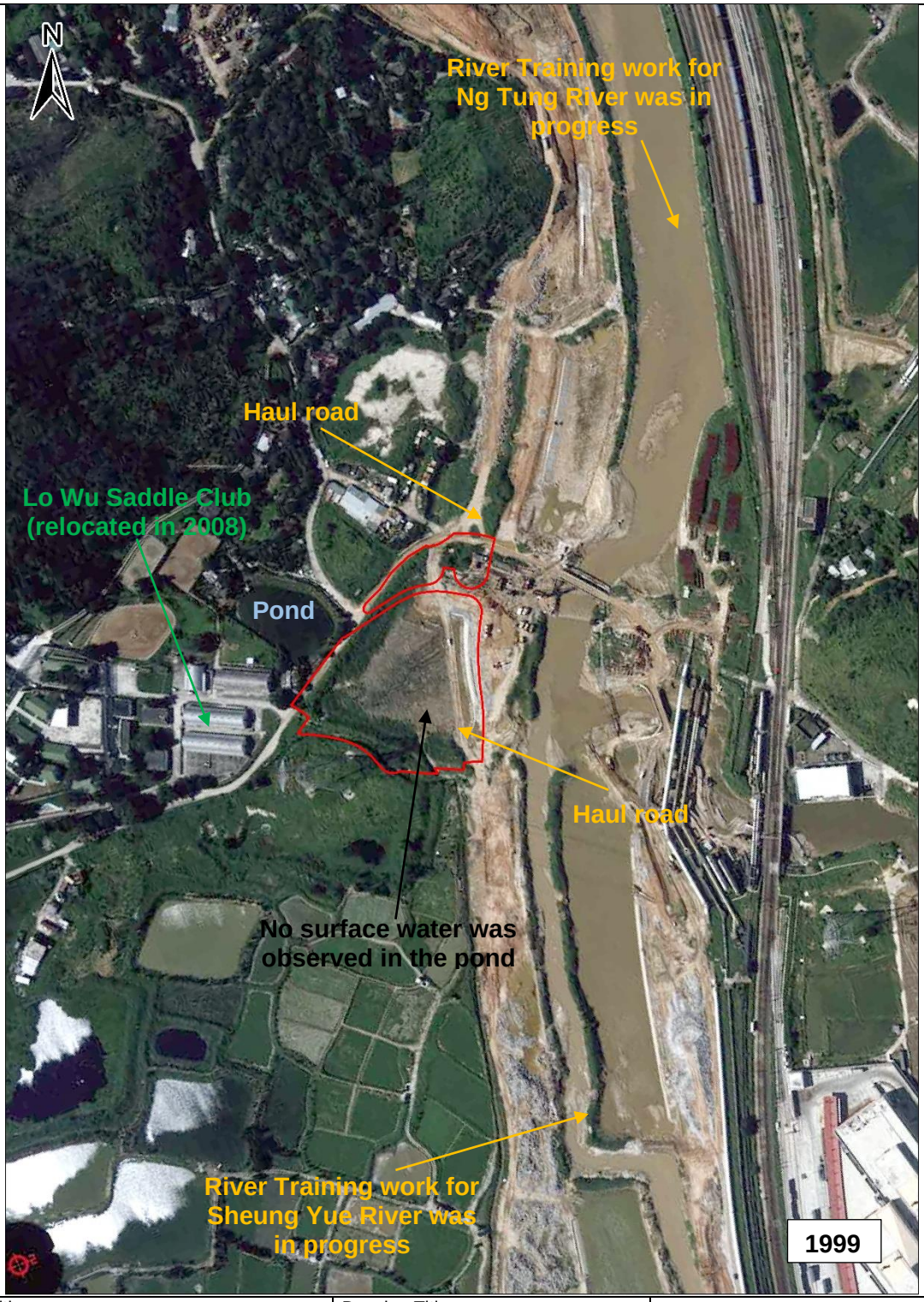

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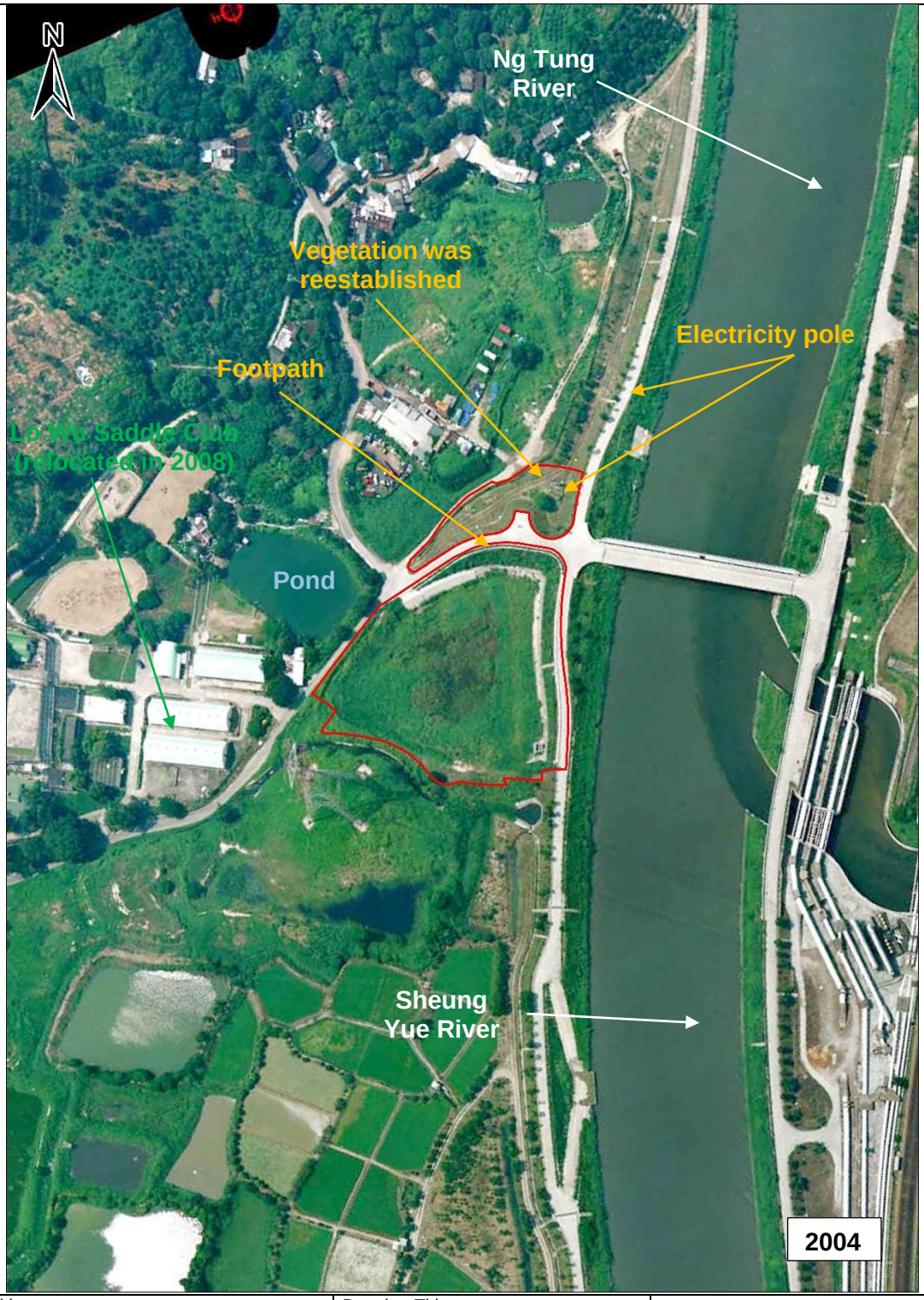

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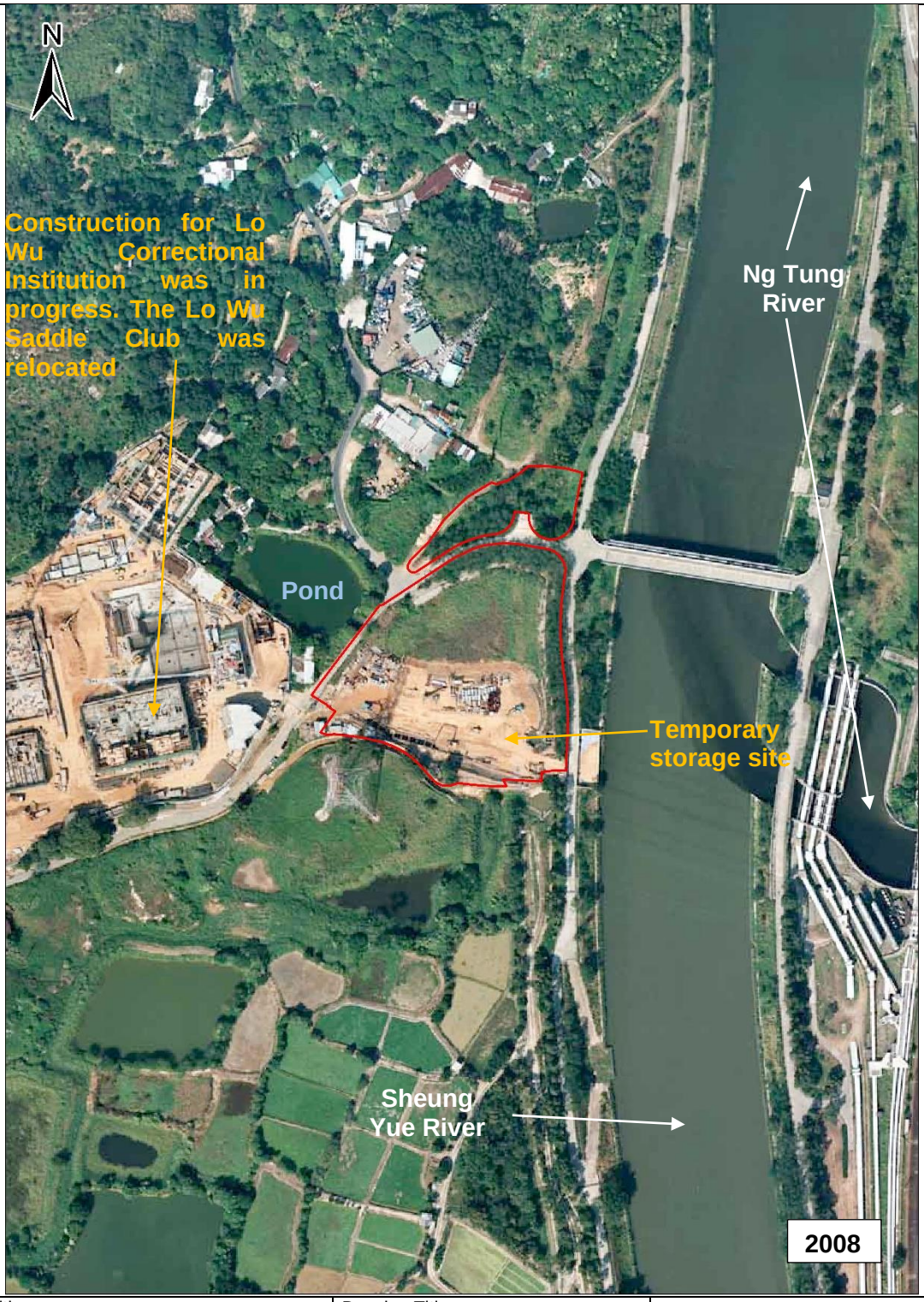

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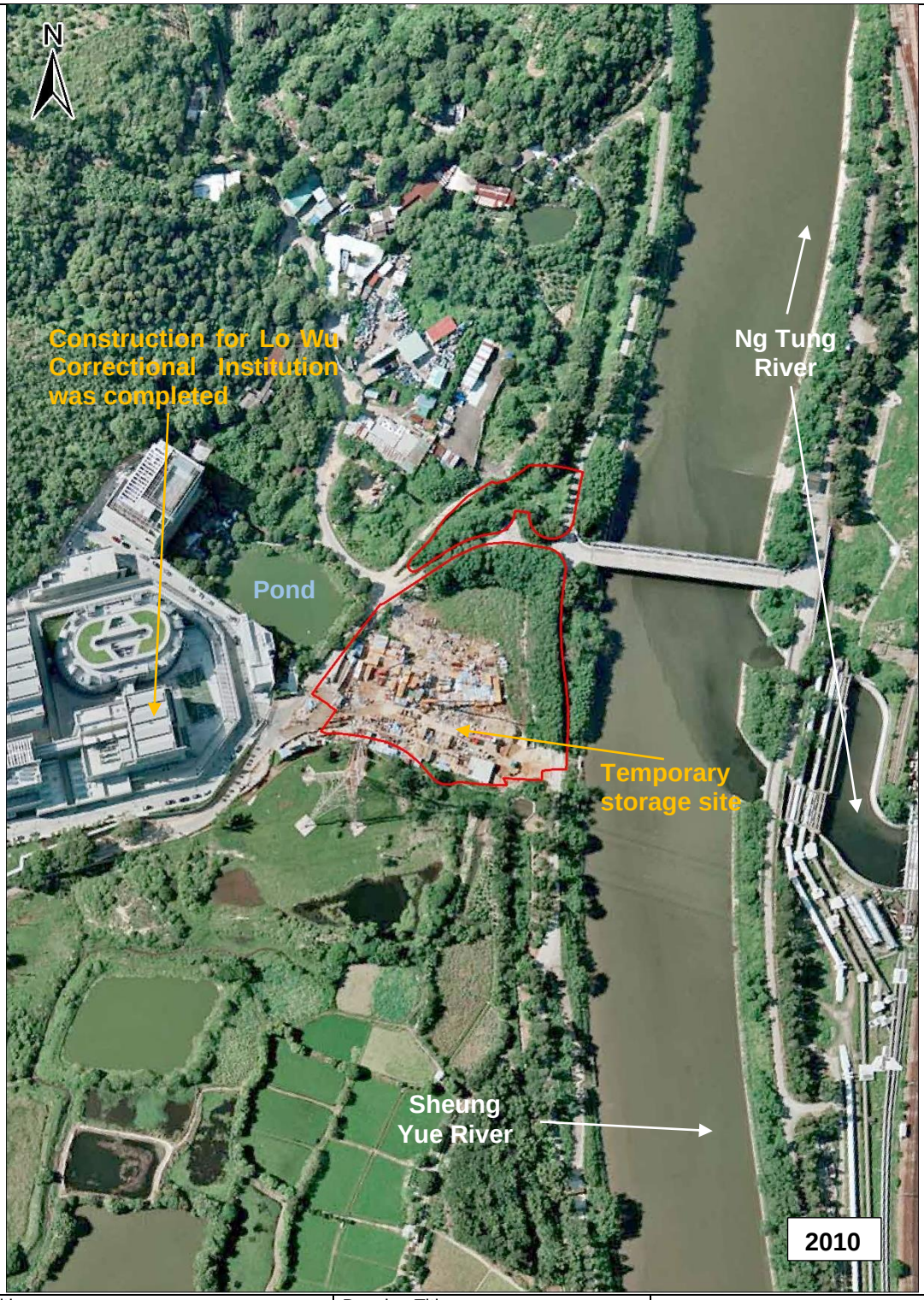

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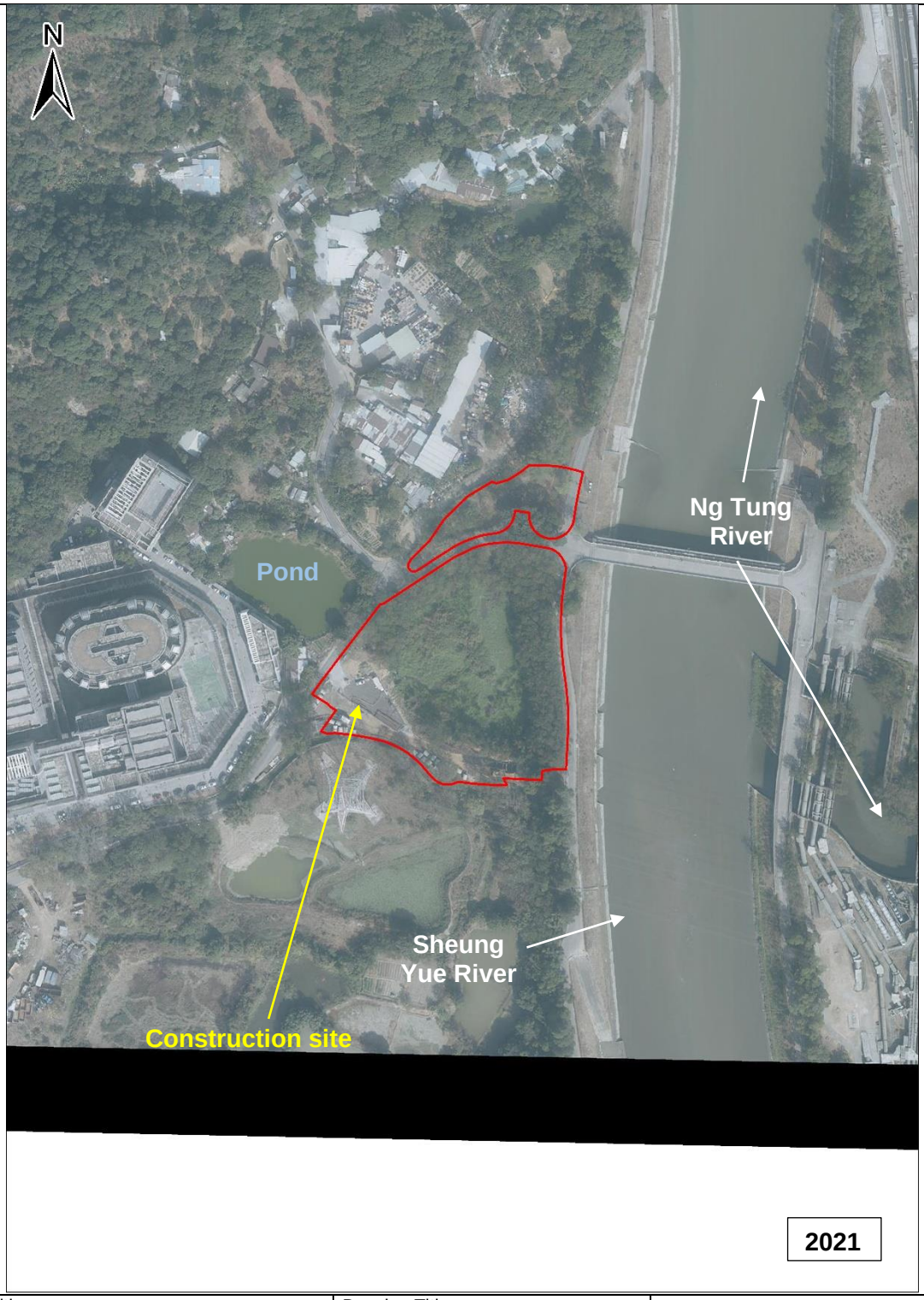

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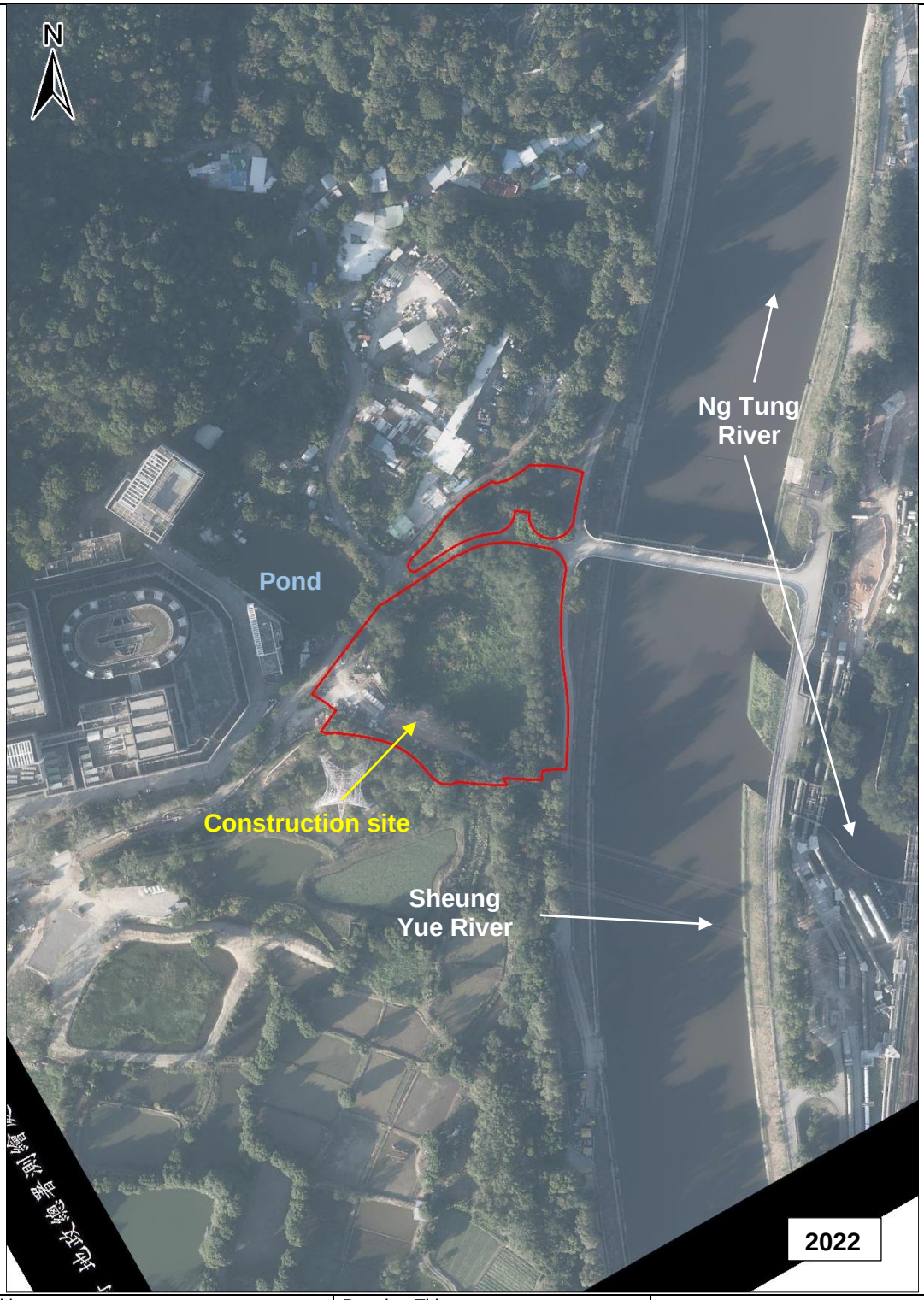

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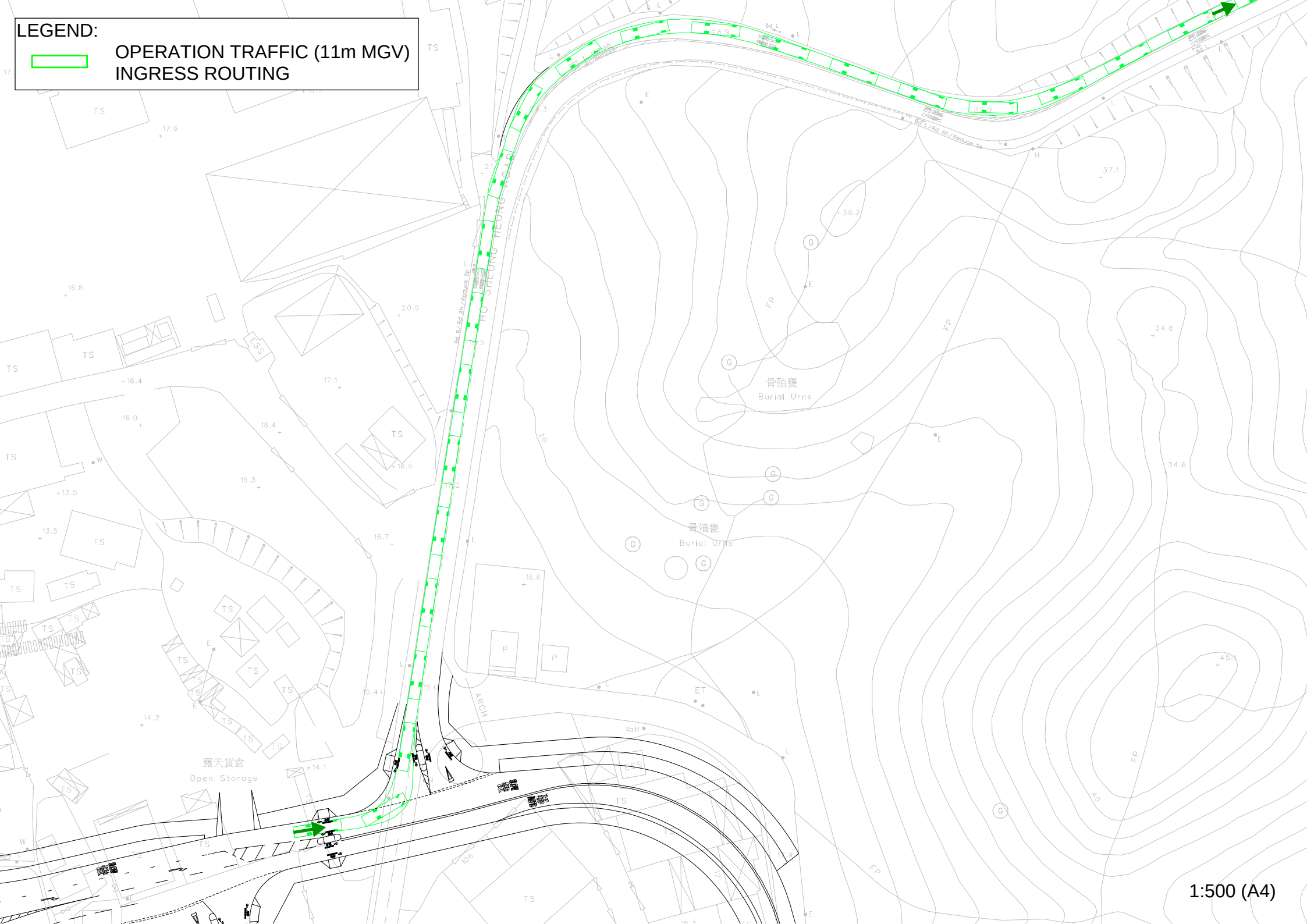
Appendix I

Swept Path Analysis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骨殖甕
Burial Urns
露天貨倉
Open Storage
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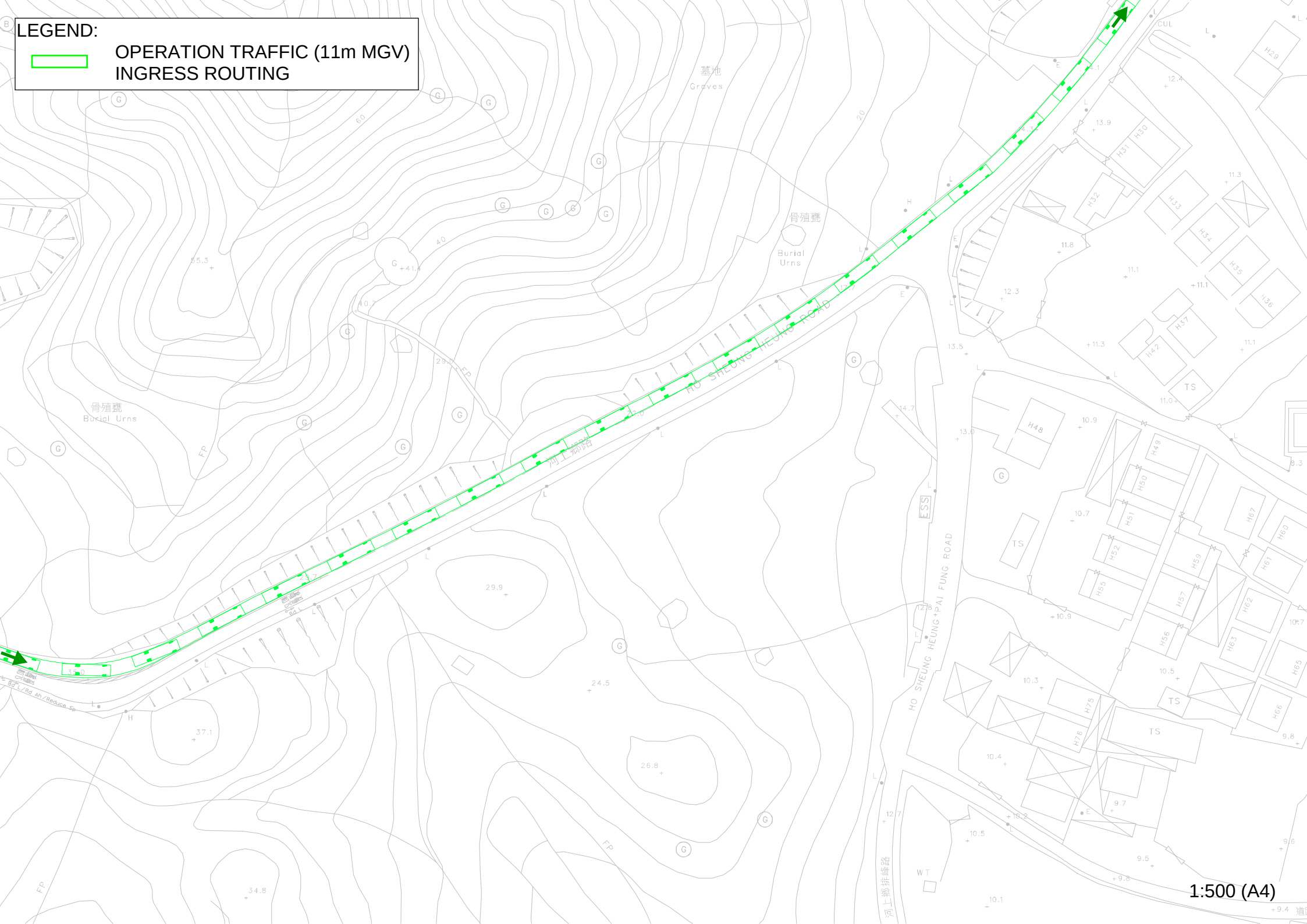
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墓地
Graves
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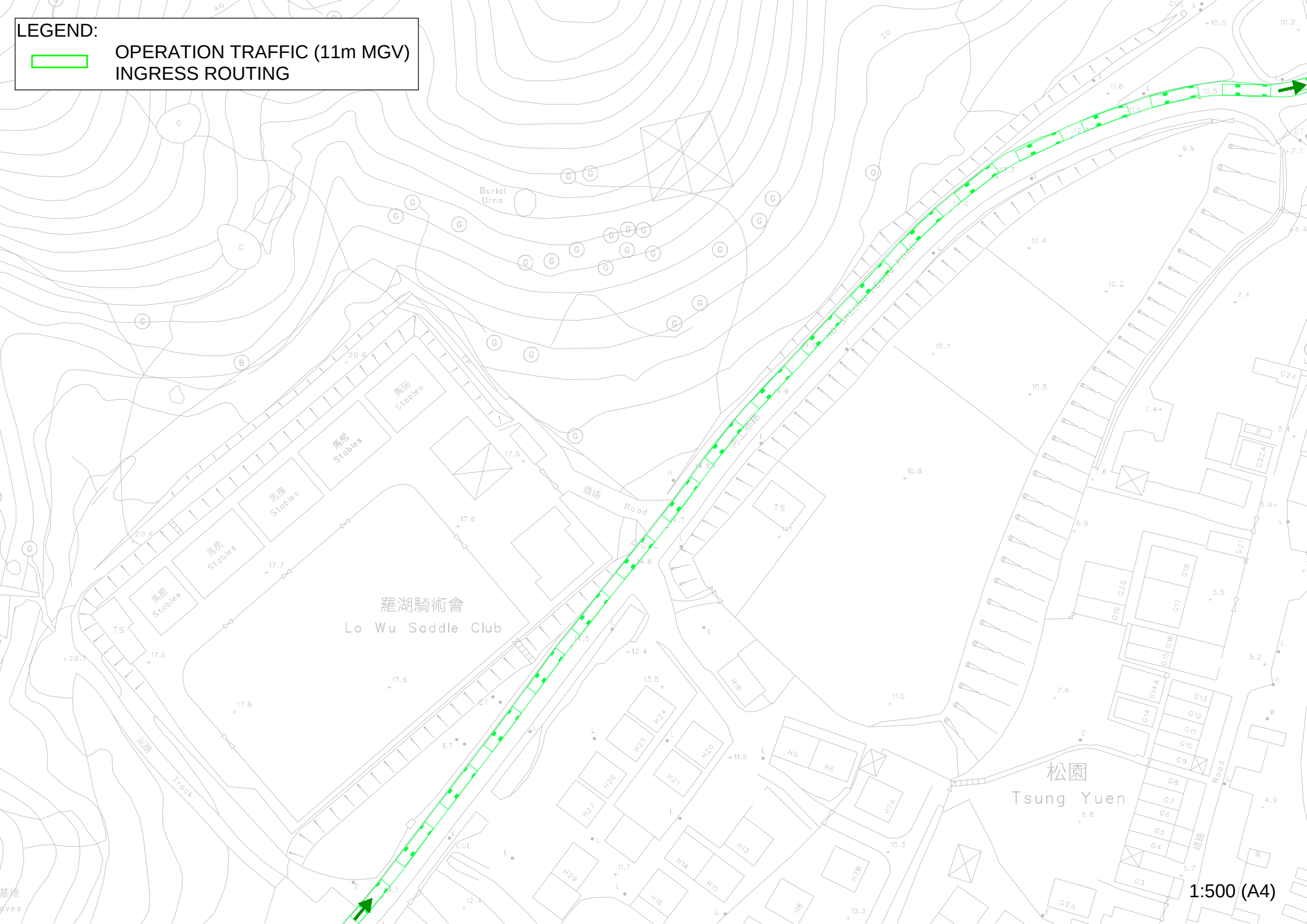
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Lo Wu Saddle Club
松園
Tsung Yuen
Burial Urns
Stables
Road
Track
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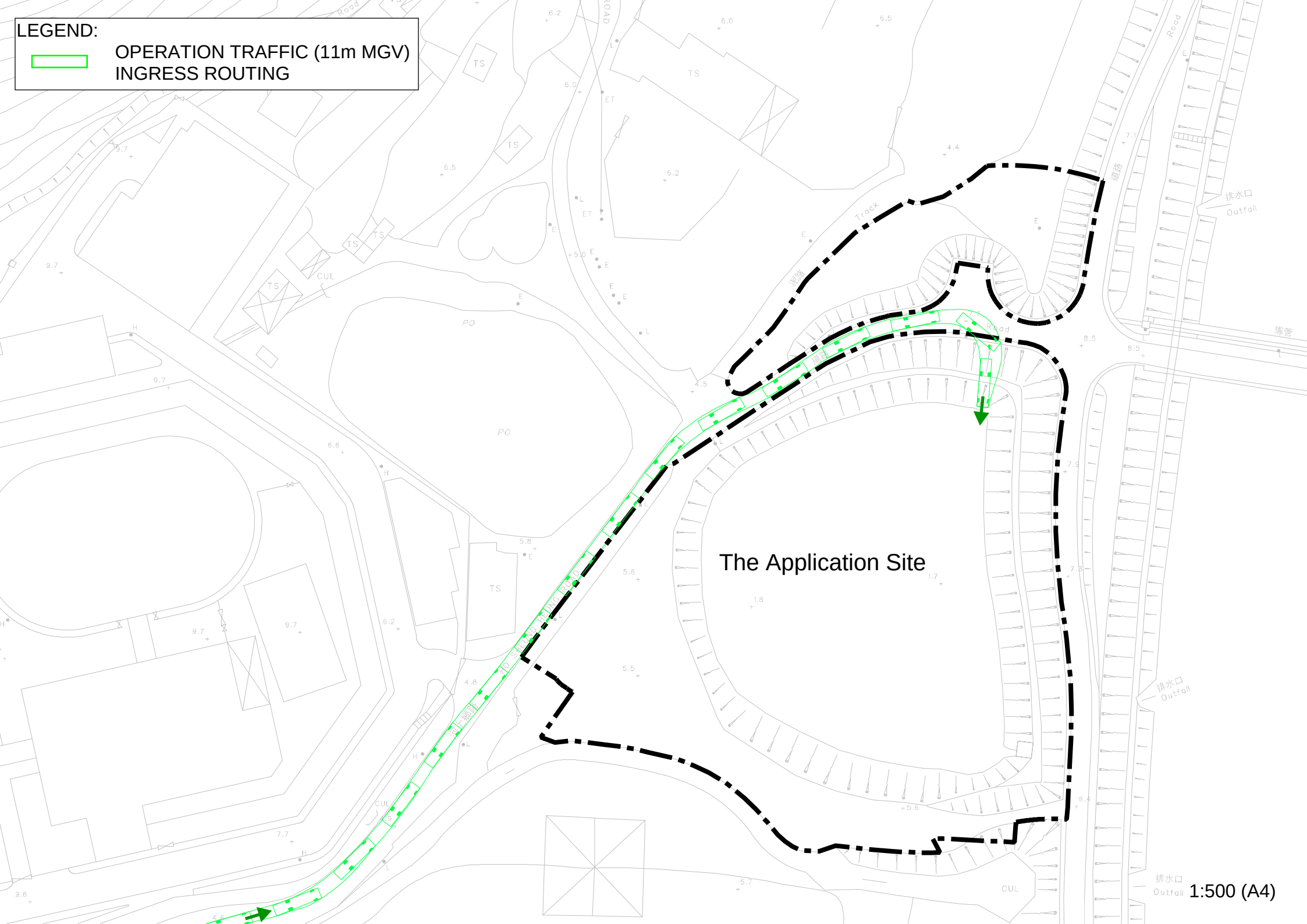
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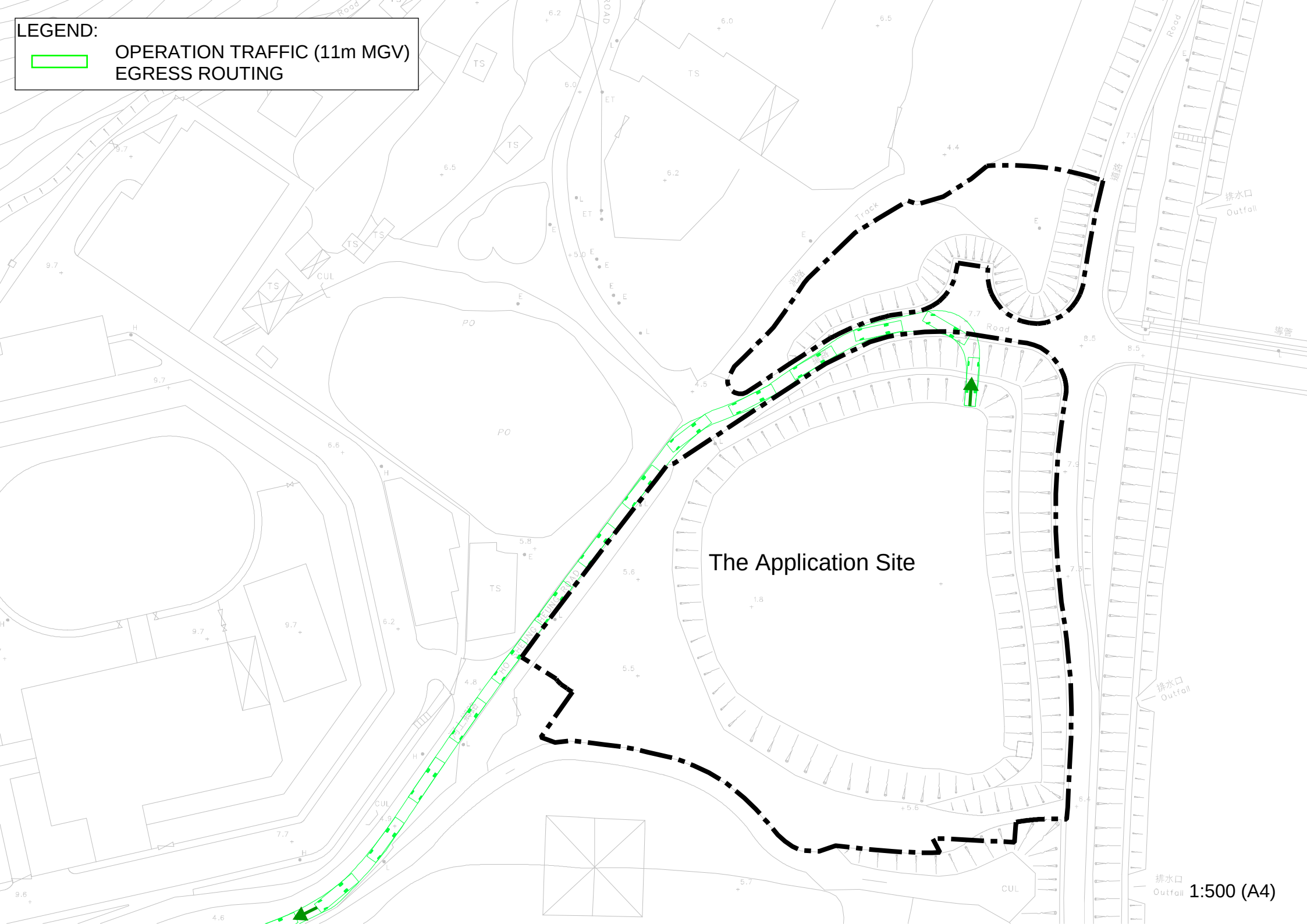
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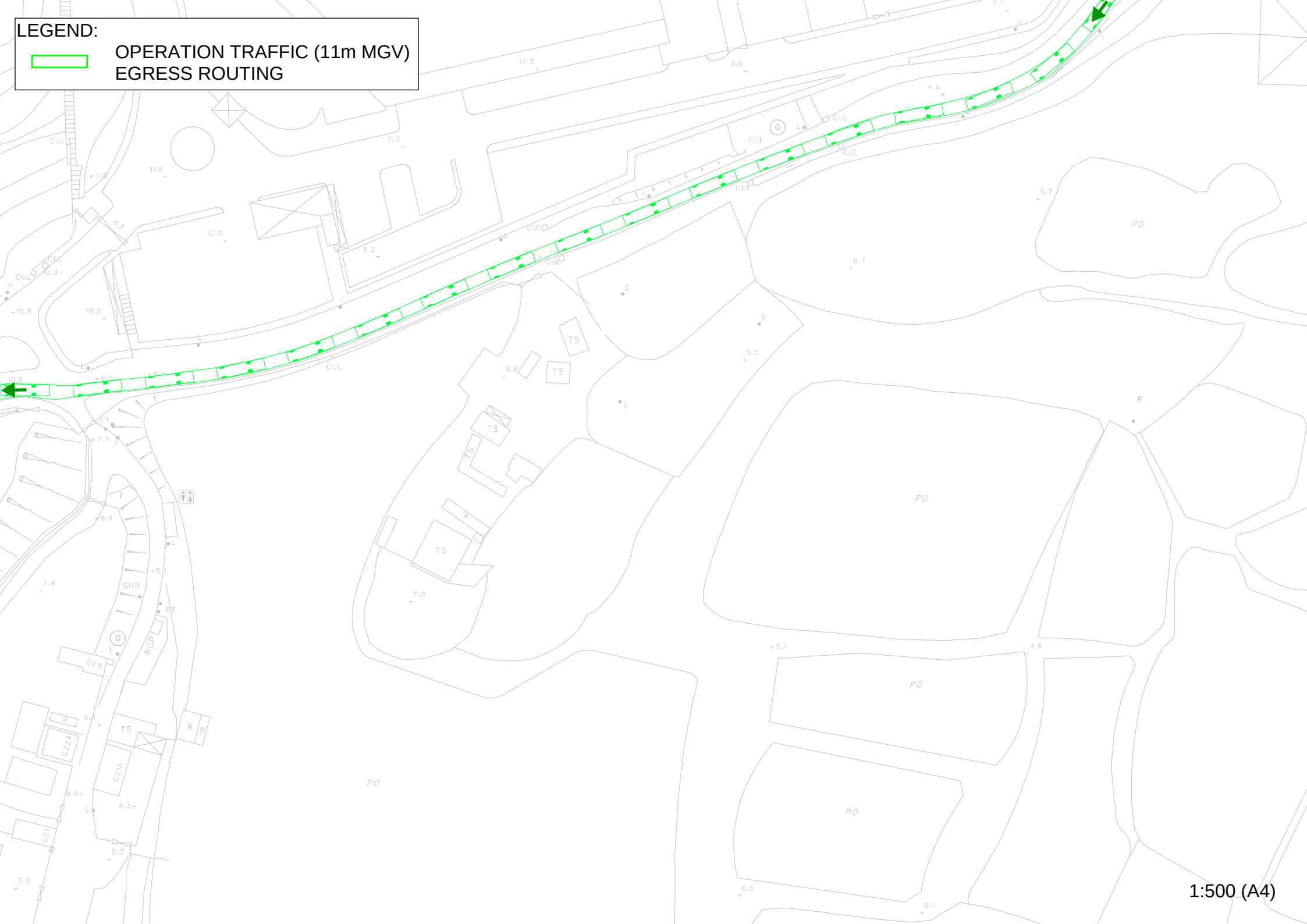
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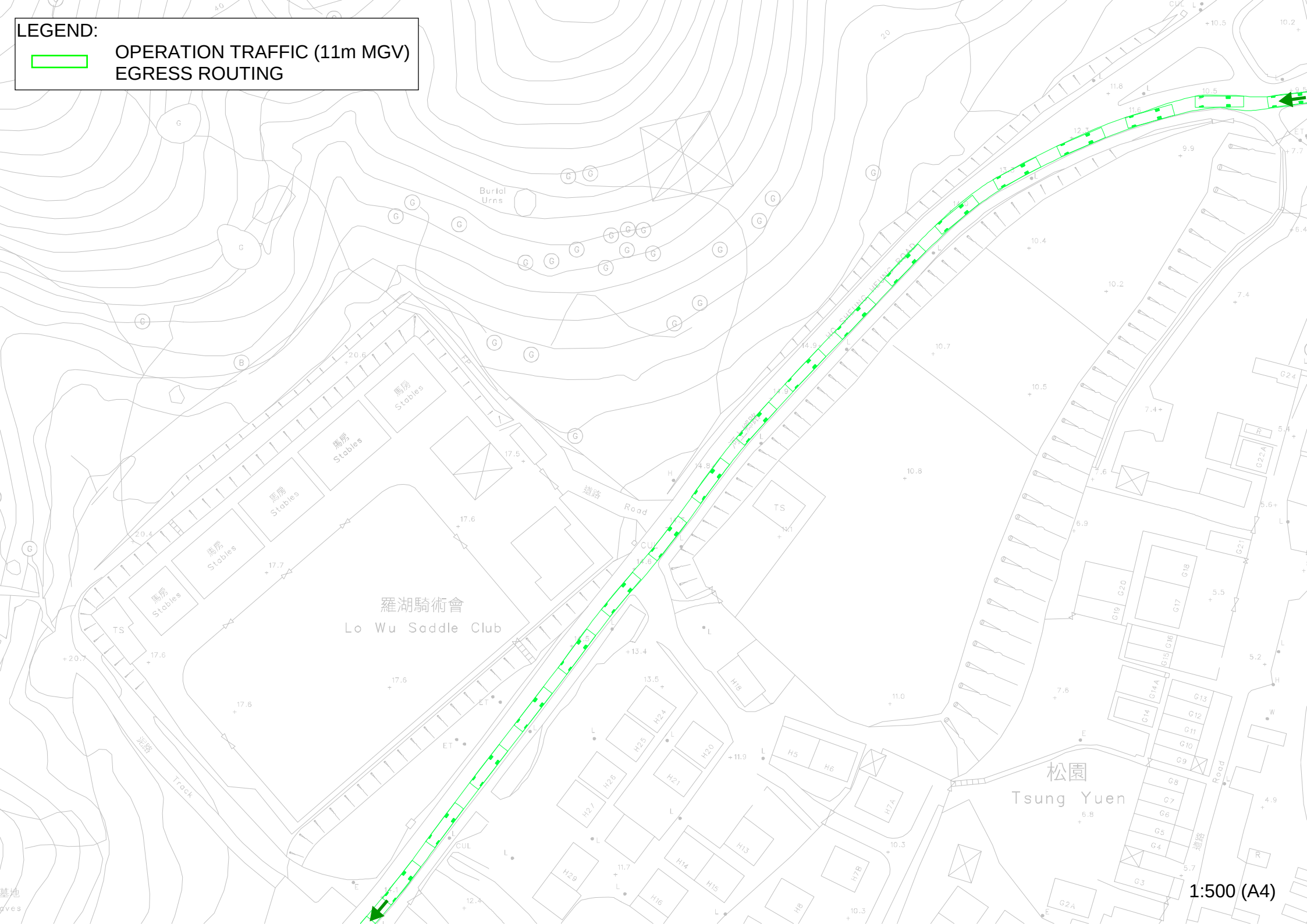
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EGRESS ROUTING
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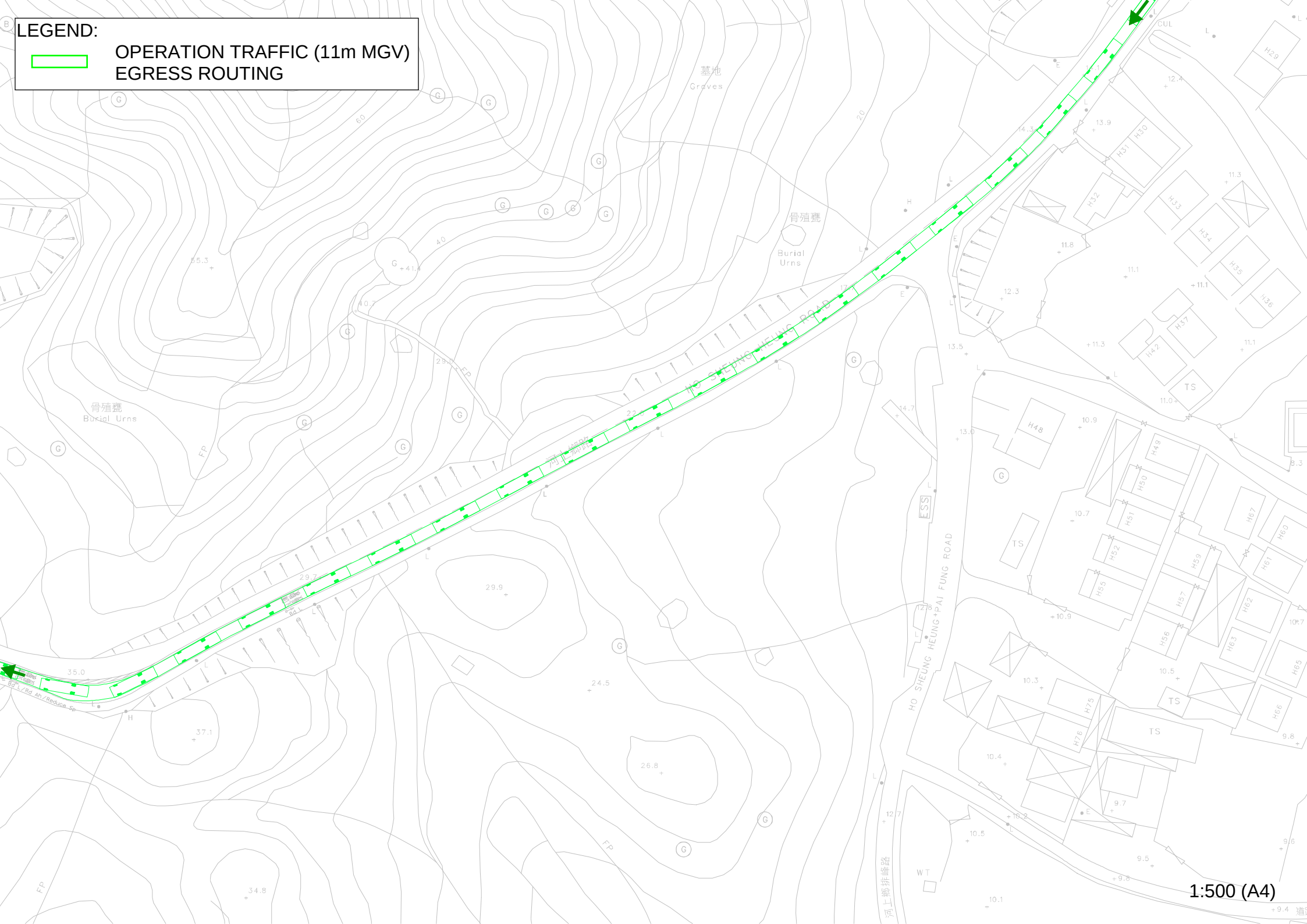
Burial Urns
Stables
Road
Track
1:500 (A4)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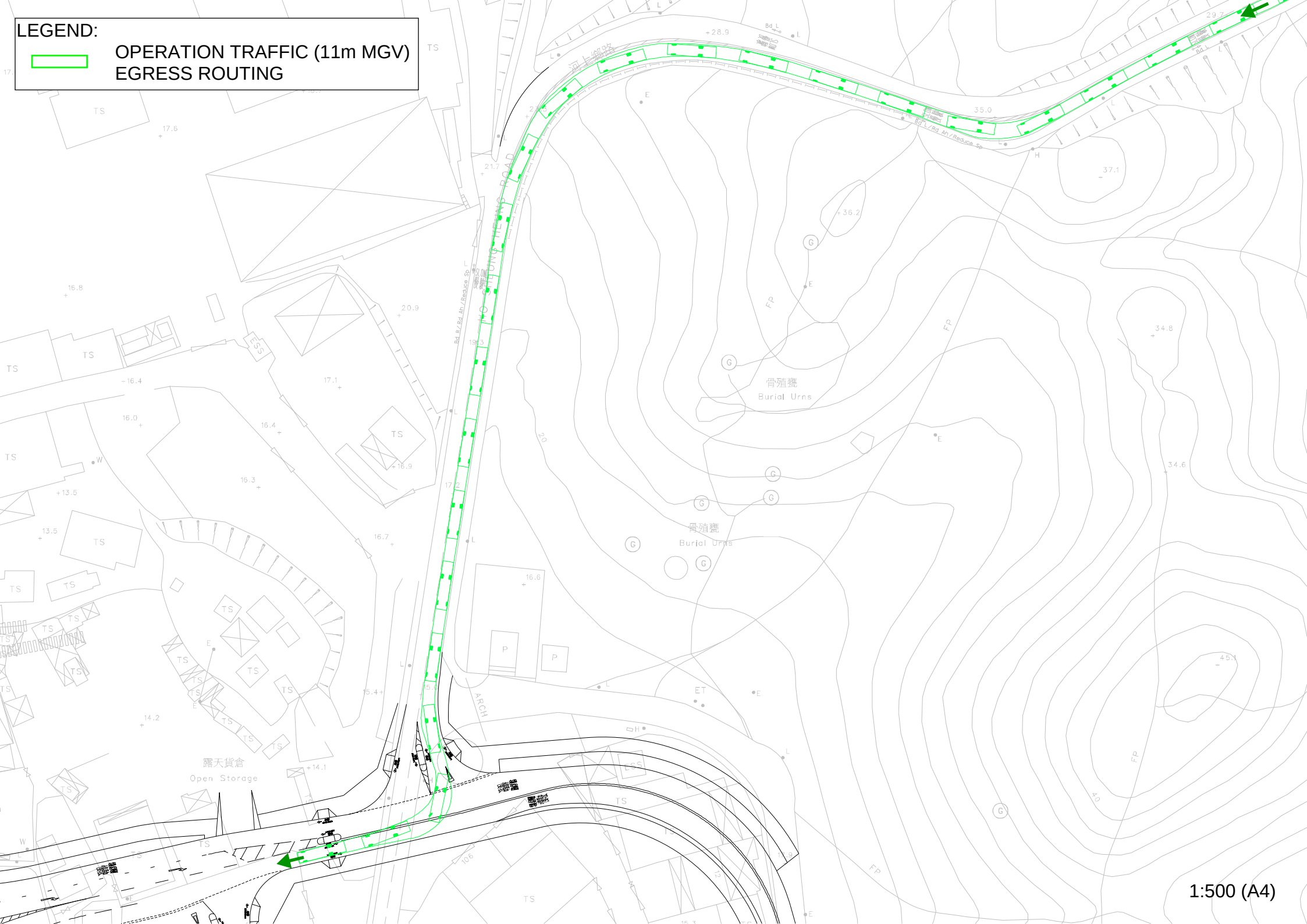
墓地
Graves
骨殖甕
Burial Urns
1:500 (A4)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EGRESS ROUTING
骨殖甕
Burial Urns
露天貨倉
Open Storage
1:500 (A4)

Appendix J

Environmental Assessment and Ecological Impact Assessment Report

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1 INTRODUCTION

1.1 Background

1.1.1.1 To provide appropriate support for livestock farms affected by the development of Northern Metropolis, the Development Bureau (DEVB) the Environment and Ecology Bureau, the Agriculture, Fisheries and Conservation Department (AFCD) and relevant departments have formed an interdepartmental working group to draw up plans that will assist the affected livestock farmers, including identification of suitable government sites for the relocation of livestock farms.

1.1.1.2 A site near the north-east boundary of Kwu Tung North New Development Area (KTN NDA) near Lo Wu Correctional Institution (i.e. "the Site" or "Site KTN-2"), inter alia, is identified as a suitable site for relocation of the affected livestock farms.

1.1.1.3 Considering that Site KTN-2 is located within KTN NDA, DEVB invited Civil Engineering and Development Department (CEDD) as works agent for the technical assessments to support the Section 16 Planning Application (hereafter referred to as s.16 Application) of the proposed site formation works (hereinafter referred as "the Project" or "the Proposed Works"). CEDD will also be responsible for the subsequent design and construction of the site formation and associated infrastructure works for Site KTN-2. The formed site would be handed over to Agriculture, Fisheries and Conservation Department (AFCD) by end 2025 for further development of a multi-storey building (MSB) to accommodate the affected livestock farms. Further studies (including environmental assessment and bio-security assessment) for the development of MSB will be carried out by Trade in a later stage.

1.1.1.4 AECOM has been commissioned to provide an Environmental Assessment and Ecological Impact Assessment Report to support the s.16 Application for of the proposed site formation works. In view of the minor nature and small scale of the Project (i.e. site formation works only), only potential water quality and ecological impacts associated with the site formation works will be anticipated. Hence, this Report presents a study of the potential water quality impact and ecological impact where necessary arising from the proposed works in order to confirm its environmental suitability.

1.2 Site Location and Existing Land Use

1.2.1.1 Site KTN-2, with an approximate area of 1.3ha, is currently zoned as "Agriculture" ("AGR") and "Open Space" ("O") in the approved Kwu Tung North Outline Zoning Plan (OZP) (No. S/KTN/4). The Site is situated between Ng Tung River and Lo Wu Correctional Institution and is divided into two patches by Ho Sheung Heung Road. Industrial uses and active agricultural lands are identified at the north and south of the Site respectively. Most area of the Site is currently occupied by marsh and plantation. The location of Site KTN-2 is shown in **Figure 1.1**.

1.3 Proposed Works

1.3.1.1 As mentioned in **Section 1.1.1.3**, site formation works and the associated infrastructure works will be conducted by CEDD for future development of MSB. The proposed construction activities mainly comprise site clearance, filling and earthwork.

1.4 Environmental Assessments

1.4.1.1 In this EA, the identified key issues associated with the proposed works are addressed in the following sections:

- Section 2: Water Quality;
- Section 3: Ecology; and
- Section 4: Conclusion.

2 WATER QUALITY

2.1 Introduction

2.1.1.1 This section discusses the potential water quality impact arising from the proposed works.

2.2 Environmental Legislation, Policies, Standards and Criteria

Water Quality Objectives under Water Pollution Control Ordinance (WPCO)

2.2.1.1 The Water Pollution Control Ordinance (WPCO) provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, Hong Kong waters are divided into ten Water Control Zones (WCZs). Site KTN-2 is located within the Deep Bay WCZ. WQOs for Deep Bay WCZ relevant to this assessment are listed in **Table 2.1**.

Table 2.1 Summary of Water Quality Objectives for Deep Bay Water Control Zone

Parameters	Objectives	Sub-Zone
Offensive Odour, Tints	Not to be present	Whole Zone
Visible foam, oil scum, litter	Not to be present	Whole Zone
Dissolved Oxygen (DO) within 2 m of the seabed	Not less than 2.0 mg/L for 90% of samples	Outer Marine Subzone excepting Mariculture Subzone
Dissolved Oxygen (DO) within 1 m below surface	Not less than 4.0 mg/L for 90% of samples	Inner Marine Subzone excepting Mariculture Subzone
	Not less than 5.0 mg/L for 90% of samples	Mariculture Subzone
Depth-averaged DO	Not less than 4.0 mg/L	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Indus Subzone, Ganges Subzone, Water Gathering Ground Subzones and other inland waters of the Zone
	Not less than 4.0 mg/L for 90 % sample	Outer Marine Subzone excepting Mariculture Subzone
pH	To be in the range of 6.5 – 8.5, change due to human activity not to exceed 0.2	Marine waters excepting Yung Long Bathing Beach Subzone
	To be in the range of 6.5 – 8.5	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	To be in the range of 6.0 – 9.0	Other Inland Waters
	To be in the range of 6.0 – 9.0 for 95% samples, change due to waste discharges not to exceed 0.5	Yung Long Bathing Beach Subzone
Salinity	Change due to human activity not to exceed 10% of ambient	Whole Zone
Temperature	Change due to human activity not to exceed 2 °C	Whole Zone
Suspended solids (SS)	Not to raise the ambient level by 30% caused by waste discharges and shall not affect aquatic communities	Marine Waters
	Not to cause the annual median to exceed 20 mg/L	Yuen Long & Kam Tin (Upper and Lower) Subzones, Beas Subzone, Ganges Subzone, Indus Subzone, Water Gathering Ground Subzones and other inland waters
Unionized Ammonia (UIA)	Annual mean not to exceed 0.021 mg/L as unionized form	Whole Zone
Nutrients	Shall not cause excessive algal growth	Marine Waters

Parameters	Objectives	Sub-Zone
Total Inorganic Nitrogen (TIN)	Annual mean depth-averaged inorganic nitrogen not to exceed 0.7 mg/L	Inner Marine Subzone
	Annual mean depth-averaged inorganic nitrogen not to exceed 0.5 mg/L	Outer Marine Subzone
Bacteria	Not exceed 610 per 100mL, calculated as the geometric mean of all samples collected in one calendar year	Secondary Contact Recreation Subzones and Mariculture Subzones
	Should be zero per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken between 7 and 21 days.	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Not exceed 1000 per 100 mL, calculated as the running median of the most recent 5 consecutive samples taken between 7 and 21 days	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
	Not exceed 180 per 100 mL, calculated as the geometric mean of all samples collected from March to October inclusive. Samples should be taken at least 3 times in one calendar month at intervals of between 3 and 14 days.	Yung Long Bathing Beach Subzone
Colour	Not to exceed 30 Hazen units	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Not to exceed 50 Hazen units	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
5-Day Biochemical Oxygen Demand (BOD_5)	Not to exceed 3 mg/L	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground Subzones
	Not to exceed 5 mg/L	Yuen Long & Kam Tin (Lower) Subzone and other inland waters
Chemical Oxygen Demand (COD)	Not to exceed 15 mg/L	Yuen Long & Kam Tin (Upper) Subzone, Beas Subzone, Indus Subzone, Ganges Subzone and Water Gathering Ground
	Not to exceed 30 mg/L	Yuen Long & Kam Tin (Lower) Subzone and Other Inland Waters
Toxins	Should not cause a risk to any beneficial uses of the aquatic environment	Whole Zone
	Waste discharge shall not cause the toxins in water significant to produce toxic carcinogenic, mutagenic or teratogenic effects in humans, fish or any other aquatic organisms.	Whole Zone
Phenol	Quantities shall not be sufficient to produce a specific odour or more than 0.05 mg/L as C_6H_5OH	Yung Long Bathing Beach Subzone
Turbidity	Shall not reduce light transmission substantially from the normal level	Yung Long Bathing Beach Subzone

Source: Statement of Water Quality Objectives (Deep Bay Water Control Zone)

Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PNs)

2.2.1.2 A "*Professional Persons Environmental Consultative Committee Practice Note*" (ProPECC PN) was issued by the EPD to provide guidelines for handling and disposal of construction

site discharges in order to control site runoff and wastewater generated during the construction phase of the Project. Practices given in the ProPECC PN 2/23 should be followed as far as possible during construction to minimise the water quality impact due to construction site drainage.

2.2.1.3 The ProPECC PN 1/23 "*Drainage Plans subject to Comments by Environmental Protection Department*" provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of various site effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC PN 1/23.

ETWB Technical Circular (Works) No. 5/2005 Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works

2.2.1.4 Environment, Transport and Works Bureau (ETWB) Technical Circular (Works) [ETWB TC(Works)] No. 5/2005 "*Protection of natural streams / rivers from adverse impacts arising from construction works*" provides an administrative framework to better protect all natural streams/rivers from the impacts of construction works. The procedures promulgated under this Circular aim to clarify and strengthen existing measures for protection of natural streams/rivers from government projects and private developments. The guidelines and precautionary mitigation measures given in the ETWB TC (Works) No. 5/2005 should be followed as far as possible to protect the inland watercourse at or near the Project area during the construction phase.

Technical Memorandum on Effluents Discharge Standards (TM-DSS)

2.2.1.5 Discharge of effluents is subject to control under the WPCO. The "*Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters*" (TM-DSS) gives guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, storm water drains, inland and coastal waters). The standards control the physical, chemical and microbial quality of effluents. Any sewage from the proposed construction and operation activities must comply with the standards for effluents discharged into the foul sewers, inland waters and coastal waters of Western Buffer WCZ, as stipulated in the TM-DSS.

2.3 Baseline Conditions

2.3.1.1 As illustrated in **Figure 2.1**, the Project sites are situated within the catchment of within the catchments of Ng Tung River and Sheung Yue River. Ng Tung River is a major river in the North District. It runs through rural areas like Lung Yeuk Tau, collects runoff from the densely populated Fanling and Sheung Shui urban areas, meets with its tributary Sheung Yue River before draining into Shenzhen River. The water quality of both rivers is routinely monitored by EPD.

2.3.1.2 Ng Tung River reached an 84% WQO compliance in 2022 as compared with 28% in 1992. The three monitoring stations (i.e. IN1, IN2 and IN3) situated along the river maintained the Water Quality Index (WQI) gradings of "Good" to "Excellent" in 2022. The water quality at these three EPD monitoring stations in the River Indus is summarised in **Table 2.2**.

2.3.1.3 As a tributary of Ng Tung River, Sheung Yue River reached an 84% WQO compliance in 2022, compared with 26% in 1992. The three EPD stations at Sheung Yue River (i.e. RB1, RB2 and RB3) received from "Fair" to "Good" WQI gradings in 2022. The water quality at these three EPD monitoring stations in Sheung Yue River is summarised in **Table 2.3**.

Table 2.2 Summary Statistics of River Water Quality Data for Ng Tung River by EPD in 2022

Parameters	EPD Stations			WPCO WQO
	IN1	IN2	IN3	
Dissolved oxygen (DO) (mg/L)	5.9 (2.9 – 7.9)	6.4 (5.6 - 10.9)	8.7 (7.9 - 10.1)	Waste discharges shall not cause the level of dissolved oxygen to be less than 4 mg/L

Parameters	EPD Stations			WPCO WQO
	IN1	IN2	IN3	
pH	7.1 (6.9 - 7.4)	7.2 (7.0 - 7.7)	7.8 (7.2 - 8.0)	The pH of the water should be within the range of 6.0-9.0
Suspended solids (mg/L)	17.0 (2.6 - 26.0)	6.0 (1.8 - 73.0)	2.7 (1.2 - 27.0)	Waste discharges shall not cause the annual median of suspended solids to exceed 20mg/L
5-day Biochemical Oxygen Demand (BOD) (mg/L)	4.2 (1.7 - 9.6)	3.9 (1.4 - 12.0)	0.9 (0.6 - 4.0)	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 5mg/L
Chemical Oxygen Demand (COD) (mg/L)	25 (5 – 47)	10 (6 – 32)	7 (3 – 15)	Waste discharges shall not cause the chemical oxygen demand to exceed 30mg/L
Oil & grease (mg/L)	<0.5 (<0.5 - <0.5)	<0.5 (<0.5 - <0.5)	<0.5 (<0.5 - <0.5)	Not available
Faecal coliforms (counts/100mL)	28 000 (1 600 - 1 100 000)	9 000 (320 - 90 000)	2 500 (560 - 10 000)	Not available
E. coli (counts/100mL)	94 000 (11 000 - 3 000 000)	32 000 (2 100 - 560 000)	6 900 (760 – 25 000)	Not exceed 1000 per 100 ml, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days
Ammonia-nitrogen (mg/L)	1.050 (0.220 – 3.800)	0.620 (0.180 – 0.960)	0.049 (0.034 - 0.270)	Not available
Nitrate-nitrogen (mg/L)	2.050 (0.420 - 4.500)	0.790 (0.470 - 1.400)	0.490 (0.041 - 0.790)	Not available
Total Kjeldahl nitrogen (mg/L)	2.70 (0.81 - 5.30)	1.20 (0.68 - 2.10)	0.32 (0.17 - 1.50)	Not available
Ortho-phosphate (mg/L)	0.220 (0.049 - 0.470)	0.056 (0.032 - 0.075)	0.055 (0.017 - 0.099)	Not available
Total phosphorus (mg/L)	0.40 (0.15 - 0.73)	0.17 (0.11 - 0.22)	0.13 (0.09 - 0.32)	Not available
Total sulphide (mg/L)	<0.02 (<0.02 - <0.02)	<0.02 (<0.02 - <0.02)	<0.02 (<0.02 - <0.02)	Not available
Aluminium (µg/L)	<50 (<50 - <50)	<50 (<50 - <50)	<50 (<50 - 59)	Not available
Cadmium (µg/L)	<0.1 (<0.1 - 0.3)	<0.1 (<0.1 - <0.1)	<0.1 (<0.1 - <0.1)	Not available
Chromium (µg/L)	<1 (<1 - 3)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Copper (µg/L)	2 (1 - 3)	1 (<1 - 4)	<1 (<1 - 2)	Not available
Lead (µg/L)	<1 (<1 - <1)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Zinc (µg/L)	11 (<10 - 73)	<10 (<10 - 20)	<10 (<10 - 13)	Not available
Flow (L/s)	13.013	NM	0.069	Not available

Parameters	EPD Stations			WPCO WQO
	IN1	IN2	IN3	
	(3.850 - 25.025)		(0.036 - 0.153)	

Notes:
(1) Data source: River Water Quality in Hong Kong in 2022 (EPD).
(2) Data presented are in annual medians of monthly samples; except those for faecal coliforms and E. coli which are in annual geometric means. <1
(3) Figures in brackets are annual ranges.
(4) NM indicates no measurement taken.

Table 2.3 Summary Statistics of River Water Quality Data for Sheung Yue River by EPD in 2022

Parameters	EPD Stations			WPCO WQO
	RB1	RB2	RB3	
Dissolved oxygen (DO) (mg/L)	9.4 (8.3 - 11.4)	7.3 (6.4 - 9.9)	7.9 (4.7 - 13.3)	Waste discharges shall not cause the level of dissolved oxygen to be less than 4 mg/L
pH	8.0 (7.3 - 8.3)	7.3 (6.8 - 7.4)	7.4 (7.1 – 8.4)	The pH of the water should be within the range of 6.5-8.5
Suspended solids (mg/L)	5.2 (2.6 - 14.0)	4.0 (1.9 - 13.0)	19.0 (1.6 - 690.0)	Waste discharges shall not cause the annual median of suspended solids to exceed 20mg/L
5-day Biochemical Oxygen Demand (BOD) (mg/L)	2.0 (1.1 - 8.8)	5.0 (1.8 - 8.1)	6.1 (1.4 - 30.0)	Waste discharges shall not cause the 5-day biochemical oxygen demand to exceed 3mg/L
Chemical Oxygen Demand (COD) (mg/L)	9 (6 - 15)	12 (5 - 18)	15 (4 - 98)	Waste discharges shall not cause the chemical oxygen demand to exceed 15mg/L
Oil & grease (mg/L)	<0.5 (<0.5 - <0.5)	<0.5 (<0.5 - <0.5)	<0.5 (<0.5 - <0.5)	Not available
Faecal coliforms (counts/100mL)	3 200 (800 - 9 600)	5 200 (380 - 24 000)	9 300 (530 - 57 000)	Not available
E. coli (counts/100mL)	14 000 (2 900 - 100 000)	25 000 (1 700 - 520 000)	38 000 (1 200 - 280 000)	Not exceed 1000 per 100 ml, calculated as the running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days
Ammonia-nitrogen (mg/L)	0.120 (0.070 - 0.730)	0.790 (0.120 - 2.600)	1.150 (0.130 - 4.100)	Not available
Nitrate-nitrogen (mg/L)	0.680 (0.260 - 1.100)	0.550 (0.081 - 0.920)	0.655 (0.330 - 1.700)	Not available
Total Kjeldahl nitrogen (mg/L)	0.66 (0.36 - 1.90)	1.50 (0.48 - 3.80)	2.40 (0.47 - 6.20)	Not available
Ortho-phosphate (mg/L)	0.160 (0.063 - 0.250)	0.110 (0.058 - 0.210)	0.110 (0.069 - 0.220)	Not available
Total phosphorus (mg/L)	0.29 (0.10 - 0.43)	0.24 (0.10 - 0.53)	0.36 (0.14 - 0.94)	Not available
Total sulphide (mg/L)	<0.02 (<0.02 - <0.02)	<0.02 (<0.02 - <0.02)	<0.02 (<0.02 - 0.02)	Not available

Parameters	EPD Stations			WPCO WQO
	RB1	RB2	RB3	
Aluminium (µg/L)	<50 (<50 - 140)	<50 (<50 - <50)	<50 (<50 - <50)	Not available
Cadmium (µg/L)	<0.1 (<0.1 - <0.1)	<0.1 (<0.1 - <0.1)	<0.1 (<0.1 - <0.1)	Not available
Chromium (µg/L)	<1 (<1 - <1)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Copper (µg/L)	<1 (<1 - 1)	1 (<1 - 3)	1 (<1 - 3)	Not available
Lead (µg/L)	<1 (<1 - <1)	<1 (<1 - <1)	<1 (<1 - <1)	Not available
Zinc (µg/L)	<10 (<10 - <10)	<10 (<10 - 14)	<10 (<10 - 16)	Not available
Flow (L/s)	0.176 (0.081 - 3.339)	0.265 (0.010 - 33.600)	NM	Not available

Notes:
(1) Data source: River Water Quality in Hong Kong in 2022 (EPD).
(2) Data presented are in annual medians of monthly samples; except those for faecal coliforms and E. coli which are in annual geometric means. <1
(3) Figures in brackets are annual ranges.
(4) NM indicates no measurement taken.

2.4 Water Sensitive Receivers

2.4.1.1 Water sensitive receivers (WSRs) identified within 500m from the boundary of Site KTN-2 include Ng Tung River, Sheung Yue River, inland watercourses and ponds. The locations of WSRs are presented in **Figure 2.1**, with details presented as below.

Table 2.4 Summary of Water Sensitive Receivers

ID	Description	Approx. Nearest Distance from the boundary of Site KTN-2, m
CA1	Conservation Area at Vernon Pass	145
CA2	Conservation Area at the west of East Rail Line - Lo Wu Station	418
W1	Ng Tung River (Modified)	26
W2	Modified watercourse at the east of W1	239
W3	Modified watercourse at the northwest of Sheung Shui Treatment Works and Water Pumping Station	308
W4	Sheung Yue River (Modified)	19
W5	Shek Sheung River (Modified)	433
W6	Modified watercourse at the west of W4	26
W7	Modified watercourse at the south of PS4	91
W8	Modified watercourse between PS4 and Site KTN-2	0
W9	Modified watercourse at the northeast of P3	8
PS1	Ponds at the north edge of the 500m assessment area	360
P2	Pond at the immediate north of Site KTN-2	112
P3	Pond at the immediate west of Site KTN-2	8
PS4	Ponds at the immediate south of Site KTN-2	25
PS5	Ponds at the northeast of Ho Sheung Heung	169
P6	Pond at the northeast of Sheung Shui Slaughter House	474
PS7	Ponds at the northwest of Sheung Shui Treatment Works and Water Pumping Station	288

2.4.1.2 No alteration / removal / modification of watercourses / ponds will be proposed due to the site formation works.

2.5 Impact Assessment and Mitigation Measures

2.5.1.1 Potential sources of water quality impacts arising from the site formation works would include general construction activities, construction site runoff, construction works near watercourses, removal / filling of wet area, accidental spillage of chemicals and sewage from construction workforce.

General Construction Activities

2.5.1.2 Wastewater generated from construction activities, including general cleaning and polishing, wheel washing, dust suppression and utility installation may contain high SS concentrations. It may also contain a certain amount of grease and oil.

2.5.1.3 Potential water quality impacts due to the wastewater discharge can be minimised if construction and site management practices are implemented to ensure that litter, fuels, and solvents do not enter public drainage systems. It is expected that with the implementation of good site practice including but not limited to the provision of adequately designed sand / silt removal facilities with channels / earth bunds / sang bag barriers and covering open stockpiles of construction materials with tarpaulin / similar fabric during rainstorms, the potential water quality impacts associated with construction activities would be minimal.

Construction Site Runoff

2.5.1.4 Construction site runoff comprises runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles. Wash water from dust suppression sprays and wheel washing facilities and fuel, oil, solvents and lubricants from maintenance of construction machinery and equipment also contribute to the pollutant levels of the construction runoff. The potential water quality impact associated with proposed works would result from the run-off and erosion from site surfaces and earth working areas. Site runoff from construction sites that are subject to earthworks might lead to surface erosion and would carry a high level of sediment. Sediment in runoff may be eventually carried to adjacent waterbodies such as watercourses or ponds near the Site.

2.5.1.5 With the implementation of good site mitigation measures to control site runoff from working areas with practices outlined in ProPECC PN 2/23 "Construction Site Drainage", and with the provision of sediment removal facilities, no adverse water quality impacts from site runoff are anticipated to occur in the adjacent waterbodies or drainage systems.

Construction Works near Watercourses

2.5.1.6 Watercourses are located in the vicinity of the Site as identified in **Figure 2.1**. Construction works near watercourses may pollute the stormwater or inland waters due to the potential release of construction wastes. Construction wastes are characterised by high concentrations of SS and elevated pH.

2.5.1.7 Adoption of good housekeeping and mitigation measures would reduce the generation of construction wastes and potential water pollution. The implementation of measures to control run-off and drainage water will be important for the construction works adjacent to the inland water in order to prevent run-off and drainage water with high levels of SS from entering the water environment. With the implementation of adequate construction site drainage and Best Management Practices (BMPs), as well as the provision of mitigation measures as specified in ETWB TC (Works) No. 5/2005 “Protection of natural streams / rivers from adverse impacts arising from construction works”, it is anticipated that water quality impacts would be minimised.

Removal / Filling of Wet Area

2.5.1.8 Due to the proposed works, marsh within the southern part of the Site (**Figure 3.1** refers) will be completely removed under the Project. The wet area to be removed should be isolated and not be connected to any existing watercourses. Before the commencement of any excavation and site formation works, removal of vegetation and draining the water (if any) from the wet area would be required. The water of the area to be drained would probably be sediment-laden and would carry a certain level of pollutants.

2.5.1.9 Direct discharge or dumping of the drained waters from the wet area to the nearby watercourse should not be allowed. The drained water generated from dewatering of the wet area should be temporarily stored in appropriate storage tanks or containers for reuse on-site as far as practicable and any surplus water should be tankered away and treated as necessary for disposal at the sewage treatment work in compliance with the TM-DSS. In order to further minimise the potential impacts, construction works at the wet area should be conducted only after the dewatering process is completed. Dewatering works in the wet area should be conducted during dry season as far as practicable to minimise the quantity of drained water.

2.5.1.10 If any excavated materials and sediment are to be generated from the construction works in wet area, they should be collected and handled in compliance with the Waste Disposal Ordinance. Direct disposal of the construction wastes or excavated materials into the stormwater drainage system and nearby waterbodies should not be allowed.

2.5.1.11 With neither direct discharge of drained water nor direct disposal of the construction wastes or excavated materials into the stormwater drainage system and nearby waterbodies, no unacceptable water quality impact would be expected.

Accidental Spillage of Chemicals

2.5.1.12 The use of chemicals (e.g. engine oil and lubricants) and their storage has the potential to create water quality impacts if spillage occurs and enters adjacent water environment. Waste oil may infiltrate into the surface soil layer, or runoff into adjacent waterbodies, increasing hydrocarbon levels.

2.5.1.13 The potential impacts could however be mitigated by handling the chemicals with practical mitigation measures and good site practices. 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 control of chemical wastes.

Sewage from Construction Workforce

2.5.1.14 Sewage effluents, which are characterised by high levels of BOD, ammonia and *E. coli* counts, will arise from the sanitary facilities provided for the on-site construction workforce. Discharge of sewage / wastewater generated during construction phase are subject to control under the WPCO. Sufficient portable chemical toilets should be provided for handling the construction sewage generated by the workforce. A licensed waste collector should be employed to clean and maintain the chemical toilets on a regular basis. Notices would be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Provided that sewage will not be discharged directly into inland waters adjacent to the construction site, and temporary sanitary facilities will be provided and properly maintained, no adverse water quality impact would be anticipated.

3 ECOLOGICAL IMPACT ASSESSMENT

3.1 Introduction

3.1.1.1 The section is to review the potential ecological impacts that are likely to be resulted from the Project.

3.2 Ecological Baseline Condition

3.2.1.1 The ecological baseline within 300m from the boundary of Site KTN-2 presented in **Sections 3.2.2** to **3.2.5** below were identified from literature and recent ecological surveys conducted from April to June 2023 and November 2023 to January 2024. A habitat map with recorded habitats, boundary of site of conservation importance and location of species of conservation importance recorded within the 300m assessment area are shown in **Figure 3.1**.

3.2.2 Recognised Sites of Conservation Importance

Conservation Area

3.2.2.1 A "Conservation Area" ("CA") of approximately 10.8ha is located at approximately 150m from Site KTN-2 at Vernon Pass (or Pai Tau Lo) (**Figure 3.1** refers). This "CA" is gazetted under the approved Ma Tso Lung and Hoo Hok Wai OZP No. S/NE-MTL/3 to retain the landscape and ecological features in the area with the presence of Ho Sheung Heung Egretry and its peripheral secondary woodland and fishponds.

Long Valley and Ho Sheung Heung Priority Site for Enhanced Conservation

3.2.2.2 The Long Valley and Ho Sheung Heung Priority Site for Enhanced Conservation (LVHSH Priority Site) coincides partially with the southern patch of site KTN-2 (**Figure 3.1** refers) within the assessment area. The LVHSH Priority Site was established under the New Nature Conservation Policy, which aims to enhance the conservation of ecologically important sites through collaboration with private sectors and non-governmental organisations (AFCD, 2004a[1] and 2004b[2]). The Ho Sheung Heung area is currently managed by non-governmental organisations under the Nature Conservation Management Agreement Project (NCMAP) (i.e. EEB(EB) 27/24/8-17 - Nature and Human in Harmony – Nature Conservation Management for Ho Sheung Heung 2023 - 2026). The monitoring result from the previous NCMAP (i.e. Nature Conservation Management for Ho Sheung Heung 2020 - 2023) reflected that the ecological value of the managed areas was enhanced by the implementation of management practices (e.g. paddy rice planting, active management of ponds)[3]. The Long Valley area, which is located at more than 300m south from Site KTN-2, is zoned as "Other Specified Uses (Nature Park)" under the Approved Kwu Tung North Outline Zoning Plan No. S/KTN/4 for the development of Long Valley Nature Park (LVNP) to protect and enhance existing wetland habitats for the benefit of the local ecology and promotion of nature conservation and education. Part of the LVNP is currently managed by non-governmental organisation under "Long Valley Nature Park Habitat Management Service".

3.2.2.3 The LVHSH Priority Site covers mainly agricultural land, Fung Shui Wood and wetland habitats (e.g. pond, marsh, watercourse) located along and at the confluence of lower Ng Tung River, Shek Sheung River and Sheung Yue River. According to previous survey findings[4], Long Valley reflects the diverse mosaic of habitats present, which are attractive to a broad range of fauna, most of the recorded species of conservation importance identified in that study occurred in wetland habitats (e.g. pond, agricultural land, marsh) and lowland areas at Long Valley. This area provides foraging, breeding, roosting and wintering habitats for a moderate diversity of faunal taxa, in particular wetland-dependent species and migratory

[1] AFCD (2004a). List of Priority Sites for Enhanced Conservation: Long Valley and Ho Sheung Heung.
[2] AFCD (2004b). List of Priority Sites for Enhanced Conservation: Deep Bay Wetland outside Ramsar Site.
[3] Leung, H. N., Yeung, L. K., & Pang, C. C. (2023). Bird Monitoring Programme - Summary Report March 2022 to February 2023. Nature and Human in Harmony - Nature Conservation Management for Ho Sheung Heung, Long Valley 2020-2023.
[4] CEDD and PlanD (2013). EIA Report for North East New Territories New Development Areas Planning and Engineering Study – Investigation (AEIAR-175/2013)

birds, such as Japanese Yellow Bunting (*Emberiza sulphurata*), Asian Dowitcher (*Limnodromus semipalmatus*), Eastern Imperial Eagle (*Aquila heliaca*). Other species of conservation importance include Common Pierrot (*Castalius rosimon*), Forget-me-not (*Catochrysops strabo*) and Lesser Bamboo Bat (*Tylonycteris fulvida*) were also recorded[1].

3.2.3 Other Key Ecological Resources

Important Bird Area

3.2.3.1 The Inner Deep Bay and Shenzhen River Catchment was recognised as one of the Hong Kong Important Bird Areas (IBA) with the area of 3,150 ha by the BirdLife International[5]. The IBA comprises various wetland and intertidal habitats including mudflats, fishponds, mangroves, gei wai (tidal shrimp pond) and farmlands[6]. It is also a globally important wetland site that supports a number of passage and wintering waterbirds including several vulnerable species such as Greater Spotted Eagle (*Clanga clanga*), Swinhoe's Egret (*Egretta eulophotes*) and Black-faced Spoonbill (*Platalea minor*). Site KTN-2 and the majority of the 300m assessment area fall within the IBA.

Ho Sheung Heung Egretry

3.2.3.2 Ho Sheung Heung Egretry is located to the west of the lower Ng Tung River and is approximately 140m north from Site KTN-2. The location of egretry recorded in previous studies[7] is presented in **Figure 3.2**. The egretry was once one of the largest egretries in Hong Kong and held the highest number of nests of Eastern Cattle Egret (*Bulbulcus coromandus*), but the number of recorded nests at the egretry has been decreasing gradually since 2018. A total of 4 nests of Chinese Pond Heron (*Ardeola bacchus*) were recorded at the egretry in 2022[8].

Ho Sheung Heung Ardeid Night Roost

3.2.3.3 Ho Sheung Heung Ardeid Night Roost is located in the pond to the southwest of Site KTN-2 (**Figure 3.1** refers). According to the observations of NTN Surveys[9], it was mainly utilized by Little Egret (*Egretta garzetta*), Chinese Pond Heron, Eastern Cattle Egret and Great Egret (*Ardea alba*), with maximum individuals of ardeids (i.e. 345) counted in November 2022, and remained active throughout the survey period (i.e. April 2022 to January 2023). A total of six flight paths were identified from the flight path survey, with only one of which was observed flying the direction from Site KTN-2 to the night roost[9]. The favourable flight height of the ardeids among the recorded flight paths was 0-10m, followed by 11-20m and 21-30m[9].

3.2.4 Terrestrial and Aquatic Ecological Resources from Literature Review

Habitats and Vegetation

3.2.4.1 A total of 10 habitats were previously recorded[10] within the 300m assessment area, including shrubland, grassland / shrubland, grassland, plantation, agricultural land, developed area / wasteland, marsh, pond, natural watercourse and modified watercourse. The ecological values of the recorded habitats generally ranged from low to moderate, with some habitats in the "Long Valley area", such as agricultural land, pond and marsh in the LVHSH Priority Site, considered to have high ecological value, which takes into account a holistic evaluation of other habitats within the "Long Valley area". The northern part of Site KTN-2 was mostly covered by plantation with some developed area / wasteland, while the larger southern part

[5] HKBWS (2004). Important Bird Areas (IBA) in Hong Kong.
[6] Birdlife International (2000). Inner Deep Bay and Shenzhen River catchment area – Birdlife International IBA.
[7] CEDD and PlanD (2013).
[8] Anon (2022). Summer 2022 Report: Egretry Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site.
[9] CEDD (2023). Ecological Survey Findings from "Remaining Phase Development of the New Territories North (NTN) – Planning and Engineering Study for NTN New Town and Man Kam To – Investigation" (NTN Surveys).
[10] CEDD and PlanD (2013).

was covered by marsh which was generally wet and overgrown with tall exotic invasive species (e.g. *Leucaena leucocephala*) of over 3m in height.

3.2.4.2 Outside Site KTN-2, hilly area at the northern and north-western part of the 300m assessment area was mainly covered by shrubland and grassland / shrubland, with some grassland and plantation in the vicinity, which partially fall within the "CA". The southern part of the assessment area was covered by a matrix of wetland habitats which mostly fall within LVHSH Priority Site, including wet agricultural land, marsh, pond and watercourse together with grassland and plantation[11]. A modified tributary of Ng Tung River is situated to the immediate south of the Site. This tributary flows eastwards and joins the modified channel of the lower Ng Tung River. The lower Ng Tung River receives water from different watercourses, including Sheung Yue River, before eventually run into the Shenzhen River and Deep Bay area. Developed area / wasteland (i.e. Lo Wu Correctional Institution) could also be found at the immediate west of the Site and east of Ng Tung River.

3.2.4.3 Majority of the floral species recorded within the 300m assessment area were common and widespread in Hong Kong, and typical to the habitats[11]. For instance, the marsh was covered by exotic wetland plant species such as *Brachiaria mutica* and *Sesbania cannabina*, and exotic *Leucaena leucocephala* as well as some native wetland herbs *Polygonum japonicum* and *Ludwigia octovalvis*. Plantation habitat was mainly comprised of dominantly exotic tree species (e.g. *Acacia confusa*) and some native tree species (e.g. *Ficus microcarpa* and *Ficus virens*). Limited floral diversity and abundance were recorded in other habitats (e.g. wet agricultural land, pond, developed area / wasteland) within the 300m assessment area. No floral species of conservation importance was previously recorded within the 300m assessment area of Site KTN-2.

Fauna

3.2.4.4 According to previous survey results[12,13], the mosaic of wetland habitats in Long Valley area, including those in Ho Sheung Heung to the south of Lo Wu Correctional Institution within the 300m assessment area of current Study, supported and attracted a variety of wetland dependent fauna, especially waterbirds and wetland-associated bird species, including species of conservation importance such as Black-winged Stilt (*Himantopus himantopus*), Eurasian Teal (*Anas crecca*), Greater Painted-snipe (*Rostratula benghalensis*) and Woodland Sandpiper (*Tringa glareola*). It was also ecologically linked to Ng Tung River nearby, which being considered as movement corridor for breeding egrets in Ho Sheung Heung, and its tidal downstream also provided foraging opportunities to waterbirds.

3.2.4.5 Other wetland or wetland-associated wildlife, including species of conservation importance such as herpetofauna Chinese Bullfrog (*Hoplobatrachus rugulosus*) and Burmese Python (*Python bivittatus*) and odonate Scarlet Basker (*Urothemis signata signata*) were also previously recorded in Long Valley area. Mammals such as Greater Bandicoot Rat (*Bandicota indica*) and Leopard Cat (*Prionailurus bengalensis*) were also recorded. Besides, an aquatic fauna species namely Rose Bitterling (*Rhodeus ocellatus*) was newly recorded in the Ho Sheung Heung area[14].

3.2.4.6 Habitats, e.g. agricultural lands with paddy rice planting and managed ponds, being actively managed under the NCMAP in the Ho Sheung Heung area have proven attractive to various types of birds, including buntings, crakes, and ardeids. Notably, species of conservation importance such as the Yellow-breasted Bunting (*Emberiza aureola*) and Slaty-breasted Rail (*Lewinia striata*) were recorded in these habitats[15].

3.2.4.7 Other habitats within the 300m assessment area, such as developed area / wasteland, grassland / shrubland and plantation, only supported low faunal diversity in general. Majority

[11] CEDD and PlanD (2013).
[12] CEDD and PlanD (2013); Leung, H. N., Yeung, L. K., & Pang, C. C. (2023).
[13] Leung, H. N., Yeung, L. K., & Pang, C. C. (2023). Bird Monitoring Programme - Summary Report March 2022 to February 2023. Nature and Human in Harmony - Nature Conservation Management for Ho Sheung Heung, Long Valley 2020-2023.
[14] So, K. (2023). Rose Bitterling Survey in Ho Sheung Heung - Final Report. Nature and Human in Harmony - Nature Conservation Management for Ho Sheung Heung, Long Valley (2020 – 2023).
[15] Leung, H. N., Yeung, L. K., & Pang, C. C. (2023).

of the species are common and widespread in Hong Kong. Some species of conservation importance were also recorded outside the habitats within the 300m assessment area but outside Site KTN-2. For example, a butterfly species of conservation importance, i.e. Danaid Eggfly (*Hypolimnas misippus*), was recorded in the grassland / shrubland habitat in the northern part of the 300m assessment area while a herpetofauna species of conservation importance, Chinese Soft-shelled Turtle (*Pelodiscus sinensis*), was recorded in the modified Ng Tung River to the northwest of Site KTN-2.

3.2.4.8 A total of 63 avifauna (50 of which were recorded in habitats (e.g. pond / agricultural land) within the Ho Sheung Heung area under NCMAP)[16], 6 mammal, 4 butterfly, 1 odonate, 14 herpetofauna and 1 aquatic fauna species of conservation importance were recorded by previous studies within or in the vicinity of the 300m assessment area of the Site. As per the study of Land Use Planning for the Closed Area in 2009[17], a single sighting of Eurasian Otter (*Lutra lutra*) had been made at a fishpond to the southwest of Sandy Ridge outside the 300m assessment area.

3.2.5 Ecological Survey Findings

Habitats and Vegetation

3.2.5.1 A total of 11 habitats were preliminarily identified within the 300m assessment area during the present ecological surveys conducted from April to June 2023, and November 2023 to January 2024 (**Figure 3.1** and **Table 3.1** refer). Marsh / reed, plantation and developed area / wasteland habitats were identified within the Site.

3.2.5.2 Habitat maps and representative photographs of the habitats recorded within the 300m assessment area are shown in **Figure 3.2** and **Appendix 3.1**. The sizes of these habitats within the assessment area of site KTN-2 are summarized in **Table 3.1** below. The floral and fauna species recorded during the ecological surveys are listed in **Appendix 3.2** and **Appendix 3.3** respectively. A total of 2 floral species of conservation importance and 30 fauna species of conservation importance were recorded within the 300m assessment area, with their indicative locations and representative photographs presented in **Figure 3.2** and **Appendix 3.4** respectively. **Appendix 3.5** presents the description of the species of conservation importance recorded within the 300m assessment area. A summary of habitats identified within the assessment area is presented in **Table 3.1**, with the general descriptions of the recorded habitats presented in below sections.

Table 3.1 Habitats Identified within 300m Assessment Area

Habitat Type	Within Site KTN-2 (ha)	Within 300m Assessment Area (ha)	Percentage of Area (%)
Marsh / Reed	0.46	1.63	3.7
Pond	-	2.24	5.1
Watercourse	-	6.15	14.1
Agricultural Land	-	2.76	6.3
Woodland	-	2.45	5.6
Mixed Woodland	-	2.03	4.7
Plantation	0.17	3.11	7.1
Shrubland	-	0.53	1.2
Grassland	-	0.55	1.3
Village / Orchard	-	1.85	4.2
Developed area / Wasteland	0.58	20.28	46.5
Total Area	**1.21**	**43.58**	**100**

- *Marsh / Reed*

[16] Leung, H. N., Yeung, L. K., & Pang, C. C. (2023)
[17] PlanD (2009). Land Use Planning for the Closed Area – Feasibility. Final Report.

3.2.5.3 Three patches of marsh / reed habitat were identified within the 300m assessment area (**Figure 3.1** refers). They were likely derived through natural succession from abandoned fishponds.

3.2.5.4 One of them was identified within the southern part of Site KTN-2, which was surrounded by developed area / wasteland habitat and located within IBA. It was observed to be brackish, subject to tidal influence and linked to Sheung Yue River via a culvert. While other 2 patches of freshwater marsh / reed habitat were located at the south of Lo Wu Correctional Institution within LVHSH Priority Site and IBA, which were linked to adjacent ponds. Vegetation recorded in this habitat were mostly common or very common herbs such as Diffuse Day-flower (*Commelina diffusa*), Narrow-leaved Cat-tail (*Typha angustifolia*), Giant Alocasia (*Alocasia macrorrhizos*) and Common Reedgrass (*Phragmites australis*). No floral species of conservation importance was recorded in this habitat.

- *Pond*

3.2.5.5 This habitat was found among other wetlands such as watercourse, marsh / reed and agricultural land, with the majority located in the southern part of the 300m assessment area within LVHSH Priority Site and / or IBA. Most of the recorded ponds were fishponds (either active, inactive or abandoned) and some of which are actively managed under the NCMAP. Besides, a potential ardeid night roost was found at the pond bund at the south of Site KTN-2 (**Figure 3.1** refers). The vegetation on the bunds of ponds were dominated by common herbs such as Lesser Duck-weed (*Lemna minor*), Diffuse Day-flower and Hairy Knotweed (*Persicaria barbata*). Some fruit trees, such as Mango (*Mangifera indica*), Guava (*Psidium guajava*) and Longan (*Dimocarpus longan*), were also recorded at the bunds. No floral species of conservation importance was recorded in this habitat. In addition, there was a night roost (hereinafter referred to as Ho Sheung Heung Ardeid Night Roost) identified at the trees along the pond bund near the southern edge of the assessment area.

- *Watercourse*

3.2.5.6 Watercourses of various scale and degrees of modification were recorded within the 300m assessment area, with the majority located within LVHSH Priority Site and IBA (**Figure 3.1** refers). Sheung Yue River and Ng Tung River were the major modified watercourses identified within the 300m assessment area. They were channelised with concrete base and the banks were covered with grasscrete, with certain sections covered with dense ruderal vegetation (e.g. *Bidens alba* and *Wedelia trilobata*) at the riverbanks. The floristic diversity was limited due to the artificial features of these watercourses. Regular vegetation maintenance was observed during the survey period.

3.2.5.7 A total four watercourses were identified at the south of Site KTN-2, water quality of which was inferior that whitish suspended solids were observed in the water rendering high turbidity due to the nearby construction activities and limited vegetation were recorded, particularly at the watercourse located at the southern edge of Site KTN-2. A short, concreted watercourse with limited vegetation was found to the west of Site KTN-2 along Fai King Road. Additionally, a natural watercourse was observed at the northeast edge of the assessment area, flowing between the grassland habitats. A floral species of conservation importance namely Prince's Feather (*Persicaria orientalis*) was recorded at the watercourse located between pond and marsh / reed habitats to the south of Site KTN-2.

- *Agricultural Land*

3.2.5.8 Agricultural land is a dynamic habitat of which the status and types of crops growing would constantly change depending on the farming practices. The agricultural land habitat was concentrated at the southern portion of the 300m assessment area (**Figure 3.1** refers), all within LVHSH Priority Site and IBA, and is being actively managed under the NCMAP. This habitat is being used for cultivating both dry and wet farmed crops such as Water Spinach (*Ipomoea aquatica*), Rice (*Oryza sativa*), Egg-plant (*Solanum melongena*) and Tapioca Plant (*Manihot esculenta*). No floral species of conservation importance was recorded in this habitat.

- *Woodland*

3.2.5.9 Patches of woodlands were scattered in the north of Lo Wu Correctional Institution and in the vicinity of Vernon Pass (**Figure 3.1** refers). This habitat was surrounded by adjacent man-made habitats (i.e. plantation, village / orchard and developed area / wasteland), some patched of woodlands were connected to the hillside mixed woodland and shrubland. Vegetation within this habitat mainly includes mature native tree species with height of 10m to 15m. Canopy was generally closed and continuous, dominated by native tree species such as Common Red-stem Fig (*Ficus variegata*) and Chinese Hackberry (*Celtis sinensis*). Understory was also well developed, including shrubs and small trees such as Opposite-leaved Fig (*Ficus hispida*) and Wild Coffee (*Psychotria asiatica*). A few mature and young Incense Tree (*Aquilaria sinensis*) individuals, a floral species of conservation importance, ranging in height from 3m to 10m, were recorded in the woodland near Lo Wu Correctional Institution.

- *Mixed Woodland*

3.2.5.10 Mixed woodland consisted of a mix of native and exotic species was identified on the hillside north of Lo Wu Correctional Institution (**Figure 3.1** refers). The canopy with a height of approximately 10m to 15m was typically dominated by pioneer tree species such as Elephant's Ear (*Macaranga tanarius var. tomentosa*) and exotic plantation tree species such as Taiwan Acacia (*Acacia confusa*). The understory was predominantly composed of seedlings and saplings of native plant species such as Opposite-leaved Fig (*Ficus hispida*), Oblong-leaved Litsea (*Litsea rotundifolia var. oblongifolia*) and Wild Coffee (*Psychotria asiatica*). No floral species of conservation importance was recorded in this habitat.

- *Plantation*

3.2.5.11 A small patch of plantation habitat was recorded within site KTN-2. Plantation habitats were mainly found at roadside along Sheung Yue River and Ng Tung River, most of them recorded within LVHSH Priority Site and IBA. Additionally, Ho Sheung Heung Egretry was recorded in a small patch of plantation habitat that falls within CA and IBA (**Figure 3.1** refers). Besides, a potential ardeid night roost was found in the plantation at the south of Site KTN-2. A patch of hillside plantation was recorded at the eastern edge of the assessment area (**Figure 3.1** refers). This habitat comprising exotic or cultivated tree species, e.g. Taiwan Acacia, *Eucalyptus* spp. and Big-leaved Fig (*Ficus virens*), with canopy height of approximately 12m to 15m. Sparse understory was observed. A mature Incense Tree individual was recorded at the roadside plantation at the west of Ng Tung River.

- *Shrubland*

3.2.5.12 A shrubland habitat was identified on the hillside to the north of Lo Wu Correctional Institution. Vegetation comprised predominantly of shrubs and herbs typical of this habitat such as Common Lophantherum (*Lophatherum gracile*) and Dichotomy Forked Fern (*Dicranopteris pedata*), interspersed with local shrub species such as Rough-leaved Holly (*Ilex asprella*) and Oblong-leaved Litsea, with no notable canopy formed. No floral species of conservation importance was recorded in this habitat.

- *Grassland*

3.2.5.13 Grassland habitats were scattered at the east of Ng Tung River (**Figure 3.1** refers), some of them fall within IBA. This habitat demonstrates simple vegetation structure and relatively low floristic diversity, where limited shrubs and trees were observed growing. Herb species such as Blunt Signal-grass and Diffuse Day-flower were commonly recorded in this habitat. No floral species of conservation importance was recorded in this habitat.

- *Village / Orchard*

3.2.5.14 Village / orchard habitat refers to areas with low-rise village houses and interspersed with patches of fruit tree cultivation. This habitat was located at the vicinity of Vernon Pass, few of them fall within CA and IBA (**Figure 3.1** refers). The floral composition was dominated by

common fruit trees, such as Common Banana (*Musa x paradisiaca*) and Night-blooming Cereus (*Hylocereus undatus*). Disturbance from regular human activities were notable in this habitat. No floral species of conservation importance was recorded in this habitat.

- *Developed Area / Wasteland*

3.2.5.15 Developed area / wasteland was the largest habitat type within the 300m assessment area, mainly comprising open storage, workshops, road and railway facilities. Heavy regular human disturbance is evident in this habitat, on-going construction works of different scale were observed, particularly along Ho Sheung Heung Road. Vegetation mainly consisted of both common native and exotic species such as Sorrel (*Oxalis corniculata*), White Popinac (*Leucaena leucocephala*) and Common Red-stem Fig.. No floral species of conservation importance was recorded in this habitat. In addition, Ho Sheung Heung Egretry was recorded in Vernon Pass (Pai Tau Lo).

Fauna

3.2.5.16 The below sections summarise the key findings of current fauna surveys. Lists of fauna species recorded within the 300m assessment area are provided in **Appendix 3.3**, the habitats in which the species of conservation importance were recorded, their protection status and distribution in Hong Kong are also presented. Their indicative locations are presented in **Figure 3.1**.

- *Avifauna*

3.2.5.17 A total of 58 avifauna species were recorded within the assessment area during recent ecological surveys (**Figure 3.1** refers). Most of the recorded species are generalist species with some waterbirds or wetland-dependent species, and were recorded at man-made habitats (e.g. agricultural land, developed area / wasteland and village / orchard). In general, the abundance and species diversity of avifauna were low to moderate within the assessment area. Majority of the recorded species are either abundant or common resident that are widely distributed throughout Hong Kong. Some uncommon species such as Grey-streaked Flycatcher (*Muscicapa griseisticta*) and Savanna Nightjar (*Caprimulgus affinis*) were also recorded. Additionally, Ho Sheung Heung Ardeid Night Roost was identified at the trees along the pond bund near the southern edge of the assessment area, detail of this night roost is presented in **Section** Error! Reference source not found..

3.2.5.18 A total of 17 avifauna species of conservation importance were recorded, most of which are waterbirds or wetland-dependent species. Among them, Chinese Pond Heron, Greater Coucal (*Centropus sinensis*), Little Egret and White-throated Kingfisher (*Halcyon smyrnensis*) were recorded at the marsh / reed habitat within Site KTN-2. No notable nursery and breeding behaviour was observed within the Site KTN-2.

- *Ho Sheung Heung Egretry*

3.2.5.19 Ho Sheung Heung Egretry was identified within the “CA” in a patch of vegetation in developed area / wasteland near Vernon Pass. Only Chinese Pond Heron was observed nesting between May and June 2023 during the survey period, with a maximum number of three nests (**Table 3.2** refers). The flight line survey for Ho Sheung Heung Egretry was conducted at two vantage points, VP1 and VP2 (refer to **Figure 3.2**), and started half an hour before sunrise and ended an hour after sunrise. The majority of flight paths (i.e. E3 and E4) was heading north-eastwards with the flight height between 10m to 30m. Besides, the minor flight path E5 was heading south-eastwards to Site KTN-2. The location, extent, and number of flight path usage for the egretry is shown in **Figure 3.2** and **Appendix 3.6**.

Table 3.2 Number of Nests Recorded at Ho Sheung Heung Egretry

Species	2023					2024
	Apr	May	Jun	Nov	Dec	Jan
Chinese Pond Heron (*Ardeola bacchus*)	0	3	1	0	0	0
Total	**0**	**3**	**1**	**0**	**0**	**0**

- *Ho Sheung Heung Ardeid Night Roost*

3.2.5.20 According to the observations from recent surveys, the night roost was located at more than 250m from Site KTN-2, on the canopy of trees along a pond near the southern edge of the assessment area. General ardeid flight paths (i.e. 1, 2, 3, 4 and 5) were potentially utilized by ardeids flying toward the night roost (refer to **Figure 3.3**). The night roost supported ardeids including Chinese Pond Heron, Eastern Cattle Egret, Litte Egret, Great Egret and Grey Heron (*Ardea cinerea*).

- *General Ardeid Flight Path*

3.2.5.21 The flight line survey for the general ardeids (including night roosting ardeids) at two vantage points, VP2 and VP3 (refer to **Figure 3.3**) started an hour before sunset and ended half an hour after sunset. The general ardeid flight paths recorded within the assessment area were mostly north-eastward and south-westward. Three flight paths (i.e. 1, 2 and 10 as shown in **Figure 3.3**) were observed to be utilized by ardeids flying across the Site KTN-2. Around 65% of the recorded ardeids flying across the assessment area with moderate height from about 11m to about 30m. Besides, some flight lines were likely made by ardeids returning / leaving the potential night roosts. Additionally, a few ardeids were observed to land at the watercourse habitat. The location, extent, and number of flight path usage recorded within the assessment area are shown in **Figure 3.3** and **Appendix 3.6**.

- *Mammal*

3.2.5.22 A total of 10 mammal species were recorded within the 300m assessment area, which include 8 bat species. All bat species in Hong Kong are considered as species of conservation importance. The recorded bat species are common in Hong Kong and able to adapt urban and suburban environment. These bat species were all recorded in flight during night surveys, mostly flying above developed area / wasteland. 1 bat species namely Japanese Pipistrelle (*Pipistrellus abramus*) was recorded flying over Site KTN-2. The remaining 2 mammal species included Eurasian Wild Pig (*Sus scrofa*) and Pallas's Squirrel (*Callosciurus erythraeus*). Individuals of Pallas's Squirrel of conservation importance were recorded in the plantation, developed area / wasteland and village / orchard habitats. Camera trap had been deployed within the marsh / reed areas in Site KTN-2 to capture potential sightings of mammal species. However, no mammal species, including Eurasian Otter, were recorded by the camera traps during the ecological surveys.

- *Butterfly*

3.2.5.23 A total of 27 butterfly species were recorded within the assessment area. General abundance and diversity of butterfly were low and low to moderate respectively. All of the recorded species are either very common or common such as Indian Cabbage White (*Pieris canidia*) and Pale Grass Blue (*Pseudozizeeria maha*) as well as wildly distributed throughout Hong Kong. Most of the butterfly species were recorded in marsh / reed and pond habitats. 2 butterfly species of conservation importance namely Small Cabbage White (*Pieris rapae*) and Metallic Cerulean (*Jamides Alecto*), were recorded at the riverbank of Ng Tung River and village / orchard habitat near Fai King Road respectively (**Figure 3.1** refers).

- *Odonate*

3.2.5.24 A total of 15 odonate species were recorded within the 300m assessment area while no species of conservation importance were recorded during recent ecological survey. General abundance and diversity of odonate were low. All of the recorded species such as Common

Blue Skimmer (*Orthetrum glaucum*) and Variegated Flutterer (*Rhyothemis ariagate aria*) are either very widespread or widespread in Hong Kong. Most of the odonate species were recorded in agricultural land and pond habitats.

- *Herpetofauna*

3.2.5.25 A total of 15 herpetofauna species, which include 10 amphibian and 5 reptile species, were recorded within the 300m assessment area. All of the recorded species are widely distributed throughout Hong Kong. General abundance of herpetofauna was low. Most of the herpetofauna were recorded in agricultural land and plantation habitats. Among the recorded herpetofauna species, 1 amphibian and 1 reptile species were of conservation importance, which are Spotted Narrow-mouthed Frog (*Kalophrynus interlineatus*) and Taiwan Kukri Snake (*Oligodon formosanus*) respectively. The former was recorded at grassland habitat at the north-eastern edge of the assessment area, while the latter were recorded at developed area / wasteland and plantation habitat outside Site KTN-2 (**Figure 3.1** refers).

- *Aquatic Communities*

3.2.5.26 A total of 12 aquatic fauna species were recorded within the 300m assessment area, none of which are species of conservation importance. The aquatic community was mainly dominated by fish and other aquatic macroinvertebrate species, most of them were recorded from watercourses. The diversity and abundance of the recorded aquatic fauna were considered as low. The recorded species comprised 4 fish species including Blotched Snakehead (*Channa maculata*), Nile Tilapia (*Oreochromis niloticus*), North African Catfish (*Clarias gariepinus*) and *Channa* sp. and other macroinvertebrates such as Apple Snail (*Pomacea analiculata*), *Orisarma dehaani* and Yellow Featherlegs (larvae) (*Copera marginipes*) were also found. All of these aquatic fauna species are either very common or common in Hong Kong.

3.3 Ecological Value of Habitats

3.3.1.1 The ecological importance of recorded habitats was evaluated in accordance with the EIAO-TM Annex 8 criteria and is presented in **Table 3.3** to **Table 3.8** below. Collaborative findings from literature review and recent surveys were considered in the habitat evaluation.

Table 3.3 Ecological Evaluation Marsh / Reed and Pond

Criteria	Marsh / Reed	Pond
Naturalness	Moderate Succeeded from man-made habitats e.g. ponds and agricultural lands through natural processes	Low A man-made habitat actively managed under NCMAP
Size	Small (approx. 1.62 ha)	Small (approx. 2.28 ha)
Diversity	Low flora and fauna diversity	Low flora diversity and low to moderate fauna diversity
Rarity	An uncommon habitat in Hong Kong A total of four avifauna species of conservation importance (i.e. Chinese Pond Heron, Greater Coucal, Little Egret and White-throated Kingfisher) were recorded in recent ecological surveys	Uncommon. Mainly restricted to northwestern New Territories A total of 11 species of conservation importance were recorded in present survey, including eight avifauna species (i.e. Black-faced Spoonbill, Black-winged Stilt, Chinese Pond Heron, Eurasian Spoonbill, Great Egret, Greater Coucal, Little Egret and Northern Shoveler) and three mammal species (i.e. Japanese Pipistrelle, Lesser Bamboo Bat and Unknown Vespertilionidae species 2) Ardeids were observed roosting on vegetation at the pond bund in nighttime
Re-creatability	Low to moderate	High

Criteria	Marsh / Reed	Pond
Fragmentation	High This habitat is scattered throughout the assessment area	High This habitat is scattered throughout the assessment area
Ecological linkage	Most of them are located within LVHSH Priority Site and IBA; and are structurally and functionally connect to adjacent wetland habitats (e.g. pond and watercourse) and agricultural land	Most of them are located within LVHSH Priority Site and IBA; and are structurally and functionally connect to adjacent wetland habitats (e.g. marsh / reed, watercourse) and agricultural land
Potential value	Moderate	Moderate Ponds within LVHSH Priority Site are actively managed under the NCMAP
Nursery / Breeding ground	Potential breeding ground for wetland dependent bird species, but no notable nursery / breeding behaviour was observed	No notable nursery / breeding behaviour observed
Age	N/A	N/A
Abundance / Richness of Wildlife	Low to moderate	Low to moderate
Ecological value	**Low to moderate**	**Moderate**

Table 3.4 Ecological Evaluation of Watercourse and Agricultural Land

Criteria	Watercourse	Agricultural Land
Naturalness	Low	Low Active management was observed
Size	Moderate (approx. 6.17 ha)	Small (approx. 2.76 ha)
Diversity	Low flora and low to moderate fauna diversity	Low to moderate flora and fauna diversity
Rarity	Common habitat in Hong Kong A total of eleven species of conservation importance were recorded in recent ecological surveys, including one flora species (i.e. Prince's Feather), seven avifauna species (i.e. Chinese Pond Heron, Great Cormorant, Great Egret, Greater Coucal, Grey Heron, Little Egret and White-throated Kingfisher), one butterfly species (i.e. Small Cabbage White) and two mammal species (i.e. Japanese Pipistrelle and Unknown Vespertilionidae species 1)	Common habitat in Hong Kong A total of 12 species of conservation importance were recorded in recent ecological surveys, including nine avifauna species (i.e. Black-winged Stilt, Chestnut-eared Bunting, Chinese Pond Heron, Great Egret, Greater Coucal, Grey Heron, Little Egret, Pied Avocet and White-throated Kingfisher) and three mammal species (i.e. Chinese Noctule, Japanese Pipistrelle and Lesser Bamboo Bat)
Re-creatability	High	High
Fragmentation	Low	Low
Ecological linkage	Majority of watercourses fall within LVHSH Priority Site and IBA Sheung Yu River partially falls within LVHSH Priority Site and IBA; and connected to Ng Tung River; and structurally and functionally connected to adjacent marsh / reed and agricultural land Ng Tung River partially falls within LVHSH Priority Site and IBA; and connecting to Sheung Yu River	All recorded agricultural land fall within LVHSH Priority Site and IBA; and are structurally and functionally connected to adjacent wetland habitats (e.g. marsh / reed, watercourse)
Potential value	Moderate	Moderate to high Agricultural land within LVHSH Priority Site is actively managed under a NCMAP

Criteria	Watercourse	Agricultural Land
Nursery / Breeding ground	No notable nursery / breeding behaviour observed	No notable nursery / breeding behaviour observed
Age	**Sheung Yu River** – Young. Modification and channelisation of these watercourses occurred around 20 years ago **Ng Tung River** – Young. Modification and channelisation of Tung River occurred around 15-20 years ago **Other watercourses** – N/A	N/A
Abundance / Richness of Wildlife	Low	Low to moderate
Ecological value	**Low to Moderate** - Sheung Yu River and Ng Tung River **Low –** Other watercourses	**High**

Table 3.5 Ecological Evaluation of Woodland and Mixed Woodland

Criteria	Woodland	Mixed Woodland
Naturalness	Moderate	Low to moderate
Size	Small (approx. 2.50 ha)	Small (approx. 2.06 ha)
Diversity	Low to moderate flora diversity and low fauna diversity	Low flora and fauna diversity
Rarity	Common habitat in Hong Kong A total of two species of conservation importance were recorded in recent ecological surveys, including one flora species (i.e. Incense Tree) and one mammal species (i.e. Lesser Bamboo Bat)	Common habitat in Hong Kong A total of three species of conservation importance were recorded in recent ecological surveys, including one avifauna species (i.e. Chinese Pond Heron) and two mammal species (i.e. Himalayan Leaf-nosed Bat and Lesser Bamboo Bat)
Re-creatability	Low	Moderate
Fragmentation	Low to moderate	Low to moderate
Ecological linkage	Woodland located at Vernon Pass (Pai Tau Lo) partially falls within Conservation Area and IBA; some woodland structurally and functionally linked to hillside mixed woodland and shrubland	Mixed woodland structurally and functionally linked with woodland and shrubland
Potential value	Low to moderate	Low to moderate
Nursery / Breeding ground	No notable nursery / breeding behaviour observed	No notable nursery / breeding behaviour observed
Age	N/A	N/A
Abundance / Richness of Wildlife	Low	Low
Ecological value	**Low to moderate**	**Low**

Table 3.6 Ecological Evaluation of Plantation and Shrubland

Criteria	Plantation	Shrubland
Naturalness	Low	Moderate
Size	Small (approx. 3.15 ha)	Small (approx. 0.58 ha)
Diversity	Low to moderate flora diversity and low fauna diversity	Low flora and fauna diversity
Rarity	Common habitat in Hong Kong A total of eight species of conservation importance were recorded in recent ecological surveys, including one flora species (i.e. Incense Tree), one avifauna species (i.e. Grey Heron), five mammal species (i.e. Intermediate Horseshoe Bat, Japanese Pipistrelle, Pallas's Squirrel, Short-nosed Fruit Bat and Unknown Vespertilionidae species 2) and one herpetofauna species (i.e. Taiwan Kukri Snake)	Common habitat in Hong Kong No species of conservation importance was recorded in recent ecological surveys
Re-creatability	High	Moderate
Fragmentation	High	Low
Ecological linkage	Plantation at Vernon Pass (Pai Tau Lo) fall within Conservation Area and IBA Plantation south of site KTN-2 fall within Priority Site and IBA	Structurally connected to adjacent wooded habitats (e.g. woodland, mixed woodland)
Potential value	Low	Low
Nursery / Breeding ground	No notable nursery / breeding behaviour observed	No notable nursery / breeding behaviour observed
Age	N/A	N/A
Abundance / Richness of Wildlife	Low	Low
Ecological value	**Low**	**Low**

Table 3.7 Ecological Evaluation of Grassland and Village / Orchard

Criteria	Grassland	Village / Orchard
Naturalness	Moderate	Low
Size	Small (approx. 0.62 ha)	Small (approx. 1.90 ha)
Diversity	Low flora and fauna diversity	Low to moderate flora diversity and low fauna diversity
Rarity	Common habitat in Hong Kong. A total of two species of conservation importance were recorded in recent ecological surveys, including one mammal species (i.e. Japanese Pipistrelle) and one herpetofauna species (i.e. Spotted Narrow-mouthed Frog)	Common habitat in Hong Kong. A total of three species of conservation importance were recorded in recent ecological surveys, including one avifauna species (i.e. Greater Coucal), one mammal species (i.e. Pallas's Squirrel) and one butterfly species (i.e. Metallic Cerulean)
Re-creatability	Moderate	High
Fragmentation	Low	Low
Ecological linkage	Structurally linked to watercourse	No notable ecological linkage
Potential value	Low to moderate	Low to moderate

Criteria	Grassland	Village / Orchard
Nursery / Breeding ground	No notable nursery / breeding behaviour observed	No notable nursery / breeding behaviour observed
Age	N/A	N/A
Abundance / Richness of Wildlife	Low	Low to moderate
Ecological value	**Low**	**Low**

Table 3.8 Ecological Evaluation of Developed Area / Wasteland

Criteria	Developed Area / Wasteland
Naturalness	Low
Size	Moderate (approx. 20.52 ha)
Diversity	Low to moderate flora diversity and low fauna diversity
Rarity	Very common habitat in Hong Kong. A total of seven species of conservation importance were recorded in recent ecological surveys, including one avifauna species (i.e. Collared Crow), five mammal species (i.e. Himalayan Leaf-nosed Bat, Japanese Pipistrelle, Lesser Bamboo Bat, Pallas's Squirrel and Unknown Vespertilionidae species 1) and one herpetofauna species (i.e. Taiwan Kukri Snake)
Re-creatability	High
Fragmentation	Low
Ecological linkage	No notable ecological linkage
Potential value	Low
Nursery / Breeding ground	Ho Sheung Heung Egretry located in developed area / wasteland habitat at Vernon Pass (Pai Tau Lo) which is a nursery and breeding ground of ardeids
Age	N/A
Abundance / Richness of Wildlife	Low to moderate
Ecological value	**Low to moderate** – for developed area / wasteland habitat at Vernon Pass (Pai Tau Lo) **Low** – for others

3.4 Impact Assessment

3.4.1.1 As detailed in **Section 1.3.1.1**, the main proposed works within Site KTN-2 mainly comprise site clearance, filling and earthwork. Direct and indirect impacts arising from the Project are discussed in bellow sections.

3.4.2 Direct Impact

Direct Impact on Recognized Sites of Conservation Importance

3.4.2.1 The southern tip of Site KTN-2 would encroach onto the northern edge of the LVHSH Priority Site, a recognized site of conservation importance, while the majority of Site KTN-2 would fall within IBA. The directly affected habitat within the LVHSH Priority Site consisted of developed area / wasteland only, while the directly affected habitats within IBA include marsh / reed, plantation and developed area / wasteland. Given that the affected habitats within LVHSH Priority Site and IBA are not important foraging / roosting area for wildlife, and there are alternative habitats nearby, the direct impact on recognized sites of conservation importance is anticipated to be minor.

Habitat and Vegetation Loss

3.4.2.2 The proposed works would unavoidably lead to habitat and vegetation loss. Habitats within Site KTN-2 include marsh / reed, developed area / wasteland and plantation. Area of habitat loss arising from the proposed works are summarized in **Table 3.9**. A small proportion of vegetation in developed area / wasteland and plantation within the LVHSH Priority Site would be directly affected. These habitats were already subject to human disturbance from nearby development, roads / footpaths, they only supported low floral and faunal diversity and abundance. Most of the recorded flora and fauna species within Site KTN-2 are also common and widespread in Hong Kong.

3.4.2.3 Although the affected marsh / reed habitats could be a potential feeding and breeding ground for wetland-dependent bird species, which breeding records were made in wetland habitats within the LVHSH Priority Site. Given that the affected marsh / reed was brackish marsh which is subject to tidal influence, and other freshwater habitats including freshwater marsh and wet agricultural land were presented within the LVHSH Priority Site, the affected marsh / reed within Site KTN-2 is therefore unlikely to be the preferable feeding and breeding ground for wetland-dependent bird species, especially species that favour freshwater swamps. Moreover, as only low abundance of wildlife including avifauna was observed within Site KTN-2 during the ecological survey, the affected marsh / reed is unlikely to be an importance foraging ground for wildlife. Besides, similar habitats are also available in the vicinity of Site KTN-2 and could be utilized by wetland-dependent bird species, the potential impact from the loss of habitats and vegetations is expected to be low.

Table 3.9 Area of Habitat Loss arising from the Proposed Works

Habitat Type	Habitat Loss (ha)
Marsh / Reed	0.46
Plantation	0.20
Developed Area / Wasteland	0.64
Total	**1.30**

Impact on Species of Conservation Importance

3.4.2.4 No floral species of conservation importance were recorded within Site KTN-2. While 6 faunal species of conservation importance were recorded within Site KTN-2, 4 of them are avifauna species (i.e. Chinese Pond Heron, Greater Coucal, Little Egret and White-throated Kingfisher), 1 herpetofauna species (i.e. Taiwan Kukri Snake) and 1 mammal species (i.e. Short-nose Fruit Bat). The recorded avifauna and flying mammal species are highly mobile and habitats of the similar kind are readily available nearby. No notable behaviour including breeding and nursing was recorded within Site KTN-2. Thus, no direct impact to these species is anticipated. However, considering that the herpetofauna species, i.e. Taiwan Kukri Snake, is with lower mobility, the proposed works may have a direct impact on it, suitable mitigation measures (e.g. pre-construction survey, translocation, etc) would be required. With the implementation of the mitigation measures proposed in **Section 3.6.1.1**, no direct impact to this herpetofauna species is anticipated.

Harm / Mortality to Other Wildlife and Bird Collision

3.4.2.5 The proposed works (e.g. site clearance and formation) would have the potential to cause direct injury/mortality to wildlife. Species with higher mobility are not anticipated to be significantly impacted, but those with lower mobility would be subject to higher risk of injury or mortality, including species of conservation importance with relatively low mobility, e.g. the recorded Taiwan Kukri Snake. However, Site KTN-2 only supports low faunal diversity and abundance, and the recorded species are common in Hong Kong and adapted to urban environments. Besides, the proposed works be conducted are minor in nature and small scale with adoption of machines of limited heights. Hence, it is expected that the chance of injury or mortality to wildlife caused by the proposed works is expected to be minor.

3.4.3 Indirect Impacts

Disturbance Impact on Egretry and Ardeid Night Roost

3.4.3.1 Ho Sheung Heung Egretry and Ho Sheung Heung Ardeid Night Roost was located at approximately 140m northwest and 250m south of Site KTN-2 respectively. Construction activities in the vicinity could lead to disturbances from increased human activities, noise, and glare, which may affect the ardeids utilizing the egretry or night roost. Notably, both egretry and night roost in Ho Sheung Heung area have already experienced disruptions due to existing anthropogenic disturbance (e.g. culturing activities, construction activities, traffic on the adjacent local road) nearby. Given that the proposed works of this Project are unlikely to increase the disturbance magnitude significantly in view of the separation distances and partial screening from existing building structures to the north of Project, the anticipated disturbance impact on the ardeid night roost is expected to be minor.

Impact on Flight Path

3.4.3.2 Flight paths were observed above Site KTN-2 and the surrounding area. Potential disruption on the flight path during the proposed works could be possible if obstacles such as heavy construction equipment maybe intersect with the flight paths. It could potentially cause increase in energy exertion of ardeids, if they need to increase their flight height / distance to avoid obstacles, which may eventually affect their foraging and breeding success. According to the results of flight line surveys, the flight height of most ardeids flying across the Site KTN-2 was around 11-30m, while that of some ardeids was relatively low (i.e. at >0 – 10m). The ardeids flying at the height of >0 – 10m across Site KTN-2 may potentially disturbed by the proposed site formation works. Given that the proposed site formation works of minor scale would be conducted by limited no. of powered mechanical equipment with limited heights, impacts on ardeid flight path is therefore anticipated to be minor.

Disturbance Impact

3.4.3.3 According to **Section 1.3.1.1**, the proposed works include site clearance, filling works and earthwork. The proposed works would lead to increase of disturbance within and in the surrounding habitats of the Site, including those within LVHSH Priority Site and CA nearby.

3.4.3.4 The proposed works would lead to fugitive dust emissions that caused by earth movement activities and handling / transportation of excavated / fill materials, which could lead to indirect disturbance to vegetation in the surrounding habitats and associated wildlife.

3.4.3.5 Noise disturbance arising from increased road traffic during the proposed works is expected, the use of powered mechanical equipment (PME) for various construction activities would also result in noise disturbance, these could lead to reductions in wildlife density close to sources of disturbance.

3.4.3.6 Wastewater generated from land-based construction works, site runoff and excavation work for the proposed drainage outfall could potentially pose impacts on the water quality at watercourse and affect associated waterbirds and aquatic organisms. In general, construction works and dewatering works involving wetland type (i.e. marsh / reed) would be undertaken during dry season, where practicable. *Guidelines in Drainage Service Department Practice Note No. 3/2021 – Guidelines on Design for Revitalisation of River Channel and Environment*, *Transport and Works Bureau (ETWB) Technical Circular (Works) No. 5/2005 – Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works* set out for the protection of natural rivers and streams from adverse impacts arising from construction works should be followed. With the implementation of precautionary measures, no significant water quality impact is anticipated.

3.4.3.7 Unmitigated disturbance such as non-directional lights, excessive construction and traffic noise and dust emission would potentially affect adjacent habitats, especially agricultural land and pond habitats to the south of the Site and associated nocturnal species, and lead to decline in faunal diversity and abundance.

3.4.3.8 There may be potential disturbance impact to LVNP during the site formation works. However, given that the LVNP is located at more than 300m from Site KTN-2, and it is buffered by other habitats including agriculture land and ponds to the south of Site KTN-2. The magnitude of the indirect impact to the LVNP is expected to be minor.

3.4.3.9 Overall, the disturbance impact during the proposed works is expected to be minor to moderate. In view of the minor nature and small scale of the proposed works and with implementation of general mitigation measures and good site practices, no unacceptable direct and indirect ecological impact would be anticipated.

3.5 Evaluation of Potential Ecological Impacts

3.5.1.1 Potential ecological impacts on the identified habitats within the Assessment Area associated with the construction of the Project were evaluated in accordance with the Annex 8 of the EIAO-TM, and are presented in **Table 3.10** to **Table 3.15**.

Table 3.10 Evaluation of Potential Ecological Impacts to Marsh / Reed and Pond

Criteria	Marsh / Reed	Pond
Habitat Quality	Low to moderate	Moderate
Species / Ecological Resources	Low flora and fauna diversity A total of four species of conservation importance were recorded in recent ecological surveys	Low flora diversity and low to moderate fauna diversity A total of 11 species of conservation importance were recorded in recent ecological surveys Ardeids were observed roosting at the pond bund in nighttime
Size / Abundance	0.46 ha would be permanently affected	Habitat would not be directly affected
Duration	*Direct Impact* Direct impact from construction phase (i.e. habitat loss) would be permanent *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Direct Impact* Direct impact from construction phase (i.e. habitat loss) would be irreversible *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low	Low
Overall Impact Significance	**Low**	**Minor**

Table 3.11 Evaluation of Potential Ecological Impacts to Watercourse and Agricultural Land

Criteria	Watercourse	Agricultural Land
Habitat Quality	Low to Moderate - Sheung Yu River and Ng Tung River Low – Other watercourses	Moderate
Species / Ecological Resources	Low flora and low to moderate fauna diversity A total of nine species of conservation importance were recorded in recent ecological surveys	Low to moderate flora and fauna diversity A total of 12 species of conservation importance were recorded in recent ecological surveys
Size / Abundance	Habitat would not be directly affected	Habitat would not be directly affected
Duration	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Indirect Impact*	*Indirect Impact*

Criteria	Watercourse	Agricultural Land
	Indirect impact (e.g. noise, air / dust) during construction phase would be reversible	Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low	Low
Overall Impact Significance	**Insignificant**	**Minor**

Table 3.12 Evaluation of Potential Ecological Impacts to Woodland and Mixed Woodland

Criteria	Woodland	Mixed Woodland
Habitat Quality	Low to moderate	Low to moderate
Species / Ecological Resources	Low to moderate flora diversity and low fauna diversity A total of two species of conservation importance were recorded in recent ecological surveys	Low flora and fauna diversity A total of three species of conservation importance were recorded in recent ecological surveys
Size / Abundance	Habitat would not be directly affected	Habitat would not be directly affected
Duration	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low	Low
Overall Impact Significance	**Insignificant**	**Insignificant**

Table 3.13 Evaluation of Potential Ecological Impacts to Plantation and Shrubland

Criteria	Plantation	Shrubland
Habitat Quality	Low	Low
Species / Ecological Resources	Low to moderate flora diversity and low fauna diversity A total of eight species of conservation importance were recorded in recent ecological surveys	Low flora and fauna diversity No species of conservation importance was recorded in recent ecological surveys
Size / Abundance	0.20 ha would be permanently affected	Habitat would not be directly affected
Duration	*Direct Impact* Direct impact from construction phase (e.g. habitat loss) would be permanent *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Direct Impact* Direct impact from construction phase (e.g. habitat loss) would be irreversible *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low	Low
Overall Impact Significance	**Minor**	**Insignificant**

Table 3.14 Evaluation of Potential Ecological Impacts to Grassland and Village / Orchard

Criteria	Grassland	Village / Orchard
Habitat Quality	Low	Low
Species / Ecological Resources	Low flora and fauna diversity A total of two species of conservation importance were recorded in recent ecological surveys	Low to moderate flora diversity and low fauna diversity A total of three species of conservation importance were recorded in recent ecological surveys
Size / Abundance	Habitat would not be directly affected	Habitat would not be directly affected
Duration	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible	*Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low	Low
Overall Impact Significance	**Insignificant**	**Insignificant**

Table 3.15 Evaluation of Potential Ecological Impacts to Developed Area / Wasteland

Criteria	Developed Area / Wasteland
Habitat Quality	Low to moderate – for developed area/wasteland habitat at Vernon Pass (Pai Tau Lo) Low – for others
Species / Ecological Resources	Low to moderate flora diversity and low fauna diversity A total of seven species of conservation importance were recorded in recent ecological surveys Ho Sheung Heung Egretry located in developed area / wasteland habitat at Vernon Pass (Pai Tau Lo)
Size / Abundance	0.64 ha would be permanently affected
Duration	*Direct Impact* Direct impact from construction phase (i.e. habitat loss) would be permanent *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be temporary
Reversibility	*Direct Impact* Direct impact from construction phase (i.e. habitat loss) would be irreversible *Indirect Impact* Indirect impact (e.g. noise, air / dust) during construction phase would be reversible
Magnitude	Low
Overall Impact Significance	**Minor**

3.6 Precautionary and Mitigation Measures

Faunal Species of Conservation Importance

3.6.1.1 To avoid adverse direct impact on the slow-moving faunal species of conservation importance, it is recommended that a detailed fauna survey within Site KTN-2 should be conducted before the commencement of the proposed works as to ascertain, locate and quantify the number of the species that may be affected. Based on the survey findings, if any, appropriate mitigation measures such as translocation would be proposed. A detailed

Fauna Survey and Mitigation Plan would be prepared and submitted by the Contractor to obtain AFCD's approval prior to the commencement of proposed works.

Monitoring of Egretry and Night Roost

3.6.1.2 As the status and location of egretry and night roost can change from time to time even under the absence of human disturbance. Pre-construction surveys are therefore recommended to confirm the location and status of the Ho Sheung Heung Egretry and Ho Sheung Heung Ardeid Night Roost within 300m from Site KTN-2, and mitigation measures, if required, should be developed based on the survey findings.

3.6.1.3 The pre-construction surveys should be carried out at least once per month before the commencement of the proposed site formation works. Surveys on egretry should cover the breeding season (i.e. between March and August). According to the current implementation programme of the Project as confirmed by the Project Engineer, the pre-construction surveys would only be able to commence from July 2024. As it was observed that the egretry was remained active in July 2021 and 2022[18], the pre-construction surveys in July and August are still able to cover the active period of the Ho Sheung Heung Egretry. For the Ho Sheung Heung Ardeid Night Roost, according to NTN survey findings[8], the night roost was observed to be active in July to September 2022. Hence, the pre-construction surveys between July and September 2024 are able to cover its active period.

3.6.1.4 As a precautionary measure, monthly egretry and night roost monitoring would be conducted, covering the breeding season (i.e. March to August) and the overwintering season (i.e. October to March), during site formation works to prevent any adverse indirect impacts on the Ho Sheung Heung Egretry and Ardeid Night Roost. The location and status (e.g. active / inactive, number of nests / ardeid utilizing the night roost) of the concerned egretry and night roost would be recorded. Monthly inspection within 100m from Site KTN-2 is also recommended during the breeding season (i.e. March to August) and overwintering season (i.e. October to March) throughout the site formation work, as to confirm the presence of any nesting and roosting ardeids within Site KTN-2 and its immediate surroundings.

3.6.1.5 In case any signs of suspected egretry (e.g. presence of nests) and/or night roost are observed within Site KTN-2 and its immediate surroundings (within 100m from the Site) during the pre-construction survey and/or monthly inspection, AFCD should be informed. Appropriate mitigation measures, such as proper scheduling of works and provision of additional barriers to minimise disturbance, should be implemented, as agreed with AFCD. Direct impact to egretry and night roost should be avoided.

Potential Bird Collision

3.6.1.6 To minimise potential obstacles along the flight path of ardeids, it is recommended to consider construction / working methods that involve fewer high-rising machines. Proper scheduling of construction activities should be undertaken to avoid heavily disruptive activities during the dry season. Additionally, implementing restrictions on working hours, particularly during the peak hours of ardeid movements, i.e. early morning and evening, can help minimise disturbance impacts on their flight path.

Minimising Disturbance Impacts

3.6.1.7 Considering that the surrounding habitats including watercourses and agricultural land which are commonly utilised by avifauna including species of conservation importance (e.g. Little Egret, Pied Avocet, etc.), and ecological sensitive site including the Ho Sheung Heung Egretry and Ardeid Night Roost, the proposed works would potentially cause disturbance impact to these avifauna species. Provision of screening (e.g. site hoardings) and good site practices as stated in **Sections 3.6.1.8** to **3.6.1.9** below would be implemented to reduce the indirect impact on avifauna caused by the proposed works. Proper scheduling of working

[18] Anon (2022) and Anon (2021) Summer 2021 Report: Egretry Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site.

activities to avoid the most active hours of avifauna (i.e. early morning and evening) could also minimise the disturbance impacts.

3.6.1.8 Appropriate measures and good site practices would be implemented to minimise the disturbance impacts to the surrounding habitats and associated wildlife to the lowest possible level. Construction activities should be restricted within demarcated works areas and provision of screening (e.g. site hoardings) should be properly implemented. Quiet construction methods, Quality PME (QPME) and other noise control requirements stated in "Recommended Pollution Control Clauses for Construction Contracts" would be adopted as far as practicable.

3.6.1.9 To alleviate dust emission, dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation (Cap. 311) as general practices should be implemented to avoid and minimise impacts to the surrounding habitats and the associated wildlife arising from the construction activities to the lowest possible level.

3.6.1.10 As discussed in **Section 4.2**, no unacceptable water quality impact is anticipated during the proposed works with the implementation of adequate construction site drainage and good site practices, such as erosion and sedimentation control, runoff quantity and quality control, etc. Potential water quality impact from uncontrolled runoff and release of contaminants would be minimised.

3.6.1.11 The intensity of light should also be controlled to the lowest possible level. Unnecessary lighting should be turned off outside working hours of the construction sites. A balance between lighting for safety and avoiding excessive lighting can be achieved through the use of directional lighting.

4 CONCLUSIONS

4.1 Introduction

4.1.1.1 An Environmental Assessment has been carried out to examine the impacts associated with the proposed works at Site KTN-2. Potential environmental impacts including water quality and ecology have been assessed. The findings are summarised below.

4.2 Water Quality

4.2.1.1 Potential water quality impacts from general construction activities, construction site runoff, construction works near watercourses, removal / filling of wet area, accidental spillage and sewage from construction workforce are identified. In view of the minor nature and small scale of the proposed works, with the adoption of recommended mitigation measures (e.g. good site practice, BMPs, provision of proper drainage facilities) during the proposed works, no adverse water quality impact to the identified WSRs is anticipated.

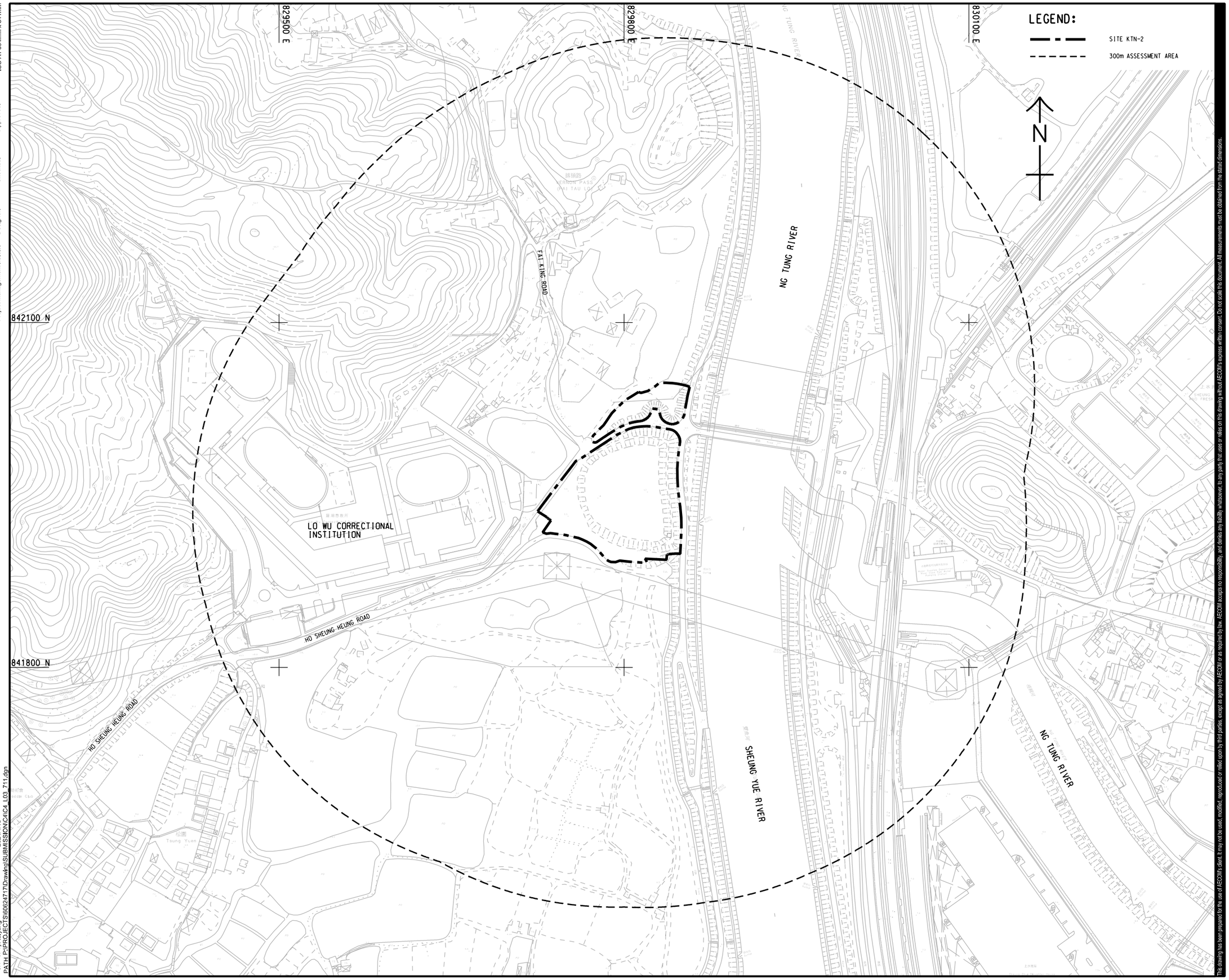
4.3 Ecology

4.3.1.1 Potential direct impacts arising from the proposed works included the loss of habitats within recognized sites of conservation importance and key ecological resource (i.e. LVHSH Priority Site and IBA), habitat loss in marsh / reed, plantation and developed area / wasteland habitats, and potential direct harm to the recorded species of conservation importance of lower mobility (i.e. Taiwan Kukri Snake), within Site KTN-2. A detailed fauna survey to ascertain the presence of the species of conservation importance within the Site would be conducted before the commencement of works, and appropriate mitigation measures would be proposed if individuals of the species are recorded during the survey.

4.3.1.2 Indirect impacts arising from the Project included disturbance impacts (i.e. glare, noise, air / dust) and water quality impact on habitats in vicinity and the associated wildlife. However, given the majority of recorded habitats were developed area or plantation, and recorded species within the assessment area were generalist species which are habituated to disturbed habitats, the disturbance impact is considered as minor to moderate. Nevertheless, good site practice and appropriate mitigation measures according to relevant guidelines including provision of screening and use of QPME would be implemented when appropriate to minimize the disturbance impacts. Hence, no adverse indirect impacts would be anticipated.

4.3.1.3 Precautionary and mitigation measures such as pre-construction egretry and night roost surveys, monthly egretry monitoring, good site practices, proper scheduling of construction activities as far as practicable and provision of screening, etc would be implemented. With the adoption of the recommended precautionary and mitigation measures, no adverse ecological impact would be anticipated to arise from the proposed site formation works at Site KTN-2.

FIGURES



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Checked:

Designer:

Project Management Initials:

2024/4/18

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DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

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CEDD Civil Engineering and Development Department

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SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

SITE LOCATION PLAN

SHEET NUMBER
圖紙編號

60624717/C4/L03/FIGURE 1.1

ISO A1 594mm x 841mm

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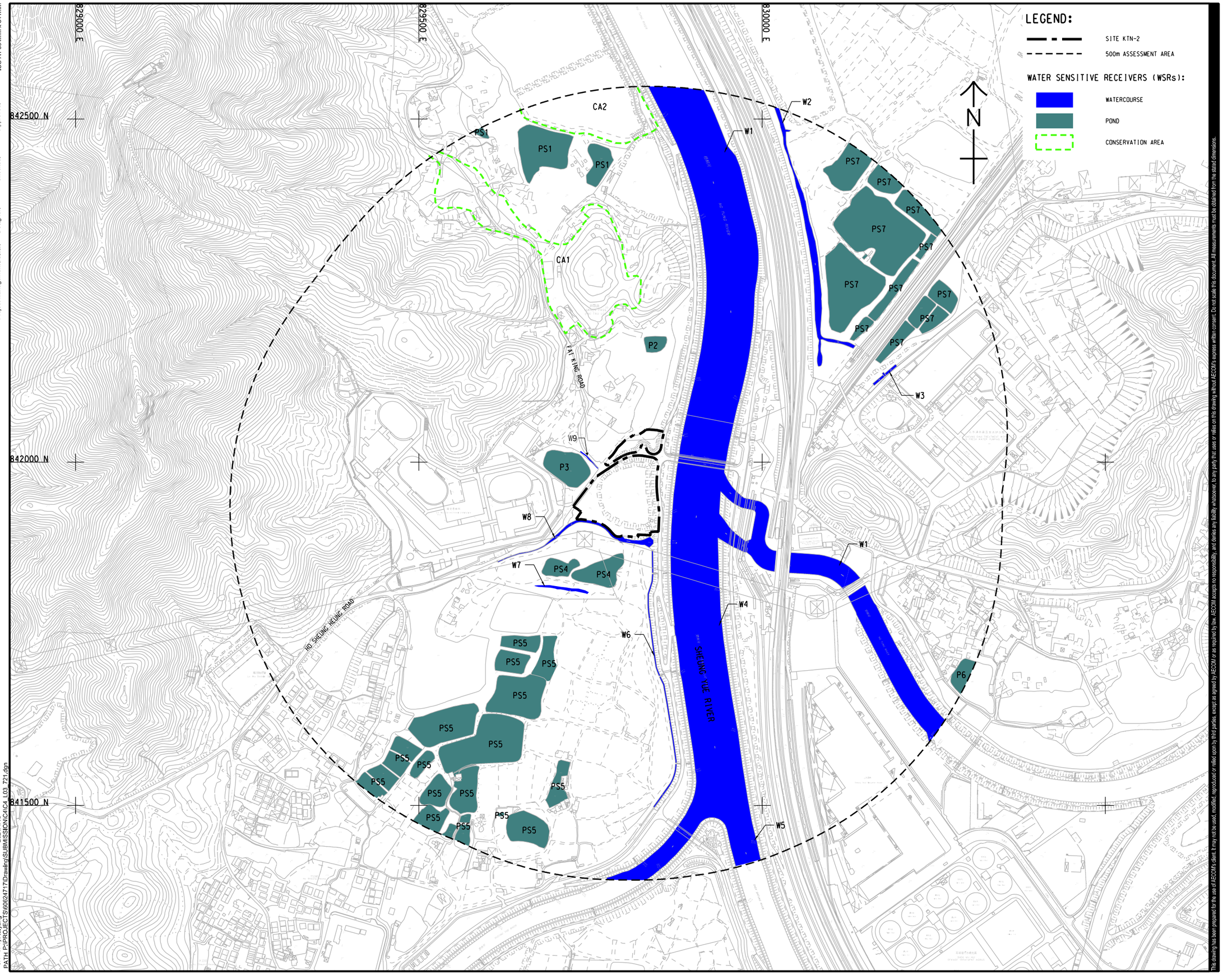
Designer:

Project Management Initials:



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索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

LOCATIONS OF WATER
SENSITIVE RECEIVERS

SHEET NUMBER
圖紙編號

60624717/C4/L03/FIGURE 2.1

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2024/4/18

ISO A1 594mm x 841mm

Approved:

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Designer:

Project Management Initials:

LEGEND:

- SITE KTN-2
- 300m ASSESSMENT AREA
- LONG VALLEY AND HO SHEUNG HEUNG PRIORITY SITE FOR ENHANCED CONSERVATION
- CONSERVATION AREA
- INNER DEEP BAY AND SHENZHEN RIVER CATCHMENT IMPORTANT BIRO AREA
- HO SHEUNG HEUNG EGRETRY
- HO SHEUNG HEUNG ARDEID NIGHT ROOST
- WOODLAND
- MIXED WOODLAND
- PLANTATION
- SHRUBLAND
- GRASSLAND
- MARSH/REED
- AGRICULTURAL LAND
- VILLAGE/ORCHARD
- DEVELOPED AREA/WASTELAND
- WATERCOURSE
- POND

829500 E

829800 E

830100 E

841800 N

N

VERNON PASS (PAI TAU LO)

LO WU CORRECTIONAL INSTITUTION

TSUNG YUEN

HO SHEUNG HEUNG ROAD

FAT KING ROAD

NG TUNG RIVER

SHEUNG YUE RIVER

SPECIES OF CONSERVATION IMPORTANCE:

FLORA:

- P1 INCENSE TREE
- P2 PRINCE'S FEATHER

AVIFAUNA:

- A1 CHINESE POND HERON
- A2 GREATER COUCAL
- A3 LITTLE EGRET
- A4 GREAT EGRET
- A5 BLACK-WINGED STILT
- A6 PIED AVOCET
- A7 GREY HERON
- A8 WHITE-THROATED KINGFISHER
- A9 EURASIAN SPOONBILL
- A10 BLACK-FACED SPOONBILL
- A11 NORTHERN SHOVELER
- A12 GREAT CORMORANT
- A13 CHESTNUT-EARED BUNTING
- A14 COLLARED CROW
- A15 RED-THROATED PIPIT

MAMMAL:

- M1 PALLAS'S SQUIRREL
- M2 SHORT-NOSE FRUIT BAT
- M3 JAPANESE PIPISTRELLE
- M4 UNKNOWN VESPERTILIONIDAE SPECIES 1
- M5 LESSER BAMBOO BAT
- M6 CHINESE NOCTULE
- M7 INTERMEDIATE HORSESHOE BAT
- M8 HIMALAYAN LEAF-NOSED BAT
- M9 UNKNOWN VESPERTILIONIDAE SPECIES 2

BUTTERFLY:

- B1 SMALL CABBAGE WHITE
- B2 METALLIC CERULEAN

HERPETOFAUNA:

- H1 SPOTTED NARROW-MOUTHED FROG
- H2 TAIWAN KUKRI SNAKE

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DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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DIMENSION UNIT 尺寸單位 — METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號 — 60624717

CONTRACT NO. 合約編號 — CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

HABITAT MAP AND LOCATIONS OF SPECEIS OF CONSERVATION IMPORTANCE RECORDED

SHEET NUMBER
圖紙編號

60624717/C4/L03/FIGURE 3.1

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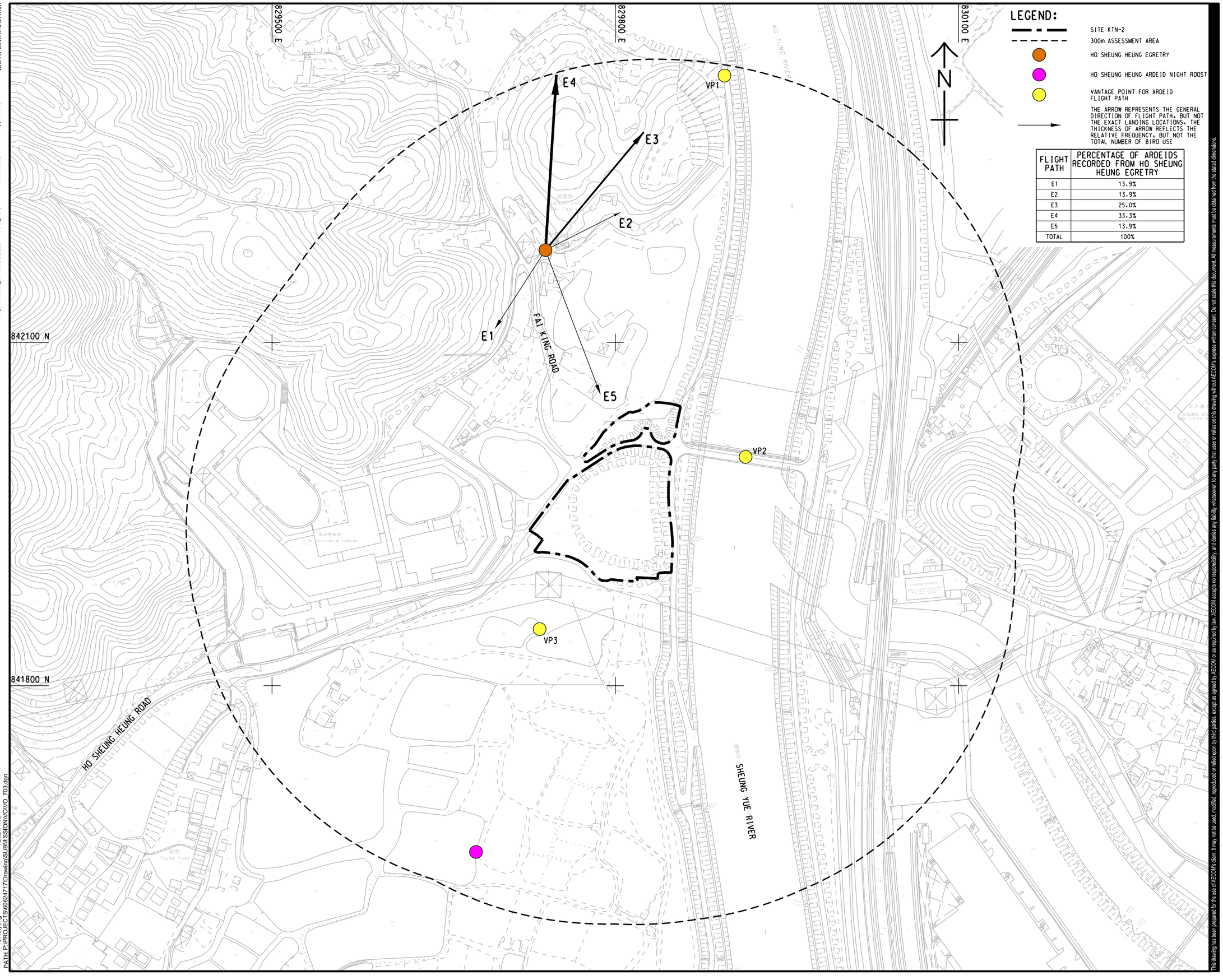

FLIGHT PATH	PERCENTAGE OF ARDEIDS RECORDED FROM HO SHEUNG HEUNG EGRETRY
E1	13.9%
E2	13.9%
E3	25.0%
E4	33.3%
E5	13.9%
TOTAL	100%

ISO A1 594mm x 841mm

Project Management Initials: Designer: Checked: Approved:

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20244418

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METRES

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PROJECT NO. 項目編號
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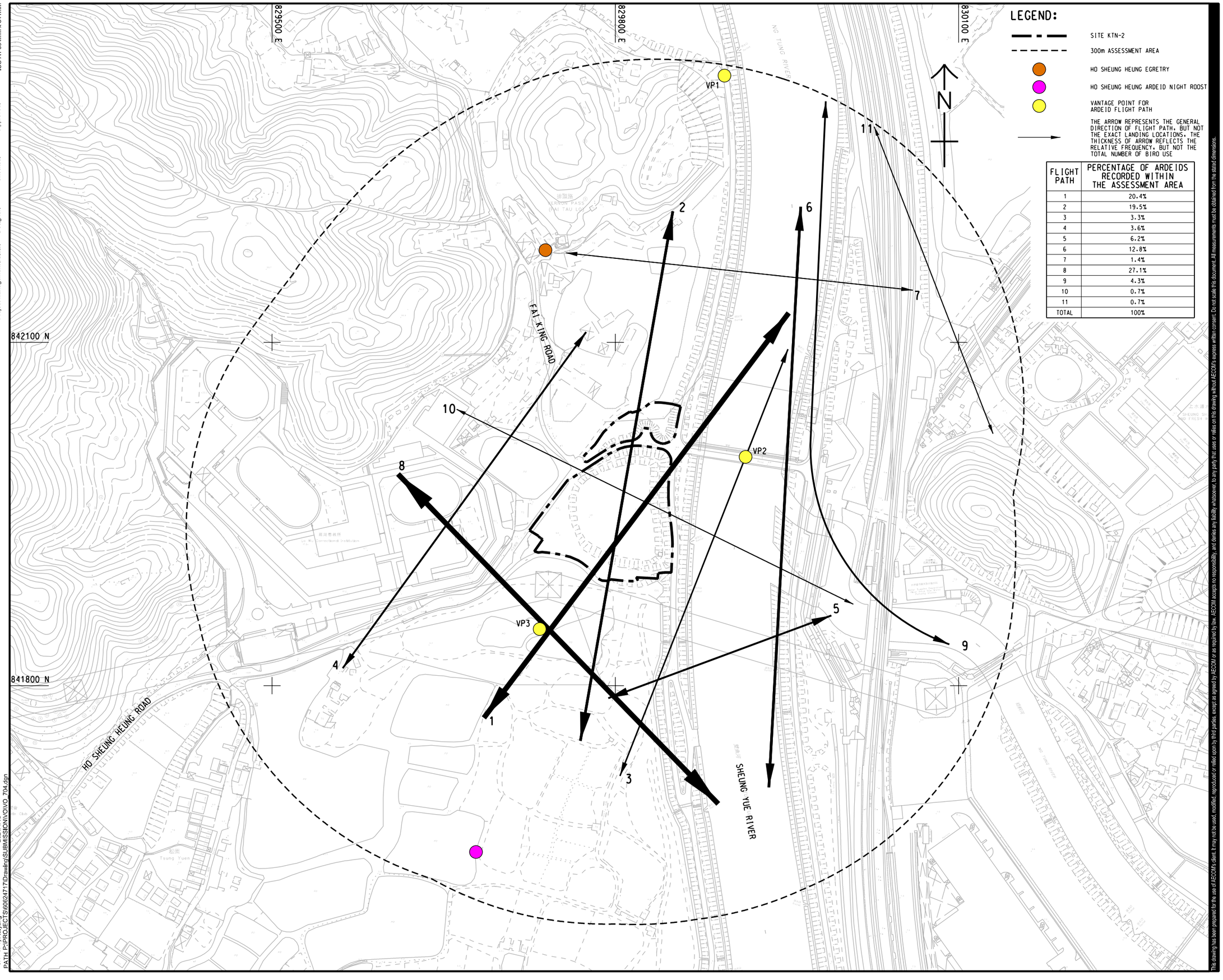
CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

FLIGHT PATHS OF ARDEIDS IN
HO SHEUNG HEUNG EGRETRY

SHEET NUMBER
圖紙編號

60624717/C4/L03/FIGURE 3.2



FLIGHT PATH	PERCENTAGE OF ARDEIDS RECORDED WITHIN THE ASSESSMENT AREA
1	20.4%
2	19.5%
3	3.3%
4	3.6%
5	6.2%
6	12.8%
7	1.4%
8	27.1%
9	4.3%
10	0.7%
11	0.7%
TOTAL	100%

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SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

GENERAL FLIGHT PATHS OF ARDEIDS WITHIN THE 300m ASSESSMENT AREA

SHEET NUMBER
圖紙編號

60624717/C4/L03/FIGURE 3.3

Appendix 3.1

Representative Photographs of Habitat Types within the Assessment Area

Marsh / Reed (within Site KTN-2)

Plantation (within Site KTN-2)

Developed Area / Wasteland (within Site KTN-2)

Marsh/Reed

Pond

Watercourse

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-24
		CHECK	LAMCCG	DRAWN	YIPMLM
	Representative Photographs of Habitat Types within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.1	**Rev** -

Agricultural Land

Woodland

Mixed Woodland

Plantation

Shrubland

Grassland

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-24
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	Representative Photographs of Habitat Types within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.1	**Rev** -

	
Village / Orchard	Developed area / Wasteland
N.A.	N.A.
N.A.	N.A.
N.A.	N.A.
N.A.	N.A.

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Appendix 3.2

Floral Species Recorded within the 300m Assessment Area

Appendix 3.2 Flora Species Recorded within the Assessment Area

Scientific Name	Common Name	Growth Form	Native / Exotic to Hong Kong	Distribution in Hong Kong[1]	Protection / Conservation Status[3]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Abelmoschus esculentus	Okra	annual herb	exotic	Cultivated	-				+							
Acacia auriculiformis	Ear-leaved Acacia	tree	exotic	Widely cultivated in Hong Kong	IUCN Red List: Least Concern							++	+			
Acacia confusa	Taiwan Acacia	tree	exotic	Widely cultivated in Hong Kong	IUCN Red List: Least Concern			+		+	++	+++	++			++
Acacia mangium	Big-leaved Acacia	tree	exotic	Widely cultivated in Hong Kong	IUCN Red List: Least Concern				+							
Acronychia pedunculata	Acronychia	tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++			+			
Adenosma glutinosum	Adenosma	herb	native	Common in Hong Kong	-							+				
Aeschynomene americana	Joint-vetch	shrubby herb	exotic	-	-									+		
Ageratum conyzoides	Billygoat-weed	herb	exotic	Naturalized and widely distributed in Hong Kong	-				+							
Alocasia macrorrhizos	Giant Alocasia	perennial herb	native	Common in Hong Kong	-	+		+							++	++
Aloe vera	Chinese Aloe	perennial herb	exotic	Cultivated	-										+	
Alpinia galanga	Great Galangal	perennial herb	native	Victoria Peak, Shing Mun, Ma Nam Wat, Tsung Tsai Yuen, Sha Lo Tung, Chung Mei, Nam Chung	-				+							
Alpinia zerumbet	Shell Ginger	perennial herb	native	Common in Hong Kong	IUCN Red List: Data Deficient			++								
Alternanthera paronychioides	Smooth Chaff-flower	perennial herb	exotic	Mai Po, Tai Shan Wai	-			++	++							
Alternanthera philoxeroides	Alligator-weed	perennial herb	exotic	Common in Hong Kong. Naturalized	-				++							
Amaranthus spinosus	Spiny Amaranth	herb	exotic	Common in Hong Kong. Naturalized	-							+				+
Amaranthus viridis	Green Amaranth	herb	native	Common in Hong Kong	-			+	++							+
Ampelopsis heterophylla var. *kulingensis*	Kuling Ampelopsis	woody vine	native	Common in Hong Kong	-				+	++						
Ananas comosus	Pineapple	herb	exotic	Cultivated	-										++	
Apluda mutica	Glutene-rice Grass	perennial herb	native	Common in Hong Kong	-									+		
Aporosa dioica	Aporosa	tree	native	Common in Hong Kong	-					+++	++	+	++			
Aquilaria sinensis	**Incense Tree**	tree	native	Common in Hong Kong	List of Wild Plants under State Protection: Category II; Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586); Rare and Precious Plants of Hong Kong (Status of China): Category 2 & 3 (Near Threatened); Listed in Wild Plants under State Protection: Category II; China Plant Red Data Book: Vulnerable; Rare and Endangered Plants and National Key Protected Plants in Guangdong: Near Threatened; Illustration of Rare and Endangered Plants in Guangdong Province; Threatened Species List of China's Higher Plants: Vulnerable; IUCN Red List: Vulnerable					+		+				
Archidendron lucidum	Chinese Apea Ear-ring	tree	native	Common in Hong Kong	IUCN Red List: Least Concern					+						
Artocarpus heterophyllus	Jackfruit	tree	exotic	Cultivated	-				+	+++					+++	
Asystasia micrantha	-	erennial ascending her	exotic	Cultivated or naturalized	-					++		+			++	+
Axonopus compressus	Carpet Grass	rennial procumbent he	exotic	Common in Hong Kong (naturalised)	-							+				
Baeckea frutescens	Dwarf Mountain Pine	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern							+	+			
Bambusa spp.	-	clumped tree bamboo	-	-	-										+	
Basella alba	Malabar-Nightshade	climber: twining vine	exotic	Cultivated	-											+
Begonia cucullata var. *hookeri*	Perpetual Begonia	perennial herb	exotic	Cultivated in gardens	-										+	
Benincasa hispida	White Gourd	herbaceous vine	exotic	Cultivated	-											+
Berchemia floribunda	Japanese Supple-jack	climbing shrub: vine	native	Hong Kong Island, Tai Mo Shan, Ma On Shan, Sai Kung, Tai Long Sai Wan, Chek Keng, Kiu Tsui, Lantau Island	IUCN Red List: Least Concern					+		+	++			
Bidens alba	-	herb	exotic	Naturalized and widely distributed in Hong Kong	-			+	+		++	++		++	+	
Blechnum orientale	Oriental Blechnum	herb	native	-	-					+++		++	++			
Bombax ceiba	Tree Cotton	tree	exotic	Cultivated	IUCN Red List: Least Concern							+				+
Bothriochloa bladhii	Australian Bluestem	perennial herb	native	Common in Hong Kong	-									+		++
Bougainvillea spectabilis	Brazil Bougainvillea	climbing shrub	exotic	Cultivated in gardens or as a pot plant	-										++	
Brachiaria mutica	Blunt Signal-grass	herb	exotic	Aberdeen, Sha Tin, Yuen Long, Nam Sang Wai, San Tin, Mai Po, Plover Cove, Tsing Yi	IUCN Red List: Least Concern	+++	+							+++		
Brassica rapa var. *parachinensis*	Flowering Chinese Cabbage	biennial herb	exotic	Cultivated	-				++							
Breynia fruticosa	Waxy Leaf	shrub	native	Common in Hong Kong	IUCN Red List: Least Concern					+						+
Bridelia tomentosa	Pop-gun Seed	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++	+	++	++			
Broussonetia papyrifera	Paper Mulberry	tree	native	Common in Hong Kong	IUCN Red List: Least Concern				+			+				+
Brucea javanica	False Sumac	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern							+				
Calliandra haematocephala	Pink Powder Puff	shrub	exotic	Cultivated	-										+	
Callipteris esculenta	Freshy Lady-fern	herb	native	-	-	++		+		+				++		
Capsella bursa-pastoris	Shepherd's Purse	biennial herb	native	Aberdeen, Victoria Peak, Sai Kung, Ng Tung Chai, Wun Yiu	-				++							
Capsicum annuum var. *conoides*	Cone Pepper	perennial herb	exotic	-	-				++						+	
Carica papaya	Papaya	tree	exotic	Cultivated	IUCN Red List: Data Deficient				++							

Scientific Name	Common Name	Growth Form	Native / Exotic to Hong Kong	Distribution in Hong Kong[1]	Protection / Conservation Status[3]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Celtis sinensis	Chinese Hackberry	tree	native	Common in Hong Kong and widely planted	IUCN Red List: Least Concern					++	+	++	+	+		++
Chukrasia tabularis	Chittagong Chickrassy	tree	exotic	Cultivated	IUCN Red List: Least Concern							++				
Cinnamomum burmannii	Batavia Cinnamon	large shrub or tree	native	Common in Hong Kong	-					+						
Cinnamomum camphora	Camphor Tree	large tree	native	Common in Hong Kong. Also widely cultivated	IUCN Red List: Least Concern					+		+				
Citrus maxima	Pummelo	tree	exotic	Cultivated	IUCN Red List: Least Concern										+	
Citrus mitis	Calamondin	shrub or small tree	-	-	-										+	
Clausena lansium	Wampi	small tree	exotic	Cultivated	IUCN Red List: Least Concern							+			++	
Cleistocalyx nervosum	Lidded Cleistocalyx	tree	native	Common in Hong Kong	-											+
Coccinia grandis	Ivy-gourd	herbaceous vines	native	Wong Chuk Hang, Tsuen Wan, Shan Liu, Ping Shan	-											++
Cocculus orbiculatus	Snail Seed	climber: vine	native	Common in Hong Kong	-				++	++		+				+
Colocasia esculenta	Taro	herb	exotic	Cultivated or wild	IUCN Red List: Least Concern	+++	+	++	++						+	+
Commelina diffusa	Diffuse Day-flower	herb	native	Common in Hong Kong	IUCN Red List: Least Concern	++++	++	+						++		
Conyza sumatrensis	-	herb	exotic	Naturalized and widely distributed in Hong Kong	-			+								
Costus speciosus	Crape Ginger	herb	native	Mount Gough, Tai Hang Rd., Lantau Peak	-											+
Cratoxylum cochinchinense	Yellow Cow Wood	shrub or tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++		+	++			
Crinum asiaticum var. *sinicum*	St. John's Lily	herb	native	Tai Long Sai Wan, Ham Tin, Tai Wan, Long Ke, Lantau Island	-			+							+	
Curcuma longa	-	herb	exotic	Cultivated	IUCN Red List: Data Deficient											+
Cyclosorus interruptus	Interrupted Tri-vein Fern	herb	native	-	IUCN Red List: Least Concern	+++										
Cyclosorus parasiticus	Wood-fern	herb	native	-	-					++	+				+	+
Cyperus involucratus	Umbrella Plant	herb	exotic	Cultivated or naturalized	-	+++										
Cyperus odoratus	-	herb	exotic	-	IUCN Red List: Least Concern				++							
Dalbergia benthamii	Bentham's Rosewood	climber: vine	native	Common in Hong Kong	IUCN Red List: Least Concern					+		++				
Daphniphyllum calycinum	-	tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++			+			
Dendrotrophe varians	-	woody vine	native	Aberdeen, Findlay Rd., Mount Collinson Rd., Pok Fu Lam Reservoir, Stanley, Tai Mo Shan, Sha Tau Kok, Lantau Island	-								+			
Desmodium heterocarpon	False Groundnut	subshrub	native	Wong Nai Chung Gap, Tai Hang Rd., Shing Mun, Sha Tin	-											+
Desmos chinensis	Desmos	woody vine	native	Common in Hong Kong	-								++			
Dianella ensifolia	Dianella	herb	native	Common in Hong Kong	-							+				
Dicranopteris pedata	Dichotomy Forked Fern	herb	native	very common	-							++	+++			
Dimocarpus longan	Longan	tree	exotic	Cultivated	List of Wild Plants under State Protection: Category II; Threatened Species List of China's Higher Plants: Vulnerable; Rare and Endangered Plants and National Key Protected Plants in Guangdong: Near Threatened; IUCN Red List: Near Threatened		+	+		++	+				+++	
Dracaena sanderiana	Belgium Evergreen	shrub	exotic	-	-										+	
Dracaena spp.	-	-	exotic	-	-										+	
Duranta erecta	Golden Dewdrops	climbing shrub	exotic	Cultivated	IUCN Red List: Least Concern											+
Dypsis lutescens	Bamboo Palm	shrub palm	exotic	Cultivated	IUCN Red List: Near Threatened				+	+		+				
Eichhornia crassipes	Water Hyacinth	floating herb	exotic	Naturalised in Hong Kong	-	++										
Eleocharis dulcis	Water Chestnut	herb	exotic	Cultivated	IUCN Red List: Least Concern		+									
Eleutherococcus trifoliatus	Three-leaved Eleutherococccus	climbing shrub	native	Common in Hong Kong	-					+						
Embelia laeta	Twig-hanging Embelia	climber: vine	native	Widely distributed in Hong Kong	-								++			
Emilia sonchifolia	Tassel Flower	herb	native	Common in Hong Kong	-				+							
Eriobotrya japonica	Loquat	small tree	exotic	Cultivated	-				++							
Eucalyptus spp.	-	tree	exotic	cultivated; common	-							+++				+
Euphorbia hirta	Garden Spurge	herb	exotic	Naturalized	-				++							
Euphorbia hypericifolia	Milk Spurge	annual herb	native	Tsim Sha Tsui, Kwai Chung Park, Fanling, Lok Ma Chau, PokWai, Sai Kung, Siu LekYuen Tsuen, Tung Chung, Lantau Island	-				+							
Excoecaria cochinchinensis	Cochin-china Excoecaria	shrub	exotic	Cultivated	IUCN Red List: Least Concern											+
Ficus fistulosa	Common Yellow Steg-fig	tree	native	Common in Hong Kong	IUCN Red List: Least Concern		+									
Ficus hirta	Hairy Fig	shrub or small tree	native	Common in Hong Kong	-					++		++				
Ficus hispida	Opposite-leaved Fig	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern		+			++	+	++		+		++
Ficus microcarpa	Chinese Banyan	tree	native	Common in Hong Kong	IUCN Red List: Least Concern							+				
Ficus pumila	Creeping Fig	climbing woody vine	native	Common in Hong Kong	-					++						
Ficus variegata	Common Red-stem Fig	tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++					+	+
Ficus variolosa	Varied-leaf Fig	shrub or tree	native	Common in Hong Kong	IUCN Red List: Least Concern								+			
Ficus virens	Big-leaved Fig	tree	native	Cultivated	IUCN Red List: Least Concern							++				+
Fimbristylis spp.	-	herb	native	-	-				++							+
Flueggea virosa	Snow Berry	shrub	native	Tai Tam, Ngau ChiWan, Fanling, Po Leng , Tai Po, Butterfly Hill	IUCN Red List: Least Concern				+			+	+	+		+
Gardenia jasminoides	Cape Jasmine	shrub	native	Common in Hong Kong	-								+			
Glochidion wrightii	Wright's Abacus Plant	-	native	Common in Hong Kong	-					+			+			

Scientific Name	Common Name	Growth Form	Native / Exotic to Hong Kong	Distribution in Hong Kong[1]	Protection / Conservation Status[3]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Gnaphalium pensylvanicum	Purple Cudweed	herb	native	Common in Hong Kong	-			+								
Goeppertia makoyana	Peacock Plant	herb	exotic	Cultivated	-										+	
Helicteres angustifolia	Narrow-leaved Screwtree	subshrub	native	Common in Hong Kong	-		+					+				
Heterosmilax japonica	Heterosmilax	climbing shrub	native	Pok Fu Lam	-								+			
Hibiscus sabdariffa	Roselle	shrub	exotic	-	-				++							
Hibiscus tiliaceus	Cuban Bast	shrub or tree	native	Hong Kong Island, Shek O, Ma Liu Shui, Mai Po, Leung Shuen Wan Chau (Tall Island)	IUCN Red List: Least Concern							++				
Hylocereus undatus	Night-blooming Cereus	perennial herb	exotic	Cultivated	IUCN Red List: Data Deficient										++	
Hymenocallis littoralis	American Hymenocallis	herb	exotic	Cultivated	-										++	
Ilex asprella	Rough-leaved Holly	shrub	native	very common	-					+		+	++			
Ipomoea aquatica	Water Spinach	herb	exotic	Cultivated	IUCN Red List: Least Concern		+		++++							
Ipomoea cairica	Gairo Morning Glory	climber: twining herb	exotic	Common in Hong Kong	IUCN Red List: Least Concern						+				+	++
Kyllinga polyphylla	Aromatic Kyllinga	herb	exotic	Victoria Park, Tsiu Hang, Tai Po Kau	-									+		+
Lantana camara	Lantana	shrub	exotic	Naturalized in Hong Kong	-							++			+	++
Lemna minor	Lesser Duck-weed	floating small herb	native	New Territories	IUCN Red List: Least Concern		++									
Leucaena leucocephala	White Popinac	small tree	exotic	Cultivated and naturalized	-			+			++	++++				++
Ligustrum sinense	Chinese Privet	shrub or small tree	exotic	Common in Hong Kong and widely cultivated	-					+++		+				++
Liriope spicata	Lily Turf	perennial herb	native	Common in Hong Kong	-					+						
Litchi chinensis	Lychee	tree	exotic	Cultivated	List of Wild Plants under State Protection: Category II; Threatened Species List of China's Higher Plants: Endangered; Rare and Endangered Plants and National Key Protected Plants in Guangdong: Near Threatened					+++	+				+++	
Litsea cubeba	Fragrant Litsea	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern							++				
Litsea glutinosa	Pond Spice	tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++	++	+				
Litsea rotundifolia var. *oblongifolia*	Oblong-leaved Litsea	shrub	native	Common in Hong Kong	-					+++	++	+	+++			+
Lophatherum gracile	Common Lophantherum	perennial herb	native	Common in Hong Kong	-						++		+			
Lophostemon confertus	Brisbane Box	tree	exotic	Cultivated	IUCN Red List: Least Concern					+						
Ludwigia erecta	-	herb	exotic	-	-	+	+		++							
Ludwigia hyssopifolia	-	herb	native	Tai Lam Chung	IUCN Red List: Least Concern	+										
Ludwigia perennis	-	herb	native	Sha Tin, Tai Mo Shan	-		+		+					+		
Lycopersicon esculentum	Tomato	herb	exotic	Cultivated	IUCN Red List: Least Concern				++							
Lygodium japonicum	Climbing Fern	climbing herb	native	-	-					++			+			
Lygodium scandens	Scansorial Climbing Fern	climbing herb	native	-	-						++	++	++			
Macaranga tanarius var. *tomentosa*	Elephant's Ear	tree	native	Common in Hong Kong	IUCN Red List: Least Concern		+			++	+++	++	+		+	+
Machilus pauhoi	Many-nerved Machilus	tree	native	Tai Po (Nam Hang), Sai Kung (Tsiu Hang)	IUCN Red List: Least Concern					++						
Macrothelypteris torresiana	Mariana Maiden Fern	herb	native	-	-		+									
Malvastrum coromandelianum	False Mallow	herb	native	Common in Hong Kong	-			+	+							
Malvaviscus penduliflorus	Turk's Cap	shrub	exotic	Commonly cultivated in Hong Kong	-											++
Mangifera indica	Mango	tree	exotic	Cultivated	IUCN Red List: Data Deficient		+		+	+					++	
Manihot esculenta	Tapioca Plant	shrub	exotic	Cultivated	-				+							
Maranta arundinacea	Arrowroot	perennial herb	exotic	Cultivated	-										++	
Melaleuca cajuputi subsp. *cumingiana*	Paper-bark Tree	tree	exotic	Cultivated	IUCN Red List: Least Concern					+						
Melastoma malabathricum	Common Melastoma	shrub	native	Common in Hong Kong	-					+++						
Melia azedarach	China-berry	tree	exotic	Cultivated or naturalized	IUCN Red List: Least Concern					+	++	++				+
Melicope pteleifolia	Thin Evodia	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern						+					
Michelia x alba	White Jade Orchid Tree	tree	exotic	Widely cultivated in gardens	Protected under Forests and Countryside Ordinance (Cap. 96)							+				
Microcos nervosa	Microcos	shrub or small tree	native	Common in Hong Kong	-				+	++			++			
Microstegium ciliatum	Ciliate Microstegium	rennial procumbent he	native	Common in Hong Kong	-					+						
Mikania micrantha	Mile-a-minute Weed	climbing herb	exotic	Naturalized and widely distributed in Hong Kong	-	++	++				+	++		++	+	++
Mimosa pudica	Sensitive Plant	herb	exotic	Naturalized in Hong Kong	IUCN Red List: Least Concern									+		+
Miscanthus floridulus	Many-flowered Silvergrass	perennial herb	native	Common in Hong Kong	-	+	+									
Miscanthus sinensis	Chinese Silvergrass	perennial herb	native	Common in Hong Kong	-							++				
Morinda parvifolia	Little-leaved Indian-mulberry	climbing shrub	native	Common in Hong Kong	-							++		+		
Morus alba	White Mulberry	shrub or tree	native	Common in Hong Kong. Also cultivated	IUCN Red List: Least Concern		+									
Murdannia loriformis	-	herb	native	New Territories	-				++							
Musa x paradisiaca	Common Banana	perennial herb	exotic	Cultivated	IUCN Red List: Least Concern				++						++	
Mussaenda pubescens	Splash-of-white	climbing shrub	native	Common in Hong Kong	-						+	+	++			
Nasturtium officinale	Water Cress	aquatic herb	exotic	Cultivated	IUCN Red List: Least Concern				++++							
Nephrolepis auriculata	Tuberous Sword Fern	herb	native	-	-							+			+	
Neyraudia reynaudiana	Burma-reed	perennial herb	native	Common in Hong Kong	-						++	++	+			
Nymphaea spp.	-	aquatic herb	exotic	-	-		+									
Ocimum basilicum	Basil	herb	exotic	Deep Water Bay, New Territories	-											+
Opuntia stricta var. *dillenii*	Prickly-pear	perennial herb	exotic	Cultivated or naturalized	-										+	
Oryza sativa	Rice	perennial herb	exotic	Cultivated	List of Wild Plants under State Protection: Category II				++++							
Oxalis corniculata	Sorrel	perennial herb	native	Common in Hong Kong	-			+								++

Scientific Name	Common Name	Growth Form	Native / Exotic to Hong Kong	Distribution in Hong Kong[1]	Protection / Conservation Status[3]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Oxalis debilis subsp. *corymbosa*	Lavender Sorrel	perennial herb	exotic	A common weed in Hong Kong	-										+	+
Paederia scandens	Chinese Fevervine	climber: vine	native	Common in Hong Kong	-											++
Palhinhaea cernua	Nodding Clubmoss	creeping herb	native	-	-								+			
Panicum maximum	Guinea Grass	perennial herb	exotic	Cultivated for forage	-						++	++				
Panicum repens	Panic Grass	perennial herb	native	Common in Hong Kong	IUCN Red List: Least Concern				++							
Paspalum conjugatum	Hilo Grass	perennial herb	native	Common in Hong Kong	IUCN Red List: Least Concern											++
Paspalum spp.	-	-	-	-	-									++		
Passiflora foetida	Passion Flower	herbaceous vine	exotic	Common in Hong Kong. Naturalized	-									++	+	+
Pedilanthus tithymaloides	Redbird Cactus	shrub	exotic	-	-											+
Pennisetum purpureum	Napier Grass	perennial herb	exotic	Cultivated	IUCN Red List: Least Concern	++										
Peperomia pellucida	Clearweed	herb	exotic	Naturalized in Hong Kong	-				+							
Perilla frutescens	Perilla	herb	exotic	Cultivated	IUCN Red List: Least Concern										+	
Persicaria barbata	Hairy Knotweed	herb	native	Common in Hong Kong	IUCN Red List: Least Concern	+	++	+								
Persicaria chinensis	Chinese Knotweed	herb	native	Common in Hong Kong	-										++	
Persicaria lapathifolia	White Smartweed	herb	native	Tsuen Wan, Sha Tin, Ha Tsuen, Ta Kwu Ling, Sheung Shui	IUCN Red List: Least Concern				+							
Persicaria orientalis	**Prince's Feather**	herb	native	Sha Po, Yuen Long	-			+								
Persicaria pubescens	Pubescent Knotweed	herb	native	Sai Kung, Sheung Shui, Tai Kwu Ling	IUCN Red List: Least Concern	+										
Phragmites australis	Common Reedgrass	perennial herb	native	New Territories, Lantau Island	IUCN Red List: Least Concern	+++										
Phyllanthus cochinchinensis	Vietnam Leaf-flower	shrub	native	Common in Hong Kong	-					+						
Phyllanthus emblica	Myrobalan	shrub or tree	native	Common in Hong Kong	IUCN Red List: Least Concern								++			
Phyllanthus reticulatus	Reticulated Leaf-flower	shrub	native	Pok Fu Lam Rd., Stubbs Rd., DeepWater Bay, Lam Tsuen, Ma On Shan, Tai O, Lantau Island	IUCN Red List: Least Concern					+						
Pinus elliottii	Slash Pine	tree	exotic	Widely planted in countryside	IUCN Red List: Least Concern								+			
Pisum sativum	Garden Pea	climbing herb	exotic	Cultivated	-											+
Platycladus orientalis	Chinese Arborvitae	tree	exotic	Cultivated in gardens	IUCN Red List: Near Threatened				+							
Portulaca oleracea	Purslane	herb	native	Common in Hong Kong	IUCN Red List: Least Concern			+	+							
Praxelis clematidea	-	perennial herb	exotic	Naturalized and widely distributed in Hong Kong	-			+	+				++			
Psidium guajava	Guava	tree	exotic	Cultivated	IUCN Red List: Least Concern		+		+							
Psychotria asiatica	Wild Coffee	shrub or tree	native	Common in Hong Kong	IUCN Red List: Least Concern					+++	++	+				+
Psychotria serpens	Creeping Psychotria	semi-woody climber: vir	native	Common in Hong Kong	-					++						
Pteris semipinnata	Semi-pinnated Brake	herb	native	-	-					++						
Pteris vittata	Ladder Brake	herb	native	-	IUCN Red List: Least Concern									+		+
Pueraria lobata var. *montana*	Montane Kudzu	climber: vine	native	Common in Hong Kong	-											++
Pueraria phaseoloides	Wild Kudzu Vine	climber: vine	native	Common in Hong Kong	-									++		
Ranunculus sceleratus	Celery-leaved Crowfoot	herb	native	New Territories	IUCN Red List: Least Concern				+							
Rhaphiolepis indica	Hong Kong Hawthorn	shrub or small tree	native	Common in Hong Kong	-					+		++	++			+
Rhododendron spp.	-	shrub	-	-	-										+	
Rhodomyrtus tomentosa	Rose Myrtle	shrub	native	Common in Hong Kong	IUCN Red List: Least Concern							+				
Rhus chinensis	Sumac	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern					+		+	++			
Rhus succedanea	Wax Tree	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern					++		++	+++			
Rorippa indica	-	biennial herb	native	New Territories, Lantau Island	-			+								
Rourea microphylla	Little-leaved Rourea	climbing shrub	native	Common in Hong Kong	-								++			
Rumex trisetifer	Trisetiferous Dock	herb	native	Hong Kong Islands	-	++		+								
Saccharum officinarum	Sugar Cane	perennial herb	exotic	Cultivated	-				+							
Sageretia thea	Hedge Sageretia	shrub	native	Common in Hong Kong	-							+	++			+
Sagittaria trifolia subsp. *leucopetala*	Chinese Arrow-head	aquatic herb	exotic	Cultivated	-		+									
Sapium discolor	Mountain Tallow Tree	small tree	native	Common in Hong Kong. Also planted	-							+	+++			
Sapium sebiferum	Chinese Tallow Tree	tree	native	Common in Hong Kong. Also planted	-				+					+		+
Sauropus spatulifolius	Spatulate-leaved Sauropus	shrub	exotic	Cultivated	-										++	+
Schefflera heptaphylla	Ivy Tree	tree	native	Common in Hong Kong	IUCN Red List: Least Concern						++		++			
Scleria spp.	-	herb	native	-	-							+				
Scoparia dulcis	Sweet Broomwort	herb	exotic	Naturalized in Hong Kong	-			+								+
Senna tora	Sickle Senna	subshrubby herb	exotic	Naturalized	-				+							+
Sida rhombifolia	Sida Hemp	erect subshrub	native	Common in Hong Kong	-											+
Solanum americanum	Shining-fruit Nightshade	herb	exotic	Naturalized in Hong Kong	-			+								
Solanum melongena	Egg-plant	herb or subshrub	exotic	Cultivated	-				++							
Solanum torvum	Tetrongan	shrub	exotic	Naturalized in Hong Kong	-		+							+		+
Sonchus arvensis	Field Sow-Thistle	herb	native	Common in Hong Kong	-			+								
Spermacoce remota	-	herb	-	-	IUCN Red List: Least Concern				+							
Spilanthes paniculata	Gold Button	herb	native	Common in Hong Kong	-				+							
Stephania longa	Long Stephania	climber: vine	native	Aberdeen, Tai Po Kau, Ma On Shan, Sheung Shui, Tai Mong Tsai	-								+			
Sterculia lanceolata	Lance-leaved Sterculia	semi-deciduous tree	native	Common in Hong Kong	IUCN Red List: Least Concern						+	+	+			
Sterculia monosperma	Common Sterculia	tree	exotic	Tsuen Wan, Shatin. Cultivated	-				+							
Synedrella nodiflora	Synedrella	herb	exotic	Naturalized and widely distributed in Hong Kong	-								+			
Syngonium podophyllum	African Evergreen	herb	exotic	-	-				+						+	
Syzygium cumini	Jambolan Plum	tree	exotic	Cultivated	IUCN Red List: Least Concern					+						
Syzygium hancei	Hance's Syzygium	tree	native	Common in Hong Kong	IUCN Red List: Least Concern								++			
Syzygium jambos	Rose Apple	tree	exotic	Cultivated & naturalized	IUCN Red List: Least Concern					+	+					+
Tetracera asiatica	Sandpaper Vine	woody vine	native	Common in Hong Kong	-					+						

Scientific Name	Common Name	Growth Form	Native / Exotic to Hong Kong	Distribution in Hong Kong[1]	Protection / Conservation Status[3]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Tetradium glabrifolium	Melia-leaved Evodia	tree	native	Hong Kong Island, Sai Kung, Tai Po, Bride's Pool, Lantau Island	-					++		++	+++			
Thunbergia erecta	Bush Thunbergia	erect shrub	exotic	Cultivated	-										+	
Thysanolaena latifolia	Tiger-grass	herb	native	Common in Hong Kong	-					+						
Trema tomentosa	India-charcoal Trema	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern						+					
Tridax procumbens	Tridax	perennial herb	exotic	Naturalized and widely distributed in Hong Kong	-			+								+
Typha angustifolia	Narrow-leaved Cat-tail	perennial herb	exotic	Cultivated	IUCN Red List: Least Concern	++										
Urena lobata	Rose Mallow	subshrubby herb	native	Common in Hong Kong	IUCN Red List: Least Concern				+	+						+
Vernonia amygdalina	-	shrub	exotic	-	-											+
Vigna unguiculata subsp. *sesquipedalis*	Yard-long Bean	climbing vine	exotic	Cultivated	-											+
Vitex negundo	Yellow Bramble	shrub or small tree	native	Common in Hong Kong	IUCN Red List: Least Concern							+				
Wedelia trilobata	-	perennial herb	exotic	Naturalized and widely cultivated	-		++	+++						++		++
Wikstroemia indica	Indian Wikstroemia	shrub	native	Common in Hong Kong	-							+				
Zanthoxylum avicennae	Prickly Ash	tree	native	Common in Hong Kong	-					++	+					
Zea mays	Maize	herb	exotic	Cultivated	IUCN Red List: Least Concern				++							
					Total no. of species	18	24	27	56	60	28	64	45	22	42	64

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) 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.

(3) Protection statuses follow:

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

Protected by the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586)

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.

"List of Wild Plants Under State Protection" (promulgated by the Ministry of Forestry in 2021)

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

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

International Union for the Conservation of Nature (IUCN) (2024). The IUCN Red List of Threatened Species. Version 2023-1. http://www.iucnredlist.org.

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

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

(4) The individual(s) is artificially introduced into the habitat for horticultural or amenity purpose, thus it is not considered as species of conservation importance.

Abbreviation for Habitats: MA=Marsh/Reed; PO=Pond; WC=Watercourse; AGL=Agricultural Land; WL=Woodland; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; GL=Grassland; VO=Village/Orchard; DA=Developed Area/Wasteland

Code for Abundance: +++++=Dominant; ++++=Abundant; +++=Frequent; ++=Occasional; +=Scarce

Species of conservation importance is in **bold** type face

Appendix 3.3

Fauna Species Recorded within the 300m Assessment Area

Appendix 1.3 Avifauna Species Recorded within the Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[3]	Principal Status[4]	Level of Concern[5]	Protection Status in China[6]	China Red Data Book[7]	Red List of China's Vertebrates[8]	IUCN Red List (Version 2022.2)[9]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA	IF
Alexandrine Parakeet	***Psittacula eupatria***	Locally common resident. Found in Kowloon Park.	-	-	Class II	-	Data Deficient	Near Threatened												+
Asian Koel	*Eudynamys scolopaceus*	Common resident. Widely distributed in Hong Kong.	Su,R	-	-	-	Least Concern	Least Concern				+	+					+	+	
Barn Swallow	*Hirundo rustica*	Abundant passage migrant and uncommon winter visitor. Widely distributed in Hong Kong.	SpM,Su	-	-	-	Least Concern	Least Concern										+		
Black Drongo	*Dicrurus macrocercus*	Common autumn passage migrant and winter visitor. Widely distributed in open area throughout Hong Kong.	M,Su	-	-	-	Least Concern	Least Concern						+					+	
Black Kite[2][10]	***Milvus migrans***	Common resident and winter visitor. Widely distributed in Hong Kong	W,R	(RC)	Class II	-	Least Concern	Least Concern												+
Black-collared Starling	*Gracupica nigricollis*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern				+		+	+		+	+	+++	
Black-crowned Night Heron[10]	*Nycticorax nycticorax*	Common resident and migrant. Widely distributed in Hong Kong.	P	(LC)	-	-	Least Concern	Least Concern	+		+									+
Black-faced Spoonbill[10]	***Platalea minor***	Common winter visitor. Found in Deep Bay area.	W	PGC	Class II	Endangered	Endangered	Endangered		+++										+
Black-winged Stilt[10]	***Himantopus himantopus***	Common migrant and wintor visitor. Found in Deep Bay area, Long Valley, Kam Tin	W	RC	-	-	Least Concern	Least Concern		+		++								
Blyth's Pipit	*Anthus godlewskii*	Vagrant. Found in Kam Tin.	-	-	-	-	Least Concern	Least Concern				+								
Chestnut-eared Bunting	***Emberiza fucata***	Uncommon passage migrant. Found in Long Valley, Tai Mong Tsai, Luk Keng, Ho Chung, Kam Tin, Lantau, Sha Lo Tung.	M	LC	-	-	Least Concern	Least Concern				+								
Chinese Bulbul	*Pycnonotus sinensis*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern				++	++	+	+	+		+	+	
Chinese Pond Heron[10]	***Ardeola bacchus***	Common resident. Widely distributed in Hong Kong.	P	PRC (RC)	-	-	Least Concern	Least Concern	+	+	+	+		+						+
Cinereous Tit	*Parus cinereus*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern					+		+			+	+	
Collared Crow[10]	***Corvus torquatus***	Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.	R	LC	-	-	Near Threatened	Vulnerable											+	
Common Sandpiper[10]	*Actitis hypoleucos*	Common passage migrant and winter visitor. Widely distributed in wetland area throughout Hong Kong.	M,W	-	-	-	Least Concern	Least Concern			+	+								
Common Snipe[10]	*Gallinago gallinago*	Common passage migrant and winter visitor. Found in Long Valley, Chau Tau, Sai Kung	W	-	-	-	Least Concern	Least Concern				+								
Common Tailorbird	*Orthotomus sutorius*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern	+	+		+				+	+		+	
Crested Goshawk[2]	***Accipiter trivirgatus***	Common resident. Widely distributed in woodlands and shrublands throughout Hong Kong.	R	-	Class II	Rare	Near Threatened	Least Concern												+
Crested Myna	*Acridotheres cristatellus*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern		+					+				++	++
Dusky Warbler	*Phylloscopus fuscatus*	Abundant winter visitor and migrant. Widely distributed in shrubland and waterside vegetation throughout Hong Kong.	W	-	-	-	Least Concern	Least Concern		+						+				
Eastern Cattle Egret[10]	*Bubulcus coromandus*	Resident and common passage migrant. Widely distributed in Hong Kong.	P	(LC)	-	-	Least Concern	Least Concern		++	+									
Eastern Yellow Wagtail	*Motacilla tschutschensis*	Common passage migrant and winter visitor. Widely distributed in agricultural fields and marsh edges throughout Hong Kong.	M,W	-	-	-	Least Concern	Least Concern				+								
Eurasian Spoonbill[2][10]	***Platalea leucorodia***	Uncommon winter visitor. Found in Deep Bay area.	W	LC	Class II	Vulnerable	Near Threatened	Least Concern		+										
Eurasian Tree Sparrow	*Passer montanus*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern		+		++	+	+					++	
Great Cormorant[10]	***Phalacrocorax carbo***	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.	W	PRC	-	-	Least Concern	Least Concern			+									++++
Great Egret[10]	***Ardea alba***	Common resident, migrant and winter visitor. Widely distributed in Hong Kong.	P	PRC (RC)	-	-	Least Concern	Least Concern		+	+	+								++++
Greater Coucal	***Centropus sinensis***	Common resident. Widely distributed in Hong Kong.	R	-	Class II	Vulnerable	Least Concern	Least Concern	+	+	+	+						+		+
Green Sandpiper[10]	*Tringa ochropus*	Common migrant and winter visitor. Found in Deep Bay area, Shuen Wan, Long Valley, Kam Tin, Shek Kong, Ho Chung.	W	-	-	-	Least Concern	Least Concern			+									
Grey Heron[10]	***Ardea cinerea***	Common winter visitor. Found in Deep Bay area, Starling Inlet, Kowloon Park, Cape D'Aguilar.	W	PRC	-	-	Least Concern	Least Concern			+	+			+					++
Grey Wagtail	*Motacilla cinerea*	Common passage migrant and winter visitor. Widely distributed in hill streams throughout Hong Kong.	W	-	-	-	Least Concern	Least Concern			+									
Grey-streaked Flycatcher	*Muscicapa griseisticta*	Uncommon passage migrant. Widely distributed in Hong Kong.	M	-	-	-	Least Concern	Least Concern							+					
Hair-crested Drongo	*Dicrurus hottentottus*	Common migrant and winter visitor, and locally common resident. Widely distributed in wooded area throughout Hong Kong.	M,Su,W	-	-	-	Least Concern	Least Concern				+						+		

Large Hawk Cuckoo	*Hierococcyx sparverioides*	Locally common spring and summer visitor. Widely distributed in woodland throughout in Hong Kong..	Su	-	-	-	Least Concern	Least Concern											+	
Large-billed Crow	*Corvus macrorhynchos*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern											+	
Little Bunting	*Emberiza pusilla*	Common passage migrant and winter visitor. Widely distributed in open area throughout Hong Kong.	W	-	-	-	Least Concern	Least Concern				+								
Little Egret[10]	***Egretta garzetta***	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	P	PRC (RC)	-	-	Least Concern	Least Concern	+	+	+	+								++
Masked Laughingthrush	*Pterorhinus perspicillatus*	Abundant resident. Widely distributed in shrubland throughout Hong Kong.	R	-	-	-	Least Concern	Least Concern	+		+	+	+	+	+	+	+	+	+	
Northern Shoveler[10]	***Spatula clypeata***	Abundant winter visitor. Found in Deep Bay area.	W	RC	-	-	Least Concern	Least Concern		+										
Oriental Magpie	*Pica serica*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern				+		+					+	
Oriental Magpie Robin	*Copsychus saularis*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern					+	++	+			+	++	
Pied Avocet[10]	***Recurvirostra avosetta***	Abundant winter visitor. Found in Deep Bay area.	W	RC	-	-	Least Concern	Least Concern				+								
Pied Kingfisher[10]	*Ceryle rudis*	Common resident. Widely distributed in lakes and ponds throughout Hong Kong.	R	(LC)	-	-	Least Concern	Least Concern		+	+									+
Red-billed Blue Magpie	*Urocissa erythroryncha*	Common resident. Widely distributed in woodland edges throught Hong Kong.	R	-	-	-	Least Concern	Least Concern			+	+			+			+		
Red-whiskered Bulbul	*Pycnonotus jocosus*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern	+			+	+	+	+	+	+	++	++	
Richard's Pipit	*Anthus richardi*	Common passage migrant, winter visitor and locally common resident. Widely distributed in Hong Kong.	W,R	-	-	-	Least Concern	Least Concern				+								
Rock Dove	*Columba livia*	Locally common resident. Widely distributed in urban area throughout Hong Kong.	R	-	-	-	Least Concern	Least Concern												+
Savanna Nightjar	*Caprimulgus affinis*	Uncommon resident and passage migrant	Su,?W	-	-	-	Data Deficient	Least Concern			+								+	
Scaly-breasted Munia	*Lonchura punctulata*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern				+++								
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	Common resident. Widely distributed in wooded area throughout Hong Kong.	R	-	-	-	Least Concern	Least Concern										+		
Spotted Dove	*Spilopelia chinensis*	Abundant resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern	+	+	+	+	+	+	+	+	+	+	+	
Swinhoe's White-eye	*Zosterops simplex*	Abundant resident. Widely distributed in Hong Kong.	R,?W	-	-	-	Least Concern	Least Concern				+	+	+	++				+	
White Wagtail	*Motacilla alba*	Resident, common passage migrant and winter visitor. Widely distributed in Hong Kong.	W,R	-	-	-	Least Concern	Least Concern		+	+	++							+	
White-breasted Waterhen[10]	*Amaurornis phoenicurus*	Common resident. Widely distributed in wetland throughout Hong Kong	R	-	-	-	Least Concern	Least Concern	+	+	+	+		+						
White-rumped Munia	*Lonchura striata*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern				+								
White-throated Kingfisher[10]	***Halcyon smyrnensis***	Common resident. Widely distributed in coastal areas throughout Hong Kong.	AM,P	(LC)	-	-	Least Concern	Least Concern	+		+	+								
Yellow-bellied Prinia	*Prinia flaviventris*	Common resident. Widely distributed in Hong Kong.	R	-	-	-	Least Concern	Least Concern	+	+							+			
Yellow-browed Warbler	*Phylloscopus inornatus*	Abundant winter visitor and migrant. Widely distributed in woodland throughout Hong Kong.	W	-	-	-	Least Concern	Least Concern							+					
								Total no. of species	11	18	19	31	9	12	13	6	6	13	19	14

Notes:
(1) All wild birds are protected under the Wild Animals Protection Ordinance (Cap. 170).
(2) Protected under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586).
(3) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.
(4) Carey, G.J., Chalmers, M.L., Diskin, D.A., Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P. J., Leven,
(5) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History*
(6) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).
(7) Zheng, G.-M. & Wang, Q.-S. (1998). China Red Data Book of Endangered Animals: Aves. First Edition. Beijing: Science Press.
(8) Jiang, Z.G., *et al*. (2016). Red List of China's Vertebrates. *Biodiversity Science* **24**(5): 500-551.
(9) International Union for the Conservation of Nature (IUCN) (2022). IUCN Red List of Threatened Species. Version 2022.2.
(10) Wetland-dependent species (including wetland-dependent species and waterbirds).

Abbreviation for Habitats: MA=Marsh/Reed PO=Pond; WC=Watercourse; AL=Agricultural Land; WL=Woodland; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; GL=Grassland; VO=Village/Orchard; DA=Developed Area/Wasteland; IF=In Flight
Species of conservation importance is in bold type face.
Code of Abundance: +=Rare; ++=Occasional; +++=Common; ++++=Abundant; +++++=Dominant

Appendix 3.3 Mammal Species Recorded within the 300m Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[3]	Level of Concern[4]	Protection Status in China[5]	China Red Data Book[6]	Red List of China's Vertebrates[7]	IUCN Red List (Version 2023.1)[8]	PO	WC	AGL	WL	MWL	PL	GL	VO	DA
Chinese Noctule[1]	***Nyctalus plancyi***	Fairly widely distributed in countryside areas throughout Hong Kong	PRC, (RC)	-	-	Least Concern	Least Concern			+						
Eurasian Wild Pig	*Sus scrofa*	Very widely distributed in countryside areas throughout Hong Kong	-	-	-	Least Concern	Least Concern									+
Himalayan Leaf-nosed Bat[1]	***Hipposideros armiger***	Widely distributed in countryside areas throughout Hong Kong	(LC)	-	-	Least Concern	Least Concern					+				+
Intermediate Horseshoe Bat[1]	***Rhinolophus affinis***	Widely distributed in countryside areas throughout Hong Kong	(LC)	-	-	Least Concern	Least Concern						+			
Japanese Pipistrelle[1]	***Pipistrellus abramus***	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern	+	+	+			++	+		++
Lesser Bamboo Bat[1]	***Tylonycteris fulvida***	Fairly widely distributed in countryside areas throughout Hong Kong	(LC)	-	Rare	Least Concern	Least Concern	+		+	+	+				+
Pallas's Squirrel[1]	***Callosciurus erythraeus***	Fairly widely distributed, with the styani subspecies found in the New Territories (e.g. Tai Lam, Shing Mun and Tai Po Kau), and the thai subspecies found on the Hong Kong Island (e.g. Tai Tam and Pok Fu Lam)	-	-	-	Least Concern	Least Concern						+		+	+
Short-nosed Fruit Bat[1]	***Cynopterus sphinx***	Very widely distributed in urban and countryside areas throughout Hong Kong	-	-	Indeterminate	Near Threatened	Least Concern						+			
Unknown Vespertilionidae species 1[1]	-	-	-	-	-	-	-		+							+
Unknown Vespertilionidae species 2[1]	-	-	-	-	-	-	-	+					+			
							Total no. of species	3	2	3	1	2	5	1	1	6

Notes:
(1) Protected under Wild Animals Protection Ordinance (Cap. 170).
(2) Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586).
(3) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.
(4) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* **25**:123-159: LC=Local Concern; PRC=Potential Regional Concern; RC=Regional Concern; PGC=Potential Global Concern; GC=Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence.
(5) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).
(6) Wang, S. (1998). China Red Data Book of Endangered Animals. Mammalia. First Edition. Beijing: Science Press.
(7) Jiang, Z.G., *et al* . (2016). Red List of China's Vertebrates. *Biodiversity Science* **24**(5): 500-551.
(8) International Union for the Conservation of Nature (IUCN) (2024). IUCN Red List of Threatened Species. Version 2023.1.

Abbreviation for Habitats: PO=Pond; WC=Watercourse; AGL=Agricultural Land; WL=Woodland; MWL=Mixed Woodland; PL=Plantation; GL=Grassland; VO=Village/Orchard; DA=Developed Area/Wasteland
Species of conservation importance is in bold type face.
Code of Abundance: +=Rare; ++=Occasional; +++=Common; ++++=Abundant; +++++=Dominant

Appendix 3.3 Butterfly Species Recorded within the 300m Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[3]	Local Restrictedness and species of concervation concern (2011)[4]	Level of Concern[4]	Protection Status in China[5]	IUCN Red List (Version 2023.1)[6]	MA	PO	WC	AGL	WL	MWL	PL	SL	GL	VO	DA
Pale Grass Blue	*Pseudozizeeria maha*	Widely distributed throughout Hong Kong	Very common	-	-	-	+		++				+				
Indian Cabbage White	*Pieris canidia*	Widely distributed throughout Hong Kong	Very common	-	-	-	+	+	++	+		+	++		+	+	+
Common Mormon	*Papilio polytes*	Widely distributed throughout Hong Kong	Very common	-	-	-	+	+		+	+	+	+	+		+	+
Great Eggfly	*Hypolimnas bolina*	Widely distributed throughout Hong Kong	Common	-	-	-	+	+					+			+	
-	*Eurema spp.*	-	-	-	-	-	+	+	+	+		+	+		+		+
Common Sailer	*Neptis hylas*	Widely distributed throughout Hong Kong	Very common	-	-	-	+				+		+				
Common Mapwing	*Cyrestis thyodamas*	Widely distributed throughout Hong Kong	Common	-	-	-							+	+		+	
-	*Catopsilia spp.*	-	-	-	-	-	+		+		+	+	+			+	
Small Cabbage White	***Pieris rapae***	Shep Mun Kap, Fan Lau, Ngong Ping, Kam Tin, Ho Chung, Luk Keng, Tuen Mun Ash Lagoon	Rare	-	-	-			+								
Common Indian Crow	*Euploea core*	Widely distributed throughout Hong Kong	Common	-	-	Least Concern											+
Spangle	*Papilio protenor*	Widely distributed throughout Hong Kong	Very common	-	-	-		+								+	
Dark-brand Bush Brown	*Mycalesis mineus*	Widely distributed throughout Hong Kong	Very common	-	-	-	+				+	+	+		+		
Common Hedge Blue	*Acytolepis puspa*	Widely distributed throughout Hong Kong	Common	-	-	-							+				
Five-dot Sergeant	*Parathyma sulpitia*	Widely distributed throughout Hong Kong	Common	-	-	-					+						
Common Five-ring	*Ypthima baldus*	Widely distributed throughout Hong Kong	Very common	-	-	-							+				
Three-spot Grass Yellow	*Eurema blanda*	Widely distributed throughout Hong Kong	Common	-	-	-		+									
Common Bluebottle	*Graphium sarpedon*	Widely distributed throughout Hong Kong	Very common	-	-	-											+
Common Tiger	*Danaus genutia*	Widely distributed throughout Hong Kong	Common	-	-	-				+	+	+			+		
Ceylon Blue Glassy Tiger	*Ideopsis similis*	Widely distributed throughout Hong Kong	Very common	-	-	-				+							
Red Helen	*Papilio helenus*	Widely distributed throughout Hong Kong	Very common	-	-	-				+							
Paris Peacock	*Papilio paris*	Widely distributed throughout Hong Kong	Very common	-	-	-					+	+	+	+			+
Red-base Jezebel	*Delias pasithoe*	Widely distributed throughout Hong Kong	Very common	-	-	-						+		+			
Plum Judy	*Abisara echerius*	Widely distributed throughout Hong Kong	Very common	-	-	-	+						+				
Dark Cerulean	*Jamides bochus*	Widely distributed throughout Hong Kong	Common	-	-	-					+						
Blue-spotted Crow	*Euploea midamus*	Widely distributed throughout Hong Kong	Very common	-	-	-	+									+	
Metallic Cerulean	***Jamides alecto***	Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo	Very rare	-	-	-										+	
South China Bush Brown	*Mycalesis zonata*	Widely distributed throughout Hong Kong	Common	-	-	-					+						
						Total no. of species	10	6	5	6	9	8	13	4	4	8	6

Notes:
(1) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.
(2) AFCD (2011). A Review of the Local Restrictedness of Hong Kong Butterflies.
(3) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in
(4) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).
(5) International Union for the Conservation of Nature (IUCN) (2024). IUCN Red List of Threatened Species. Version 2023.1.

Abbreviation for Habitats: MA=Marsh/Reed PO=Pond; WC=Watercourse; AGL=Agricultural Land; WL=Woodland; MWL=Mixed Woodland; PL=Plantation; SL=Shrubland; GL=Grassland; VO=Village/Orchard; DA=Developed Area/Wasteland
Species of conservation importance is in bold type face.
Code of Abundance: +=Rare; ++=Occasional; +++=Common; ++++=Abundant; +++++=Dominant

Appendix 3.3 Odonate Species Recorded within the 300m Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[1]	Level of Concern[2]	IUCN Red List (Version 2022.2)[4]	IUCN Priority Species for Conservation[5]	MA	PO	WC	AGL	PL	GL	VO	DA
Asian Amberwing	*Brachythemis contaminata*	Widely distributed in weedy ponds and sluggish streams; Scattered	-	Least Concern	-		+				+		
Common Blue Skimmer	*Orthetrum glaucum*	Widely distributed in streams, conduits, drainage channels, seepages and road gutters throughout Hong Kong; Very Widespread	-	Least Concern	-			+					
Common Flangetail	*Ictinogomphus pertinax*	Widely distributed in ponds and still water throughout Hong Kong; Widespread	-	Least Concern	-		+		+				
Common Red Skimmer	*Orthetrum pruinosum neglectum*	Widely distributed in slow streams, ponds, rain puddles and irrigation conduits; Widespread	-	Least Concern	-	+	+		+		+		
Crimson Dropwing	*Trithemis aurora*	Found in marshes, ponds, streams, andor even ornamental ponds in urban areas. Widely distributed throughout Hong Kong; Very Widepsread	-	Least Concern	-		+		+		+		
Green Skimmer	*Orthetrum serapia*	Widely distributed in all wetland habitats throughout Hong Kong; Widespread	-	Least Concern	-		+	+	+				
Indigo Dropwing	*Trithemis festiva*	Favours sluggish sections of streams with a strong current or the small rock pools inof mountain streams. Widespread in Hong Kong; Widespread	-	Least Concern	-					+			
Marsh Skimmer	*Orthetrum luzonicum*	Widely distributed in abandoned paddies, marshy swampy and boggy locations; Widespread	-	Least Concern	-	+		+					
Orange-tailed Sprite	*Ceriagrion auranticum ryukyuanum*	Widely distributed in weedy ponds, marshes, abandoned fields or grasslands adjacent to waters; Very Widespread	-	Least Concern	-	+	+		+		+	+	
Pied Skimmer	*Pseudothemis zonata*	Widely distributed in woodlands adjacent to reservoirs, sluggish streams, ponds, tanks and marshes throughout Hong Kongn; Very Widespread	-	Least Concern	-		+		+				
Russet Percher	*Neurothemis fulvia*	Found in marshes, cultivated areas, streams, tanks and irrigation feeders, sometimes even found in nearly dried out marshy areas. Widely distributed throughout Hong Kong; Widespread	-	Least Concern	-				+				
Saddlebag Glider	*Tramea virginia*	Widely distributed in trees adjacent to ponds and lakes throughout Hong Kong; Widespread	-	Least Concern	-				+			+	
Variegated Flutterer	*Rhyothemis variegata arria*	Widely distributed in marshes, ponds and tanks throughout Hong Kong; Widespread	-	Least Concern	-				+			+	+
Wandering Glider	*Pantala flavescens*	Widely distributed all over Hong Kong; Widespread	-	Least Concern	-				+	+			+
Yellow Featherlegs	*Copera marginipes*	Widely distributded in lowland streams, ditches, and weedy margins of pond throughout Hong Kong; Widespread	-	Least Concern	-						+		
					Total no. of species	3	7	3	10	2	5	3	2

Notes:

(1)(a) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.

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

(2) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* **25**:123-159: LC=Local Concern; PRC=Potential Regional Concern; RC=Regional Concern; PGC=Potential Global Concern; GC=Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence.

(3) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).

(4) International Union for the Conservation of Nature (IUCN) (2024). IUCN Red List of Threatened Species. Version 2023.1.

(5) Moore, N.W. (1997). *Dragonflies - Status Survey and Conservation Action Plan.* IUCN/SSC Odonata Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. v + 28 pp.

Abbreviation for Habitats: MA=Marsh/Reed PO=Pond; WC=Watercourse; AGL=Agricultural Land; PL=Plantation; GL=Grassland; VO=Village/Orchard; DA=Developed Area/Wasteland

Species of conservation importance is in bold type face.

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

Appendix 3.3 Herpetofauna Species Recorded within the 300m Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[3]	Level of Concern[4]	Protection Status in China[5]	China Red Data Book[6]	Red List of China's Vertebrates[7]	IUCN Red List (Version 2023.1)[8]	PO	AL	PL	GL	VO	DA
Amphbian													
Brown Tree Frog	*Polypedates megacephalus*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern		+			+	+
Asian Common Toad	*Duttaphrynus melanostictus*	Widely distributed in Hong Kong	-	-	-	Least Concern	Least Concern		++	+	+	+	+
Gunther's Frog	*Sylvirana guentheri*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern	+	+		+		
Ornate Pygmy Frog	*Microhyla fissipes*	Widely distributed in Hong Kong	-	-	-	Least Concern	Least Concern		+				
Paddy Frog	*Fejervarya limnocharis*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern		++				
Greenhouse Frog	*Eleutherodactylus planirostris*	Widely distributed throughout Hong Kong	-	-	-	-	Least Concern			+			
Asiatic Painted Frog	*Kaloula pulchra pulchra*	Widely distributed in Hong Kong	-	-	-	Least Concern	Least Concern			+		+	++
Spotted Narrow-mouthed Fro	***Kalophrynus interlineatus***	Widely distributed from low to moderate altitudes in northern and central New Territories	-	-	-	Near Threatened	Least Concern				+		
Butler's Pygmy Frog	*Microhyla butleri*	Widely distributed in Hong Kong	-	-	-	Least Concern	Least Concern		+				
Marbled Pygmy Frog	*Microhyla pulchra*	Widely distributed in Hong Kong	-	-	-	Least Concern	Least Concern		+				
							Total no. of species	1	7	3	3	3	3
Reptile													
Chinese Gecko	*Gekko chinensis*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern			+			
Bamboo Snake	*Cryptelytrops albolabris*	Very common and widespread in Hong Kong	-	-	-	Least Concern	Least Concern						+
Long-tailed Skink	*Eutropis longicaudata*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern			+			
Taiwan Kukri Snake	***Oligodon formosanus***	Widely distributed throughout Hong Kong	-	-	-	Near Threatened	Least Concern			+			+
Chinese Skink	*Plestiodon chinensis chinensis*	Widely distributed throughout Hong Kong	-	-	-	Least Concern	Least Concern			+			
							Total no. of species	0	0	4	0	0	2

Notes:
(1) Protected under Wild Animals Protection Ordinance (Cap. 170).
(2) Protected under Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586).
(3) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.
(4) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* **25**:123-159: LC=Local Concern; PRC=Potential Regional Concern; RC=Regional Concern; PGC=Potential Global Concern; GC=Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence.
(5) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).
(6) Zhao, E.M. (1998). China Red Data Book of Endangered Animals. Amphibia and Reptilia. First Edition. Beijing: Science Press.
(7) Jiang, Z.G., *et al*. (2016). Red List of China's Vertebrates. *Biodiversity Science* **24**(5): 500-551.
(8) International Union for the Conservation of Nature (IUCN) (2024). IUCN Red List of Threatened Species. Version 2023.1.

Abbreviation for Habitats: PO=Pond; AL=Agricultural Land; PL=Plantation; GL=Grassland; VO=Village/Orchard DA=Developed Area/Wasteland
Species of conservation importance is in bold type face.
Code of Abundance: +=Rare; ++=Occasional; +++=Common; ++++=Abundant; +++++=Dominant

Appendix 3.3 Aquatic Fauna Species Recorded within the 300m Assessment Area

Common Name	Scientific Name	Distribution in Hong Kong[1]	Level of Concern[2]	Protection Status in China[3]	China Red Data Book[3]	Red List of China's Vertebrates[4]	IUCN Red List [5]	FS1	FS2	MA	PO	WC	AL
Freshwater Fishes													
Blotched Snakehead	*Channa maculata*	Uncommon in the wild. Records from a few streams in North District, Tuen Mun, on Hong Kong and Lantau Island. It is a relatively important food fish and cultivated in some fish farms. The fish is also available in local fish market.	-	-	-	Least Concern	Least Concern		+			+	
Nile Tilapia	*Oreochromis niloticus*	A widespread species occurring in most local streams, rivers and reservoirs. The fish is also cultivated in some fish farms	-	-	-	-	Least Concern	+	+++		+++	+++	
North African Catfish	*Clarias gariepinus*	Records from North New Territories	-	-	-	-	Least Concern		+			+	
-	*Channa* sp.	-	-	-	-	-	-					+	
Snails and Bivalves													
Apple Snail	*Pomacea canaliculata*	Invasive species	-	-	-	-	Least Concern	+	+		+++	+	++
River Snail	*Unidentified* sp. *1*	-	-	-	-	-	-	+				+	
Crabs and Shrimps													
-	*Orisarma dehaani*	-	-	-	-	-	-	+	+++	+++		+++	
-	*Orisarma intermedium*	-	-	-	-	-	-	+	+	+		++	
Other Aquatic Fauna													
Yellow Featherlegs (larvae)	*Copera marginipes*	Abundant; Widespread	-	-	-	-	Least Concern	+				+	
Waterskater/Water strider	*Ptilomera tigrina*	Very common	-	-	-	-	-						+
-	*Gerris sp.*	-	-	-	-	-	-	+				+	
Backswimmer	*Unidentified* sp. *1*	Very common	-	-	-	-	-			+			
							Total no. of species	7	6	3	2	10	2

Notes:

(1) Agriculture, Fisheries and Conservation Department (AFCD) (2022). Hong Kong Biodiversity Information Hub.
Dudgeon, D. (2003). Hillstreams - Hong Kong Field Guides 2. The Department of Ecology and Biodiversity, The University of Hong Kong. Hong Kong: Wan Li Book Co., Ltd.
Lee, L.F., Lam, K.S., Ng, K.Y., Chan, K.T. and Young, L.C. (2004). Field Guide to the Freshwater Fish of Hong Kong. Friends of the Country Parks.
Reels, G.T. (2019). An Annotated Check List of Hong Kong Dragonflies and Assessment of Their Local Conservation Significance.

(2) Fellowes, J.R., Lau, M.W.N., Dudgeon, D., Reels, G.T., Ades, G.W.J., Carey, G.J., Chan, B.P.L., Kendrick, R.C., Lee, K.S., Leven, M.R., Wilson, K.D.P. & Yu, Y.T. (2002). Wild Animals to Watch: Terrestrial and Freshwater Fauna of Conservation Concern in Hong Kong. *Memoirs of the Hong Kong Natural History Society* **25**:123-159: LC=Local Concern; PRC=Potential Regional Concern; RC=Regional Concern; PGC=Potential Global Concern; GC=Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence.

(3) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February, 2021).

(4) Yue, P.Q. & Chan, Y.Y. (1998). China Red Data Book of Endangered Animals. Pisces. First Edition. Beijing: Science Press.

(5) International Union for the Conservation of Nature (IUCN) (2024). IUCN Red List of Threatened Species. Version 2023.1.

Abbreviation for Habitats:FS=Sampling Point; MA=Marsh/Reed; WC=Watercourse; AL= Agricultural Land
Species of conservation importance is in bold type face.
Code of Abundance: +=Rare; ++=Occasional; +++=Common; ++++=Abundant; +++++=Dominant

Appendix 3.4

Representative Photographs of the Species of Conservation Importance Recorded within the Assessment Area

Prince's Feather
(*Persicaria orientalis*)

Incense Tree
(*Aquilaria sinensis*)

Black-faced Spoonbill
(*Platalea minor*)

Black-winged Stilt
(*Himantopus himantopus*)

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-2024
		CHECK	LAMCCG	DRAWN	YIPMLM
	Representative Photographs of the Species of Conservation Importance Recorded within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.4	**Rev** -

Chestnut-eared Bunting
(*Emberiza fucata*)

Chinese Pond Heron
(*Ardeola bacchus*)

Eurasian Spoonbill
(*Platalea leucorodia*)

Great Cormorant
(*Phalacrocorax carbo*)

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-2024
		CHECK	LAMCCG	DRAWN	YIPMLM
	Representative Photographs of the Species of Conservation Importance Recorded within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.4	**Rev** -

	
Great Egret (*Ardea alba*)	Greater Coucal (*Centropus sinensis*)
	
White-throated Kingfisher (*Halcyon smyrnensis*)	Pallas's Squirrel (*Callosciurus erythraeus*)

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-2024
		CHECK	LAMCCG	DRAWN	YIPMLM
	Representative Photographs of the Species of Conservation Importance Recorded within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.4	**Rev** -

	
Short-nosed Fruit Bat (*Cynopterus sphinx*)	Small Cabbage White (*Pieris rapae*)
	N.A.
Taiwan Kukri Snake (*Oligodon formosanus*)	N.A.

AECOM	Agreement No. CE 19/2019 (CE) – Kwu Tung North New Development Area Remaining Works near Ho Sheung Heung – Relocation of Livestock Farm	SCALE	N.T.S.	DATE	Jan-2024
		CHECK	LAMCCG	DRAWN	YIPMLM
	Representative Photographs of the Species of Conservation Importance Recorded within the Assessment Area	JOB NO.	60624717	**Appendix No.** 3.4	**Rev** -

Appendix 3.5

Summary of Species of Conservation Importance Recorded within the 300m Assessment Area in Present Study

Appendix 3.5 Summary of Species of Conservation Importance Recorded within the 300m Assessment Area in Present Study

Common Name (Scientific Name)	Recorded Habitat in Present Study	Distribution in Hong Kong [1]	Conservation / Protection Status
Flora			
Incense Tree (*Aquilaria sinensis*)	Woodland; Plantation	Common in Hong Kong	Cap. 586 [2], Cat 2&3(NT) [9]; Cat II [10], VU [2,11,13], NT [12]
Prince's Feather (*Persicaria orientalis*)	Watercourse	Rare [7]	-
Avifauna			
Black-winged Stilt [8] (*Himantopus himantopus*)	Agricultural Land	Common migrant and winter visitor	Cap. 170[2]; RC [2]
Chinese Pond Heron [8] (*Ardeola bacchus*)	Marsh / Reed; Pond; Watercourse; Agricultural Land; Village / Orchard	Widely distributed in Hong Kong	Cap.170 [2]; PRC (RC) [2]
Crested Goshawk *(Accipiter trivirgatus)*	In Flight	Common resident. Widely distributed in woodlands and shrublands throughout Hong Kong.	Cap.170 [2]; Cap.586 [2]; Class II [3]; NT [4]; Rare [5]
Black Kite (*Milvus migrans*)	In Flight	Widely distributed in Hong Kong.	Cap. 586 [2]; (RC) [2]; Class II [3]
Great Egret [8] (*Ardea alba*)	Pond; Watercourse; Agricultural Land	Common resident and winter visitor	Cap. 170 [2]; PRC (RC) [2]
Greater Coucal (*Centropus sinensis*)	Marsh / Reed; Pond; Watercourse; Agricultural Land; Village / Orchard	Common resident. Widely distributed in Hong Kong.	Cap. 170 [2]; Class II [3]; VU [4]
Grey Heron [8] (*Ardea cinerea*)	Watercourse; In Flight	Common winter visitor.	Cap.170 [2]; PRC [2]
Little Egret [8] (*Egretta garzetta*)	Marsh / Reed; Pond; Watercourse; Agricultural Land;	Common resident, migrant and winter visitor. Widely distributed in coastal area throughout Hong Kong.	Cap.170 [2]; PRC (RC) [2]
Pied Avocet [8] (*Recurvirostra avosetta*)	Agricultural Land	Abundant winter visitor	Cap.170 [2]; RC [2]
White-throated Kingfisher [8] (*Halcyon smyrnensis*)	Marsh / Reed; Watercourse; Agricultural Land	Common resident. Widely distributed in coastal areas throughout Hong Kong.	Cap. 170 [2]; (LC) [2]; Class II [3]
Eurasian Spoonbill [8] *(Platalea leucorodia)*	Pond	Uncommon winter visitor. Found in Deep Bay area.	Cap. 170 [2]; LC [2]; Class II [3]; NT [4]; Vulnerable [5]
Black-faced Spoonbill [8] *(Platalea minor)*	Pond; In Flight	Common winter visitor. Found in Deep Bay area.	Cap. 170 [2]; PGC [2]; EN [2]; Class II [3]; EN [4]; Endangered [5]
Northern Shoveler [8] *(Spatula clypeata)*	Pond	Abundant winter visitor. Found in Deep Bay area.	Cap. 170 [2]; RC [2]

Common Name (Scientific Name)	Recorded Habitat in Present Study	Distribution in Hong Kong [1]	Conservation / Protection Status
Great Cormorant [8] *(Phalacrocorax carbo)*	Watercourse; In Flight	Common winter visitor. Widely distributed in coastal areas throughout Hong Kong.	Cap. 170 [2]; PRC [2]
Chestnut-eared Bunting *(Emberiza fucata)*	Agricultural Land	Uncommon passage migrant. Found in Long Valley, Tai Mong Tsai, Luk Keng, Ho Chung, Kam Tin, Lantau, Sha Lo Tung.	Cap. 170 [2]; LC [2]
Collared Crow (*Corvus torquatus*)	Developed Area / Wasteland	Locally common resident. Found in Inner Deep Bay area, Nam Chung, Kei Ling Ha, Tai Mei Tuk, Pok Fu Lam, Chek lap Kok, Shuen Wan, Lam Tsuen.	Cap. 170 [2]; VU [2]; LC [2]; NT [4]
Red-throated Pipit (*Anthus cervinus*)	Agricultural Land	Common passage migrant and winter visitor. Widely distributed in dry agricultural areas throughout Hong Kong.	Cap. 170 [2]; LC [2]
Mammal			
Chinese Noctule (*Nyctalus plancyi*)	Agricultural Land	Fairly widely distributed in countryside areas throughout Hong Kong	Cap. 170 [2]; PRC, (RC) [2]
Himalayan Leaf-nosed Bat (*Hipposideros armige*)	Mixed Woodland; Developed Area/Wasteland	Widely distributed in countryside areas throughout Hong Kong	Cap. 170 [2]; LC [2]
Intermediate Horseshoe Bat (*Rhinolophus affinis*)	Plantation	Widely distributed in countryside areas throughout Hong Kong	Cap. 170 [2] LC [2]
Japanese Pipistrelle (Pipistrellus abramus)	Pond; Agricultural Land; Plantation; Grassland; Developed Area / Wasteland	Widely distributed throughout Hong Kong	Cap. 170 [2]
Lesser Bamboo Bat (*Tylonycteris fulvida*)	Pond; Agricultural Land; Woodland; Mixed Woodland; Developed Area / Wasteland	Fairly widely distributed in countryside areas throughout Hong Kong	Cap. 170 [2]; LC [2]; Rare [5]
Pallas's Squirrel (*Callosciurus erythraeus*)	Plantation; Village / Orchard; Developed Area / Wasteland	Fairly widely distributed, with the styani subspecies found in the New Territories (e.g. Tai Lam, Shing Mun and Tai Po Kau), and the thai subspecies found on the Hong Kong Island (e.g. Tai Tam and Pok Fu Lam)	Cap. 170 [2]
Short-nosed Fruit Bat (*Cynopterus sphinx*)	Plantation	Very widely distributed in urban and countryside areas throughout Hong Kong	Cap. 170 [2]; Intermediate [5]; NT [6]
Unknown Vespertilionidae species 1	Developed Area / Wasteland	-	Cap. 170 [2]
Unknown Vespertilionidae species 2	Pond; Plantation	-	Cap. 170 [2]
Butterfly			
Metallic Cerulean (*Jamides alecto*)	Village / Orchard	Victoria Peak, Fung Yuen, Chuen Lung, Mui Wo	Very rare [14]

Common Name (Scientific Name)	Recorded Habitat in Present Study	Distribution in Hong Kong (1)	Conservation / Protection Status
Small Cabbage White (*Pieris rapae*)	Watercourse	Shek Mun Kap, Fan Lau, Ngong Ping, Kam Tin, Ho Chung, Luk Keng, Tuen Mun Ash Lagoon	Rare (14)
Herpetofauna			
Spotted Narrow-mouthed Frog (*Kalophrynus interlineatus*)	Grassland	Widely distributed from low to moderate altitudes in northern and central New Territories	NT (4)
Taiwan Kukri Snake (*Oligodon formosanus*)	Plantation; Developed Area/Wasteland	Widely distributed throughout Hong Kong	NT (4)

Notes:

(1) Distribution in Hong Kong and Rarity follows:

Flora: Wu and Lee (2000); Xing and Chau (2000); Siu (2000).

Fauna: AFCD (2023); Karsen et al. (1998); Shek (2006a); Reels (2019).

(2) Fellowes *et al*. (2002): GC=Global Concern; LC=Local Concern; RC=Regional Concern; PRC=Potential Regional Concern; PGC: Potential Global Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in nesting and/or roosting sites rather than in general occurrence. LC=Local Concern; PRC=Potential Regional Concern; RC=Regional Concern; PGC=Potential Global Concern; GC=Global Concern.

Cap. 96: Forests and Countryside Ordinance (Cap. 96).

Cap. 170: Protected under Wild Animals Protection Ordinance (Cap. 170).

Cap. 586: Protection of Endangered Species of Animals and Plants Ordinance (Cap.586).

IUCN (2024).

(3) List of Wild Animals Under State Protection (promulgated by State Forestry Administration and Ministry of Agriculture on 9 February 2021).

(4) Jiang et al. (2016). CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern

(5) Zhao and Wang. (1998).

(6) Wang (1998).

(7) 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.

(8) Wetland-dependent species (including wetland-dependent species and waterbirds).

(9) Hu et al. (2003): NT= Near Threatened, VU = Vulnerable

(10) Protected by List of Wild Plants Under State Protection (promulgated by the Ministry of Forestry in 2021)

(11) Fu (1992): VU= Vulnerable

(12) Feng et al. (2002): NT= Near Threatened

(13) Qin et al. (2017): VU= Vulnerable

AFCD (2011). A Review of the Local Restrictedness of Hong Kong Butterflies.

Appendix 3.6

Results of Flight Path Survey

Appendix 3.6a Result of Flight Path Survey at Ho Sheung Heung Egretry

Table 1A Number of Flight Path Recorded Utilized by Ardeid

Flight Path	No.	Percentage
E1	5	13.9%
E2	5	13.9%
E3	9	25.0%
E4	12	33.3%
E5	5	13.9%
Total	36	100%

Note:
Representative flight paths are presented in Figure 3.

Table 1B Flight Height of Flight Path Utilized by Ardeid

Flight Heigh (m)	Path E1		Path E2		Path E3		Path E4		Path E5		All Flight Paths	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
0-10	-	-	3	60%	1	11.1%	3	25.0%	3	60%	10	27.8%
11-20	3	60%	1	20%	6	66.7%	3	25.0%	2	40%	15	41.7%
21-30	2	40%	1	20%	2	22.2%	1	8.3%	-	-	6	16.7%
>30	-	-	-	-	-	-	5	41.7%	-	-	5	13.8%
Total	5	100%	5	100%	9	100%	12	100%	5	100%	36	100%

Note:
Representative flight paths are presented in Figure 3.3.

Appendix 3.6b Result of Flight Path Survey within the 300m Assessment Area

Table 1A Number of Flight Path Recorded Utilized by Ardeid

Flight Path	No.	Percentage
1	86	20.4%
2	82	19.5%
3	14	3.3%
4	15	3.6%
5	26	6.2%
6	54	12.8%
7	6	1.4%
8	114	27.1%
9	18	4.3%
10	3	0.7%
11	3	0.7%
Total	421	100%

Note:
Representative flight paths are presented in Figure 4.

Table 1B Flight Height of Flight Path Utilized by Ardeid

Flight Heigh (m)	Flight Path 1		Flight Path 2		Flight Path 3		Flight Path 4		Flight Path 5		Flight Path 6		Flight Path 7		Flight Path 8		Flight Path 9		Flight Path 10		Flight Path 11		Grand Total	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
0-10	9	10.5%	14	17.1%	1	7.1%	1	6.7%	7	26.9%	19	35.2%	2	33.3%	2	1.8%	4	22.2%	2	66.7%	-	-	61	14.5%
11-20	23	26.7%	23	28.0%	5	35.7%	3	20.0%	9	34.6%	11	20.4%	-	-	1	0.9%	8	44.4%	1	33.3%	1	33.3%	85	20.2%
21-30	39	45.3%	25	30.5%	5	35.7%	3	20.0%	1	3.8%	9	16.7%	4	66.7%	81	71.1%	4	22.2%	-	-	1	33.3%	172	40.9%
>30	15	17.5%	20	24.4%	3	21.5%	8	53.3%	9	34.7%	15	27.7%	-	-	30	26.2%	2	11.2%	-	-	1	33.4%	103	24.4%
Total	86	100%	82	100%	14	100%	15	100%	26	100%	54	100%	6	100%	114	100%	18	100%	3	100%	3	100%	421	100%

Note:
Representative flight paths are presented in Figure 4.

Appendix K

Drainage Impact Assessment

3 DRAINAGE IMPACT ASSESSMENT

3.1 Introduction

3.1.1 The purpose of this DIA is to assess the drainage impact and support the proposed future land use of KTN-2. This DIA will include:-

- Desktop review of the existing drainage system at KTN-2 site; and
- Identify and assess the drainage impact generated by the proposed KTN-2 land use

3.1.2 The KTN-2 site is located west of the Sheung Yue River, with existing drainage located inside and south of the site. The existing drainage in general run from west to east to discharge into Sheung Yue River.

3.2 Information Collection

3.2.1 The following documents were collected and reviewed:-

- The DIA developed under CE19/2019 (CE) – Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction (Deliverable G3Da) for the KTN NDA
- Water level data near KTN-2 developed under CE18/2019 (CE) – Development of Fanling North NDA, Remaining Phase D&C
- DSD Drainage record plans

3.3 Design Parameters and standards

Design Standard

3.3.1 The Assignment of CE19/2019 (CE) commissioned in 2019, where the prevailing standard was Stormwater Drainage Manual Fifth Edition, January 2018 (“SDM 2018”).

3.3.2 DSD intended the design to be upgraded to SDM Manual Corrigendum No. 1/2022 (“the Corrigendum”) published in September 2022, yet there is lack of information on the Sheung Yue River boundary conditions, which made the assessment difficult. SDM 2018 with climate change effect up to end of 21st century was used in the design of KTN NDA DIA (Deliverable G3Da).

3.3.3 Same with KTN NDA DIA (Deliverable G3Da), this assessment will adapt the design standard with available data, i.e. SDM 2018 with climate change effect up to end of 21st century.

Design Parameters

3.3.4 The design parameters to be used will be in line with KTN NDA DIA (Deliverable G3Da) unless otherwise specified. The following design parameters will be used.

Table 3.1 Design Parameters

Parameters	Description
Catchment Nature	• Major rural catchment
Design Return Period of rainfall intensity for Drainage System	• 1 in 50 year for urban branch drain • 1 in 50 year for Main rural catchment drainage Channels • 1 in 200 year for urban trunk drain
Freeboard for Drainage System	• 300mm for pipe drains • 500 mm for box culverts/ open channels
Runoff Coefficient	Fixed runoff model for NDA development areas Runoff Coefficient = • 0.9-1.0 for paved/ impermeable area • 0.35-0.5 for unpaved/ permeable area
	Soil Conservation Service (SCS) runoff model using curve numbers (CN) for non-development catchments. The CN values for different land uses are shown in **Table 3.5**.
Pipe Roughness, k_s	1.5 - 3.0 mm for concrete
Sediment Depth	5% reduction in flow area for pipe gradient > 1 in 25 10% reduction in flow area for pipe gradient < 1 in 25

Design Rainfall Zone

3.3.5 According to SDM 2018, the KTN-2 site falls into the North District Area rainfall delineation zone. The corresponding storm constants of the North District Area as shown in **Table 3.2** will be used in design.

Table 3.2 Storm Constants of North District Area

Return Period (Year)	a	b	c
10	1157.7	19.04	0.597
50	1167.6	16.76	0.561
200	1074.8	12.47	0.523

Design Sea level

3.3.6 According to SDM 2018, the KTN-2 site is closest to the Tsim Bei Tsui tidal station. The corresponding design sea levels will be used in design. The sea levels are listed in **Table 3.3**.

Effect of Climent Change

3.3.7 To consider the effect of climate change in the drainage design, the projection of rainfall increase percentage and sea level rise are provided in the SDM 2018 and taken into account in the design. A rainfall increase of 13.8% and design sea level increase 0.49 m is added for end of 21st century. The design sea level shown in **Table 3.3** will be used in design.

Table 3.3 Design Sea Levels at Tsim Bei Tsui

Return Period (Year)	Extreme Sea Levels at Tsim Bei Tsui (mPD)	(Mean) Sea Level Rise due to Climate Change (m)	Design sea level (mPD)
10	+3.51	0.49	+4.00
50	+4.09	0.49	+4.58
200	+4.77	0.49	+5.26

Combination of Rainfall and Sea Level effects

3.3.8 As the hydraulic performance of the drainage system is affected by both rainfall and sea level, the design flood levels of the drainage system are to be assessed based on the joint probabilities of rainfall dominated and sea level dominated events. According to SDM 2018, the following design cases will be considered.

Table 3.4 Design Return Period Combinations of Rain and Tide Events

Return Period	Case I ("Case 'a' ")	Case II ("Case 'b' ")
200-year	200-year rain + 10-year sea level	10-year rain + 200-year sea level
50-year	50-year rain + 10-year sea level	10-year rain + 50-year sea level

Freeboard and site formation levels

3.3.9 To in line with the KTN NDA DIA (Deliverable G3Da), the site formation levels should be able to withstand a 50-year water level, with at least 500mm freeboard. It is also anticipated to have no flooding during a 200-year event. As a result, the higher of the following will be used in design the site formation levels.

- Predicted 50-year channel water levels from Hydraulic Model Carried out under CE 18/2019 (CE) + 500mm freeboard; and
- Predicted 200-year channel water levels from Hydraulic Model Carried out under CE 18/2019 (CE) + 0mm freeboard, i.e. without flooding

Land use types and characteristics

3.3.10 The existing land is rural catchment. The drainage property can be reflected by curve number (CN) which depends on land use. **Table 3.5** summarized the common landuse types and the corresponding CN values. A larger CN value suggest a larger runoff potential and a less permeable surface.

Table 3.5 Curve Number (CN) for Different Land Use Type

Landuse Type	CN
Upland	
Upland	65
Woodland	25
Other upland	65
Agriculture	
Active – no structures	65
Active – few structures	70
Active – many structures	75
Abandon paddy	60
Abandon ponds	100
Ponds	100
Rural activity area	70
Other agriculture	70
Village	90
Urban	
Existing	95
Future	85
Storage and rural industry	
Industry	90
Storage Area	90
New reclamation	65
Vacant lots	85
Recreational	
Paved (RECP)	90
Grassed (RECG)	70
Special use	
Airfield	85
Barracks	85
Borrow	95
Cemetery	65
Construction in Progress	90
Fire Station Dept	90
G/IC	90
Government/Institution	90
Hospital	90
Sewerage Treatment Works	75
SSSI (marsh)	100
Water Supplies Dept.	90
Highways (major rural routes)	90
Drainage	
Breakwater	100
Drainage	100
Marsh	100
Reservoir	100
River	100

3.3.11 According to the existing layout plan (refer to **Figure 1.1**), the KTN-2 site and nearby areas are ponds. The corresponding CN value is 100, which indicates impermeable surface.

3.4 Anticipated Impact

Existing drainage pipes affected by the development site

3.4.1 There is existing drainage near and inside the KTN-2 site. The existing drainage plan is attached on **Figure 3.1**.

3.4.2 At north-west of the site, there is 450 to 1200 mm diameter pipes running from west to east. The system starts at SMH1031660 outside the proposed development site. The pipe enters the north portion of the site as 1200 mm diameter before discharge to Sheung Yue River at outfall SOF1000777.

3.4.3 At south side of the site, there is twin 900 and single 1200 mm diameter pipes running from west to east. The system starts at SSH1003660 near Lo Wu Correctional Institution. The pipe enters the south portion of the site as 1200 mm diameter at SSH1003661 before discharge to Sheung Yue River at outfall SOF1010600.

3.4.4 There are also existing 150 to 450 mm diameter U-channels inside the site to connect the existing pond and the above pipe drainage systems.

3.4.5 It is anticipated that the proposed development will affect these existing drainage pipes and U-channels, which re-provision or relocation may be needed subject to the proposed buildings layout.

Flood risk to the site due to water level

3.4.6 Due to the existing low ground levels and land use of ponds, it is anticipated flood risk by back water from Sheung Yue River. It is suggested to propose a suitable formation level with consideration of the Sheung Yue River water level and freeboard.

3.4.7 According to the interface project CE18/2019 (CE), nodes N_2098 and N_55 are in proximity of the KTN-2 site. The location of nodes is shown in **Diagram 3.1**. With hydraulic model simulation under SDM 2018 end of 21st century, the maximum water levels are as follows:-

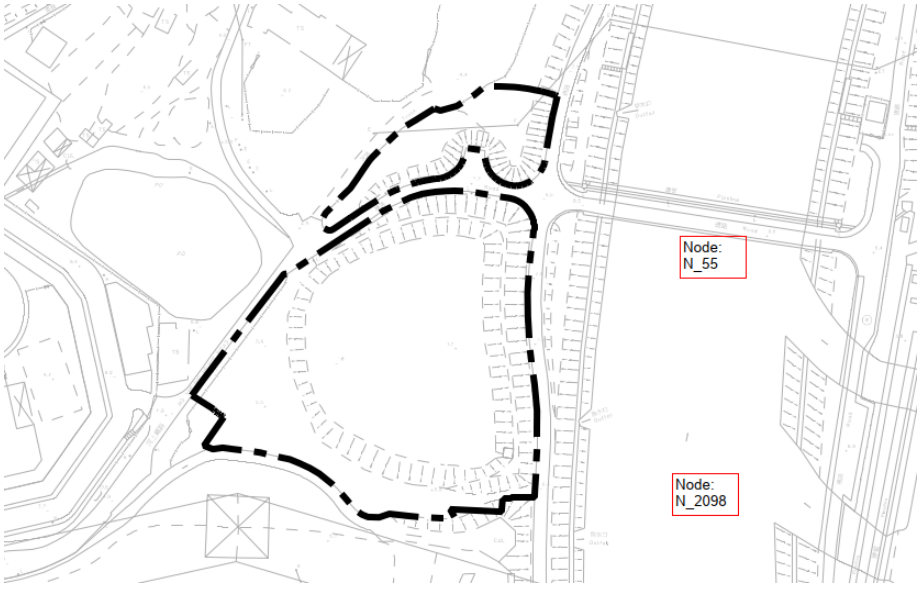


Diagram 3.1 – Location of nodes with water level information

Table 3.6 Maximum Water Levels at Sheung Yue River near KTN-2 Site (mPD)

Location	50a	50b	200a	200b
N_55	6.931	6.367	7.293	6.580
N_2098	6.940	6.381	7.303	6.588

Flood risk to others due to change of land use after land and pond filling

3.4.8 If the land use change will cause the surface to become less permeable, there will be increase of runoff. Additional drainage may be necessary to convey the additional flow.

3.4.9 However, the existing land use of pond is considered as impermeable surface with the maximum curve number 100. Even if the proposed livestock farm being fully paved, it will not further increase curve number and bring additional runoff. Therefore, it is suggested the change of land use by the proposed development will not cause adverse drainage impact by creating more flow.

3.4.10 With observation to the surrounding ground level, the existing pond have a top level of +5.5 mPD. As under the prevailing existing scenario it was assumed the pond will not have storage function as a worse-case scenario. Therefore, under both existing and proposed scenario, all surface water will pass through an impermeable surface and discharge to the river. No impact will be caused by the development in this aspect.

3.5 Suggested minimum Site formation levels

3.5.1 The proposed 500mm freeboard for 50-year events is added on the water level data in **Table 3.7.** The maximum level will be 7.440 mPD at case 50a at node N_2098. Therefore it is suggested the minimum site formation levels to be +7.440 mPD from flood prevention perspective. Maps of flow path are provided in **Figure 3.2** to illustrate the change in flow path before and after the development for reference.

Table 3.7 Maximum Water Levels at Sheung Yue River near KTN-2 Site with 500 freeboard added to 50-year data (mPD)

Location	50a (plus 500 mm freeboard)	50b (plus 500 mm freeboard)	200a	200b
N_55	7.431	6.867	7.293	6.580
N_2098	7.440	6.881	7.303	6.588

3.6 Potential Blue-green Infrastructures and Resilience Measures

3.6.1 With reference to the Development Bureau Technical Circular (Works) No. 9/2020, the adoption of Blue-Green drainage infrastructure is outlined. Eight Blue-Green elements have been suggested:

(1) Revitalized river channel

(2) Flood lake/ wetland

(3) Flood storage tank

(4) Floodable area and landscape

(5) Bioretention system

(6) Green roof

(7) Porous paving system

(8) Water harvesting

3.6.2 In view of the available site area, existing land use of ponds that will be filled, and the proposed land use of livestock farm, it is suggested there is potential for (3) (6) (8) to be further explored in the proposed development.

Figures

ISO A1 594mm x 841mm

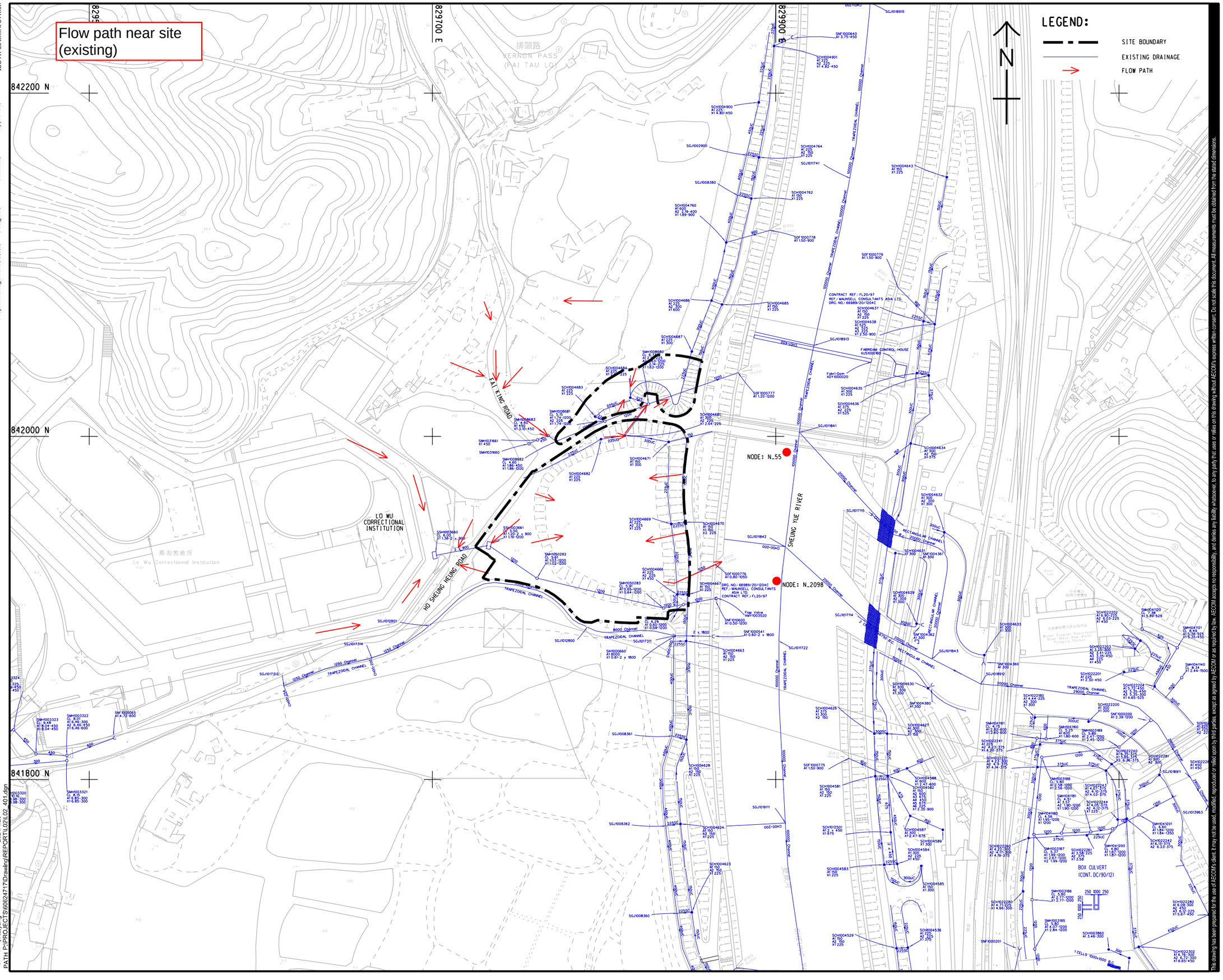
Approved:

Checked:

Designer:

Project Management Initials:

Flow path near site (existing)



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PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

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SCALE 比例
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DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

EXISTING DRAINAGE PLAN AND
FLOW PATH NEAR SITE

SHEET NUMBER
圖紙編號

60624717/L02/401

ISO A1 594mm x 841mm

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Checked:

Designer:

Project Management Initials:

Flow path near site (future)

829500 E

829700 E

842200 N

842000 N

841800 N

排頭路
KERNON PASS
(PAI TAU LO)

LO WU CORRECTIONAL INSTITUTION

Lo Wu Correctional Institution

FAT KING ROAD

HO SHEUNG HEUNG ROAD

SHEUNG YUE RIVER

NODE: N_55

NODE: N_2098

CONTRACT REF.: FL20/97
REF.: MAUNSELL CONSULTANTS ASIA LTD.
ORG. NO.: 66989/20/2045C

DRG. NO.: 66989/20/2045
REF.: MAUNSELL CONSULTANTS ASIA LTD
CONTRACT REF.: FL20/97

FABRICOM CONTROL HOUSE
XUS1000760

Fabri-Dam
XDY1000020

BOX CULVERT
(CONT. DC/90/12)

LEGEND:

- SITE BOUNDARY
- EXISTING DRAINAGE
- FLOW PATH
- LAND FILLING

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SCALE 比例
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DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱
EXISTING DRAINAGE PLAN AND FUTURE FLOW PATH NEAR SITE

SHEET NUMBER
圖紙編號
60624717/L02/403

ISO A1 594mm x 841mm

Approved:

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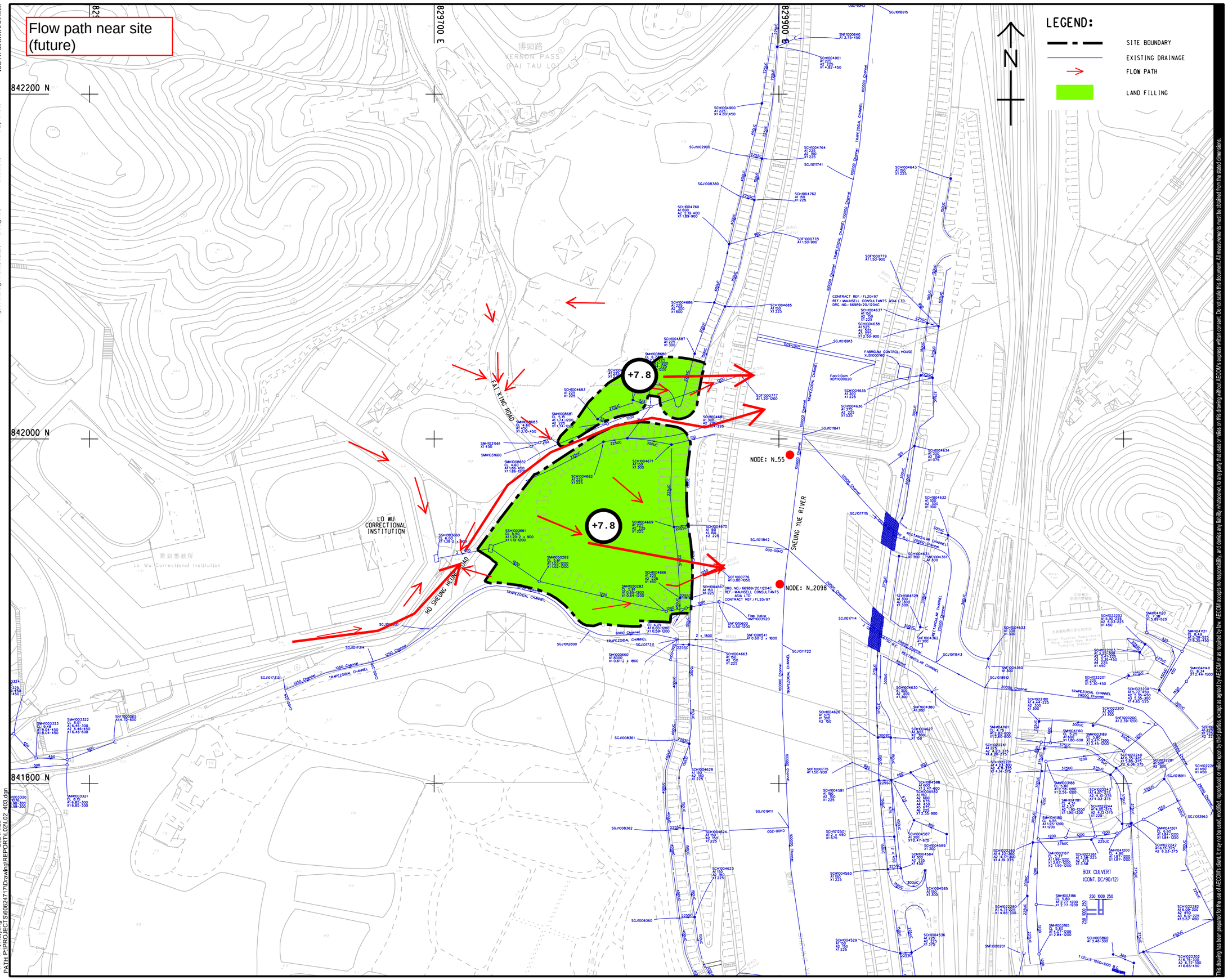
Designer:

Project Management Initials:

Flow path near site (future)



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2024/4/25

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DIMENSION UNIT 尺寸單位
METRES

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CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

EXISTING DRAINAGE PLAN AND FUTURE FLOW PATH NEAR SITE

SHEET NUMBER
圖紙編號

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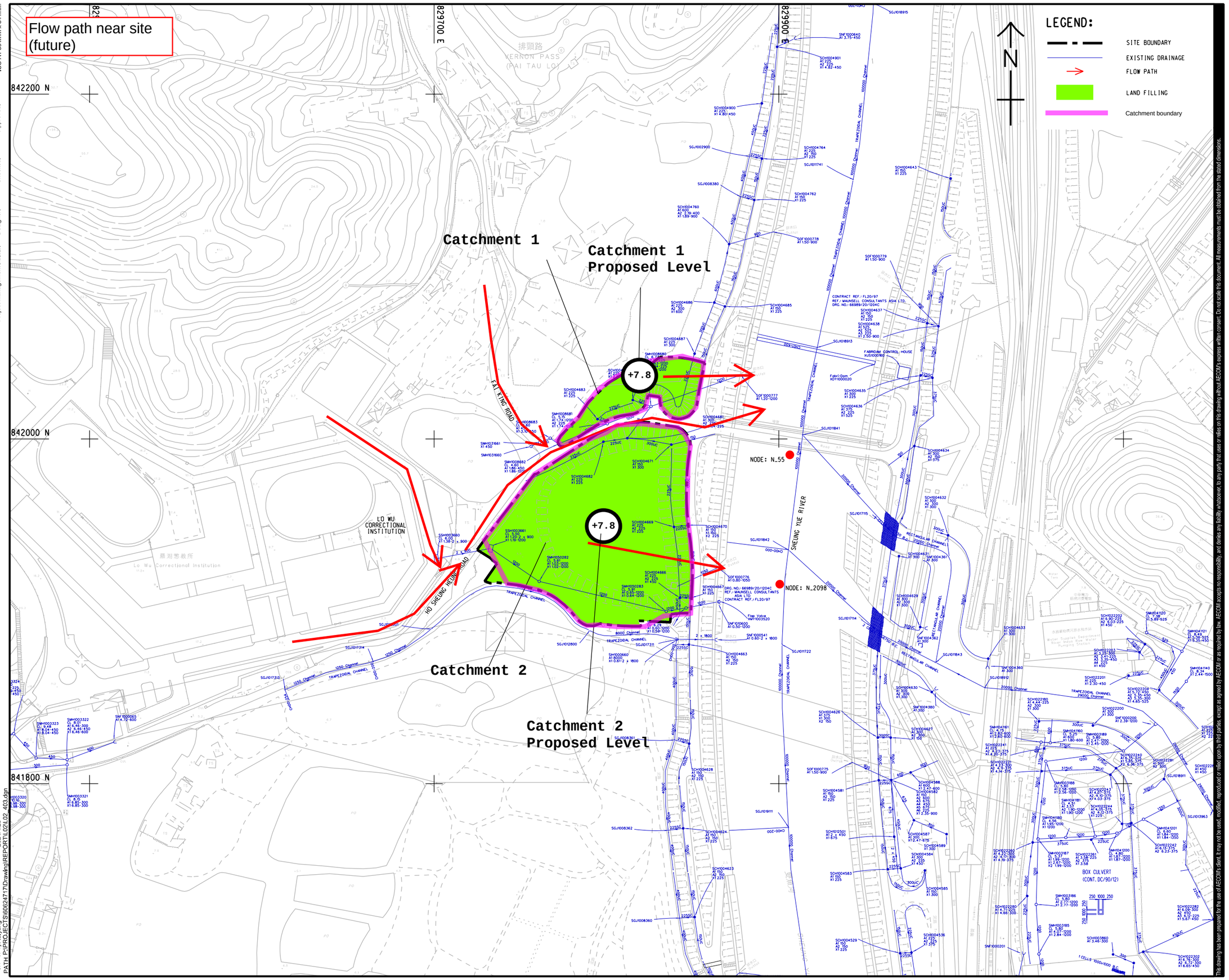
Project Management Initials:

Flow path near site (future)



AECOM

PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT
業主

土木工程拓展署
Civil Engineering and Development Department

CONSULTANT
土木顧問公司

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SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

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

STATUS
階段

SCALE 比例
A1 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

EXISTING DRAINAGE PLAN AND FUTURE FLOW PATH NEAR SITE

SHEET NUMBER
圖紙編號

60624717/L02/403

Plot File by: liu.yang
PATH: P:\PROJECTS\60624717\Drawing\REPORT\L02\L02_403.dgn
2024/4/25

Appendix L

Landscape Review Report

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FIGURES

APPENDICES

1 INTRODUCTION

1.1 Background

1.1.1 To provide appropriate support for livestock farms affected by the development of Northern Metropolis, the Development Bureau (DEVB) the Environment and Ecology Bureau, the Agriculture, Fisheries and Conservation Department (AFCD) and relevant departments have formed an interdepartmental working group to draw up plans that will assist the affected livestock farmers, including identification of suitable government sites for the relocation of livestock farms.

1.1.2 A site near the north-east boundary of Kwu Tung North New Development Area (KTN NDA) near Lo Wu Correctional Institution (i.e. "the Site" or "Site KTN-2"), inter alia, is identified as a suitable site for relocation of the affected livestock farms.

1.1.3 Considering that Site KTN-2 is located within KTN NDA, DEVB invited Civil Engineering and Development Department (CEDD) as works agent for the technical assessments to support the Section 16 Planning Application (hereafter referred to as s.16 Application) of the proposed site formation works (hereinafter referred as "the Project" or "the Proposed Works"). CEDD will also be responsible for the subsequent design and construction of the site formation and associated infrastructure works for Site KTN-2. The formed site would be handed over to Agriculture, Fisheries and Conservation Department (AFCD) by end 2025 for further development of a multi-storey building (MSB) to accommodate the affected livestock farms. Further studies (including environmental assessment and bio-security assessment) for the development of MSB will be carried out by Trade in a later stage.

1.1.4 AECOM Asia Co. Ltd. has been commissioned to prepare Landscape Impact Assessment and Landscape Proposal to support the Section16 Application for Application for the Project. In view of the minor nature and small scale of the Project (i.e. site formation works only), only potential landscape impacts associated with the site formation works will be anticipated.

1.2 Purpose of Landscape Impact Assessment and Landscape Proposal

1.2.1 The purpose of this Landscape Impact Assessment and Landscape Proposal is to review and evaluate any potential landscape impact arising from the proposed site formation works, and to propose mitigation measures where necessary to alleviate any potential adverse impact identified; and to support the S16 Application for the Project.

1.2.2 Tree survey findings and recommendations including Tree Treatment Recommendations and Preliminary Tree Planting Proposals is also included in the report.

1.3 Structure of the Report

1.3.1 Following this introductory section, the remaining sections of this Landscape Proposal with Broad Brush Tree Survey Report are arranged as follows:

- Section 2 describes the Site Context;
- Section 3 describes the Proposed Development;
- Section 4 describes the findings in Tree Survey Report and Proposed Tree Treatment;
- Section 5 presents the Landscape Impact Assessment;
- Section 6 presents the Landscape Proposal; and
- Section 7 concludes the findings of this Report.

2 SITE CONTEXT

2.1 Site Location and Existing Land Use

2.1.1 Site KTN-2, with an approximate area of 12,400m^2, is currently zoned as "Agriculture" ("AGR") and "Open Space" ("O") in the approved Kwu Tung North Outline Zoning Plan (OZP) (No. S/KTN/4). The Site is situated between Ng Tung River and Lo Wu Correctional Institution and is divided into two patches by Ho Sheung Heung Road. Open space use is identified at the east of the site, industrial uses and active agricultural lands are identified at the north and south of the Site respectively. Most area of the Site is currently occupied by marsh and plantation. The location of Site KTN-2 is shown in Figure 2.1.

3 PROPOSED DEVELOPMENT

3.1 Proposed Works

3.1.1 As mentioned in **Section 1**, site formation works and the associated infrastructure works will be conducted by CEDD for future development of MSB. The proposed construction activities mainly comprise site clearance, filling and earthwork.

4 TREE SURVEY FINDINGS AND RECOMMENDATIONS

4.1 Findings of Tree Survey

4.1.1 A total of approximately 237 nos. of trees with 14 nos. of species have been surveyed. Total 163 trees in 12 tree groups and 76 individual trees (including 1 Trees of Particular Interest (TPIs)) that within the project boundary and would be potentially affected were surveyed.

4.1.2 There is no rare or endangered tree species and registered Old and Valuable Tree (OVT) found within the project site boundary. I TPI of species *Ficus microcarpa* with DBH over 1m is identified within the site boundary. All the species identified are common landscape species, include *Ficus hispida, Macaranga tanarius var. tomentosa, Acacia confusa,* and *Ficus virens*.

4.1.3 Approximately, 80% of the trees surveyed are self-seeded trees of undesirable species - *Leucaena leucocephala*（銀合歡）. They are generally in poor to average form, poor to average health and poor to average amenity value.

4.2 Tree Treatment Recommendations

4.2.1 Of the tree surveyed, 5 trees are proposed to be retained, of which 3 are inside the application boundary, and 234 trees are proposed to be felled, including 190 nos. of undesirable species (*Leucaena leucocephala*). No tree is recommended to be transplanted. Details of the tree treatment recommendations are shown in Tree Preservation and Removal Report with extracted pages relevant to this submission in **Appendix A**.

4.3 Compensatory Tree Planting Proposal

4.3.1 To allow design flexibility for future development, off-site tree compensation in a ratio of 1:1 in terms of number is proposed, as shown in **Figure 4.1**. In total, 44 nos. of compensatory trees are proposed.

4.3.2 Trees/shrub are proposed for visual screening purpose as far as possible in order to improve visual amenity wherever appropriate as part of the landscape proposal.

5 LANDSCAPE IMPACT ASSESSMENT

5.1 Introduction

5.1.1 This chapter is to review and evaluate any potential landscape impact arising from the proposed works, and to propose mitigation measures where necessary to alleviate any potential adverse impact identified.

5.2 Assessment Methodology

5.2.1 The landscape impacts of the Proposed Development are assessed. The landscape impacts have been assessed according to the following procedures

- **Identification of the baseline Landscape Resources (LRs) and landscape characters found within the study area.** This is achieved by site visits and desktop study of topographical maps, information databases and photographs.

- **Assessment of the degree of sensitivity of the LRs and Landscape Character Areas (LCAs).** This is influenced by a number of factors including whether the resource/character is common or rare, whether it is considered to be of local, regional, national or global importance, whether there are any statutory or regulatory limitations/requirements relating to the resource, the quality of the resource/character, the maturity of the resource and the ability of the resource/character to accommodate change.

- **The sensitivity of each landscape feature and character area is classified as follows: -**

  High: Important landscape character or resource of particularly distinctive character or high importance, sensitive to relatively small change.

  Medium: Landscape character or resource of moderately valued landscape characteristics reasonably tolerant to change.

  Low: Landscape character or resource, the nature of which is largely tolerant to change.

- **Identification of potential sources of landscape changes**. These are the various elements of the construction works and operation procedures that would generate landscape impacts.

  Substantial: Adverse / beneficial impact where the proposal would cause significant deterioration or improvement in existing landscape quality.

  Moderate: Adverse / beneficial impact where the proposal would cause a noticeable deterioration or improvement in existing landscape quality.

  Slight: Adverse / beneficial impact where the proposal would cause a barely perceptible deterioration or improvement in existing landscape quality.

  Insubstantial: No discernible change in the existing landscape quality.

- **The magnitude of landscape changes is classified as follows: -**

  Large: The landscape character or landscape resource would incur a major change

  Intermediate: The landscape character or landscape resource would incur a moderate change.

  Small: The landscape or landscape resource would incur slight or barely perceptible change.

  Negligible: The landscape or landscape resource would incur no discernible change.

- **Identification of potential landscape mitigation measures.** These may take the form of adopting basic engineering design to prevent and/or minimise adverse landscape impacts before adopting other mitigation or compensatory measures to alleviate the impacts. Potential mitigation measures shall also include the preservation of vegetation and natural landscape resources, transplanting trees in good condition and value, provision of screen planting, compensatory planting and any measures to mitigate the impact on the existing and planned land users. Comprehensive mitigation measures throughout construction and operation phase shall be explored in Table 7.

- **Prediction of the significance of landscape impacts before and after the implementation of the mitigation measures.** By synthesizing the magnitude of the various impacts and the sensitivity of the various landscape resources, it is possible to categorise impacts in a logical, well-reasoned and consistent fashion. Table below shows the rationale for dividing the degree of significance into four thresholds, namely insubstantial, slight, moderate, and substantial, depending on the combination of a negligible-small-intermediate-large magnitude of change and a low-medium-high degree of sensitivity of landscape resource /character.

Table 1 – Relationship between Landscape Sensitivity and Magnitude of Change in Defining Impact Significance

		Sensitivity of Landscape Character Area and Resource		
		Low	**Medium**	**High**
Magnitude of Change	**Large**	Moderate	Moderate / Substantial	Substantial
	Intermediate	Slight / Moderate	Moderate	Moderate / Substantial
	Small	Insubstantial / Slight	Slight / Moderate	Moderate
	Negligible	Insubstantial	Insubstantial	Insubstantial

Note: All impacts are adverse unless otherwise noted with Beneficial.

- The significance of landscape impacts is categorized as follows: -
- **P*rediction of Acceptability of Impacts.*** An overall assessment of the acceptability, or otherwise, of the impacts according to the five criteria set out in Annex 10 of the EIAO-TM

5.3 Environmental Legislation, Standards and Guidelines

5.3.1 The following legislation, standards and guidelines are applicable to landscape impact assessment associated with the construction and operation of the project: -

- Town Planning Ordinance (Cap.131);
- Guidance Notes on Application for Amendment of Plan under Section 12A;
- Hong Kong Planning Standards and Guidelines Chapters 4, 10 and 11;
- DEVB TCW No. 2/2012 - Allocation of Space for Quality Greening on Roads;
- DEVB TCW No. 6/2015 - Maintenance of Vegetation and Hard Landscape Features;
- DEVB TCW No. 5/2020 - Registration of Old and Valuable Trees, and Guidelines for their Preservation;
- LAO PN No. 6/2023 – Processing of Tree Preservation and Removal Proposals for Building Development in Private Projects; and
- Study on Landscape Value Mapping of Hong Kong.

5.4 Baseline Findings

5.4.1 **General**

5.4.2 In view of the confined site area, it is anticipated no Landscape Resources (LRs) and Landscape Character Area (LCAs) would be affected out of 300m from the project boundary. Therefore, key LRs and LCAs within 300m assessment boundary would be identified and discussed under this Landscape Impact Assessment.

Landscape Resources (LRs) and their Sensitivity

5.4.3 The identified landscape resources which would be potentially affected by the proposed development, together with their sensitivities are described in **Table 5.1**. There is no OVT identified. Locations of these landscape resources are mapped in **Figure 5.1**.

Table 5.1 – Baseline Landscape Resources (LRs) and their Sensitivity

LRs	Description	Sensitivity
KLR 1	**Channelized Watercourse** This landscape resource refers to modified water courses channelized with concrete or grasscrete, or with gabion-fortified banks, or water courses undergoing such channelization, namely Sheung Yue River. This LR includes both large channelized river water courses as well as some much smaller concrete lined water courses associated with agricultural land. This LR also includes some walkways along the larger water course and the vegetation associated with the water course, both within the channel and along the banks as well as the ridge of the banks. Sheung Yue River's banks are fortified with a rigid lining of stone masonry among which grasses grow sparsely between the stone blocks. At ground level, planted trees are found along both sides of the river. Most of the dominant trees are exotic, including species such as *Acacia auriculiformis*, *Acacia confusa* and *Leucaena leucocephala*. Other trees include the native species *Cordia dichotoma*, *Ficus virens* and *Macaranga tanarius*. This river is reasonably capable of accommodating change and its sensitivity is considered to be medium.	Medium
KLR 3	**Water Pond**	Medium
KLR 4	**Marsh / Wetland** This landscape resource refers to freshwater marsh/ wetland landscape resources found in Pai Tau Lo, which likely previously used as fish ponds, for wet agriculture or for irrigation purposes, have been abandoned for a long time and now have dense emergent vegetation present in them such that they are considered marshes. This LR is relatively intolerant to change due to the succession of vegetation and the natural sensitivity of marsh; however it is dominated by vegetation of undesirable species and has a medium capacity to accommodate change.	Medium
KLR 5	**Plantation** This landscape resources refers to medium sized and larger clusters of trees that have been planted and are distinct from natural woodland since they have been planted by man, including for slope greening. In the tree survey findings, There is no rare or endangered tree species and registered Old and Valuable Tree (OVT) found within the project site boundary. All the species identified are common landscape species, include *Ficus hispida*, *Macaranga tanarius var. tomentosa*, *Acacia confusa*, and *Ficus virens*. Approximately, 80% of the trees surveyed are self-seeded trees of undesirable species - *Leucaena leucocephala*（銀合歡）. This LR is dominated by vegetation of undesirable species, has low amenity value and a high capacity to accommodate change.	Low
KLR 6	**Hillside Woodland** This landscape resources refers to woodland areas largely scattered over hillsides, including at the base of hills and associated patches of woodland. This LR is predominantly composed of native tree species and is generally located some distance from human activities and hence disturbance (except at the base of hills where it often borders rural development areas where there is human activity), growing naturally with some understorey vegetation. It can include areas of Fung Shui Woodland growing in hillsides in the vicinity of villages as detailed in the individual descriptions. Common tree species in this LR include *Macaranga tanarius*, *Leucaena leucocephala*, *Celtis sinensis* and *Ficus microcarpa*.	High
KLR 7	**Lowland Woodland** This landscape resources refers to a small patch of woodland patch at Vernon Pass to the north east of the Study Area. It contains some built structures and is generally disturbed by frequent human interaction. The dominant species in this LR include native species (*Ficus variegata var. chlorocarpa*, *Ficus hispida* and *Macaranga tanarius*) and exotic species (*Dimocarpus longan*). Due to its association with built structures and therefore not being in a totally natural state, this LR has a medium capacity to tolerate change.	Medium
KLR 8	**Shrubland / Grassland Mosaic** This landscape resources a mosaic of shrubland and grassland which is usually large in size and uniform in appearance, including along Sheung Yue River and in Fu Tei Au. Along Shueng Yue River, these shrublands /grasslands are all located in lowland areas and in the vicinity of artificial resources such as channelized watercourses and highways. They are waste grounds through lack of	Low

LRs	Description	Sensitivity
	maintenance and have been gradually colonized by weeds and climbers. While for the resource located north of Fu Tei Au Road and in the immediate vicinity of Sheung Shui Water Treatment Works, this LR is dominated by grasses such as *Miscanthus sinensis* and *Miscanthus floridulus* and some small trees including *Rhus succedanea* and *Macaranga tanarius* are also present. This LR is of low landscape value and amenity and is relatively tolerant to change.	
KLR 9	**Agricultural Land** This landscape resources refers to land used for agriculture including crops and orchards as well as ornamental plant nurseries, such as area near Ngam Pin. This LR contains a small number of structures such as small irrigation ponds, green houses, equipment sheds and small/ narrow hard paved areas. It not only contains agricultural vegetation but also some scattered non-agricultural vegetation including some shrubs and trees. It is often an intermediary between areas of development and natural areas. This LR has medium value in terms of crop production and being agricultural is relatively tolerant to change although trees generally take longer to grow and produce fruit than crops take to be harvestable, so ability to accommodate change is medium.	Medium
KLR 11	**Urban Development Area** This landscape resources refers to urbanized areas which are heavily developed with considerable hard paved surfaces and limited landscaped areas, namely Lo Wu Correctional Institution. Buildings in this LR are medium-rise and roads are all hard-paved. Tree planting is limited within the institution although it does have some green roofs. This LR has a high ability to accommodate change due to its artificial nature.	Low
KLR 12	**Rural Development Area** This landscape resources refers to traditional villages, modern villages and small scale, low rise residential areas of lower density dominated by domestic structures (mainly of 2-3 stories) interwoven with roads and paths, but limited other infrastructure, namely Pai Tau Lo in Ngam Pin and the rural development area to the East of MTRS East Railway Line, There are some Ancestral Halls, shrines and temples, and this LR may also contain limited facilities such as small police stations, post offices, and covered water reservoirs and pumping stations and some small, managed, recreational areas (such as football and basket ball pitches) and small wasteland areas either wholly or partly covered by weedy or sparse vegetation. This LR often has small orchard areas associated with it (most commonly planted fruit tree species are *Dimocarpus longan*, *Litchi chinensis*, *Clausena lansium, Mangifera indica* and *Citrus maxima*) and private gardens, as well as amenity planting among the built structures. This LR usually occurs in fragmented patches with agricultural or natural landscape resources adjacent to it.	Medium
KLR 13	**Industrial / Open Storage** This landscape resources refers to areas which are heavily adapted for human industrial use, namely Sheung Shui Water Treatment Works. There is very little existing vegetation within this LR. This LR has relatively low landscape amenity value and consists mostly of modern man-made structures that can be easily recreated.	Low
KLR 14	**Major Transportation Corridor** This landscaper resources mainly refers to the MTRC East Railway leading to Lo Wu Station running south-north. The Lok Ma Chau Spur Line running west-east is underground. No significant planting is found along the railways and trees growing randomly in its vicinity are dominated by *Leucaena leucocephala*. This resource is highly utilized and well linked but it is man-made with low landscape value and a high ability to accommodate change.	Low

Landscape Character Areas (LCAs) and their Sensitivity

5.6.4 The details of Baseline Landscape Character Areas which would be potentially affected by the proposed development, together with their sensitivity are described in **Table 5.2.** The locations of baseline landscape character areas are mapped in **Figure 5.2**.

Table 5.2 – Baseline Landscape Character Areas (LCAs) and their Sensitivity

LCAs	Description	Sensitivity
KLCA 1	**Natural Hillside Landscape** This landscape character refers to large hillside areas which are dominated by shrubland, grassland and some woodland in places. This landscape area is natural and has high landscape quality. Its significance is also high and it is not capable of tolerating change.	High
KLCA 2	**Rural and Urban Peripheral Village Landscape** This landscape character refers to rural village areas and village areas on the fringes of urban developments, including relic landscapes of former villages. This LCA is dominated by small or medium sized villages with modern and traditional houses and some Ancestral Halls, interspersed with small agricultural plots and comprises a broad mix of other land uses including water ponds, schools, sports grounds, and playgrounds, some open storage areas and car parks, and a golf course to the southeast of Kwu Tung. This LCA also has some small patches of woodland as well as vegetation associated with the villages and park areas. This LCA is considered to have medium tolerance to change and moderate amenity value.	Medium
KLCA 3	**Urban Development Landscape** This landscape character refers to urban areas with significant numbers of high rise developments and extensive transport infrastructure. It also contains hospital, car parks and open areas associated with urban development such as playgrounds and small parks and sitting out areas. This LCA has little if any natural vegetation but does include some man-made landscaping. Within the Study Area, this LCA is found only in the Lo Wu Correctional Institution. This is an urban development landscape and has reasonable tolerance to change.	Low

LCAs	Description	Sensitivity
KLCA 4	**Industrial Landscape** This landscape character refers to areas comprising a broad mix of land uses including factories, utility facilities, workshops, open storage and some channelized water courses. It is normally located on low lying ground or at the base of hills and may include small and fragmented areas of residential houses and their associated agricultural land. There is little significant vegetation among this built environment, but small patches of vegetation do exist, particularly along the channelized river. Within the Study Area, this LCA is found to the in the east at the Sheung Yue River, namely the Sheung Shui Water Treatment Works. Most areas in this LCA have little vegetation, resulting in a low landscape amenity.	Low
KLCA 5	**Lowland Agricultural Landscape** This landscape character refers to large areas dominated by cultivated land with scattered small villages and low-rise buildings and may also include some fishponds and irrigation ponds. This LCA is mostly found among lowlands and floodplain areas. Tree vegetation is generally sparse and restricted to field boundaries, adjacent to local houses and, together with bamboo, along the banks of Sheung Yue River. The value and significance of the LCA is medium with moderate tolerance to change.	Medium
KLCA 6	**Major Transportation Corridor Landscape** This landscape character refers to major highway and railway areas, with their scattered associated buildings and associated planting. Within the Study Area, this LCA is found to be the MTRC East Rail leading to the Lo Wu Station runs south-north in the east of the study area. Due to the considerable associated planting, this LCA resource is considered to be less tolerant to change than simple highway/railway.	Medium
KLCA 7	**Major Water Course Corridor Landscape** This landscape character refers to modified water courses channelized with concrete or grasscrete and also includes the vegetation associated with the water course, both within the channel and along the banks as well as in the ridge of the banks, namely Sheung Yue River within the study area. The landscape amenity and significance of this LCA are medium. Due to its partially artificial state, it is relatively tolerant to change.	Medium

5.5 Landscape Impact Assessment

5.5.1 The potential landscape impacts due to the proposed Works are itemized and assessed below.

5.5.2 The magnitude of unmitigated impacts on LRs and LCAs associated with the Project are assessed and described in **Table 5.3**.

Table 5.3 – Magnitude of Changes on LRs and LCAs during Construction and Operation

LRs/ LCAs	Description	Potential Source of Impact	Magnitude of Change (Large/Intermediate /Small/Negligible)
Landscape Resources (LRs)			
KLR 1	Channelized Watercourse	No additional landscape impact on this landscape resource.	Negligible
KLR 4	Marsh / Wetland	A marsh area near Sheung Yue River would be affected by the proposed site formation works; however is dominated by vegetation of undesirable species.	Small
KLR 5	Plantation	234 of 237 existing trees would be affected and removed by the proposed site formation works; however is dominated by vegetation of undesirable species.	Small
KLR 6	Hillside Woodland	No additional landscape impact on this landscape resource.	Negligible
KLR 7	Lowland Woodland	No additional landscape impact on this landscape resource.	Negligible
KLR 8	Shrubland / Grassland Mosaic	No additional landscape impact on this landscape resource.	Negligible
KLR 9	Agricultural Land	No additional landscape impact on this landscape resource.	Negligible
KLR 11	Urban Development Area	No additional landscape impact on this landscape resource.	Negligible
KLR 12	Rural Development Area	No additional landscape impact on this landscape resource.	Negligible
KLR 13	Industrial / Open Storage	No additional landscape impact on this landscape resource.	Negligible
KLR 14	Major Transportation Corridor	No additional landscape impact on this landscape resource.	Negligible
Landscape Character Areas (LCAs)			
KLCA 1	Natural Hillside Landscape	No additional landscape impact on this landscape character area.	Negligible
KLCA 2	Rural and Urban Peripheral Village Landscape	A small portion of the landscape character area would be affected by the proposed work with site formation works and future livestock farms development in MSB; however the	Small

LRs/ LCAs	Description	Potential Source of Impact	Magnitude of Change (Large/Intermediate /Small/Negligible)
		proposed land use is compatible with the current LCA	
KLCA 3	Urban Development Landscape	No additional landscape impact on this landscape resource.	Negligible
KLCA 4	Industrial Landscape	No additional landscape impact on this landscape resource.	Negligible
KLCA 5	Lowland Agricultural Landscape	No additional landscape impact on this landscape resource.	Negligible
KLCA 6	Major Transportation Corridor Landscape	No additional landscape impact on this landscape resource.	Negligible
KLCA 7	Major Water Course Corridor Landscape	No additional landscape impact on this landscape resource.	Negligible

5.5.3 In summary, the existing landscape resources within proposed site: marsh/ wetland (KLR4) and plantation (KLR5) will be impacted by the site formation works. The proposed works are considered to have slight additional landscape impacts on LRs. The corresponding significance of impacts on LRs from site formation works assessed in the approved EIA report (AEIAR-175/2013) are extracted as follows: marsh/ wetland (KLR4) and plantation (KLR5) are assessed to have an negligible residual impact.

5.5.4 It is anticipated that with the proposed site formation works would slightly alter the overall landscape character of area. In this regard, it is anticipated that negligible to small additional impacts will be imposed to the LCAs identified in the sites under the proposed works.

5.6 Landscape Mitigation Measures

5.6.1 Based on the potential landscape impacts identified, a series of mitigation measures are recommended below to mitigate any adverse impacts. The mitigation measures are illustrated in Figure 6.1.

a. **MM1: Preservation of existing vegetation** – All existing trees to be retained or not be affected by the project shall be carefully protected during construction in accordance with the latest guidelines on tree preservation during development issued by GLTM Section of DEVB.

b. **MM2: Provision of buffer planting** – To provide buffer planting with tree and shrub where appropriate for visual screening and soft transition to the adjacent landscape context.

c. **MM3: Maximizing greenery opportunity** – To provide planting as far as possible for greening and visual amenity.

5.7 Evaluation of Residual Impacts

5.7.1 A portion of LR4 with medium sensitivity and LR5 with low sensitivity will be affected. The magnitude of change is negligible to small and the unmitigated landscape impact is insubstantial to slight. By assuming the proposed mitigation measures are implemented, the predicted residual landscape impact of the proposed development shall be reduced to insubstantial.

6 LANDSCAPE PROPOSAL

6.1 Design Objectives

6.1.1 The Landscape Design Objectives include the followings:

- To preserve existing trees as much as possible within the proposed development;
- To provide tree planting for improving visual amenity; and
- To make use of existing trees as part of the local open spaces.

6.2 Landscape Proposals

6.2.1 The Landscape Proposal for the proposed development are illustrated in **Figure 6.1.** Landscape Design Proposals for the proposed development include the followings: -

- Provision of buffer planting with trees and shrub along the eastern boundary of the Site to provide visual screening and soft transition to the adjacent landscape context.
- Provision of new shrub planting as far as possible within the Site to provide greening and visual amenity.

6.3 Hard and Soft Landscape Proposals

6.3.1 The hard landscape elements include footpath and planters. These elements will be designed and / or selected using the following general criteria:

- Reasonable Cost and maintenance requirement – materials shall be easily maintained and managed.
- Visual compatibility with existing developments.

6.3.2 The soft landscape elements include plant materials, soil media and planter drainage. These elements will be selected using the following general criteria:

- Fast Growing – able to provide the desired landscape design intent within short period of time.
- Use of Native Species where possible to enhance local biodiversity.
- Seasonal Interest – providing seasonal variety or special seasonal flowers, fruit or foliage colour
- Non-Toxic – relatively safe and non-poisonous materials.
- Appropriate spacing for tree planting according to the different tree species and mature size is required.
- Adequate soil depth shall be allowed for tree/shrub/groundcover planting.
- Trees planting species are proposed as follows:

Table 6.1 Proposed Tree Planting Species

Species Name	Chinese Name	Size
*Cinnamomum burmannii**	陰香	Heavy Standard / Standard
*Ilex rotunda var. microcarpa**	小果鐵冬青	Heavy Standard / Standard
*Sterculia lanceolata**	假蘋婆	Heavy Standard / Standard
*Viburnum odoratissimum**	珊瑚樹	Heavy Standard / Standard

** Native*

6.4 Irrigation Strategy

6.4.1 For generally flat accessible areas, hand operated water points will be provided.

7 CONCLUSION

7.1.1 This Landscape Impact Assessment and Landscape Proposal has provided a review of the potential landscape impacts associated with the construction and operation of the proposed site formation works.

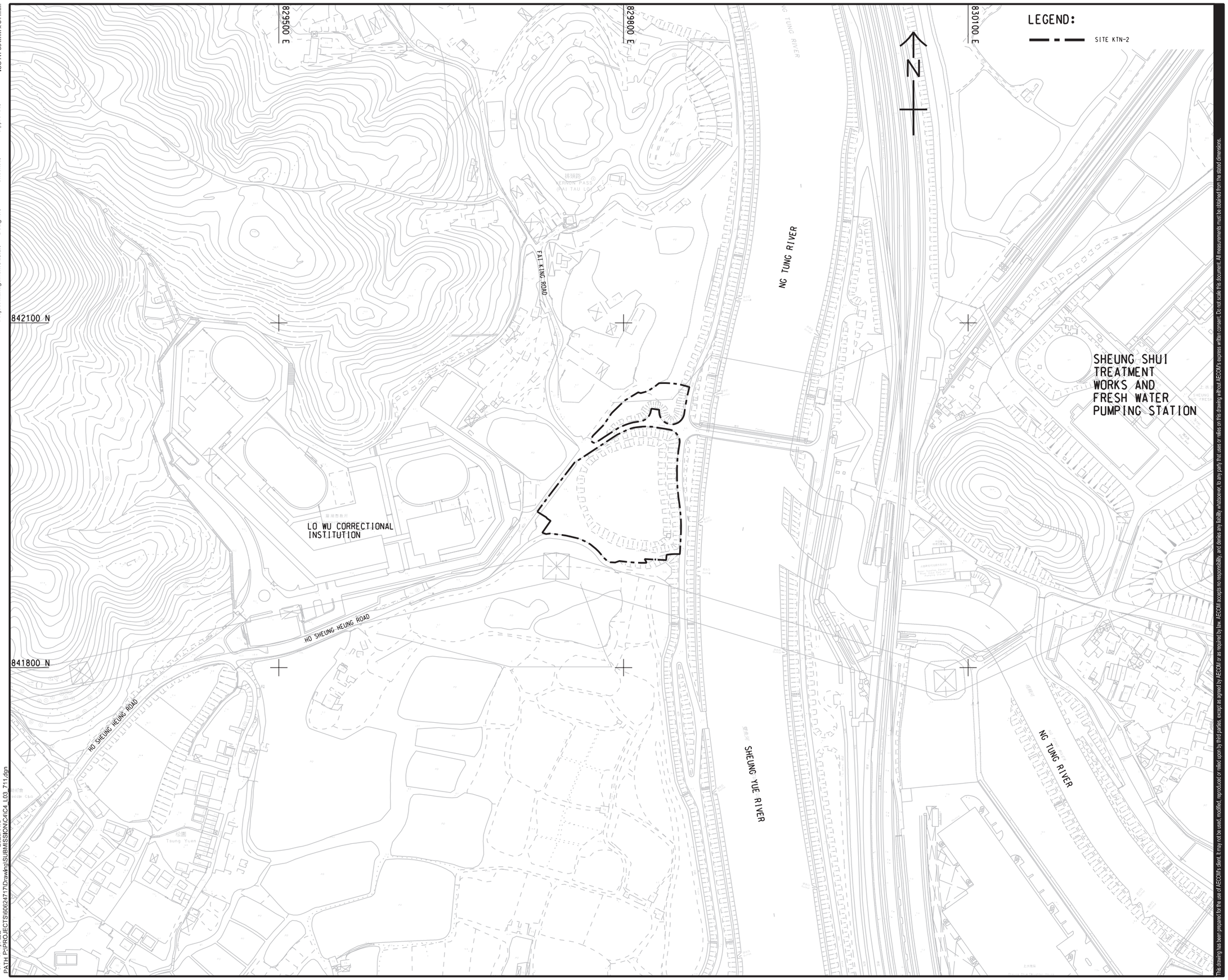
7.1.2 The proposed site formation works affects a portion of existing marsh and plantation area, however dominated by self-seeded trees of undesirable species - *Leucaena leucocephala* （銀合歡）, with low amenity value. These impacts have been minimized to an insubstantial level through careful consideration of proposed mitigation measures and landscape treatments of proposed development works.

7.1.3 Landscape Proposal is proposed to optimise the environment of the proposed works and mitigate the potential impact on existing landscape resources and landscape character area due to the proposed development.

7.1.4 Proposed buffer planting along the eastern boundary of the Site forms a visual screen to the development on at grade level and provide green transition to adjacent landscape context. Proposed new shrub planting provide greening and visual amenity.

7.1.5 It is concluded with the landscape proposals for the proposed development as illustrated in the Landscape Proposal, would blend in well with the existing and planned landscape context of the area.

FIGURES



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PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT
業主

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

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ISSUE/REVISION
修訂

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STATUS
階段

SCALE 比例
A1 1 : 1500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

SITE LOCATION PLAN

SHEET NUMBER
圖紙編號

FIGURE 2.1

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

NOTES:

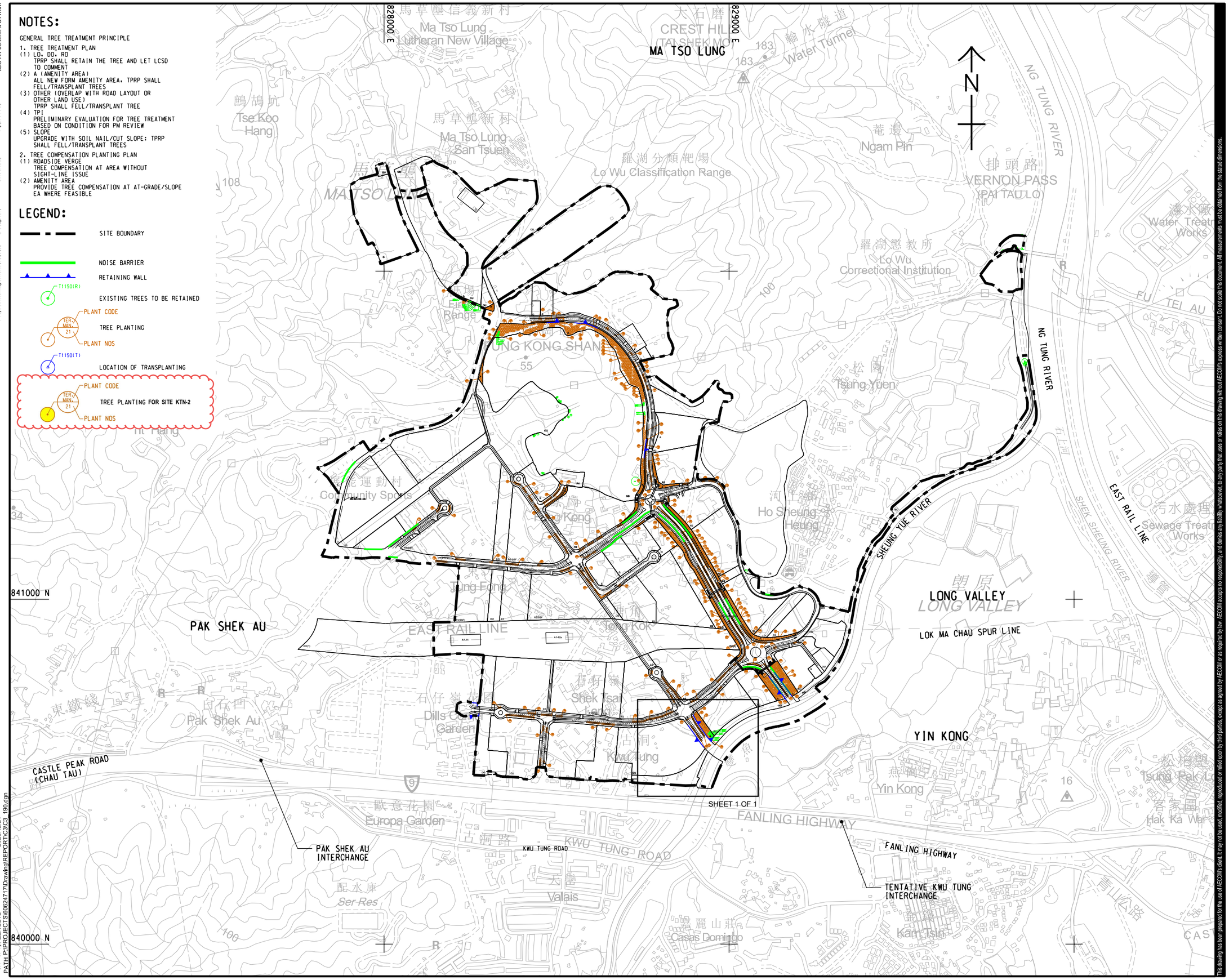
GENERAL TREE TREATMENT PRINCIPLE

1. TREE TREATMENT PLAN
(1) LO, DD, RO
TPRP SHALL RETAIN THE TREE AND LET LCSD TO COMMENT
(2) A (AMENITY AREA)
ALL NEW FORM AMENITY AREA, TPRP SHALL FELL/TRANSPLANT TREES
(3) OTHER (OVERLAP WITH ROAD LAYOUT OR OTHER LAND USE)
TPRP SHALL FELL/TRANSPLANT TREE
(4) TPI
PRELIMINARY EVALUATION FOR TREE TREATMENT BASED ON CONDITION FOR PM REVIEW
(5) SLOPE
UPGRADE WITH SOIL NAIL/CUT SLOPE: TPRP SHALL FELL/TRANSPLANT TREES

2. TREE COMPENSATION PLANTING PLAN
(1) ROADSIDE VERGE
TREE COMPENSATION AT AREA WITHOUT SIGHT-LINE ISSUE
(2) AMENITY AREA
PROVIDE TREE COMPENSATION AT AT-GRADE/SLOPE EA WHERE FEASIBLE

LEGEND:

- SITE BOUNDARY
- NOISE BARRIER
- RETAINING WALL
- T1150(R) — EXISTING TREES TO BE RETAINED
- PLANT CODE / TER. / MAN. / 21 / PLANT NOS — TREE PLANTING
- T1150(T) — LOCATION OF TRANSPLANTING
- PLANT CODE / TER. / MAN. / 21 / PLANT NOS — TREE PLANTING FOR SITE KTN-2



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2023/12/21

AECOM

PROJECT
項目
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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

CONSULTANT
土木顧問公司
AECOM Asia Company Ltd.
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STATUS
狀況

SCALE 比例: A1 1 : 5000
DIMENSION UNIT 尺寸單位: METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號: 60624717
CONTRACT NO. 合約編號: CE 19/2019 (CE)

SHEET TITLE
圖紙名稱
OFF-SITE TREE COMPENSATORY PLAN FOR SITE KTN-2

SHEET NUMBER
圖紙編號
FIGURE 4.1

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

NOTES:

1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 60624717/C3/191.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60624717/C3/191 TO 216.

840700 N

CUT LINE 32-32

SEE DRAWING NO. 60624717/C3/210

828800 E

824900 E

829000 E

U27

N

PYR. CAL. 5

TER. MAN. 14

PYR. CAL. 3

ILE. ROT. 10

CHU. TAB. 10

CIN. CAM. 12

R2

A

T01811(T)

T01484(T)

T01240(T)

T01485(T)

T00857(T)

T01248(T)

T01245(T)

T01237(T)

TAB. CHR. 9

TAB. CHR. 11

MEL. CAJ. 12

840600 N

CUT LINE 35-35

SEE DRAWING NO. 60624717/C3/213

CUT LINE 33-33

SEE DRAWING NO. 60624717/C3/211

U31

2SE-B/FR36

840500 N

U29

KWU TUNG ROAD

Cycling Track

Ramp

排水口 Outfall

Road

Factory

Plot File by: ZENGLY2
PATH: P:\PROJECTS\60624717\Drawing\REPORT\C3\C3_214.dgn
2023/12/21

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KWU TUNG NORTH
NEW DEVELOPMENT AREA,
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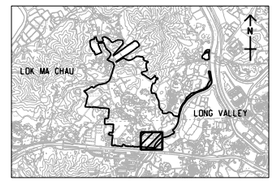
狀況

SCALE 比例
A1 1 : 500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A1 1 : 50000



PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

OFF-SITE TREE COMPENSATORY PLAN FOR SITE KTN-2

SHEET 1 OF 1

SHEET NUMBER
圖紙編號

FIGURE 4.1

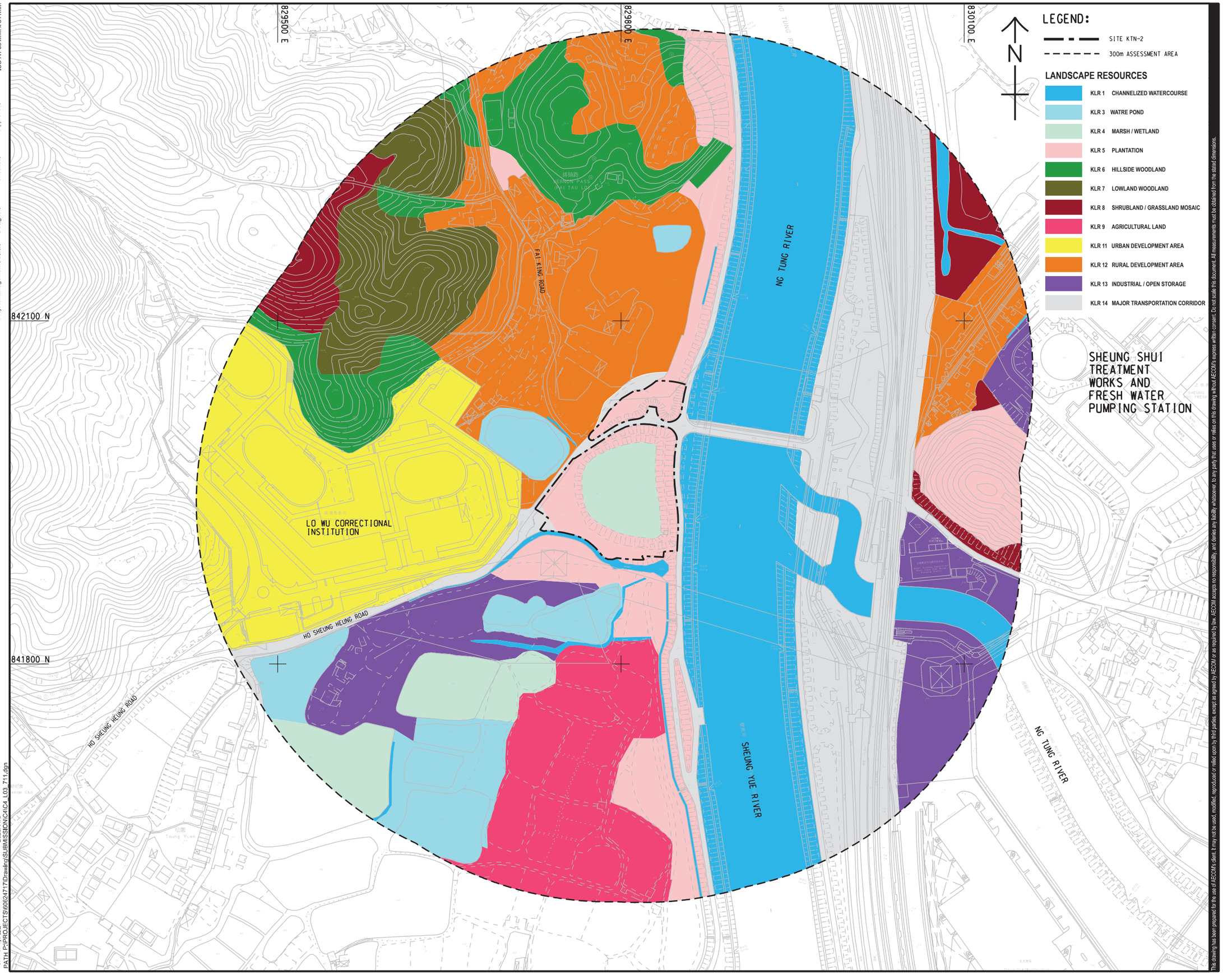
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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2023/11/3

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DEVELOPMENT OF
KWU TUNG NORTH
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REMAINING PHASE -
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STATUS
階段

SCALE 比例	DIMENSION UNIT 尺寸單位
A1 1 : 1500	METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號	CONTRACT NO. 合約編號
60624717	CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

LOCATION OF LANDSCAPE RESOURCES

SHEET NUMBER
圖紙編號

FIGURE 5.1

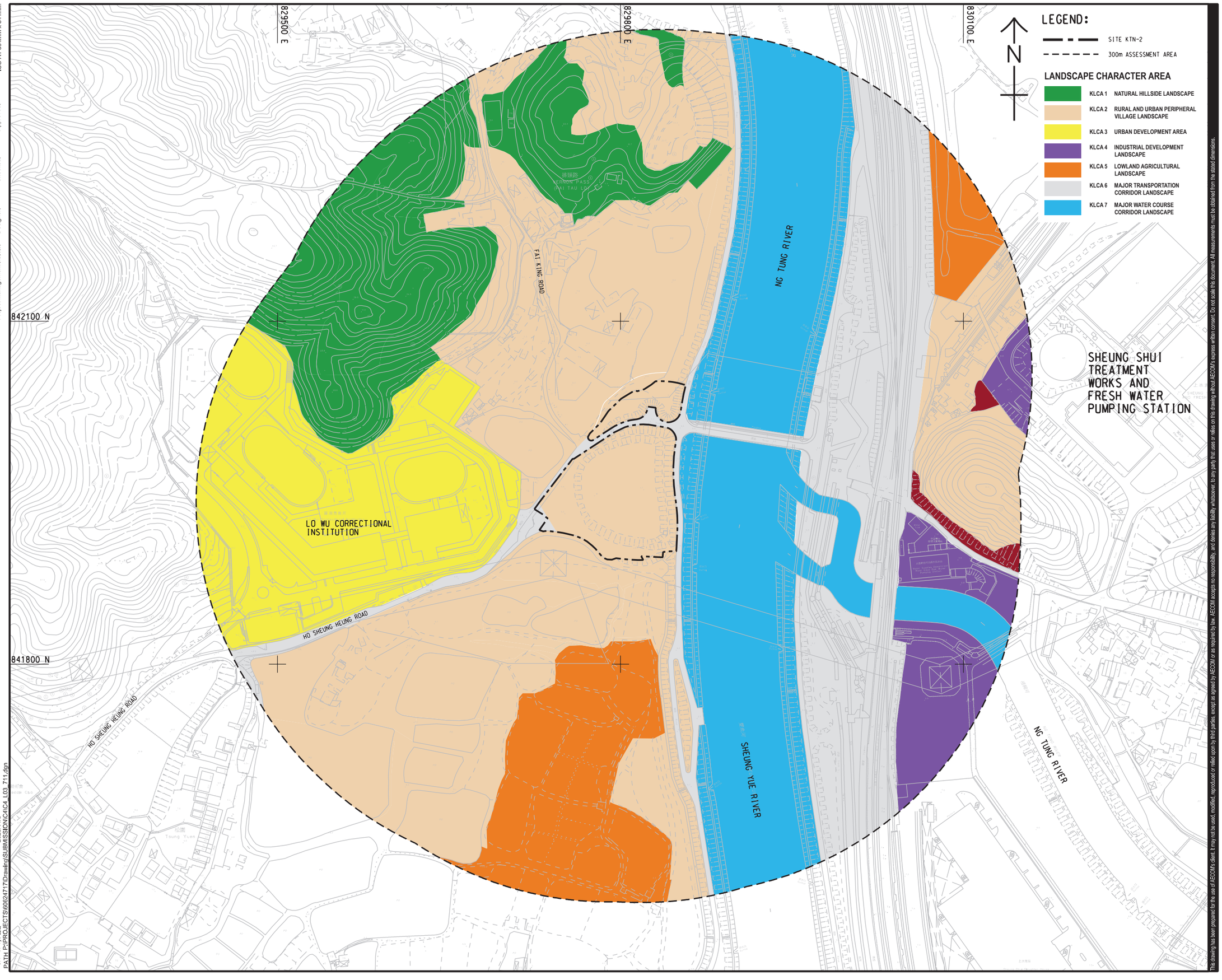
ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:



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PROJECT
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階段

SCALE 比例: A1 1 : 1500

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號: 60624717

CONTRACT NO. 合約編號: CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

LOCATION OF LANDSCAPE CHARACTER AREA

SHEET NUMBER
圖紙編號

FIGURE 5.2

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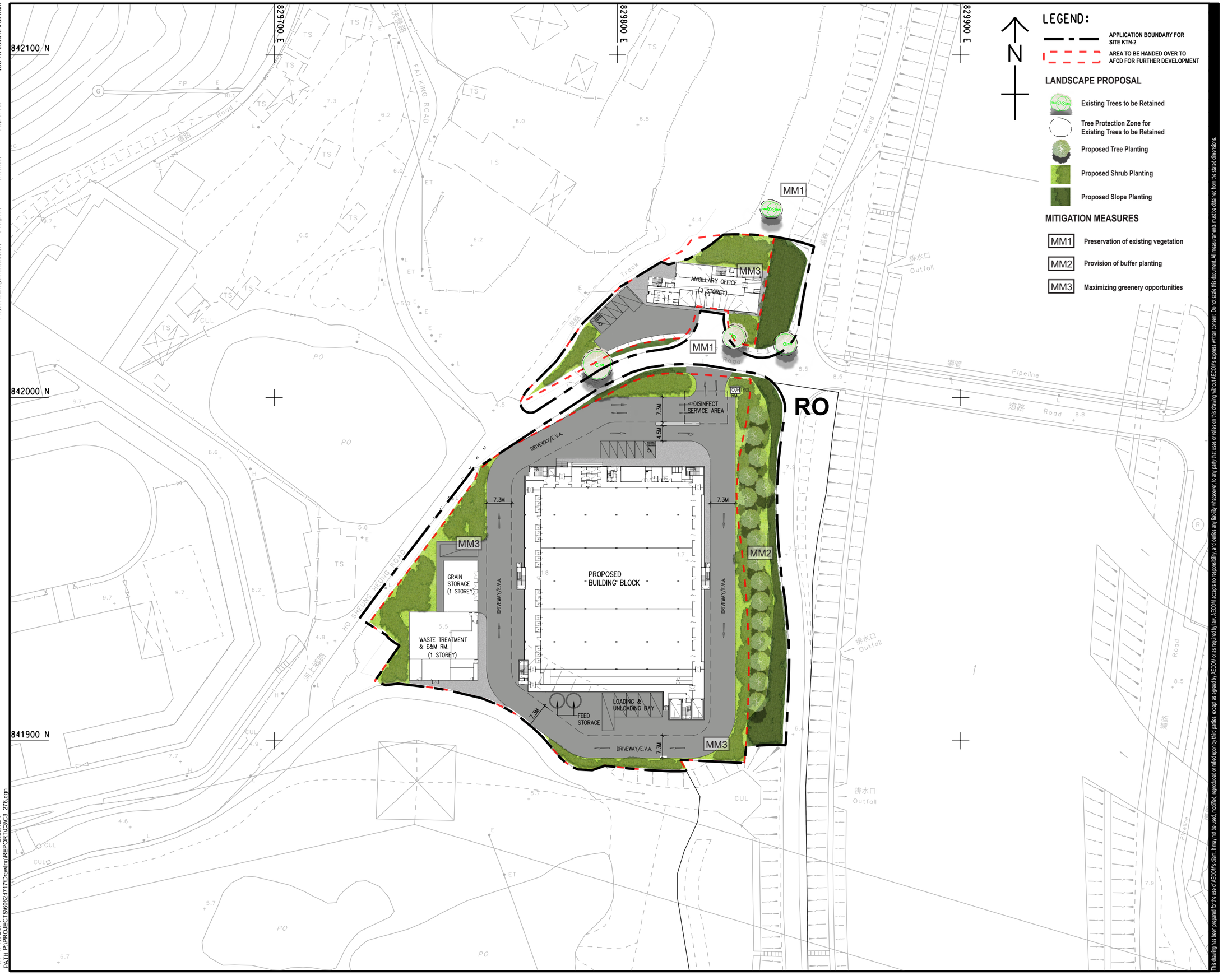
2023/11/3



ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: DuP1

PATH: P:\PROJECTS\60624717\Drawing\REPORTCSC\3_276.dgn

2023/12/4

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PROJECT
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DEVELOPMENT OF
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NEW DEVELOPMENT AREA,
REMAINING PHASE -
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SCALE 比例
A1 1 : 500

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN 索引圖 A1 1 : 50000

PROJECT NO. 項目編號
60624717

CONTRACT NO. 合約編號
CE 19/2019 (CE)

SHEET TITLE
圖紙名稱

LANDSCAPE PROPOSAL

SHEET NUMBER
圖紙編號

FIGURE 6.1

Appendix A

土木工程拓展署
Civil Engineering and Development Department

Agreement No. CE 19/2019 (CE)

Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction

Tree Preservation and Removal Proposal (Final)

(Ref. C3-02B)

February 2024

AECOM Imagine it. Delivered.

土木工程拓展署
Civil Engineering and Development Department
North Development Office

Agreement No. CE 19/2019 (CE)

Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction

Tree Preservation and Removal Proposal (Final)

(Ref. C3-02)

December 2023

Reviewed: Jeff Tang 11 December 2023

Approved for Issue: Raymond Pau 11 December 2023

AECOM ASIA COMPANY LIMITED

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TABLE OF CONTENTS

Appendices

1 INTRODUCTION

1.1 Project Background

1.1.1 The Territorial Development Strategy Review in 1990s first identified that there was potential for strategic growth in the North East New Territories (NENT). The Planning and Development Study on NENT (NENT Study), which was commissioned in 1998 and completed in 2003 under Agreement No. CE 64/96, identified the areas at Kwu Tung North (KTN), Fanling North (FLN) and Ping Che/Ta Kwu Ling as suitable for the development of New Development Areas (NDAs) in the NENT and confirmed the feasibility of development based on the findings and recommendations from various technical assessments.

1.1.2 The Chief Executive announced in the 2007-08 Policy Address that the Government would revive the planning and engineering studies on the NENT NDAs and work out implementation strategies with a view to providing housing land and meeting other land use requirements in the future. The NENT NDAs, together with Hung Shui Kiu NDA, was one of the ten major infrastructure projects announced in the 2007-08 Policy Address for economic growth.

1.1.3 The North East New Territories New Development Areas Planning and Engineering Study-Investigation (NENT NDAs Study) under Agreement No. CE 61/2007(CE) was commissioned jointly by the Civil Engineering Development Department (CEDD) and the Planning Department (PlanD) in June 2008 and was completed in December 2013. Various planning, engineering and environmental studies were completed to formulate a revised proposal for the NENT NDAs based on the NENT Study, confirm the feasibility of implementing the revised proposal and formulate the implementation strategies and programme for the NDAs. A planning and development framework for the KTN, FLN and PC/TKL NDAs was also established to meet the long-term demand for housing, especially public housing, and employment. Development of the NENT NDAs could also cater for various land use needs arising from social and economic developments in Hong Kong.

1.1.4 On the basis of the final recommendations of the NENT NDAs Study, the Outline Development Plan (ODP) and the statutory Outline Zoning Plans (OZPS) for the KTN and FLN NDAs were formulated which provided a comprehensive planning framework to guide the future development of the NDAs and provided the foundation for drafting the statutory Outline Zoning Plans (OZPs) for the KTN and FLN NDAs. The KTN and FLN OZPs were approved by Chief Executive in Council on 16 June 2015. The approved KTN and FLN OZPs were exhibited for public inspection on 19 June 2015.

1.1.5 The design consultancy for Development of KTN and FLN NDAs, Phase 1 under Agreement No. CE 13/2014(CE) (the First Phase Assignment) was commissioned by CEDD in November 2014, to carry out detailed design and site investigation of the First Phase Works (i.e. the site formation and engineering infrastructure works for the Advance Works and First Stage Works.

1.1.6 As one of the initiatives set out in the Policy Agenda of The Chief Executive's 2018 Policy Address announced in October 2018, the Government determined to, as medium and long-term measures, press ahead with the implementation of the plans for the KTN and FLN NDAs as an extension to the Fanling/Sheung Shui New Town.

1.2 The Project

1.2.1 The KTN and FLN NDAs are being developed in phases, comprising the First Phase Works (i.e. the Advance Works and First Stage Works) and the Remaining Phase Works.

1.2.2 The First Phase Works are to carry out advance site formation (including soil remediation) of part of lands in the KTN and FLN NDAs for housing and local rehousing, community facilities, construction of roads including the eastern section of Fanling Bypass connecting the FLN NDA and Fanling Highway and local roads, and to develop a nature park at Long Valley (including provision of a visitor centre and a linking footbridge), reprovisioning of two egretry sites in FLN NDA and enhancement works to an existing egretry site in the KTN NDA, site formation of land for a village resite area in the KTN NDA, and associated engineering infrastructures. The detailed design and site investigation of the First Phase Works was substantially completed in 2018. The construction of the First Phase Works commenced progressively from 2019.

1.2.3 The Remaining Phase Works is to carry out remaining phase site formation and engineering infrastructure works at KTN NDAs for housing, community, commercial and other developments. The construction of the Remaining Phase Works is expected to commence progressively from 2024 in order to meet the target completion for all infrastructure works for the NDA development in 2031.

1.2.4 AECOM Asia Co Ltd has been commissioned by the Civil Engineering and Development Depart (CEDD) to undertake Agreement No. CE 19/2019 (CE) – Development of Kwu Tung North New Development Area, Remaining Phase – Design and Construction. The starting date of the services commenced on 30 December 2019 and the completion date is 29 December 2033 tentatively.

1.3 Structure of this Report

1.3.1 Following this introductory section, the remainder of this Tree Survey Report is structured as follows::

- Section 2 describes legislations, standards and guidelines related to tree survey and tree preservation and removal proposal; and
- Section 3 illustrates the tree survey approaches and methodology; and
- Section 4 presents the tree preservation, transplanting and removal proposals; and
- Section 5 presents the compensatory tree planting proposals; and
- Section 6 summarises the findings of this Report for Tree Preservation and Removal Proposal.

2 PROJECT DESCRIPTION

2.1 Scope of Works

2.1.1 The scope of the proposed works comprises: -

(a) site formation of about 149 hectares of land at KTN NDA for housing, community, commercial and other developments;

(b) engineering infrastructure works including but not limited to roadworks, drainage, sewerage, waterworks, pumping stations and other associated buildings/structures/E&M/systems for supporting the development sites in the Remaining Phase Works of KTN NDA;

(c) soil remediation;

(d) landscaping works;

(e) implementation of environment of monitoring and mitigation measures for the works mentioned in (a) to (d) above; and

(f) administration of the contract between the Social Service Team (SST) in KTN and FLN NDAs and the Employer and supervision of the SST's services.

2.2 Tentative Implementation Programme

2.2.1 According to the tentative implementation programme, the construction phase will commence in July 2024 and complete by December 2031.

3 LEGISLATIONS, STANDARD AND GUIDELINES

3.1 Government Publications, Guidelines and Reports

3.1.1 Government Publications, Guidelines and Reports related to Tree Survey, Preservation and Removal Proposals include:

- Agriculture, Fisheries and Conservation Department – AFCD Nature Conservation Practice Note No. 1 – Clearing Mikani
- Agriculture, Fisheries and Conservation Department – AFCD Nature Conservation Practice Note No. 2 – Measurement of Diameter at Breast Height (DBH)
- Agriculture, Fisheries and Conservation Department – AFCD Nature Conservation Practice Note No. 3 – The Use of Plant Names
- Civil Engineering and Development Department (2020) – General Specifications for Civil Engineering Works, Sections 3 and 26
- Civil Engineering and Development Department (2016) – Project Administration Handbook for Civil Engineering Works, Chapters 1 and 4
- Development Bureau – Latest Guidelines for Tree Risk Management and Assessment Arrangement on an Area Basis and on a Tree Basis
- GEO Publication (2000) – Highway Slope Manual, Chapters 6 and 8
- GEO Publication No. 1/2011 – Technical Guidelines on Landscape Treatment for Slopes
- GEO Technical Guidance Note No. 20 – Updating of GEO Publication No. 1/2000
- GEO Report No. 56 (1999) – Application of Prescriptive Measures to Slopes and Retaining Walls, 2nd Edition
- GEO Report No. 116 (2001) – Review of Effective Methods of Integrating Man made Slopes and Retaining Walls (Particularly for Roadside Slopes) into Their Surroundings
- GEO Report No. 136 (2003) – Guidelines on Safe Access for Slope Maintenance
- GEO Report No. 183 (2006) – Performance Assessment of Greening Techniques on Slopes
- GEO Special Project Report No. SPR 7/2004 (2004) – Identification of Suitable Vegetation Species for Use on Man-made Slopes
- Greening Master Plan for North District
- Input Guideline - HyD Slope Vegetation (SVI) Records
- HyD HQ/GN/13 – Interim Guidelines for Tree Transplanting Works under Highways Department's Vegetation Maintenance Ambit
- HyD HQ/GN/15 – Guidelines for Greening Works along Highways
- HyD HQ/GN/15A Guidelines for Landscape Works for Highway Projects
- RD/GN/044B – Guidance Notes on Design and Construction of Pavements with Paving Units.

- HyD Requirements for Handover of Vegetation to Highways Department
- Latest General Standards and Maintenance Requirements for Roadside Landscape Works to be Handed Over to LCSD for Maintenance.
- Development Bureau – Latest Guidelines on Greening of Noise Barriers
- "Guidelines on Tree Preservation during Development" issued by GLTMS of DevB
- "Guidelines on Tree Transplanting" issued by GLTMS of DevB
- "Guidelines for Tree Risk Assessment and Management Arrangement" issued by GLTMS of DevB
- "Guidelines on Soil Improvement" issued by GLTMS of DevB
- "Guidelines on Soil Volume for Urban Trees" issued by GLTMS of DevB
- "Street Tree Selection Guide" issued by GLTMS of DevB
- Proper Planting Practices and other relevant guidelines issued by GMLT of DevB
- LPM Branch, Design Technical Guideline No. 17, "Tree Preservation for Slope Works"
- Guidelines on Yard Waste, Reduction and Treatment
- Chapter 4 – Recreation, Open Space and Greening, Hong Kong Planning Standards and Guidelines (HKPSG) issued by Planning Department
- Chapter 11 – Urban Design Guideline, Hong Kong Planning Standards and Guidelines (HKPSG) issued by Planning Department
- Universal Accessibility for Externa; Areas, Open Spaces and Green Spaces, 2007 issued by ArchSD
- Approved EIA Report (AEIAR No. 175/2013)

3.2 Technical Circulars

3.2.1 Technical Circulars related to Landscape Design include:

- ETWB TCW No. 13/2003A – Guidelines and Procedures for Environmental Impact Assessment of Government Projects and Proposals Planning for Provision of Noise Barriers
- ETWB TCW No. 11/2004 – Cyber Manual for Greening
- WBTC No. 25/93 – Control of Visual Impact of Slopes
- WBTC No. 17/2000 – Improvement to the Appearance of Slopes in connection with WBTC 23/93
- WBTC No. 7/2002 – Tree Planting in Public Works
- CEDD TC No. 3/2016 - Reporting of Incidents on CEDD Works Sites
- CEDD TC No. 03/2022 – Tree Works Vetting Panels
- DEVB TCW No. 3/2012 - Site Coverage of Greenery for Government Building Projects
- DEVB TCW No. 2/2012 - Allocation of Space for Quality Greening on Roads
- DEVB TCW No. 6/2015 – Maintenance of Vegetation and Hard Landscape Features.
- DEVB TCW No. 4/2020 - Tree Preservation
- DEVB TCW No. 5/2020 - Registration and Preservation of Old and Valuable Trees
- DEVB TCW No. 5/2017 - Community Involvement in Greening Works
- DEVB TCW No. 1/2018 - Soft Landscape Provisions for Highway Structures

3.3 Ordinances and Regulations

3.3.1 Ordinances and Regulations related to Landscape Design include:

- Forests and Countryside Ordinance (Cap. 96) and its subsidiary legislations
- Plant Varieties Protection Ordinance (Cap. 490)
- Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586).
- Wild Animals Protection Ordinance (Cap. 170)
- Environmental Impact Assessment Ordinance (Cap. 499)
- TC No. 10/2001 – Visibility of Directional Signs

4 TREE SURVEY METHODOLOGY

4.1.1 In accordance with DEVB TCW No. 4/2020, all existing individual trees with a trunk diameter larger than 95mm (300mm girth) measured at 1,300mm above ground level are surveyed and identified with the following information recorded and presented in the Tree Assessment Schedule in the Appendix III:

4.1.2 Individual Tree Survey

(a) Drawing. : Drawing where the individual tree can be found.

(b) Tree No. : Individual trees as being number labelled on site and marked on site and denoted correspondingly on the plan.

(c) Photo No. : The photograph reference number of the tree being identified.

(d) Species: Scientific and Chinese names of the trees surveyed.

(e) Tree size:

a. Overall Height: Height measured from ground level to the top branch;

b. Trunk Diameter: Diameter of the main trunk measured at 1.3m high above ground level;

c. Average Crown Spread: Average diameter of the foliage canopy.

(f) Amenity Value of a tree should be assessed by its functional values for shade, shelter, screening, reduction of pollution and noise and also its fung shui significance, and classified into the following categories:

a. Good – important trees which should be retained by adjusting the design layout accordingly;

b. Average – trees that are desirable to be retained in order to create a pleasant environment, which includes healthy specimens of lesser importance than “Good” trees;

c. Poor – trees that are dead, dying or potentially hazardous and should be removed.

(g) Form:

a. Good - Well-balanced crown and straight strong trunk(s);

b. Average - Slightly unbalanced crown and non-straight trunk(s);

c. Poor - Misshapen or awkwardly-forked trunk and / or unbalanced crown.

(h) Health:

a. Good - Sound and healthy trees;

b. Average - Trees which are with few or no visible defects or health problem;

c. Poor - Rot and / or cavities in the main trunk and / or crown die back, severely infected with disease.

(i) Structural Condition:

a. Good - Trees with no or little sign of structural defect and would have low risk level of potential failure;

b. Average - Trees with moderate sign of structural defect and would have medium risk level of potential failure;

c. Poor - Trees with significant and obvious sign of structural defect and would have high risk level of potential failure.

(j) Suitability for Transplanting: Assess the suitability of affected trees be transplanted taken in to account of the following factors: -

- conditions of the tree to be transplanted (including form, health and structure which will affect success of the proposed transplanting);
- size, species, and conservation status of the tree to be transplanted;
- availability and suitability of a permanent receptor site, both within and outside the project site;
- adequate time for preparation of transplanting operation;
- identification of a long-term maintenance party for the transplanted tree(s);
- access to the existing location and transportation to the receptor site (including availability of access to accommodate the tree, topography of the proposed route, engineering limitations, etc.); and
- cost-effectiveness.

Trees with the following features should not be considered suitable for transplanting under normal circumstances:

- low amenity value;
- irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
- low survival rate after transplanting;
- very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
- with evidence of over-maturity and onset of senescence;
- with poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits); or
- undesirable species (e.g. *Leucaena leucocephala* which is an invasive exotic tree).
- tree grown under poor conditions which have limited the formation of proper root ball necessary for transplanting (e.g. on steep slope, roots integrated with existing structure/utilities/trees etc,.)

Having considered the above factors and features of the trees, trees are assessed as follows: -

a. High - Trees are highly suitable for transplanting.

b. Medium - Trees are moderately suitable for transplanting.

c. Low – Trees are not suitable for transplanting.

(k) Conservation Status: State the rarity and protection status of the species under relevant ordinances in Hong Kong. References such as Rare and Precious Plants of Hong Kong, the IUCN Red List of Threatened Species and the Forests and Countryside Ordinance (Cap. 96) are used.

(l) Recommendation: Proposed action for individual species which fall into the following categories:

a. Retain

b. Transplant

c. Remove

(m) Department to Provide Expert Advice to LandsD: AFCD (Agriculture, Fisheries and Conservation Department)/DSD (Drainage Services Department) / HyD (Highways Department) / LCSD (Leisure and Cultural Services Department) / Respective Government Department.

(n) Justification: Proposed works which justify the recommendation.

(o) Additional Remarks: Supplementary note towards the assessment.

Note: Item (i), (m) and (n) will be incorporated in Report for TPRP

4.1.3 Group Tree Survey

Survey of existing trees in the following site conditions are recommended to proceed with tree group survey instead of tree individual survey:

- Appendix C (1) DEVB TC(W) No. 4/2020- "For large-scale infrastructure works projects, such as site formation works and advance infrastructure works for new town development, tree group survey can be adopted subject to justification() provided".
- For inaccessible areas which are without safe and walkable access (either maintenance or public access) such as remote countryside slopes, fenced-off areas, within private lit and dense woodland and /or site areas with potential hazard /risk to the tree surveyors; and /or
- For vegetated areas which the physical condition and vegetation composition are similar within the whole areas such as on individual SIMAR slope under one slope maintenance party.

4.1.4 To safeguard the quality of the tree group inspection, the size and coverage of each tree group should not be excessively large.

4.1.5 Tree survey boundary has been defined to assess all existing tree groups located in close proximity of all proposed permanent works and to be affected by any construction works related or temporary works thereof.

4.1.6 Each tree group is identified on the basis that vegetation at contiguous areas of similar character and is kept as small as practical.

4.1.7 The area recommended to proceed with group tree survey is subject to the existing site condition based on the General Layout Plan in **Appendix I**. Individual tree survey should be carried out once possession of or access to the area(s) concerned is granted by respective DLOs of LandsD.

(a) Drawing: Drawing showing where the tree groups are found.

(b) Tree Group No.: Tree Groups as being number labelled on site and marked on site and denoted correspondingly on the plan.

(c) Tree Group Photo No.: The photograph reference number of the tree group being identified.

(d) Species and Composition in the Tree Group: Scientific and Chinese names of the trees surveyed and the estimate of the number of trees within the group.

(e) Estimated tree size in the Group:

a. Height: Range of height measured from ground level to the top branch;

b. Trunk Diameter: Range of diameter of the main trunk measured at 1.3m high above ground level; and

c. Crown Spread: Range of diameter of the foliage canopy.

(f) Amenity Value of a tree should be assessed by its functional values for shade, shelter, screening, reduction of pollution and noise and also its fung shui significance, and classified into the following categories:

a. Good – important trees which should be retained by adjusting the design layout accordingly;

b. Average – trees that are desirable to be retained in order to create a pleasant environment, which includes healthy specimens of lesser importance than "Good" trees;

c. Poor – trees that are dead, dying or potentially hazardous and should be removed.

(g) Overall Form:

a. Good - Well-balanced crown and straight strong trunk(s);

b. Average - Slightly unbalanced crown and non-straight trunk(s); and

c. Poor - Misshapen or awkwardly-forked trunk and / or unbalanced crown.

(h) Overall Health:

a. Good - Sound and healthy trees;

b. Average - Trees which are with few or no visible defects or health problem; and

c. Poor - Rot and / or cavities in the main trunk and / or crown die back, severely infected with disease.

(i) Overall Structural Condition:

a. Good - Trees in the group with no or little sign of structural defect and would have low risk level of potential failure;

b. Average - Trees in the group with moderate sign of structural defect and would have medium risk level of potential failure; and

c. Poor - Trees in the group with significant and obvious sign of structural defect and would have high risk level of potential failure.

(j) Suitability for Transplanting: Assess the suitability of affected trees be transplanted taken in to account of the following factors: -

- conditions of the tree to be transplanted (including form, health and structure which will affect success of the proposed transplanting);
- size, species, and conservation status of the tree to be transplanted;
- availability and suitability of a permanent receptor site, both within and outside the project site;
- adequate time for preparation of transplanting operation;
- identification of a long-term maintenance party for the transplanted tree(s);

- access to the existing location and transportation to the receptor site (including availability of access to accommodate the tree, topography of the proposed route, engineering limitations, etc.); and
- cost-effectiveness.

Trees with the following features should not be considered suitable for transplanting under normal circumstances:

- low amenity value;
- irrecoverable form after transplanting (e.g. if substantial crown and root pruning are necessary to facilitate the transplanting);
- low survival rate after transplanting;
- very large size (unless the feasibility to transplant has been considered financially reasonable and technically feasible during the feasibility stage);
- with evidence of over-maturity and onset of senescence;
- with poor health, structure or form (e.g. imbalanced form, leaning, with major cavity/cracks/splits); or
- undesirable species (e.g. Leucaena leucocephala which is an invasive exotic tree).
- tree grown under poor conditions which have limited the formation of proper root ball necessary for transplanting (e.g. on steep slope, roots integrated with existing structure/utilities/trees etc,.)

Having considered the above factors and features of the trees, trees are assessed as follows: -

a. High - Trees are highly suitable for transplanting;

b. Medium - Trees are moderately suitable for transplanting; and

c. Low – Trees are not suitable for transplanting.

(k) Conservation Status: State the rarity and protection status of the species under relevant ordinances in Hong Kong. References such as Rare and Precious Plants of Hong Kong, the IUCN Red List of Threatened Species and the Forests and Countryside Ordinance (Cap. 96) are used.

(l) Recommendation: Proposed action for trees in the group which fall into the following categories:

a. Retain

b. Transplant and

c. Remove

(m) Department to Provide Expert Advice to LandsD: AFCD (Agriculture, Fisheries and Conservation Department) /DSD (Drainage Services Department) / HyD (Highways Department) / LCSD (Leisure and Cultural Services Department) / Respective Government Department.

(n) Justification: Proposed works which justify the recommendation.

(o) Additional Remarks: Supplementary note towards the assessment.

Note: Item (l), (m) and (n) will be incorporated in Report for TPRP

5 TREE SURVEY FINDINGS AND RECOMMENDATIONS

5.1 Tree Survey Findings

5.1.1 The location of Individual and Group tree surveyed is plotted on the Tree Survey Plans in **Appendix II-A** and **Appendix II-B**. Tree Assessment Schedule for Individual and Group Survey is shown in **Appendix III-A** and **Appendix III-B**. Photos of trees surveyed are shown in **Appendix IV**.

5.1.2 A total of approximately 12,267 nos. of trees with 137 nos. of species have been surveyed. Total 8,183 trees in 258 groups and 4,084 individual trees (including 45 Trees of Particular Interest (TPIs) that within the project boundary and would be potentially affected were surveyed.

5.1.3 Individual Tree Survey Findings

The dominant tree species among 4,084 individual trees include *Macaranga tanarius* var. *tomentosa*, *Dimocarpus longan*, *Leucanena leucocephala*, *Ficus hispida* and *Celtis sinensis*, *Clausena lansium*. They are in general in poor form, average in health and structural condition; and medium in amenity value. Their height, DBH and crown spread ranges from 2-30m, 95-2561mm, and 0-26 m respectively.

5.1.4 Group Tree Survey Findings

Approximate 8,183 nos. of trees are surveyed, they are mostly common species including but not limited to *Dimocarpus longan*, *Macaranga tanarius* var. *tomentosa*, *Leucaena leucocephala*, *Clausena lansium* and *Mangifera indica.* They are in general poor to average in form, health and structural condition; and low to medium in amenity value. Their height, DBH and crown spread ranges from 3-20m; 100-900mm; and 1-23m respectively.

5.1.5 There is no OVT identified in accordance with DEVB TC(W) No. 5/2020 within the project boundary. There are 59 nos. Trees of Particular Interest (TPIs) identified in reference to the definition in the Guidelines for Tree Risk Assessment and Management Arrangement issued by DEVB. For the 45 individual trees of particular interest, 34 nos. are very large size with DBH over 1 metre and height over 25 metre and 11nos. are protected species. A list of all TPIs is summarized in **Table 5.1** and highlighted in yellow in **Appendix III-A** and extracted in **Appendix III-C.**

Table 5.1: Summary of TPIs within Site boundary

Scientific Name	Chinese Name	No. of Trees	Justification
Aquilaria sinensis	土沉香	10	• Tree with conservation value • Endangered Species under Cap 586
Dalbergia odorifera	降香黃檀	1	
Celtis sinensis	朴樹	2	• Existing mature trees with DBH over 1000mm
Cinnamomum camphora	樟	2	
Cinnamomum parthenoxylon	黃樟	1	
Dead tree	死樹	1	
Ficus elastica	印度榕(印度橡樹)	3	
Ficus microcarpa	榕樹(細葉榕)	17	
Ficus variegata	青果榕	1	
Ficus virens	大葉榕	4	
Eucalyptus urophylla	尾葉桉	3	• Existing trees with height over 25m
	Total	**45**	

5.1.6 According to procedures as set out in para. 26 of DEVB TC(W) No. 4/2020 – Tree Preservation and Section 2.6 of the Guidelines for Tree Risk Assessment and Management Arrangement (TRAM), Sensitivity Analysis Report with detail review of each TPI will be separately supplemented after commencement of works. The **Tree Assessment Schedule (Trees of Particular Interest)** and **Photographic Record (Trees of Particular Interest)** are presented in **Appendix III(C)** and **Appendix IV(C)** respectively.

5.1.7 A summary of the quantity and species of trees is summarized **Table 5.2**.

Table 5.2: Summary of Quantity and Species of Trees

Scientific Name	Chinese Name	Number of Trees Individual (Group)
Acacia auriculiformis	耳果相思	12(1)
Acacia confusa	台灣相思	45(143)
Acacia mangium	大葉相思	(4)
Acronychia pedunculata	山油柑(降真香)	1(3)
Aglaia odorata	米仔蘭	(6)
Albizia lebbeck	大葉合歡	6(6)
Aleurites moluccana	石栗	8(9)
Annona glabra	圓滑番荔枝	1
Annona squamosa	番荔枝	4(2)
Antidesma bunius	五月茶	1
Aporosa dioica	銀柴	8(30)
Aquilaria sinensis	土沉香	10
Araucaria columnaris	柱狀南洋杉	5(12)
Araucaria heterophylla	異葉南洋杉	(1)
Archidendron clypearia	猴耳環	1
Archontophoenix alexandrae	假檳榔	16(18)
Artocarpus heterophyllus	菠蘿蜜	92(244)
Averrhoa carambola	楊桃	27(37)
Bauhinia sp.	羊蹄甲屬	71(73)
Bauhinia variegata	宮粉羊蹄甲	(28)
Bauhinia variegata var. candida	白花羊蹄甲	(1)
Bauhinia x blakeana	洋紫荊	2(9)
Bischofia javanica	秋楓	12(9)
Bombax ceiba	木棉	27(83)
Bridelia tomentosa	土蜜樹	31(25)
Callistemon viminalis	串錢柳	11
Camellia japonica	山茶	1
Canarium album	橄欖	2(1)
Carica papaya	番木瓜	45(97)
Caryota mitis	短穗魚尾葵	53(93)
Cassia fistula	豬腸豆	(2)
Castanea mollissima	栗	1
Casuarina equisetifolia	木麻黃	8(17)

Scientific Name	Chinese Name	Number of Trees Individual (Group)
Cinnamomum burmannii	陰香	8(2)
Cinnamomum parthenoxylon	黃樟	5
Citrus maxima	柚	8(10)
Crateva unilocularis	樹頭菜	1(6)
Cratoxylum cochinchinense	黃牛木	14(16)
Croton tiglium	巴豆	1
Dead Tree	死樹	170(30)
Delonix regia	鳳凰木	4(5)
Diospyros kaki	柿	4
Dracaena fragrans	巴西鐵樹	10(3)
Dracontomelon duperreanum	人面子	(1)
Drumstick moringa	辣木	1
Dypsis lutescens	散尾葵	18(17)
Ehretia acuminata	厚殼樹	40(5)
Eriobotrya japonica	枇杷	9(19)
Eucalyptus robusta	大葉桉	(1)
Eucalyptus urophylla	尾葉桉	16
Euphorbia neriifolia	金剛纂	1(1)
Ficus benjamina	垂葉榕	3(14)
Ficus elastica	印度榕(印度橡樹)	3
Ficus hispida	對葉榕	276(338)
Ficus religiosa	菩提樹	(1)
Ficus variegata	青果榕	21(40)
Ficus virens	黃葛樹	4
Flueggea virosa	白飯樹	4
Gymnanthemum amygdalinum	桃葉斑鳩菊	1
Hibiscus tiliaceus	黃槿	15(30)
Ilex rotunda	鐵冬青	34(1)
Juniperus chinensis 'Kaizuca'	龍柏	2(23)
Koelreuteria bipinnata	複羽葉欒樹	(2)
Lagerstroemia speciosa	大花紫薇	2(21)
Leucaena leucocephala	銀合歡	413(1422)
Ligustrum sinense	山指甲	54(69)
Lindera communis	香葉樹	1
Litchi chinensis	荔枝	155(328)
Litsea cubeba	山蒼樹	2
Litsea glutinosa	潺槁樹	39(54)
Litsea monopetala	假柿木薑子	1
Livistona chinensis	蒲葵	26(23)
Lophostemon confertus	紅膠木	1
Macaranga tanarius var. tomentosa	血桐	551(1288)

Scientific Name	Chinese Name	Number of Trees Individual (Group)
Machilus chekiangensis	浙江潤楠	1(1)
Machilus pauhoi	刨花潤楠	21(3)
Machilus spp.	潤楠屬	(2)
Magnolia grandiflora	荷花玉蘭	(1)
Mallotus paniculatus	白楸	1(1)
Mangifera indica	杧果	77(260)
Manilkara zapota	人心果	(3)
Markhamia stipulata	貓尾木	10
Melaleuca bracteata	黃金香柳	(1)
Melaleuca cajuputi subsp. cumingiana	白千層	2(4)
Melia azedarach	苦楝	49(82)
Michelia champaca	黃蘭	1
Michelia figo	含笑	1
Michelia x alba	白蘭	11(24)
Microcos nervosa	破布葉(布渣葉)	57(155)
Morus alba	桑	114(143)
Opuntia cochenillifera	胭脂掌	1
Osmanthus fragrans	桂花(木犀)	1
Pachira aquatica	瓜栗	2
Pachira glabra	馬拉巴栗	1(1)
Paliurus ramosissimus	馬甲子	(1)
Persea americana	鱷梨 (牛油果)	(1)
Phoenix roebelenii	日本葵	(3)
Phyllanthus emblica	餘甘子(油甘子)	(2)
Pinus massoniana	馬尾松	81(13)
Platycladus orientalis	側柏	4(4)
Podocarpus macrophyllus	羅漢松	5(19)
Prunus mume	梅	2
Psidium guajava	番石榴	50(73)
Pterocarpus indicus	紫檀	3
Pterospermum heterophyllum	翻白葉樹	(1)
Rhus chinensis	鹽膚木	1(5)
Roystonea regia	大王椰子(王棕)	1(2)
Sapium discolor	山烏桕	1
Sapium sebiferum	烏桕	4(1)
Schefflera heptaphylla	鵝掌柴(鴨腳木)	3(7)
Senna siamea	鐵刀木	34(5)
Senna surattensis	黃槐決明	(1)
Sterculia lanceolata	假蘋婆	6(1)
Sterculia monosperma	蘋婆	8(17)
Syzygium cumini	烏墨(海南蒲桃)	3(6)

Scientific Name	Chinese Name	Number of Trees Individual (Group)
Syzygium hancei	韓氏蒲桃	1
Syzygium jambos	蒲桃	12(47)
Syzygium nervosum	水翁	36(4)
Tamarindus indica	酸豆	(7)
Terminalia catappa	欖仁樹	1
Tetradium glabrifolium	楝葉吳茱萸	6(21)
Trema tomentosa	山黃麻	1(3)
Viburnum odoratissimum	珊瑚樹	10(1)
Zanthoxylum avicennae	簕欓花椒（簕欓）	(3)
	Total	**4,084 (8,183)**

5.2 Tree Preservation, Transplanting and Removal Proposals

5.2.1 The engineering layout had been designed to minimize the impact on existing tree. Any trees surveyed which are in conflict with the proposed works will be proposed to be transplanted and removed. Besides site formation designed finish level, trees will be affected due to level changes, trees located within future vehicular access, necessary associated facilities will also be affected. General engineering layout plans for trees to be affected are illustrated in **Appendix I** for justification support. Tree Treatment Plan is shown in **Appendix II-B.**

5.2.2 Findings relevant maintenance parties of affected trees and justification for removal of existing trees found in Kwu Tung Remaining site are summarized in **Table 5.3a, Table 5.3b, Table 5.4** and **Table 5.5.**

Table 5.3a: Summary of Proposed Individual Trees Treatments

Proposed Tree Treatment	Dead tree	Undesirable species (Leucaena leucocephala)	Tree of particular interest	Other tree
Trees to be retained	0	0	2	55
Trees to be removed	170	413	33	3,376
Trees to be transplanted	0	0	10	25
Total (4,084 Nos.)	170	413	45	3,456

Table 5.3b: Summary of Proposed Group Trees Treatments

Proposed Tree Treatment	Dead tree	Undesirable species (Leucaena leucocephala)	Other trees (approx.)
Trees to be retained	0	16	79
Trees to be removed	30	1,406	6,652
Total (approx. 8,183 Nos.)	30	1,422	6,731

Table 5.4: Summary of Proposed individual trees treatment under current maintenance parties

Proposed Tree Treatment	DSD	HyD	LandsD	LCSD	Total Nos.
Trees to be retained	4	0	52	1	57
Trees to be removed	108	23	3,260	601	3,992
Trees to be transplanted	0	0	30	5	35
Total	112	23	3,342	607	4,084

Table 5.5: Summary of Proposed individual trees treatment under relevant maintenance parties

Justification of tree removal/ transplant ; Affected by	Proposed road works	Proposed site formation works	Dead trees within site	Undesirable trees
Trees to be removed	588	2,821	170	413

5.2.3 According to procedures as set out in para. 26 of DEVB TC(W) No. 4/2020 – Tree Preservation and Section 2.6 of the Guidelines for Tree Risk Assessment and Management Arrangement (TRAM), Sensitivity Analysis Report with detail review of each TPI will be separately supplemented after commencement of works. The Tree Assessment Schedule (Trees of Particular Interest) and Photographic Record (Trees of Particular Interest) are presented in Appendix III(C) and Appendix IV(C) respectively.

5.2.4 In accordance with the criteria provided in Guidelines for Tree Risk Assessment and Management Arrangement as mentioned in Section 3.2.2, total 45 nos. (T02152, T04736,T03787,T03815,T03775,T03666,T03780,T03772,T03340,T03646,T05086,T03668,T03053,T03063 ,T03050,T02524, LS-T072, T01117, T02287, T04310, T05166, T02151, T05231, T02571, T01983, T00873,T03609,T02411,T00876,T02753,T02349,T03977,T00881,T00875,T02713,T02714,T04993,T05233 ,T03574,T01002,T00882,T02712,T00880,T05232,T04071) of Trees of Particular Interest (TPIs) are identified within development boundary under the Project. For the 45 individual TPIs, 34 nos. are very large size with DBH over 1m/ Crown Spread over 25m and 11 nos. are protected species.

5.2.5 Among the identified TPIs within development boundary as mentioned in **Section 5.1**, 41 nos. of trees would be inevitably affected by the development, in which 2 nos. would be retained, 33 nos. would be removed. The list of all OVTs and TPIs with DBH over 1000mm/ and their relevant treatment are summarized in **Appendix III (C)** and **Table 5.1b**

Table 5.1b List of Trees of Particular Interest

No.	Tree ID/ (Registered OVT No.)	Scientific Name	Treatment Proposal	Justifications for Removal of TPIs
1	LS-T-072	*Ficus microcarpa*	Retain	-
2	T00873		remove	• Direct conflict with proposed road works
3	T00875		remove	• Direct conflict with proposed road works
4	T00876		remove	• Direct conflict with proposed road works
5	T00880		remove	• Direct conflict with proposed site formation works

No.	Tree ID/ (Registered OVT No.)	Scientific Name	Treatment Proposal	Justifications for Removal of TPIs
6	T00881		remove	• Direct conflict with proposed site formation works
7	T00882		remove	• Direct conflict with proposed site formation works
8	T01002		Remove	• conflict with proposed site formation works
9	T01117	*Ficus elastica*	Remove	• conflict with proposed site formation works
10	T01983		remove	• Direct conflict with proposed road works
11	T02151	*Cinnamomum camphora*	remove	• Direct conflict with proposed site formation works
12	T02152	*Dead tree*	remove	• safety
13	T02287	*Ficus microcarpa*	remove	• Direct conflict with proposed road works
14	T02349		remove	• Direct conflict with proposed road works
15	T02411		remove	• Direct conflict with proposed site formation works
16	T02524	*Ficus variegata*	remove	• Direct conflict with proposed site formation works
17	T02571	*Ficus virens*	remove	• Direct conflict with proposed site formation works
18	T02712	*Ficus microcarpa*	Remove	• Direct conflict with proposed site formation works
19	T02713	*Ficus virens*	remove	• Direct conflict with proposed site formation works
20	T02714	*Ficus virens*	remove	• Direct conflict with proposed site formation works
21	T02753	*Ficus microcarpa*	remove	• Direct conflict with proposed site formation works
22	T03050	*Eucalyptus urophylla*	remove	• Direct conflict with proposed road works
23	T03053		remove	• Direct conflict with proposed road works
24	T03063		remove	• Direct conflict with proposed road works
25	T03340	*Aquilaria sinensis*	transplant	• Direct conflict with proposed site formation works
26	T03574	*Ficus elastica*	remove	• Direct conflict with proposed site formation works
27	T03609	*Cinnamomum parthenoxylon*	remove	• Direct conflict with proposed site formation works
28	T03646	*Aquilaria sinensis*	transplant	• Direct conflict with proposed site formation works
29	T03666		transplant	• Direct conflict with proposed site formation works
30	T03668		transplant	• Direct conflict with proposed site formation works
31	T03772		transplant	• Direct conflict with proposed site formation works
32	T03775		transplant	• Direct conflict with proposed site formation works
33	T03780		transplant	• Direct conflict with proposed site formation works
34	T03787		transplant	• Direct conflict with proposed site formation works
35	T03815		transplant	• Direct conflict with proposed site formation works
36	T03977	*Ficus virens*	remove	• Direct conflict with proposed site formation works
37	T04071	*Ficus microcarpa*	remove	• Direct conflict with proposed site formation works
38	T04310	*Celtis sinensis*	remove	• Direct conflict with proposed site formation works
39	T04736	*Aquilaria sinensis*	Transplant	• Direct conflict with proposed site formation works
40	T04993	*Ficus microcarpa*	remove	• Direct conflict with proposed site formation works

No.	Tree ID/ (Registered OVT No.)	Scientific Name	Treatment Proposal	Justifications for Removal of TPIs
41	T05086	*Dalbergia odorifera*	remove	• Direct conflict with proposed site formation works
42	T05166	*Cinnamomum camphora*	remove	• Direct conflict with proposed site formation works
43	T05231	*Celtis sinensis*	remove	• Direct conflict with proposed road works
44	T05232	*Ficus microcarpa*	Retain	-
45	T05233		remove	• Direct conflict with proposed site formation works

5.2.6 For the TPI with conservation importance in species *Aquilaria sinensis* (i.e. T03340, T03646, T03666, T03668, T03772, T03775, T03780, T03787, T03787, T03815 and T04736), are proposed to be transplanted. Transplantation of *Aquilaria sinensis* required delicate procedures (i.e. the transplanted would be directly to final receptor site, to enhance the survival rate in view of the species sensitivity to environment changes.) They are proposed to be transplanted straight to final receptor site, to avoid holding in a temporary nursery where feasible to ensure the survival rate after transplanting. Receptor location is located at the compensatory woodland areas near Fung Kong Shan and Crest Hill as identified in the Approved EIA Report. Detail review of the transplant location shall be carried out in later stage to ensure the gradient of final receptor site is relatively gradual, which facilitates site preparation and transplanting. Method Statement for Transplanting of Aquilaria sinensis is provided in **Appendix VIII**.

5.2.7 Besides, for the other 29 nos. of Trees of Particular Interest with DBH over 1000mm in common landscape species, they are proposed to be removed due to direct conflict with the proposed road, noise barrier with pile foundation and retaining wall. Transplantation is not recommended for these trees with mature sizes in view of the technical infeasibility of forming proper root ball for transplanting for such large trees, irrecoverable form after transplanting and low chance of survival upon transplanting of the mature trees in senile age

5.2.8 Trees proposed to be retained for trees outside site boundary, out of scope of works yet will be preserved in-situ on site. During construction period, retained trees will be protected from impact due to construction activity, following the proposed 'Method Statement for Tree Preservation, Protection in **Appendix VII.** Tree Protection Plan including detail of Tree Protective Fencing is shown in **Appendix VI.**

5.2.9 Transplanting would be considered as far as possible unless the trees affected are of low conservation and amenity value, or have a low chance of surviving or recovering to its normal form after transplanting. If the trees to be transplanted to other permanent locations within site are not possible, transplant the trees to a permanent location off site. Location of receptor site should preferably be within the same area for retention of amenity value in the vicinity, following the proposed 'Method Statement for transplanting of Existing Tree' in **Appendix VIII**. 35 nos. of trees including 10 nos. of Trees of Particular Interest in species *Aquilaria sinensis* are proposed to be transplanted. Proposed transplant location of the 25 nos. of trees (excluding 10 nos. of Trees of Particular Interest) shown in the Compensatory Planting and Final Receptor Site Plan**– Appendix V**

6 COMPENSATORY TREE PLANTING PROPOSALS

6.1 Guidelines for Compensation

6.1.1 Compensatory planting should be favourably considered if space and site conditions permit, with due regard to the planting guidelines promulgated by GLTMS. The species used should be compatible with the surrounding landscape and can enhance the vegetation diversity of the local environment.

6.1.2 As far as practicable, implementation of compensatory tree planting should be of a ratio not less than 1:1 in terms of number, i.e., the quantity of compensatory trees onsite and offsite not be lower than that of the quantity of trees removed including dead trees, but excluding trees of undesirable species.

6.1.3 Under this site formation and engineering infrastructure works at KTN NDAs project, most of the trees proposed to be removed are within future housing, community, commercial and other development sites; Future housing, community and commercial design are outside the purview of CEDD. With respect to the remaining area which are mainly public roads and engineering infrastructure works, which is not practicable to achieve the compensatory tree planting in a ratio not less than 1:1 in terms of number. The trees, shrubs and woodland mix proposed to be compensated within the site boundary have been reviewed and maximized as far as possible, details are given in section 6 of this TPRP submission for consideration.

6.1.4 Sufficient space shall be provided for the planting of compensatory trees taking into the account the adequate space required to cater for the establishment and health growth of the trees up to maturity.

6.1.5 Mitigation measure on planting species selection shall also be considered as the approved EIA report for existing habitats reinstatement as far as possible.

6.2 Compensatory Planting Proposals

6.2.1 In this project, approximately 10,261 nos. of trees excluding undesired species are proposed to be removed. Compensatory trees will be planted as far as possible to reinstate the planting by compensating whip trees, or heavy standard trees. Greening and reinstating the landscape character after construction increases the amenity value in surrounding area. Trees are compensated in the same area in order to mitigate against impact to existing landscape resources and characters of the affected area by providing rehabilitation and ensuring their greening and amenity value. Compensatory planting to mitigate the loss of existing trees due to the project is proposed and illustrated in **Appendix V**, **Appendix IX** and described below: -

- Heavy Standard Trees are provided for the proposed amenity areas within the project boundary.
- Whips and shrubs for woodland mix are provided for cut and fill slopes as far as practical to compensate the loss of trees
- Native and ornamental shrub and groundcover species are proposed for roadside planters to compensate for alternative greening.
- Compensatory Woodland Planting with native tree whips are proposed in the two near Fung Kong Shan and Crest Hill as identified in the Approved EIA Report, The compensatory woodland planting will be maintained by AFCD and AFCD noted this arrangement. The planting also includes 700 no. of compensatory trees under agreement no. CE 18/2019(CE) proposed to be compensated in the Kwu Tung North Remaining Phase Works.

6.2.2 In total, approximately **11,481** nos. of on-site tree planting, including 1,781 nos. of heavy standard trees and 9,700 nos. of whip trees would be implemented by CEDD, and the compensatory tree ratio is 1:1.12 in terms of quantity. Summary of Compensatory Planting Proposal is shown below:

Table 6.1 List of Tree Species to be compensated

Location	No. of trees surveyed	Trees to be retained	Trees to be removed (Exclude undesirable species)	Compensatory tree planting
Amenity Area within the project boundary	**12,267**	152	10,261	1,781
Compensatory Woodland Planting of EIA to be compensated (Approx. 2.9 ha)	/	/	/	9,700
Total	**12,267**	**152**	**10,261**	**11,481**

6.2.3 Trees and shrubs proposed to be compensated will be planted within the site boundary. Tree Species are selected based on the 'A Landscape Born of River and Mountain' theme in North District Greening Master Plan. **Table 6.2a** shows the proposed tree species to be compensated, while proposed shrub species with size and spacing are indicated in **Table 6.2b**, proposed woodland mix species are indicated in **Table 6.2c;**

Table 6.2a List of Tree Species to be compensated

Code	Scientific Name	Chinese Name	Size	Spacing (mm)	Quantity
BIS.JAV.	**Bischofia javanica*	秋楓	Heavy standard	5000	15
BRI.TOM.	**Bridelia tomentosa*	土蜜樹	Heavy standard	5000	34
CIN.CAM.	**Cinnamomum camphora*	樟樹	Heavy standard	5000	53
CHU.TAB.	*Chukrasia tabularis*	麻楝	Heavy standard	5000	91
CLE.NER.	**Cleistocalyx nervosum*	水翁	Heavy standard	5000	71
CRA.COC.	**Cratoxylum cochinchinense*	黃牛木	Heavy standard	5000	118
DAL.ASS.	**Dalbergia assamica*	南嶺黃檀	Heavy standard	5000	20
ELA.CHI.	**Elaeocarpus chinensis*	中華杜英	Heavy standard	5000	33
ELA.HAI.	*Elaeocarpus hainanensis*	水石榕	Heavy standard	5000	31
FIC.HIP.	**Ficus hispida*	對葉榕	Heavy standard	5000	25
GAR.SUB.	*Garcinia subelliptica*	菲島福木	Heavy standard	4000	65
ILE.ROT.	**Ilex rotunda var. microcarpa*	小果鐵冬青	Heavy standard	5000	179
JAC.MIM.	*Jacaranda mimosifolia*	藍花楹	Heavy standard	5000	67
LAG.SPE.	*Lagerstroemia speciosa*	大花紫薇	Heavy standard	5000	35
LIQ.FOR.	**Liquidambar formosana*	楓香	Heavy standard	5000	48
MAC.CHE.	**Machilus chekiangensis*	浙江潤楠	Heavy standard	5000	40
MAC.CHI.	**Machilus chinensis*	華潤楠	Heavy standard	5000	10
MEL.CAJ.	*Melaleuca cajuputi. Subsp. Cumingiana*	白千層	Heavy standard	5000	42
MEL.AZE.	*Melia azedarach*	楝	Heavy standard	5000	49
MIC.NER.	**Microcos nervosa*	布渣葉	Heavy standard	5000	41
PEL.TON.	*Peltophorum tonkinense*	銀珠	Heavy standard	5000	124
PYR.CAL.	**Pyrus calleryana*	豆梨	Heavy standard	5000	89
RHU.SUC.	**Rhus succedanea*	木蠟樹	Heavy standard	5000	25
SAP.DIS.	**Sapium discolor*	山烏桕	Heavy standard	5000	83
SCH.SUP.	**Schima superba*	木荷	Heavy standard	5000	9
STE.LAN.	**Sterculia lanceolata*	假蘋婆	Heavy standard	5000	44
SYZ.LEV.	**Syzygium levinei*	山蒲桃	Heavy standard	5000	55
TAB.CHR.	*Tabebuia chrysantha*	黃花風鈴木	Heavy standard	5000	175
TER.MAN.	*Terminalia mantaly*	小葉欖仁	Heavy standard	5000	62
XAN.CHR.	*Xanthostemon chrysanthus*	金蒲桃	Heavy standard	5000	48

Table 6.2b Proposed Shrub and groundcover species to be planted for roadside planters

Scientific Name	Chinese Name	Height (mm) (H) x Spread (mm)(S)	Spacing (mm)
Allamanda schottii	硬枝黃蟬	500 (H)x 400(S)	500
*Ardisia crenata	朱砂根	400 (H)x 400(S)	500
Codiaeum variegatum	灑金榕	400 (H)x 400(S)	500
Cordyline terminalis rubra	紅鐵	800 (H)x 600(S)	500
Duranta repens 'Sapphire Showers'	五彩連翹	400 (H)x 400(S)	400
Nandina domestica	南天竺	500 (H)x 400(S)	500
*Sarcandra glabra	草珊瑚	400 (H)x 400(S)	500
Schefflera arboricola	鵝掌藤	400 (H)x 400(S)	500
Syzygium campanulatum	鐘花蒲桃	800 (H)x 600(S)	600
*Nephrolepis hirsutula	毛葉腎蕨	300 (H)x 300(S)	400
Ophiopogon intermedius	斑葉沿階草	150 (H)x 200(S)	150

Table 6.2c List of woodland mix species to be compensated

Scientific Name	Chinese Name	Size	Spacing (mm)	Percentage
**Ailanthus fordii*	常綠臭椿	Whip	1500	10%
**Castanopsis fissa*	黧蒴錐	Whip	1500	10%
** Celtis sinensis*	朴樹	Whip	1500	10%
** Cinnamomum camphora*	樟樹	Whip	1500	10%
Clausena lansium	黃皮	Whip	1500	10%
** Sapium discolor*	山烏桕	Whip	1500	10%
**Schefflera heptaphylla*	鵝掌柴	Whip	1500	10%
**Gardenia jasminoides*	梔子	400 (H)x 400(S)	500	5%
**Melastoma dodecandrum*	地稔	400 (H)x 400(S)	500	5%
**Rhaphiolepis indica*	車輪梅	400 (H)x 400(S)	500	10%
**Rhododendron simsii*	紅杜鵑	400 (H)x 400(S)	500	5%
**Rhodomyrtus tomentosa*	崗稔	400 (H)x 400(S)	500	5%

* Native species

6.2.4 Proposed soil specification for the compensatory trees shall follow the General Specification for Civil Engineering Works (2020 Edition), Section 3 Landscape Softworks and Establishment Works and Guidelines on soil Volume for Urban Trees issued by GTLMS, DEVB.

6.3 Justification for Compensatory Planting Proposal

6.3.1 Compensatory planting proposal for KTN NDAs project developments is prepared based on the best practices of tree planting promulgated by DEVB. New trees have been carefully selected to ensure that they are compatible with the new development areas.

6.3.2 For roadside tree planting areas, sufficient spaces are provided to cater for establishment and healthy growth of the trees in accordance with *Proper Planting Practice – Provide Adequate Growing Space for Future Growth of Canopy* promulgated by DEVB. All the available roadside planting spaces have been utilized for quality planting, and therefore, compensation of heavy standard trees within the site limit have been optimized.

6.3.3 The provision of 1,781 nos. of heavy standard trees as compensatory planting is considered appropriate and complying with the requirements as stipulated in DEVB TCW No. 04/2020. Compensatory Planting and Final Receptor Site Plan shall refer to **Appendix V**.

6.3.4 Though roadside planting areas cannot provide sufficient width for tree planting, native and ornamental shrubs proposed for the planters to compensate the greening of the area Planting layout plans shall refer to **Appendix V**.

6.3.5 The proposed compensatory species on compensatory woodland planting area are primarily native species which can mitigate the loss of existing greenery and enhance local biodiversity. They shall be self-sustained after establishment period which will not require regular horticultural maintenance. Woodland Compensatory tree planting plan shall refer to **Appendix IX**.

7 COMPLIANCE WITH EIA REQUIREMENT

7.1.1 The below summary table demonstrates this TPRP and compensatory planting proposal in line with AEIAR-175/2013, including recommended LVI mitigation measures.

LVI Mitigation Code		Mitigation Measure	Application to this project
7.1.2	MM4	**Tree Protection & Preservation** Existing trees to be retained within the Project Site should be carefully protected during construction. In particular, OVTs will be preserved according to ETWB Technical Circular (Works) No. 29/2004, Management Guidelines for Mature Trees and Guideline for Tree Risk Assessment and Management Arrangement by DEVB. Detailed Tree Protection Specification shall be provided in the Contract Specification. Tree risk assessment shall be undertaken in accordance with "Guidelines for Tree Risk Assessment and Management Arrangement" by DEVB.	Yes. The preservation of OVTs follow the requirement as stipulated in latest DEVB TC(W) No. 5/2020.
7.1.3	MM5	**Tree Transplantation** Trees unavoidably affected by the Project works should be transplanted where practical. Trees should be transplanted straight to their final receptor site and not held in a temporary nursery as far as possible. A detailed transplanting proposal will be submitted to relevant government departments for approval in accordance with DEVB TCW 6/2015 and 7/2015 and Guidelines on Tree Transplanting by DEVB and final locations of transplanted trees should be agreed prior to commencement of the work.	Yes. The detailed transplanting proposal submitted in accordance with latest DEVB TC(W) No. 4/2020.
7.1.4	MM6	**Slope Landscaping** Site formation has been reduced as far as possible to avoid substantial slope cutting	Yes. The site formation design is optimised.
7.1.5 7.1.6	MM7	**Compensatory Planting** Compensatory tree planting for all felled trees shall be provided to the satisfaction of relevant Government departments. Required numbers and locations of compensatory trees shall be determined and agreed separately with Government during the Tree Preservation and Removal Proposal process under DEVB TCW 7/2015. Compensatory planting is proposed at the potential open areas such as open spaces, amenity areas, open areas of the streetscapes, as well as the open areas within development lots.	Yes. The Tree Preservation and Removal Proposal submitted in accordance with latest DEVB TC(W) No. 4/2020.
7.1.7	MM8	**Woodland Compensatory Planting** Specific Woodland compensatory planting is proposed for any areas of woodland that are unavoidably affected. The location and design of the woodland compensatory planting will principally be within habitats of grassland. Native trees will be mainly selected.	Woodland compensatory planting is proposed and native species are selected
7.1.8	MM11	**Screen Planting** Tall screen/buffer trees and shrubs should be planted to assist in screening proposed road corridors and associated above ground structures such as elevated road sections and engineered embankments. This measure may additionally form part of the compensatory planting and will improve compatibility with the surrounding environment and create a pleasant pedestrian environment.	Trees are proposed at road side to achieve screen planting effect.

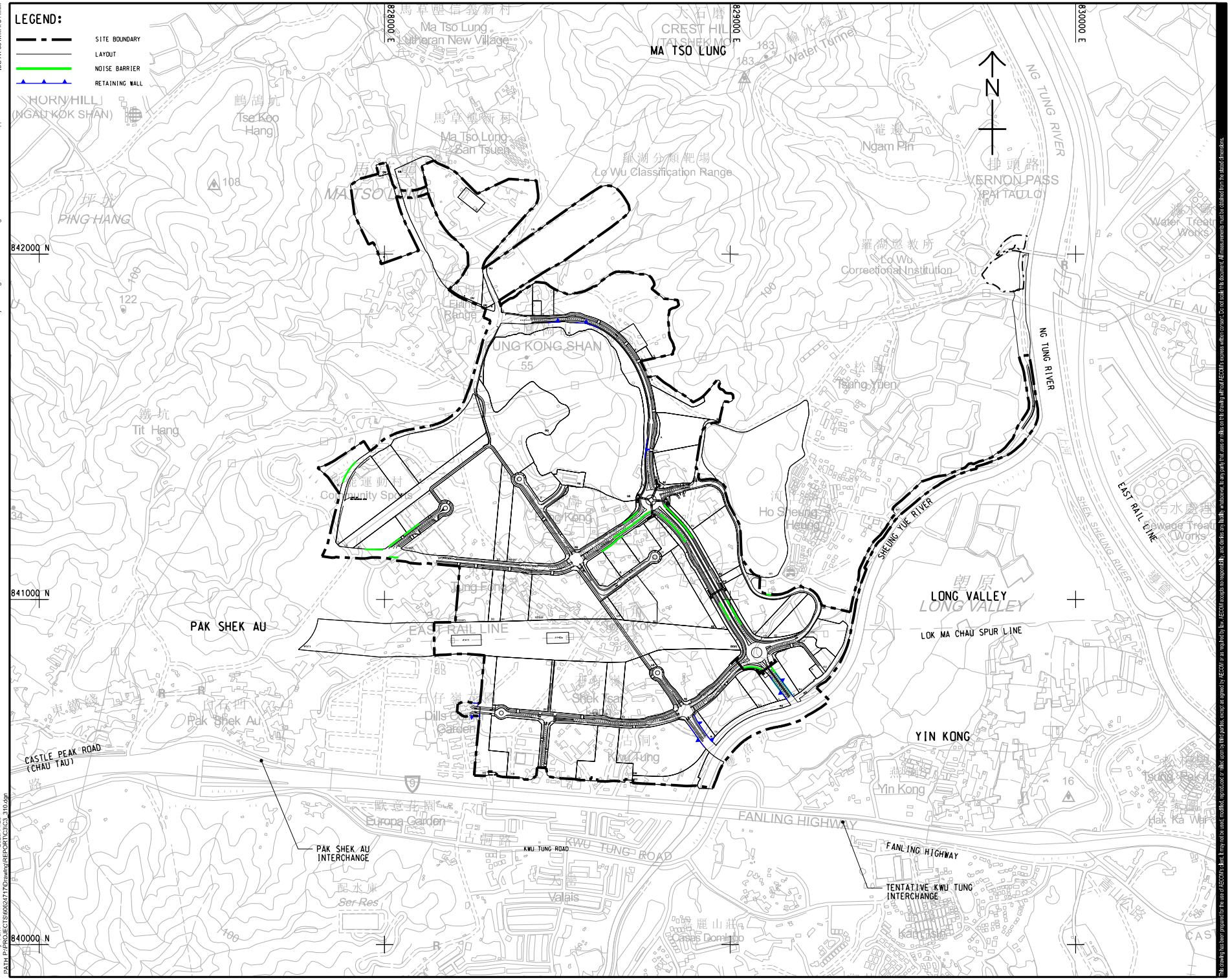
8 CONCLUSION

8.1.1 Approximately 10,296 nos. of trees excluding undesired species will be affected by the proposed works in the road works and engineering infrastructure works within the project boundary. 10,261 nos. of trees shall be removed, 35 nos. of trees shall be transplanted.

8.1.2 In view of limited available planting area and every practical opportunity for maximizing greening has been sought, the current compensatory planting proposal strikes, balance amongst healthy tree growth, slope safety, ecological and aesthetic value in long term development.

8.1.3 To compensate the loss of existing trees, approximately **11,481** nos. of on-site tree planting, including 1,781 nos. of heavy standard trees where tree planting space has been maximized to compensate the loss of existing trees due to the project site area, and approximately 2.9 ha. of Compensatory Woodland Planting that equivalent to approximately 9,700 nos. of whip trees are proposed to mitigate the loss of woodland trees in accordance with the Approved EIA Report, including 700 no. of compensatory trees under agreement no. CE 18/2019(CE) proposed to be compensated in the Kwu Tung North Remaining Phase Works. Furthermore, shrubs and groundcover will be planted for roadside planters, woodland mix of whip and shrubs will be planted for slopes for alternative greening

APPENDIX I GENERAL LAYOUT PLAN



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Designer:

Project Management Initials:

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DEVELOPMENT OF
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METRES

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PROJECT NO.
合同編號

60624717

CONTRACT NO.
合同號

CE 19/2019 (CE)

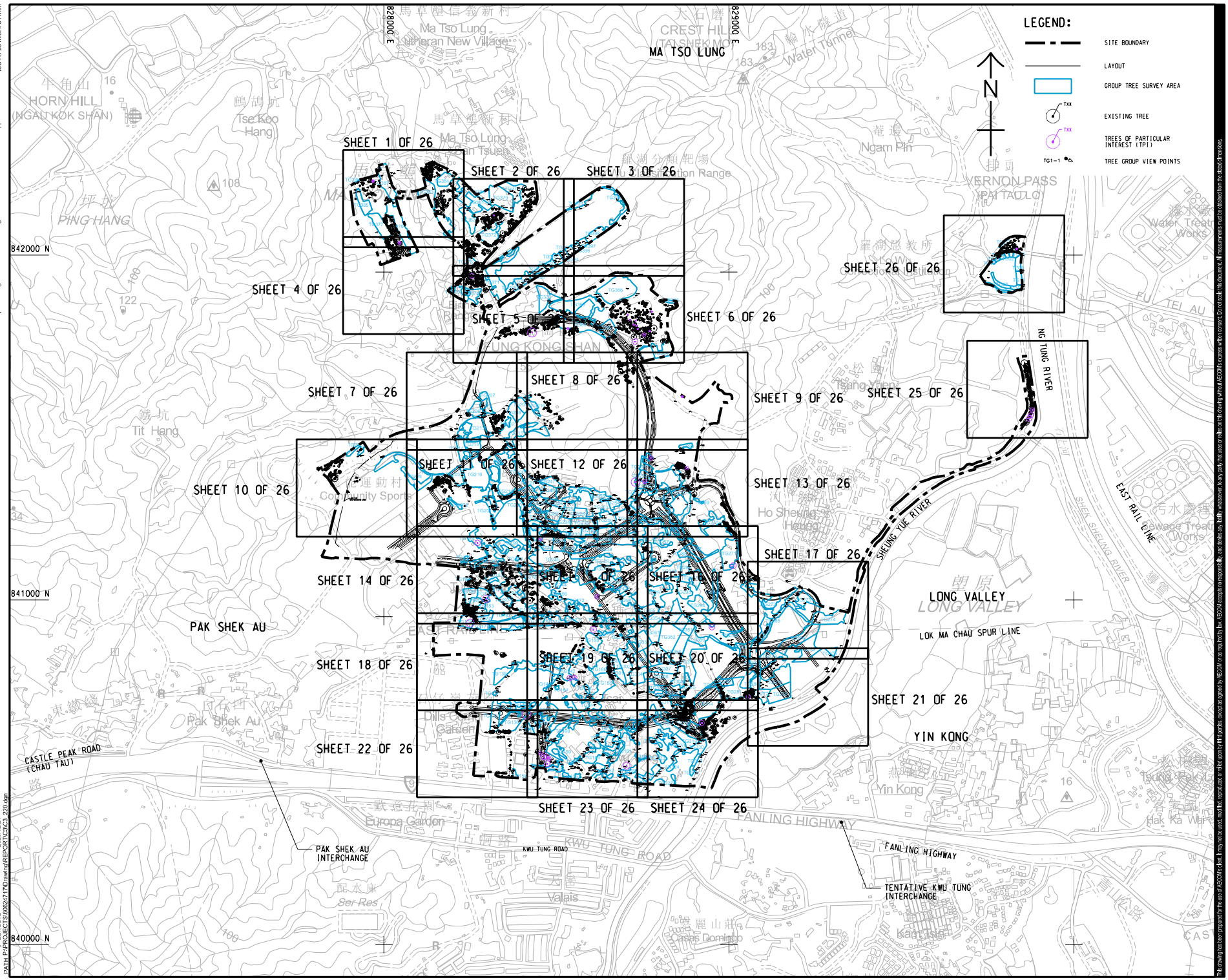
SHEET TITLE
圖紙名稱

GENERAL LAYOUT PLAN

SHEET NUMBER
圖紙編號

60624717/C3/310

APPENDIX II-A TREE SURVEY PLAN
(EXTRACTED FOR SITE KTN-2)



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PROJECT
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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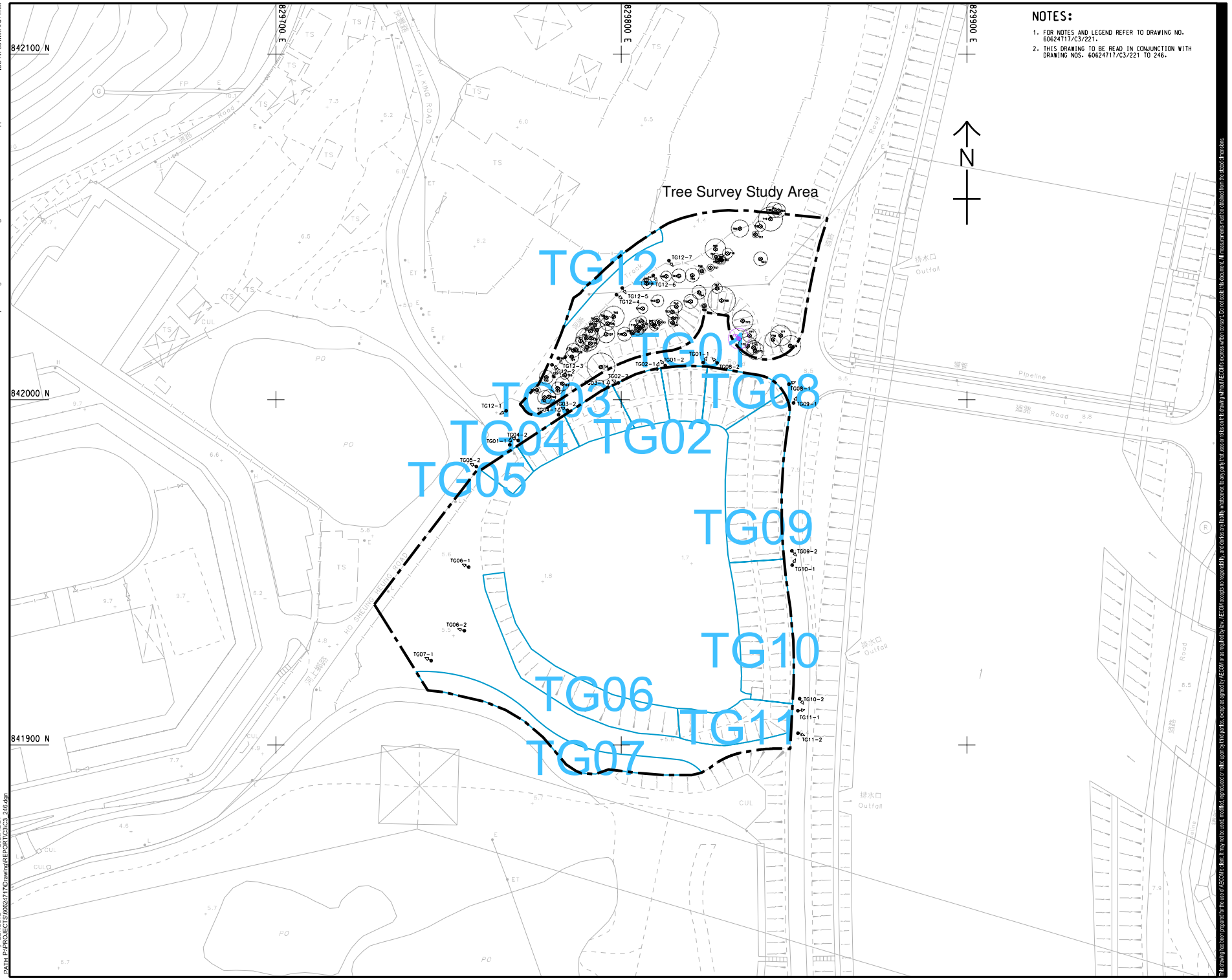

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2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60624717/C3/221 TO 246.

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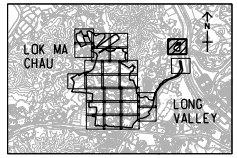

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SHEET 26 OF 26

SHEET NUMBER

60624717/C3/246

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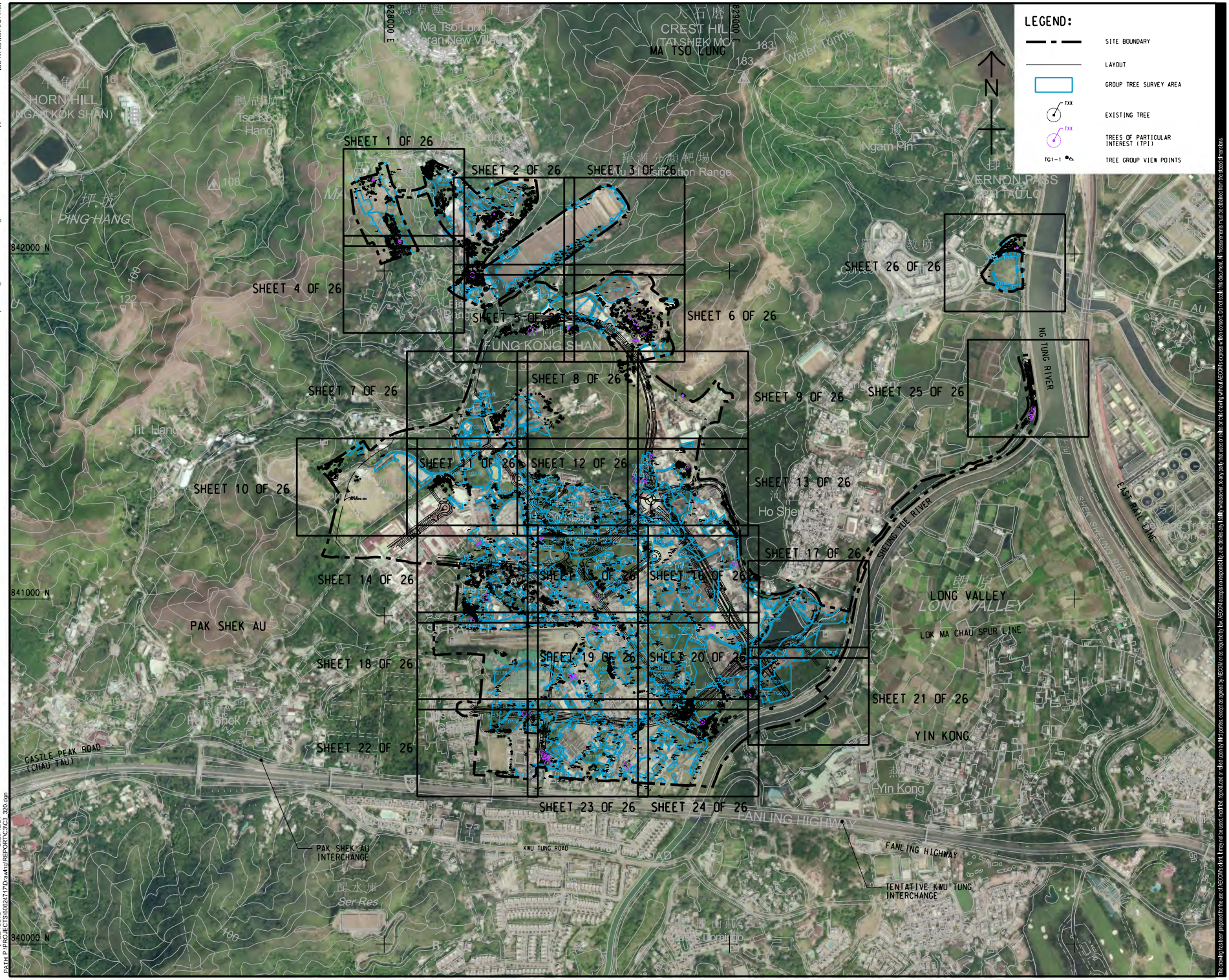
APPENDIX II-B TREE SURVEY PLAN WITH AERIAL IMAGE

(EXTRACTED FOR SITE KTN-2)



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60624717/C3/320

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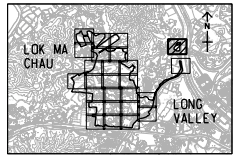

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項目編號
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CONTRACT NO.
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CE 19/2019 (CE)

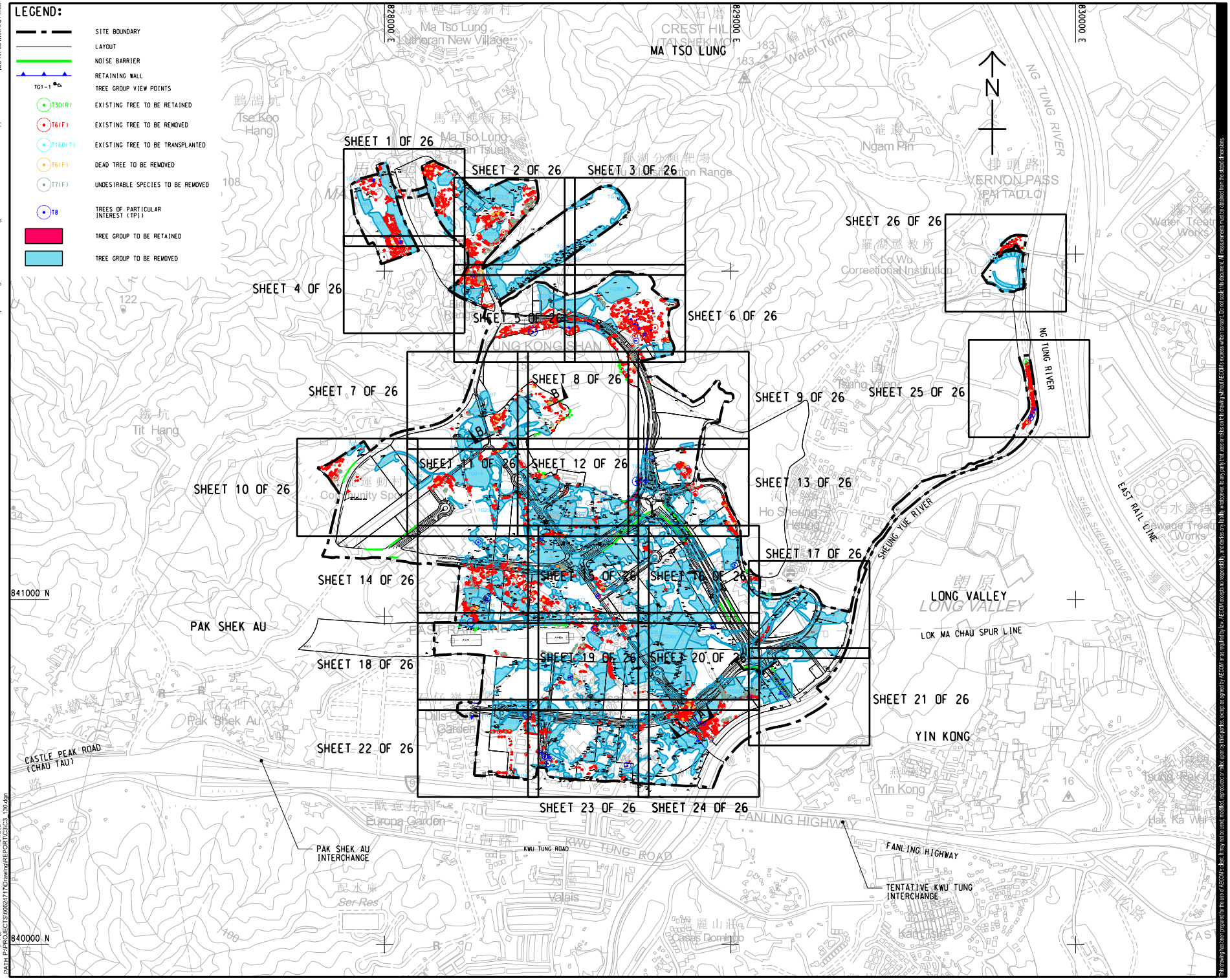
SHEET TITLE
圖紙名稱
TREE SURVEY PLAN

SHEET 26 OF 26

SHEET NUMBER
圖紙編號
60624717/C3/346

APPENDIX II-C TREE TREATMENT PLAN (WITH ENGINEERING DESIGN OVERLAID)

(EXTRACTED FOR SITE KTN-2)



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Project Management Initials:

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PROJECT
DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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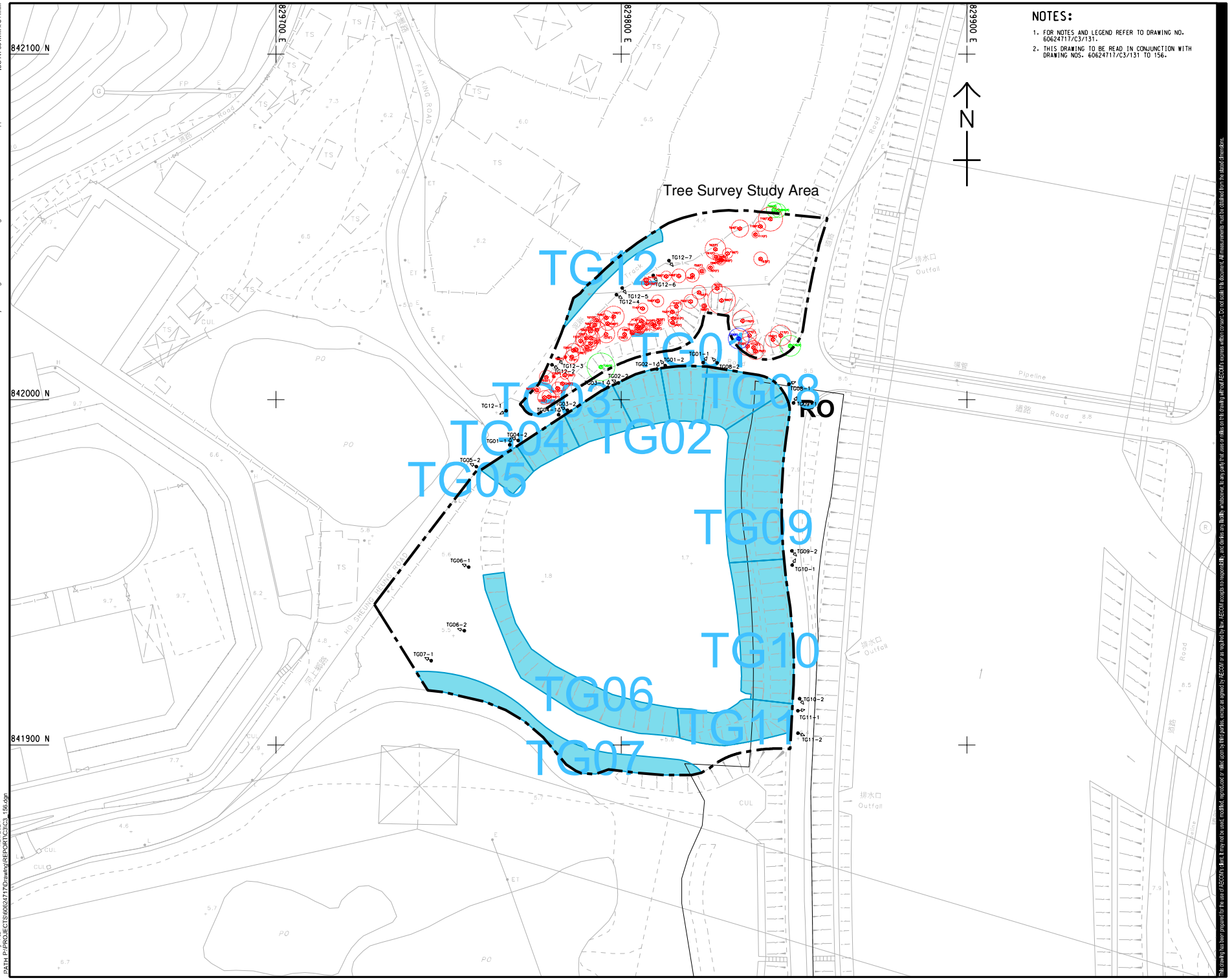
60624717

CONTRACT NO.
CE 19/2019 (CE)

SHEET TITLE
TREE TREATMENT PLAN
KEY PLAN

SHEET NUMBER
60624717/C3/130



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PROJECT

DEVELOPMENT OF KWU TUNG NORTH NEW DEVELOPMENT AREA, REMAINING PHASE - DESIGN & CONSTRUCTION

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DIMENSION UNIT: METRES

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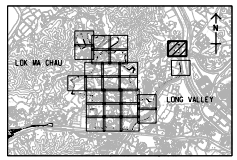

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CONTRACT NO.: CE 19/2019 (CE)

SHEET TITLE

TREE TREATMENT PLAN

SHEET 26 OF 26

SHEET NUMBER

60624717/C3/156

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1/24/2024

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APPENDIX III-A ASSESSMENT SCHEDULE -INDIVIDUAL TREE

(EXTRACTED FOR SITE KTN-2)

Tree Assessment Schedule - Individual Tree Survey
Date of Tree Survey: Jan - Aug 2023

Tree No.	Species		Measurements			Coordinates			Amenity Value	Form	Health Condition	Structural Condition	Suitability for transplanting		Conservation Status	Recommendation	Justification	Department to provide comments on TPRP		Additional Remarks	Contract
	Scientific Name	Chinese Name	Height (m)	DBH (mm)	Crown Spread (m)	Northing	Easting	Top of soil level above root collar mPD)	(High/ Medium/ Low)	(Good/ Average/ Poor)			(High/ Medium/ Low)	Remarks		(Retain / Transplant / Remove)		Before	After		
LS-T-001	Dead Tree	死樹	5.0	130	2.0	829775.54	842002.79	4.48	-	-	-	-	-	-	-	Remove	Safety	LandsD	-	dead crown; leaning; split bark	C1
LS-T-002	*Bauhinia* spp.	羊蹄甲屬	4.0	110	4.0	829779.03	842000.86	4.47	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks	C1
LS-T-003	*Ficus hispida*	對葉榕	4.0	95	4.0	829778.27	842006.51	4.46	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks	C1
LS-T-004	*Ficus hispida*	對葉榕	6.0	150	5.0	829792.93	842020.24	4.45	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems	C1
LS-T-005	*Ficus hispida*	對葉榕	4.0	135	3.0	829791.11	842019.86	4.46	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; close to chain-link fence	C1
LS-T-006	*Ficus hispida*	對葉榕	4.0	105	3.0	829792.38	842021.67	4.45	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; close to chain-link fence	C1
LS-T-007	*Ficus hispida*	對葉榕	4.0	130	2.0	829792.87	842023.05	4.43	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; climbers on crown; close to chain-link fence	C1
LS-T-008	*Ficus hispida*	對葉榕	6.0	120	4.0	829796.04	842022.05	4.46	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; climbers on crown	C1
LS-T-009	*Ficus hispida*	對葉榕	5.0	180	4.0	829795.63	842023.74	4.47	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems	C1
LS-T-010	*Ficus hispida*	對葉榕	6.0	120	5.0	829804.71	842021.18	4.45	Low	Poor	Average	Poor	Low	a, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks; leaning; unbalanced crown; root collar close to LS-T-011 and LS-T-040	C1
LS-T-011	*Ficus hispida*	對葉榕	6.0	110	3.0	829805.40	842020.77	4.46	Low	Poor	Average	Poor	Low	a, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; leaning; root collar close to LS-T-010 and LS-T-040	C1
LS-T-012	*Ficus hispida*	對葉榕	5.0	120	3.0	829806.13	842021.30	4.44	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems	C1
LS-T-013	*Ficus hispida*	對葉榕	5.0	100	3.0	829805.86	842022.72	4.45	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks	C1
LS-T-014	*Ficus hispida*	對葉榕	5.0	150	3.0	829806.16	842026.42	4.43	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks; broken branches; unbalanced crown; climbers on crown	C1
LS-T-015	*Ficus hispida*	對葉榕	4.0	145	3.0	829807.32	842033.62	4.43	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks; climbers on crown	C1
LS-T-016	*Ficus hispida*	對葉榕	4.0	190	3.0	829830.74	842042.33	4.45	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; broken trunk; poor taper	C1
LS-T-017	*Carica papaya*	番木瓜	4.0	110	2.0	829838.84	842047.82	4.45	Medium	Average	Average	Average	Medium	-	Nil	Remove	Conflict with proposed site formation works	LandsD	-	-	C1
LS-T-018	*Ficus virens*	黃葛樹	4.0	180	3.0	829840.24	842050.20	4.46	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	poor taper; climbers on crown	C1
LS-T-019	*Acacia auriculiformis*	耳果相思	11.0	350	7.0	829843.18	842052.32	4.46	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; leaning; close to chain-link fence	C1
LS-T-022	*Leucaena leucocephala*	銀合歡	8.0	125	4.0	829777.78	842000.62	4.48	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-023	*Leucaena leucocephala*	銀合歡	8.0	95	3.5	829781.59	842003.31	4.48	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; poor taper	C1
LS-T-024	*Leucaena leucocephala*	銀合歡	8.0	95	4.0	829782.93	842004.65	4.47	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-025	*Leucaena leucocephala*	銀合歡	3.0	130	1.0	829780.42	842006.72	4.46	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; broken trunk	C1
LS-T-026	*Leucaena leucocephala*	銀合歡	8.0	140	2.5	829783.63	842007.13	4.44	Medium	Average	Average	Average	Low	g	Nil	Remove	Undesirable species	LandsD	-	-	C1
LS-T-027	*Leucaena leucocephala*	銀合歡	8.0	155	4.0	829785.68	842012.41	4.44	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	multi-trunk; poor taper	C1
LS-T-028	Dead Tree	死樹	4.5	110	1.0	829783.79	842012.32	4.43	-	-	-	-	-	-	-	Remove	Safety	LandsD	-	dead crown; on slope; close to chain-link fence	C1
LS-T-029	*Leucaena leucocephala*	銀合歡	3.0	150	1.5	829786.84	842014.46	4.43	Low	Poor	Poor	Average	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	broken main trunk	C1
LS-T-030	*Leucaena leucocephala*	銀合歡	8.0	120	4.0	829786.12	842014.26	4.43	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; on slope	C1
LS-T-031	*Leucaena leucocephala*	銀合歡	8.0	160	3.0	829788.21	842017.01	4.45	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; close to chain-link fence	C1
LS-T-032	*Leucaena leucocephala*	銀合歡	8.0	110	3.0	829790.04	842015.30	4.46	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-033	*Leucaena leucocephala*	銀合歡	8.0	100	4.0	829791.02	842016.30	4.44	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-034	*Leucaena leucocephala*	銀合歡	8.5	220	5.0	829791.24	842017.77	4.43	Low	Average	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	codominant trunks; included bark	C1
LS-T-035	*Leucaena leucocephala*	銀合歡	8.0	165	6.0	829789.86	842017.83	4.45	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; twisted branches	C1
LS-T-036	*Bombax ceiba*	木棉	12.0	550	8.0	829794.12	842009.49	7.75	Medium	Average	Average	Average	Low	d	Nil	Retain	-	LandsD	LandsD	on slope; broken branches	C1
LS-T-037	*Leucaena leucocephala*	銀合歡	8.0	205	5.0	829795.59	842018.94	4.42	Medium	Average	Average	Average	Low	g	Nil	Remove	Undesirable species	LandsD	-	dead branches	C1
LS-T-038	*Leucaena leucocephala*	銀合歡	8.0	130	4.0	829800.92	842018.95	4.43	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	twisted trunk	C1
LS-T-039	*Leucaena leucocephala*	銀合歡	7.5	95	1.5	829803.17	842019.44	4.43	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-040	*Leucaena leucocephala*	銀合歡	8.5	170	2.0	829804.73	842020.57	4.47	Low	Average	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	codominant trunks; included bark; root collar close to LS-T-010 and LS-T-011	C1
LS-T-041	*Leucaena leucocephala*	銀合歡	8.0	110	2.0	829809.01	842021.87	4.42	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-042	*Leucaena leucocephala*	銀合歡	8.0	120	3.0	829809.53	842021.54	4.42	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning	C1
LS-T-043	*Leucaena leucocephala*	銀合歡	6.0	120	2.0	829810.91	842022.37	4.42	Low	Poor	Poor	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	uprooted; collasped	C1
LS-T-044	*Leucaena leucocephala*	銀合歡	4.0	100	2.5	829814.86	842022.29	4.67	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; poor taper	C1
LS-T-045	*Leucaena leucocephala*	銀合歡	7.0	140	6.0	829797.81	842024.07	4.41	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	codominant trunks; leaning; climbers on crown	C1
LS-T-046	*Leucaena leucocephala*	銀合歡	4.0	130	3.5	829810.54	842028.59	4.49	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	twisted trunks; unbalanced crown; climbers on crown	C1
LS-T-047	*Leucaena leucocephala*	銀合歡	4.0	110	1.5	829807.18	842034.65	4.43	Medium	Average	Average	Average	Low	g	Nil	Remove	Undesirable species	LandsD	-	broken branches; climbers on crown; close to chain-link fence	C1
LS-T-048	*Leucaena leucocephala*	銀合歡	3.5	100	3.0	829813.00	842035.74	4.44	Medium	Average	Average	Average	Low	g	Nil	Remove	Undesirable species	LandsD	-	on slope; climbers on crown	C1

Tree No.	Species		Measurements			Coordinates			Amenity Value	Form	Health Condition	Structural Condition	Suitability for transplanting		Conservation Status	Recommendation	Justification	Department to provide comments on TPRP		Additional Remarks	Contract
	Scientific Name	Chinese Name	Height (m)	DBH (mm)	Crown Spread (m)	Northing	Easting	Top of soil level above root collar mPD)	(High/ Medium/ Low)	(Good/ Average/ Poor)			(High/ Medium/ Low)	Remarks		(Retain / Transplant / Remove)		Before	After		
LS-T-049	*Leucaena leucocephala*	銀合歡	4.0	150	4.0	829816.68	842035.84	4.45	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; broken main branches; multi-stems; climbers on crown	C1
LS-T-050	*Leucaena leucocephala*	銀合歡	7.5	175	4.0	829820.08	842028.46	5.78	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	on slope; leaning	C1
LS-T-051	*Flueggea virosa*	白飯樹	2.5	130	3.0	829814.99	842023.52	4.45	Medium	Average	Average	Poor	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; broken branches; climbers on crown	C1
LS-T-052	*Flueggea virosa*	白飯樹	2.5	165	3.5	829814.78	842025.46	4.45	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; broken branches	C1
LS-T-053	*Flueggea virosa*	白飯樹	2.5	95	3.5	829815.89	842027.01	4.42	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; broken branches	C1
LS-T-054	*Leucaena leucocephala*	銀合歡	5.0	150	4.0	829822.48	842031.09	4.67	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	on slope; extensive epicormic shoots	C1
LS-T-055	*Flueggea virosa*	白飯樹	2.5	260	4.0	829820.55	842036.05	4.46	Medium	Poor	Average	Average	Low	f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-stems; broken branches; climbers on crown	C1
LS-T-056	*Leucaena leucocephala*	銀合歡	4.5	240	2.0	829823.31	842037.26	4.46	Low	Poor	Poor	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	uprootes; collasped	C1
LS-T-057	*Leucaena leucocephala*	銀合歡	8.0	95	2.0	829825.80	842038.22	4.45	Low	Average	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	growing on grasscrete	C1
LS-T-058	*Leucaena leucocephala*	銀合歡	8.0	100	2.0	829828.29	842040.36	4.47	Low	Poor	Average	Average	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	on slope	C1
LS-T-059	*Ficus hispida*	對葉榕	4.0	100	3.0	829828.82	842040.50	4.48	Low	Poor	Average	Poor	Low	a, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	unbalanced form; broken branches	C1
LS-T-060	*Leucaena leucocephala*	銀合歡	8.0	130	2.0	829829.10	842040.44	4.48	Low	Poor	Poor	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	uprooted; collasped	C1
LS-T-061	*Leucaena leucocephala*	銀合歡	8.0	110	2.0	829827.36	842041.36	4.49	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; on slope	C1
LS-T-062	*Leucaena leucocephala*	銀合歡	8.0	280	6.0	829827.25	842043.57	4.43	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; poor taper	C1
LS-T-063	*Leucaena leucocephala*	銀合歡	6.0	130	4.0	829840.32	842040.78	4.49	Low	Poor	Poor	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	multi-stems; uprooted; collasped	C1
LS-T-064	*Leucaena leucocephala*	銀合歡	8.0	200	5.0	829834.34	842049.54	4.41	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	trunk twisted with fence	C1
LS-T-065	*Ficus virens*	黃葛樹	8.0	180	4.0	829845.56	842054.73	4.46	Medium	Average	Average	Average	Medium	-	Nil	Retain	-	LandsD	LandsD	on slope	C1
LS-T-066	*Acacia auriculiformis*	耳果相思	8.0	320	4.5	829844.24	842054.96	4.46	Medium	Poor	Average	Poor	Low	f	Nil	Retain	-	LandsD	LandsD	codominant trunks; included bark; leaning; broken branches; on slope	C1
LS-T-067	*Leucaena leucocephala*	銀合歡	4.0	210	3.0	829827.72	842032.26	4.43	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	broken branches; leaning; extensive epicormic shoots; on slope	C1
LS-T-068	*Leucaena leucocephala*	銀合歡	8.0	215	1.5	829823.98	842027.12	7.73	Low	Poor	Average	Poor	Low	a, f, g	Nil	Remove	Undesirable species	LandsD	-	leaning; broken branches; on slope	C1
LS-T-069	*Ficus virens*	黃葛樹	10.0	520	8.0	829829.01	842028.72	6.78	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; unbalanced crown; broken branches; epiphytes on trunk; on slope	C1
LS-T-070	*Ficus virens*	黃葛樹	12.0	710	6.0	829835.14	842022.84	6.43	Medium	Average	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; broken branches; on slope	C1
LS-T-071	*Delonix regia*	鳳凰木	4.0	180	4.0	829837.09	842018.59	6.24	Low	Poor	Average	Poor	Low	a, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	leaning; unbalanced crown; on slope	C1
LS-T-072	*Ficus microcarpa*	榕樹	10.0	1,020	7.5	829833.96	842017.68	7.82	Medium	Average	Average	Average	Low	d	Nil	Retain	-	LandsD	LandsD	TPI (DBH>1000mm); multi-trunks; broken branches; on slope	C1
LS-T-073	*Acacia confusa*	台灣相思	8.0	320	5.5	829836.56	842015.46	7.91	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	multi-trunks; leaning; broken branches; on slope	C1
LS-T-074	*Acacia confusa*	台灣相思	10.0	450	4.0	829838.28	842015.12	7.90	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	codominant trunks; included bark; unbalanced form; on slope	C1
LS-T-075	*Ficus microcarpa*	榕樹	10.0	570	5.0	829838.80	842014.10	7.92	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	leaning; on slope	C1
LS-T-076	*Eucalyptus urophylla*	尾葉桉	10.0	440	6.0	829848.88	842015.59	8.51	Medium	Poor	Average	Poor	Low	d, f	Nil	Retain	-	LandsD	LandsD	leaning; boken branches; on slope	C1
LS-T-077	*Acacia confusa*	台灣相思	9.0	530	6.0	829846.14	842018.57	6.45	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	included bark in main branch collar; unbalanced crown; on slope	C1
LS-T-078	*Acacia confusa*	台灣相思	9.0	360	4.5	829843.91	842017.44	5.95	Medium	Poor	Average	Poor	Low	d, f	Nil	Remove	Conflict with proposed site formation works	LandsD	-	included bark in main branch collar; unbalanced crown; borken branches; on slope	C1
T00837	*Litsea glutinosa*	潺槁樹	8	194	4	840489.54	828342.86	12.82	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LandsD	-	Restricted root, co-dominant leaders	C1
T00838	*Callistemon viminalis*	串錢柳	6	213	4	840510.80	828365.63	12.57	Medium	Poor	Average	Poor	Low	f,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted root, leaning, crossed branches	C1
T00839	*Callistemon viminalis*	串錢柳	7	414	4	840514.63	828366.09	12.58	Medium	Poor	Average	Average	Low	f,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted root, leaning, co-dominant leaders	C1
T00840	*Callistemon viminalis*	串錢柳	6	258	4	840520.76	828366.35	12.57	Medium	Poor	Average	Average	Low	f,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted root, leaning, v-crotch	C1
T00841	*Callistemon viminalis*	串錢柳	6	309	4	840535.05	828367.82	12.64	Medium	Poor	Average	Poor	Low	f,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted root, leaning, extensive trunk wound	C1
T00842	*Bischofia javanica*	秋楓	12	427	8	840497.52	828352.76	12.74	Medium	Average	Average	Average	Low	h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, co-dominant leaders	C1
T00843	*Aleurites moluccana*	石栗	12	331	6	840497.52	828348.75	12.74	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, multiple attachments, imbalanced crown	C1
T00844	*Bischofia javanica*	秋楓	12	366	6	840497.78	828344.87	12.73	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, dieback, imbalanced crown	C1
T00845	*Aleurites moluccana*	石栗	11	271	5	840497.76	828341.03	12.75	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, low live crown ratio	C1
T00846	*Aleurites moluccana*	石栗	12	334	7	840498.19	828333.22	12.69	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, multiple attachments	C1
T00847	*Bischofia javanica*	秋楓	13	528	8	840498.88	828329.21	12.71	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, co-dominant leaders	C1
T00848	*Aleurites moluccana*	石栗	12	315	6	840498.32	828325.41	12.73	Medium	Poor	Average	Average	Low	f,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted root, co-dominant leaders, imbalanced crown	C1
T00852	*Callistemon viminalis*	串錢柳	11	484	7	840601.75	828330.64	12.60	Medium	Poor	Average	Average	Low	f,h	Nil	remove	conflict with proposed site formation works	LCSD	-	Restricted root, crooked trunk, imbalanced crown, co-dominant leaders	C1

APPENDIX III-B ASSESSMENT SCHEDULE - GROUP TREE
(EXTRACTED FOR SITE KTN-2)

Tree Assessment Schedule - Group Tree Survey
Date of Tree Survey: Jan - May 2023

Tree Group No.	Species		Estimated Quantity of each Species	Estimated Tree Quantity within this Group	Estimated Tree Quantity within this Group (Exclude undesirable species)	Estimated Measurements			Overall Amenity Value	Overall Form	Overall Health Condition	Overall Structural Condition	Overall Suitability for transplanting		Conservation Status					Justification	Department to provide comments on TPRP		Additional Remarks	Contract
	Scientific Name	Chinese Name				Height (m)	DBH (mm)	Crown Spread (m)	(High/ Medium/ Low)	(Good (G)/ Average(A) / Poor(P))			(High/ Medium/ Low)	Remarks		% of Retain	Retain	Transplant	Remove		Before	After		
LS-TG-001	*Leucaena leucocephala*	銀合歡	18	20	2	7.0-8.0	95-150	1.5-3.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	20	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
	Macaranga tanarius var. *tomentosa*	血桐	2			2.0-2.5	95-110	1.5-2.0	Medium	Average	Average	Poor	Low	on grasscrete s	Nil					conflict with proposed site formation works			on grasscrete slope	
LS-TG-002	*Leucaena leucocephala*	銀合歡	16	16	0	7.0-8.0	95-150	1.5-3.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	16	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
LS-TG-003	*Leucaena leucocephala*	銀合歡	16	16	0	6.0-7.0	95-200	2.0-3.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	16	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
LS-TG-004	*Leucaena leucocephala*	銀合歡	10	12	2	4.0-8.0	95-150	1.5-3.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	12	Undesirable species	LandsD	-	on grasscrete slope; leaning; broken branches; undesirable species	C1
	Macaranga tanarius var. *tomentosa*	血桐	1			5.0	150	3.5	Medium	Average	Average	Poor	Low	on grasscrete slope	Nil					conflict with proposed site formation works			on grasscrete slope	
	Melia azedarach	楝	1			9.5	250	7.0	Medium	Average	Average	Poor	Low	trunk conflicting with fence	Nil								included bark in main branch collar; trunk conflicting with fence	
LS-TG-005	*Ficus hispida*	對葉榕	1	9	1	4.0	130	1.5	Medium	Poor	Average	Average	Low	poor form	Nil	0%	0	0	9	conflict with proposed site formation works	LandsD	-	leaning; unbalanced crown	C1
	Leucaena leucocephala	銀合歡	8			5.0-8.0	95-180	1.5-4.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species	Nil					Undesirable species			leaning; undesirable species	
LS-TG-006	*Leucaena leucocephala*	銀合歡	18	19	1	6.0-8.0	95-150	2.5-5.0	Low-Medium	Average	Average	Average	Low	undesirable species	Nil	0%	0	0	19	Undesirable species	LandsD	-	undesirable species	C1
	Macaranga tanarius var. *tomentosa*	血桐	1			5.0	100	4.0	Medium	Poor	Average	Average	Low	poor form	Nil					conflict with proposed site formation works			-	
LS-TG-007	*Ficus microcarpa*	榕樹	1	7	2	6.0	250	6.0	Medium	Average	Average	Average	Medium	-	Nil	0%	0	0	7	conflict with proposed site formation works	LandsD	-	-	C1
	Leucaena leucocephala	銀合歡	5			6.-8.0	95-200	1.5-4.0	Low-Medium	Average	Average	Average	Low	undesirable species	Nil					Undesirable species			undesirable species	
	Melia azedarach	楝	1			10.0	350	7.0	Medium	Average	Average	Average	Medium	-	Nil					conflict with proposed site formation works			-	
LS-TG-008	*Leucaena leucocephala*	銀合歡	15	15	0	3.5-7.0	95-150	1.5-3.0	Low-Medium	Average	Average	Poor	Low	undesirable species; on grasscrete slope	Nil	0%	0	0	15	Undesirable species	LandsD	-	on grasscrete slope; undesirable species	C1
LS-TG-009	*Leucaena leucocephala*	銀合歡	15	16	1	3.5-6.0	95-150	1.5-3.0	Low-Medium	Poor	Average	Poor	Low	undesirable species; on grasscrete slope	Nil	0%	0	0	16	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
	Macaranga tanarius var. *tomentosa*	血桐	1			4.0	95	3.5	Medium	Poor	Average	Poor	Low	on grasscrete slope	Nil					conflict with proposed site formation works			on grasscrete slope; leaning	
LS-TG-010	*Leucaena leucocephala*	銀合歡	15	15	0	3.5-6.0	95-150	1.5-3.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	15	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
LS-TG-011	*Leucaena leucocephala*	銀合歡	15	15	0	3.5-8.0	95-150	1.5-5.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species; on grasscrete slope	Nil	0%	0	0	15	Undesirable species	LandsD	-	on grasscrete slope; leaning; undesirable species	C1
LS-TG-012	*Ficus hispida*	對葉榕	1	3	2	8.0	350	5.0	Medium	Poor	Poor	Poor	Low	poor form, health and structure	Nil	0%	0	0	3	conflict with proposed site formation works	LandsD	-	large wound on trunk; exyensive climber on crown; unbalanced crown	C1
	Leucaena leucocephala	銀合歡	1			8.0	120	6.0	Low-Medium	Poor	Average	Poor	Low	poor form; undesirable species	Nil					Undesirable species			leaning; poor taper; undesirable species	
	Macaranga tanarius var. *tomentosa*	血桐	1			3.0	95	2.0	Medium	Average	Average	Average	Medium	-	Nil					conflict with proposed site formation works			-	
TG133	*Leucaena leucocephala*	銀合歡	35	50	15	7-15	200-250	6-8	L	P	A	A	L		Nil	0%	0	0	50	undesirable species	LandsD	-	Restricted roots, invasive species, poor form	C1
	Acacia confusa	台灣相思	10			9-11	250-300	4-7	M	A	A	A	L		Nil					conflict with proposed road works & site formation			Restricted roots, large size	
	Ficus microcarpa	榕樹(細葉榕)	2			6-8	200-250	5-7	M	A	A	A	L		Nil								Restricted roots	
	Macaranga tanarius var. tomentosa	血桐	2			7-9	100-200	5-8	M	P	A	A	L		Nil								Restricted roots, poor form, Poor taper	
	Dead tree	死樹	1			6	200	3	-	-	-	-	-	-	-					safety			Dead tree	
	Leucaena leucocephala	銀合歡	20			8-12	200-250	5-6	L	P	A	A	L		Nil					undesirable species			Restricted roots, invasive species, poor form	

APPENDIX III-C ASSESSMENT SCHEDULE – TREE OF PARTICULAR INTEREST (TPI)

(EXTRACTED FOR SITE KTN-2)

Agreement No.CE19/2019
Development of Kwu Tung North New Development Area, Remaining Phase

Tree Assessment Schedule - Individual Tree Survey
Date of Tree Survey: Jan - Aug 2023

Tree No.	Species		Measurements			Coordinates			Amenity Value	Form	Health Condition	Structural Condition	Suitability for transplanting		Conservation Status	Recommendation	Justification	Department to provide comments on TPRP		Additional Remarks	Contract
	Scientific Name	Chinese Name	Height (m)	DBH (mm)	Crown Spread (m)	Northing	Easting	Top of soil level above root	(High/ Medium/ Low)	(Good/ Average/ Poor)			(High/ Medium/ Low)	Remarks		(Retain / Transplant / Remove)		Before	After		
LS-T-072	*Ficus microcarpa*	榕樹	10.0	1,020	7.5	829833.96	842017.68	-	Medium	Average	Average	Average	Low	d	Nil	Retain	-	LandsD	LandsD	TPI (DBH>1000mm); multi-trunks; broken branches; on slope	C1
T00873	Ficus microcarpa	榕樹(細葉榕)	13	1070	11	840557.25	828448.87	10.78	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted root, multiple attachments, dead branches, pest attack, DBH>1m	C1
T00875	Ficus microcarpa	榕樹(細葉榕)	16	1432	20	840547.21	828465.03	10.95	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed road works	LandsD	-	Restricted root, multiple attachments, dead branch, large size, DBH>1m	C1
T00876	Ficus microcarpa	榕樹(細葉榕)	16	1155	16	840543.80	828463.68	11.03	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed road works	LandsD	-	Restricted root, multiple attachments, dieback, dead branches, large size, DBH>1m	C1
T00880	Ficus microcarpa	榕樹(細葉榕)	17	2416	17	840525.16	828472.93	11.14	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed site formation works	LandsD	-	Restricted root, imbalanced crown, multiple attachments, large size, DBH>1m	C1
T00881	Ficus microcarpa	榕樹(細葉榕)	15	1311	9	840542.12	828475.38	10.98	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed site formation works	LandsD	-	Restricted root, leaning, multiple attachments, dead branches, large size, DBH>1m	C1
T00882	Ficus microcarpa	榕樹(細葉榕)	15	2328	11	840539.46	828479.25	11.21	Medium	Poor	Average	Average	Low	b,d,f,h	Nil	remove	conflict with proposed site formation works	LandsD	-	Restricted root, multiple attachments, conflicts with building, large size, DBH>1m	C1
T01002	Ficus microcarpa	榕樹(細葉榕)	12	2323	20	840519.33	828702.99	8.07	Medium	Average	Average	Average	Low	b,d,h	Nil	Remove	conflict with proposed site formation works	LCSD	-	Restricted roots, large size, DBH>1m	C1
T01117	Ficus elastica	印度榕(印度橡樹)	16	1020	18	840914.05	828607.29	11.16	Medium	Average	Average	Average	Low	b,d,h	Nil	Remove	conflict with proposed site formation works	LandsD	-	Restricted roots, large size, DBH>1m	C1
T01983	Ficus elastica	印度榕(印度橡樹)	16	1060	25	840667.72	828412.70	13.19	Medium	Average	Average	Average	Low	b,d,h	Nil	remove	conflict with proposed road works	LCSD	-	Restricted roots, multiple trunks, large size, DBH>1m	C2
T02151	Cinnamomum camphora	樟	14	1040	16	840773.17	828538.27	12.72	Medium	Average	Average	Average	Low	d,h	Nil	remove	conflict with proposed site formation works	LandsD	-	Restricted roots, multiple stems, large size, DBH>1m	C1
T02152	Dead tree	死樹	12	1302	14	840774.63	828552.33	12.44	-	-	-	-	-	-	-	remove	safety	LandsD	-	Dead crown, DBH>1m	C1
T02287	Ficus microcarpa	榕樹(細葉榕)	6	1025	14	841009.12	828617.24	9.43	Medium	Poor	Average	Average	Low	h	Nil	remove	conflict with proposed road works	LandsD	-	Restricted roots, multiple trunks, DBH>1m	C1
T02349	Ficus microcarpa	榕樹(細葉榕)	10	1282	13	841411.65	828774.30	14.55	Medium	Average	Average	Average	Low	f,h	Nil	remove	conflict with proposed road works	LandsD	-	Restricted roots, multiple trunks, climbers, DBH>1m	C1
T02411	Ficus microcarpa	榕樹(細葉榕)	11	1120	11	841381.91	828877.86	14.11	Medium	Average	Average	Average	Low	f,h	Nil	remove	conflict with proposed site formation works	HyD	-	Restricted root, multiple stems, aerial roots, DBH>1m	C1

APPENDIX IV-A INDIVIDUAL TREE PHOTOGRAPHIC RECORDS

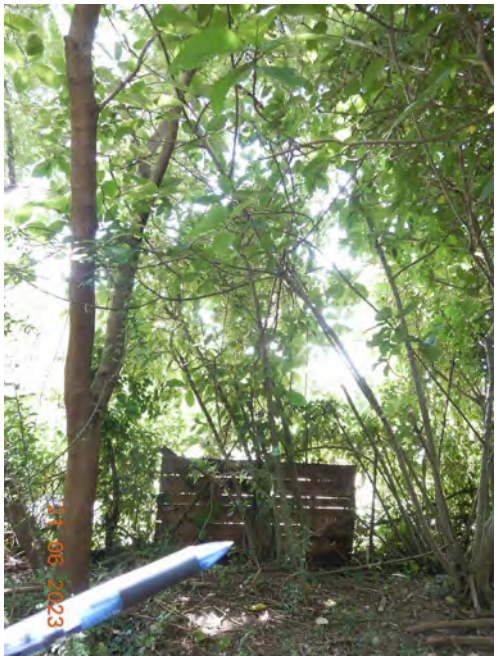
(EXTRACTED FOR SITE KTN-2)

LS-T-001_1_Dead tree_Overview_Remove

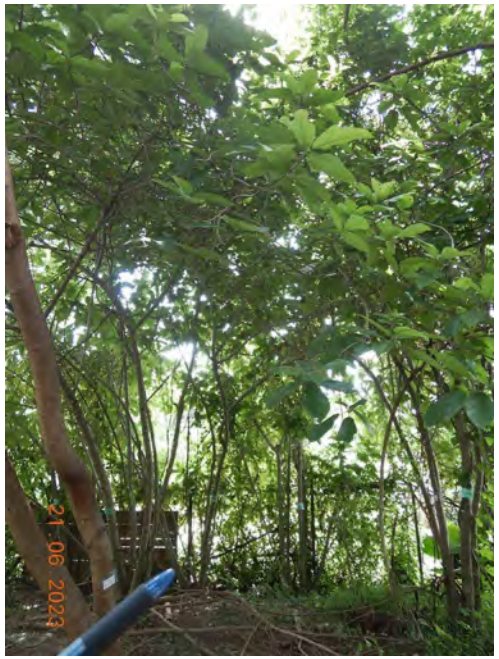
LS-T-002_1_Bauhinia spp._Overview_Remove

LS-T-003_1_Ficus hispida_Overview_Remove

LS-T-004_1_Ficus hispida_Overview_Remove



LS-T-005_1_Ficus hispida_Overview_Remove



LS-T-006_1_Ficus hispida_Overview_Remove

LS-T-007_1_Ficus hispida_Overview_Remove

LS-T-008_1_Ficus hispida_Overview_Remove

LS-T-009_1_Ficus hispida_Overview_Remove

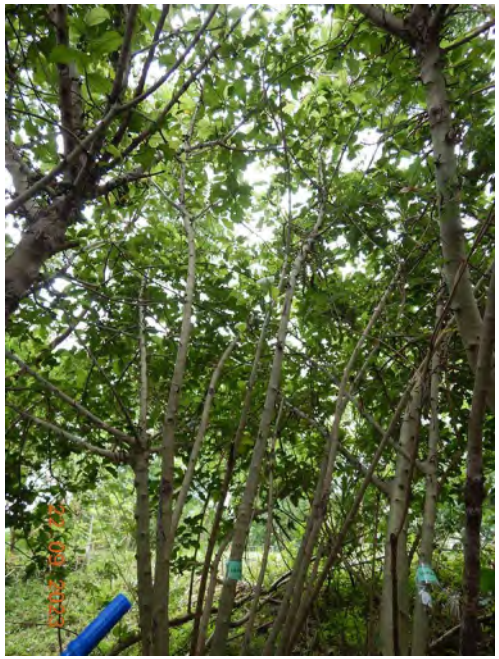
LS-T-010_1_Ficus hispida_Overview_Remove

LS-T-010_2_Ficus hispida_Crown_Remove

LS-T-010_3_Ficus hispida_Trunk_Remove

LS-T-011_2_Ficus hispida_Crown_Remove

LS-T-011_3_Ficus hispida_Trunk_Remove



LS-T-012_2_Ficus hispida_Crown_Remove

LS-T-012_3_Ficus hispida_Trunk_Remove

LS-T-013_2_Ficus hispida_Crown_Remove

LS-T-013_3_Ficus hispida_Trunk_Remove

LS-T-014_1_Ficus hispida_Overview_Remove

LS-T-015_1_Ficus hispida_Overview_Remove

LS-T-016_1_Ficus hispida_Overview_Remove

LS-T-017_1_Carica papaya_Overview_Retain

LS-T-018_1_Ficus virens_Overview_Retain

LS-T-019_1_Acacia auriculiformis_Overview_Retain

LS-T-022_1_Leucaena leucocephala_Overview_Remove

LS-T-023_1_Leucaena leucocephala_Overview_Remove

LS-T-024_1_Leucaena leucocephala_Overview_Remove

LS-T-025_1_Leucaena leucocephala_Overview_Remove

LS-T-026_1_Leucaena leucocephala_Overview_Remove

LS-T-027_1_Leucaena leucocephala_Overview_Remove

LS-T-028_1_Dead tree_Overview_Remove

LS-T-029_1_Leucaena leucocephala_Overview_Remove

LS-T-030_1_Leucaena leucocephala_Overview_Remove

LS-T-031_1_Leucaena leucocephala_Overview_Remove

LS-T-032_1_Leucaena leucocephala_Overview_Remove

LS-T-033_1_Leucaena leucocephala_Overview_Remove

LS-T-034_2_Leucaena leucocephala_Crown_Remove

LS-T-034_3_Leucaena leucocephala_Trunk_Remove

LS-T-034_4_Leucaena leucocephala_Root_Remove

LS-T-035_2_Leucaena leucocephala_Crown_Remove

LS-T-035_3_Leucaena leucocephala_Trunk_Remove

LS-T-036_1_Bombax ceiba_Overview_Retain

LS-T-036_2_Bombax ceiba_Crown_Retain

LS-T-036_3_Bombax ceiba_Trunk_Retain

LS-T-036_4_Bombax ceiba_Root_Retain

LS-T-037_1_Leucaena leucocephala_Overview_Remove

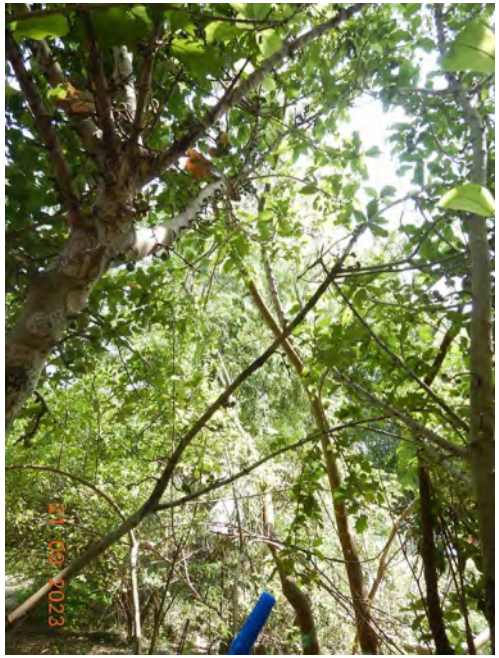
LS-T-038_1_Leucaena leucocephala_Overview_Remove

LS-T-039_2_Leucaena leucocephala_Crown_Remove

LS-T-039_3_Leucaena leucocephala_Trunk_Remove

LS-T-040_2_Leucaena leucocephala_Crown_Remove

LS-T-040_3_Leucaena leucocephala_Trunk_Remove

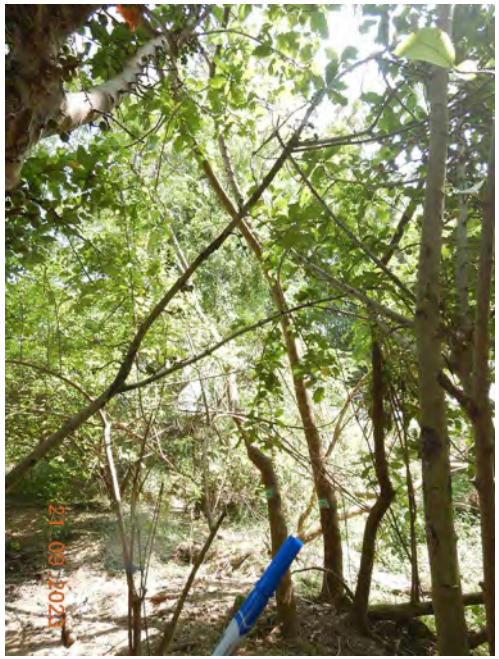


LS-T-041_2_Leucaena leucocephala_Crown_Remove

LS-T-041_3_Leucaena leucocephala_Trunk_Remove

LS-T-042_1_Leucaena leucocephala_Overview_Remove

LS-T-042_2_Leucaena leucocephala_Crown_Remove



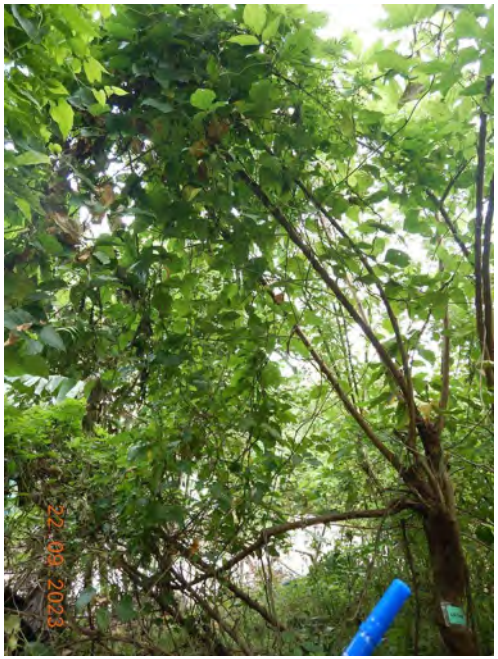
LS-T-042_3_Leucaena leucocephala_Trunk_Remove

LS-T-043_1_Leucaena leucocephala_Overview_Remove

LS-T-044_1_Leucaena leucocephala_Overview_Remove

LS-T-045_2_Leucaena leucocephala_Crown_Remove

LS-T-045_3_Leucaena leucocephala_Trunk_Remove



LS-T-046_2_Leucaena leucocephala_Crown_Remove

LS-T-046_3_Leucaena leucocephala_Trunk_Remove

LS-T-047_2_Leucaena leucocephala_Crown_Remove

LS-T-047_3_Leucaena leucocephala_Trunk_Remove

LS-T-048_1_Leucaena leucocephala_Overview_Remove

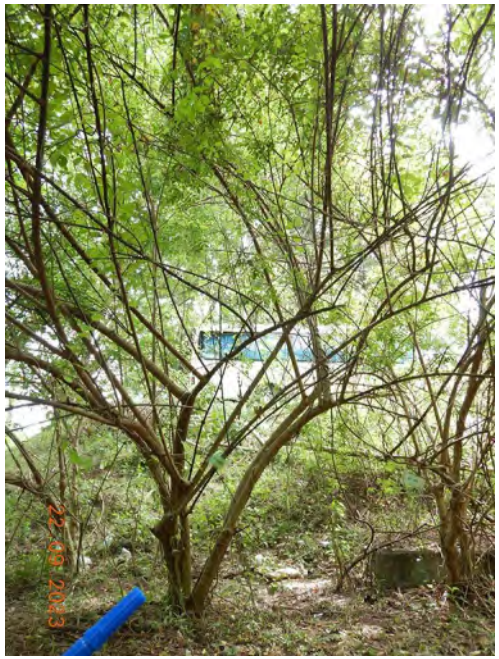
LS-T-049_1_Leucaena leucocephala_Overview_Remove

LS-T-050_2_Leucaena leucocephala_Crown_Remove

LS-T-050_3_Leucaena leucocephala_Trunk_Remove

LS-T-051_1_Flueggea virosa_Overview_Remove

LS-T-052_2_Flueggea virosa_Crown_Remove



LS-T-052_3_Flueggea virosa_Trunk_Remove

LS-T-053_1_Flueggea virosa_Overview_Remove

LS-T-054_1_Leucaena leucocephala_Overview_Remove

LS-T-055_1_Flueggea virosa_Overview_Remove

LS-T-056_1_Leucaena leucocephala_Overview_Remove

LS-T-057_2_Leucaena leucocephala_Crown_Remove

LS-T-057_4_Leucaena leucocephala_Root_Remove

LS-T-058_2_Leucaena leucocephala_Crown_Remove

LS-T-058_3_Leucaena leucocephala_Trunk_Remove

LS-T-058_4_Leucaena leucocephala_Root_Remove

LS-T-059_1_Ficus hispida_Overview_Remove

LS-T-060_1_Leucaena leucocephala_Overview_Remove

LS-T-061_2_Leucaena leucocephala_Crown_Remove

LS-T-061_3_Leucaena leucocephala_Trunk_Remove

LS-T-061_4_Leucaena leucocephala_Root_Remove

LS-T-062_2_Leucaena leucocephala_Crown_Remove

LS-T-062_3_Leucaena leucocephala_Trunk_Remove

LS-T-063_1_Leucaena leucocephala_Overview_Remove

LS-T-064_1_Leucaena leucocephala_Overview_Retain

LS-T-065_2_Ficus virens_Crown_Retain

LS-T-065_4_Ficus virens_Root_Retain

LS-T-066_2_Acacia auriculiformis_Crown_Retain

LS-T-066_3_Acacia auriculiformis_Trunk_Retain

LS-T-067_1_Leucaena leucocephala_Overview_Remove

LS-T-068_1_Leucaena leucocephala_Overview_Remove

LS-T-069_1_Ficus virens_Overview_Remove

LS-T-069_2_Ficus virens_Crown_Remove

LS-T-069_3_Ficus virens_Trunk_Remove

LS-T-069_4_Ficus virens_Root_Remove

LS-T-070_2_Ficus virens_Crown_Remove

LS-T-070_3_Ficus virens_Trunk_Remove

LS-T-070_4_Ficus virens_Root_Remove

LS-T-071_2_Delonix regia_Crown_Remove

LS-T-071_3_Delonix regia_Trunk_Remove

LS-T-072_1_Ficus microcarpa_Overview_Retain

LS-T-072_2_Ficus microcarpa_Crown_Retain

LS-T-072_3_Ficus microcarpa_Trunk_Retain

LS-T-072_4_Ficus microcarpa_Root_Retain

LS-T-072_4_Ficus microcarpa_Root (2)_Retain

LS-T-073_1_Acacia confusa_Overview_Remove

LS-T-073_2_Acacia confusa_Crown_Remove

LS-T-073_3_Acacia confusa_Trunk_Remove

LS-T-073_4_Acacia confusa_Root_Remove

LS-T-073_4_Acacia confusa_Root(2)_Remove

LS-T-074_1_Acacia confusa_Overview_Remove

LS-T-074_2_Acacia confusa_Crown_Remove

LS-T-074_3_Acacia confusa_Trunk_Remove

LS-T-074_4_Acacia confusa_Root_Remove

LS-T-074_4_Acacia confusa_Root(2)_Remove

LS-T-075_1_Ficus microcarpa_Overview_Remove

LS-T-075_2_Ficus microcarpa_Crown_Remove

LS-T-075_3_Ficus microcarpa_Trunk_Remove

LS-T-075_4_Ficus microcarpa_Root_Remove

LS-T-076_1_Eucalyptus urophylla_Overview_Retain

LS-T-077_2_Acacia confusa_Crown_Retain

LS-T-077_3_Acacia confusa_Trunk_Retain

LS-T-077_4_Acacia confusa_Root_Retain

LS-T-078_2_Acacia confusa_Crown_Retain

LS-T-078_3_Acacia confusa_Trunk_Retain

LS-T-078_4_Acacia confusa_Root_Retain

APPENDIX IV-B GROUP TREE PHOTOGRAPHIC RECORDS
(EXTRACTED FOR SITE KTN-2)

LS-TG-001_V1

LS-TG-001_V2

LS-TG-002_V1

LS-TG-002_V2

LS-TG-003_V1

LS-TG-003_V2


LS-TG-004_V1

LS-TG-004_V2


LS-TG-005_V1

LS-TG-005_V2

LS-TG-006_V1

LS-TG-006_V2

LS-TG-007_V1

LS-TG-008_V1

LS-TG-008_V2

LS-TG-009_V1

LS-TG-009_V2

LS-TG-010_V1

LS-TG-010_V2

LS-TG-011_V1

LS-TG-011_V2

LS-TG-012_V1

LS-TG-012_V2

LS-TG-012_V3

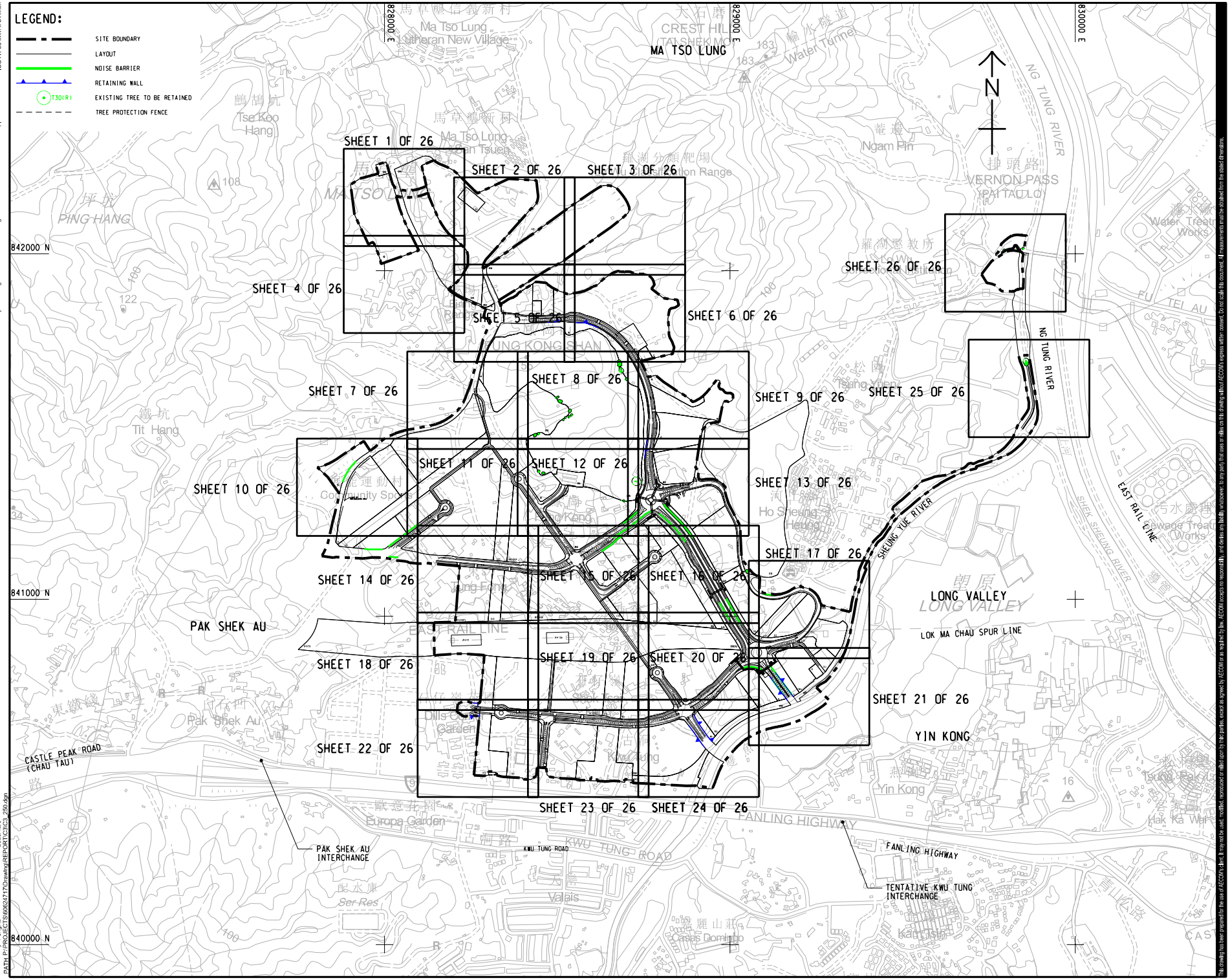
LS-TG-012_V4

LS-TG-012_V5

LS-TG-012_V6

LS-TG-012_V7

APPENDIX VI TREE PROTECTION PLAN
(EXTRACTED FOR SITE KTN-2)



AECOM

PROJECT

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT

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

CONSULTANT

AECOM Asia Company Ltd.
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SUB-CONSULTANTS

ISSUE/REVISION

IR	DATE	DESCRIPTION	CHK.

STATUS

SCALE: A1 1 : 5000

DIMENSION UNIT: METRES

KEY PLAN

PROJECT NO.: 60624717

CONTRACT NO.: CE 19/2019 (CE)

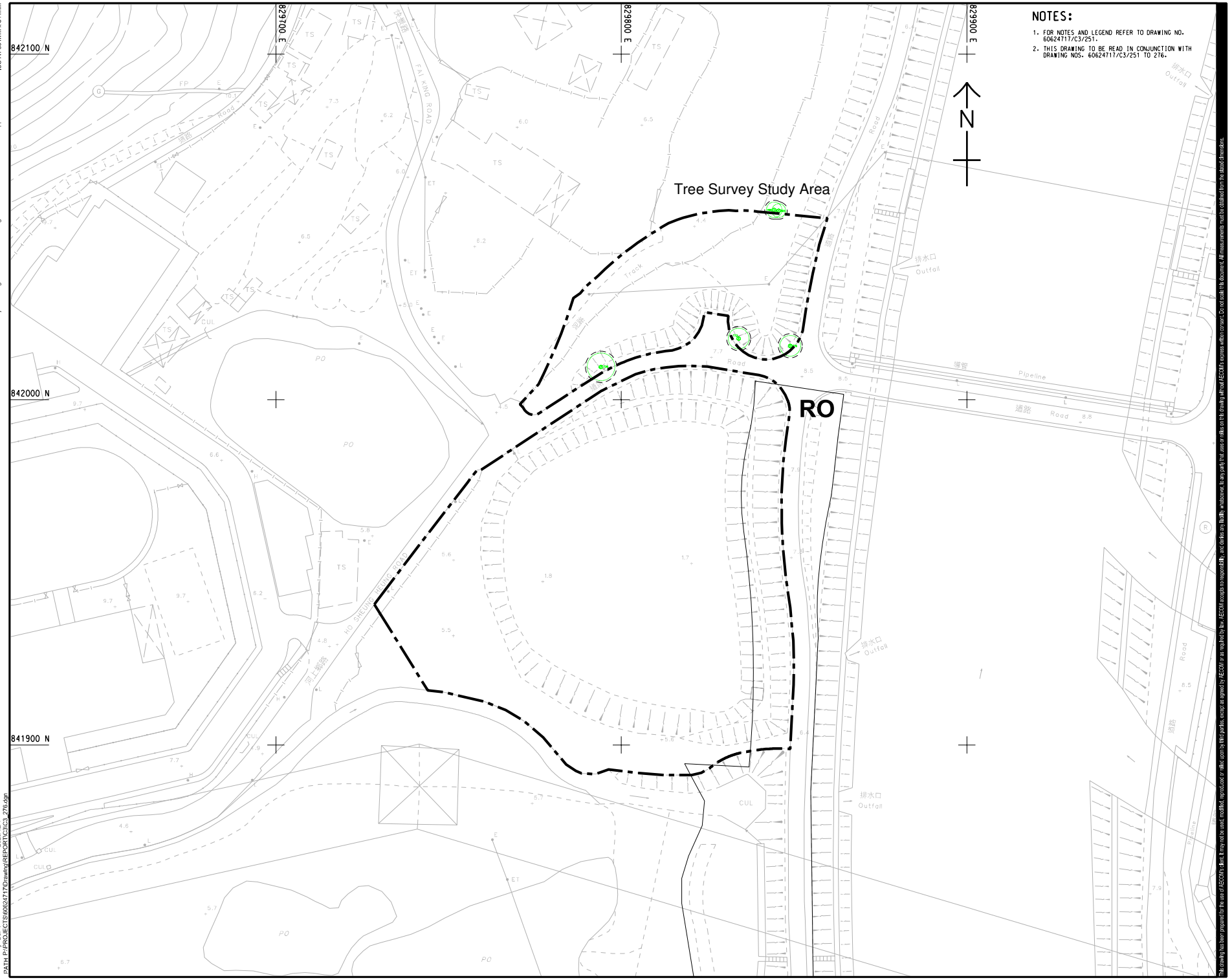
SHEET TITLE

TREE PROTECTION PLAN
KEY PLAN

SHEET NUMBER

60624717/C3/250

ISO A1 594mm x 841mm
Approved:
Checked:
Designer:
Project Management Initials:
Plot File by: PengX2
PATH P:\PROJECTS\60624717\Drawing\REPORT\C3\C3_250.dgn
2023/12/8



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ISSUE/REVISION

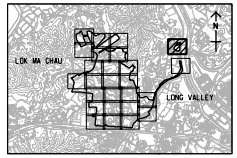
I/R	DATE	DESCRIPTION	CHK.

STATUS

SCALE A1 1 : 500

DIMENSION UNIT METRES

KEY PLAN A1 1 : 50000



PROJECT NO. 60624717

CONTRACT NO. CE 19/2019 (CE)

SHEET TITLE

TREE PROTECTION PLAN

SHEET 26 OF 26

SHEET NUMBER

60624717/C3/276

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

Plot File by: DuP1
PATH: P:\PROJECTS\60624717\Drawing\REPORT\C3\C3_276.dgn
2023/12/4

APPENDIX VII METHOD STATEMENT FOR TREE PROTECTION DURING CONSTRUCTION PERIOD

Tree Preservation and Protection Measures

1. GENERAL

A landscape specialist contractor from the "List of Approved Suppliers of Materials and Specialist Contractors for Public Works – Landscaping: Class I – General Landscape Work" shall be engaged to carry out the arboricultural works that shall include but not be limited to tree protection, tree surgery work, control of pests and diseases. .

The contractor shall assign tree protection issues to a suitably qualified and experienced full-time member of the site staff. This member of staff shall be responsible for monitoring and reporting on all tree related issues. All tree survey /arboricultural work shall be supervised by a qualified Arborist (ISA Certified Arborist or HKILA Accredited Arborists) or Registered Landscape Architect.

Tree Protection Zones (TPZs) shall be erected for trees identified for preservation. TPZs shall be clearly demarcated in the overall layout plan, and adequately protected by robust fencing at the commencement of the site formation and construction works.

Tree protection zone encompassing the tree along its dripline projecting vertically from the tree canopy and extending 2 meters at the ground level and 2 meters above the top of the tree as Tree Protection Zone (TPZ) in accordance with DEVB TC(W) 5/2020.

2. TREE FELLING ADJACENT TO RETAINED TREE

Prior to starting any tree felling works, all trees to be retained shall be identified and the necessary tree protection fencing installed. The limits of site clearance shall be agreed by the Landscape Architect/Architect on the Site before site clearance commences. The Contractor shall comply with the following requirements.

Felling of trees to be removed shall involve the complete removal of trees indicated on the approved, including stumps, by one of the following methods to be approved by the Landscape Architect before work commences:

a) Bulldozer
   A bulldozer shall be used to push over the whole tree which shall then be cut by chain saw and removed from Site. The method shall only be used where no trees are to be retained.
b) Winches
   Power mounted or hand winches shall be used for pulling over the whole tree, the main support roots having first be severed either by mechanical means or by hand grubbing. Preserved trees shall not be used as anchor points for winching without approved adequate protection.
c) Chain Saw
   Felling by this method shall be in accordance with BS3998 (1989), either felling the whole tree at once or in sections. The stump shall be removed by hand grubbing and winching; stump cutting machine; hydraulic lifting or another method approved by the Architect before work commences.

Safety Precautions: Take all necessary safety precautions to protect the people engaged in the tree felling work as well as the people and property in the vicinity throughout the whole process of tree felling. Tree trunks and branches shall be removed in sections for reasons of safety and in such a manner that any potential damage to the public and adjacent utilities, services or pipes, structure, slopes or vegetation is avoided.

In respect of tree felling, the Contractor shall:

i. Fell the trees by cutting them near the ground, with their stumps ground rather
ii. Remove the stumps and rootballs of the felled trees carefully to avoid causing damage to the roots of the nearby plants to be retained.
iii. Do not use a preserved tree as anchor when winching out a stump,
iv. Remove all debris, wood, and roots where necessary from the trees felled from the Site as soon as possible. Burning of vegetation or any other construction debris is not permitted, and
v. All voids formed as a result of the above works shall be backfilled with clean material as appropriate.

Carting away for felled trees: Tree trunks and branches shall be removed in sections for reasons of safety and in such a manner that any potential damage to the public and adjacent utilities, services or pipes, structure, slopes or vegetation is avoided.

3. WORKS NEAR EXISTING TREES

Where excavation is required near existing trees for construction of works, the following precautions shall be taken to protect the roots:-

a) Roots exposed during excavation shall be wrapped with straw or hessian during construction of the works. Cutting of the roots shall be kept to a minimum;

b) Before backfilling, roots shall be cut cleanly back to living tissue ;

c) Excavation shall be backfilled with topsoil mixed with conditioner as specified including sufficient slow release fertilizer to assure a rate of application of 500 g/m³

Trench excavation for services, including drainage and sewage, shall be kept to a minimum of 1.5m from the tree trunk. Detailed location of services shall be agreed with the Architect before excavation commences if this minimum cannot be achieved. Large roots exposed in trench excavations and above the final line of the installation shall be preserved, and excavation close to trees shall be carried out with particular care to ensure this. Following installation of the services, severed roots shall be cut back cleanly to living tissue. Trenches shall be backfilled as specified, except that where topsoil is required, sufficient slow release fertilizer to assure a rate of application of 500 g/m3 shall be applied.

4. PROTECTION OF EXISTING TREES

The Contractor shall submit a detailed Tree Preservation and Protection Method

Statement for the Landscape Architect's approval before commencing any works on site.

a) To protect the trees to be retained, the Contractor shall exercise the greatest care to avoid any damage to them and shall comply with the following for the whole duration of the Contract:

- No unnecessary intrusions into areas of existing trees are to be made;
- no access routes will be allowed to pass through existing tree stands;
- the limits of site clearance are to be agreed with the Landscape Architect/Engineer on site before site clearance commences;
- no nails or other fixings shall be driven into trees;
- no fencing or signs shall be attached to trees;
- no materials or machinery shall be stored under or against trees;
- no workshop, canteens, or similar shall be installed beneath trees, nor shall equipment maintenance etc. be carried out under trees;
- no trees shall be used as anchors for ropes or chains used in guying, pulling and the like;
- no fires shall be lit inside or within 5m of the tree protection zone(TPZ);
- no unauthorised stripping of surface vegetation from around the tree;
- no concrete mixing or use or washing out of chemicals shall take place within the tree protection zone;
- Any necessary scarification or cultivation within the TPZ(s) shall be carried out carefully by hand so as not to cause damage to the trees, in particular the bark and the roots,
- Any equipment, in particular delivery vehicles, overhead cranes, mechanical excavations, drilling rigs and piling rigs, shall be carefully operated so as not to cause striking of the trunks, branches, foliage or root collars of the trees,
- The trees to be felled that are adjacent to, or that lie within a continuous canopy of, the preserved trees, shall be carefully removed, and if necessary in sections but not using bulldozers in any circumstances, so as not to cause damage to the preserved trees such as scraping bark off trunks or breaking branches of trees,
- Where it is necessary to use herbicides to kill any vegetation, herbicides that can leach through the soil, such as the products containing sodium chlorate, and any other herbicides that are injurious to the trees shall not be used,
- Allowance shall be made for the slope of the ground so that damaging materials such as concrete washings, mortar or diesel oil cannot run towards the trees,
- Alkaline clays or limestone shall not be used for filling or paving, concrete shall be mixed on a thick plastic tarpaulin or outside the Site, and mixing trucks shall not be rinsed out on the Site, so as not to cause changes, in particular increases, in soil pH, and
- All building debris and chemical wastes shall be hauled away for proper disposal, and in any circumstances shall not be burned or buried on the Site or be disposed of by pouring them on the soil within the Site.
- Without the prior approval of the Engineer, the Contractor shall not change the existing ground levels within the TPZ(s) of the preserved trees unless the Contract explicitly requires such changes.

b) To enhance the health and the appearance of the retained trees, advance tree surgery works may be required prior to any construction activity. The following tree surgery work may be required.

i. Removal of broken, damaged and diseased branches;

ii. Removal of weak or crossing branches to ensure a well-balanced crown.

iii. Securing of trees with cables throughout the construction period.

iv. All pruning works/ tree surgery works shall be submitted to the Landscape Architect for approval prior to works commencement.

A. Precautions in carrying out excavation

The Contractor shall take the following precautions when carrying out excavation that involves cutting of the roots of the preserved trees:

i. Excavation shall be carried out using only hand-held tools such as hoe and spade, but not mechanical diggers or bulldozers in any circumstances,

ii. Whenever roots are encountered and before root cutting is carried out, soil shall be carefully forked away from the roots using hand-held tools up to the edge along which root cutting is required,

iii. Root cutting shall be carried out carefully using sterilized hand-held pruning tools, and roots greater than 25 mm in diameter shall be pruned carefully so as not to result in shattered and frayed roots,

iv. Any roots damaged during excavation shall be cut back cleanly with sharp tools to undamaged tissue and treated with an approved fungicidal dressing prior to backfilling,

v. All cut and exposed roots shall be prevented from drying out during excavation by adopting the following measures until backfilling, unless otherwise agreed by the Architect:

vi. Wrap the tap roots, sinker roots, support roots, and roots with diameter exceeding 50 mm, which shall not be cut, with hessian, straw or other porous, absorbent fabric once they are exposed,

vii. Hang thick hessian or other porous, absorbent fabric from top of the cut surface over the exposed roots and soil immediately after root cutting, and

viii. Mist the hessian or fabric in a frequency that keeps the roots and the soil at the cut surface moist all the time,

ix. The hessian, straw or other porous, absorbent fabric and the hessian or fabric shall be removed immediately before backfilling, and

x. Excavations shall be backfilled with soil mix incorporated with slow release

fertilizer at a rate of 500 g/m3 or at a rate as directed by the Architect to a level not higher than the original soil level at the root collar.

B. Precautions to avoid root damage

The Contractor shall take the following precautions when carrying out drilling work that involves cutting of the roots of the preserved trees:

i. Drilling work and root cutting work shall be carried out carefully,
ii. Roots greater than 25 mm in diameter shall be pruned carefully in order to prevent shattered and frayed roots, and
iii. Any roots damaged during drilling shall be cut back cleanly with sharp tools to undamaged tissue and treated with an approved fungicidal dressing.

d) No root pruning will be allowed within the TPZ of the retained trees to avoid irreversible and irreparable damage as far as possible

C. Crown Thinning

Generally, no crown thinning should be necessary on the retained trees except where preparation works for crown pruning are required or as per item 4. i and ii above. The contractor shall submit method statements for the proposed crown thinning works to the Landscape Architect prior to commencing pruning works .

D. Root Pruning

Generally, no root pruning shall be permitted on the retained trees except where permission for pruning has been obtained in the Approved Tree Removal Application or for trees identified for transplanting. The contractor shall submit method statements for the proposed pruning works to the Landscape Architect/Engineer prior to commencing root pruning works.

E. Securing and Staking retained Trees

During construction work and for the duration of the contract, should the site conditions require (e.g. local excavations in the vicinity of tree roots or removal of adjacent trees thus exposing retained trees to risk of wind blow). The contractor shall be liable for the cost of reinstatement of any tree that dies or is damaged due to lack of support and protection.

Physical support should be installed for selected trunks to ensure stability of retained trees. The anchoring material and guying method will be submitted to maintenance department for approval prior to installation. Trunk and branches should be protect with 2mm thick and 150-190mm wide flexible rubber pad to minimize damages to the trees. The area of trunk guyed above ground shall be wrapped with pads of hessian or rubber to prevent the tie from chafing the trunk or branches

F. Pruning works

Damaged branches or branches that must be removed shall be carefully pruned using a sharp clean implement to give a single flat sloping face cut and wounds shall be left open to the air to self heal. All pruning works are to be supervised by a qualified arborist and are to be in accordance with recognised best practice including the Development Bureau's guidelines on pruning works. Method statement for tree pruning shall be submitted to the Landscape Architect for approval prior to commencing of works.

G. Pests & Fungal Growth

The site shall be regularly checked for any insect or termite attack or fungus infestation particularly during known periods of activity. Remedial measures shall be carried out. Use of sprayed insecticide/fungicides shall only be permitted in strict accordance with the manufacturer's instructions. Use of such materials shall be undertaken with due care and have regard to the safety and convenience of the general public and is to be carefully controlled to avoid unnecessary dispersion. In the case of termite attack, specialists shall be employed by the contractor to provide proposals to eliminate the termites and shall submit monthly monitoring reports throughout the contract and the Establishment Period.

5. Maintenance/Establishment Works

Retained trees shall be maintained from site possession until the completion of the project by the contractor who shall engage staff suitably trained and experienced in arboricultural and tree surgery works to undertake the task. The maintenance works shall include all measures necessary to establish and maintain the trees in an acceptable, vigorous and healthy growing condition.

During establishment period, trees will be maintained by Contractor until final handover of the Site to future tree maintenance party. The maintenance works include:

i. watering, weeding, grass cutting and apply insecticide and fungicide if necessary; top up mulching

ii. inspect and maintain well drained of the ground soil;

iii. inspect and adjust tree support, tree ties, if necessary;

iv. carry out precautionary measure when typhoon or inclement weather is forecast; and

v. remove the temporary protective fencing from the Site upon completion of all construction works.

6. Creation and Protection of the Cordon Zone by protective fencing

Temporary protective fencing shall be erected before other site works commence. Protective fencing (minimum 1.5m high) should be erected beyond the crown spread/drip line or the designed protection zone of all existing trees.

The alignment of temporary protective fencing can be in circular, square, rectangular or any other shape so long as the fencing including its foundations does not encroach into the protection zone.

The protective fence shall come with a padlocked door and access to it shall be restricted only to workers directly involved in tree work. No construction worker shall enter the cordon zone (CZ).

The Contractor shall submit the construction of the temporary protective fencing to the Landscape Architect for approval prior to erection of the fencing.

No construction equipment or materials shall breach the CZ. No fires shall be lit in or near the CZ and hoisted materials shall not encroach into the CZ. Where there is a risk of the entry of contaminated construction water and other effluent into the CZ, the base of the protective fence shall be sealed by sand bags at least 200 mm tall.

Figure 1 Illustrated Typical temporary protective fencing for individual tree, and Figure 2 Illustrated Typical temporary protective fencing for group of trees.

7. Monitoring System

The performance of the retained trees shall be monitored throughout the project construction period on a monthly basis by the submission of Tree Assessment Reports. Tree growth conditions with reference to trunk, branches, foliage, soil and root, any arboricultural problems and associated remedial measures shall be recorded. Any construction activities that may impact the trees negatively shall be reported well in advance by the Contractor to the Landscape Architect/Engineer for planning of preventive tree work to avoid possible damages.
The contractor shall report to the management office the day's establishment work on the retained trees and a countersigned record log book of the work carried out shall be kept at the site office and made available for inspection. All non-routine tree problems are to be promptly reported to the Landscape Architect/Engineer.

Photographs shall be taken at the following key stages of the tree works:

i. Before commencement of construction;

ii. After completion of each operation, such as pruning, supporting, weeding, etc.

iii. Monthly, throughout the construction and establishment period.

Monthly progress reports with progress photographs on the status of the retained trees including statements on their health should be prepared by the contractor's tree specialist or arborist for the Landscape Architect/Engineer's review and a complete copy provided at the stage of Certificate of Completion.

The arborist shall carry out Tree Risk Assessment at least once per year and after the lowering of Tropical Cyclone Signal No.8 and/or Black Rain Storm Warning shall be submitted during the construction period and establishment period until handover to future tree maintenance party.

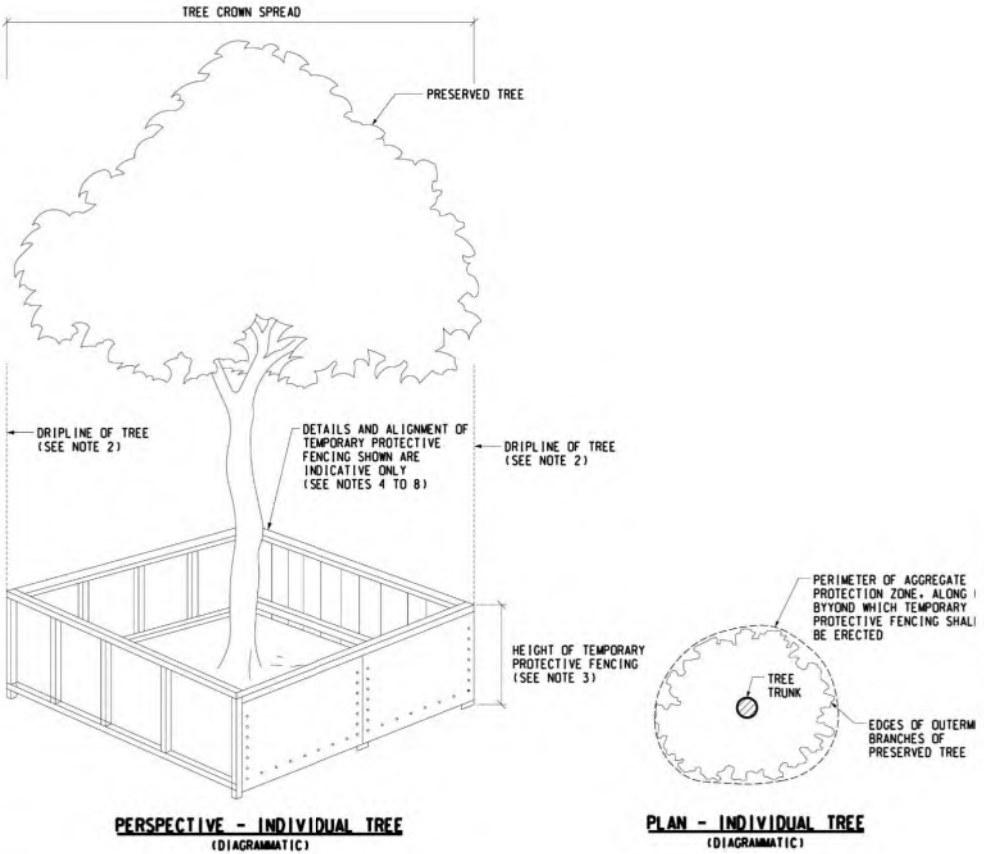


Figure 1 Typical temporary protective fencing for retained tree

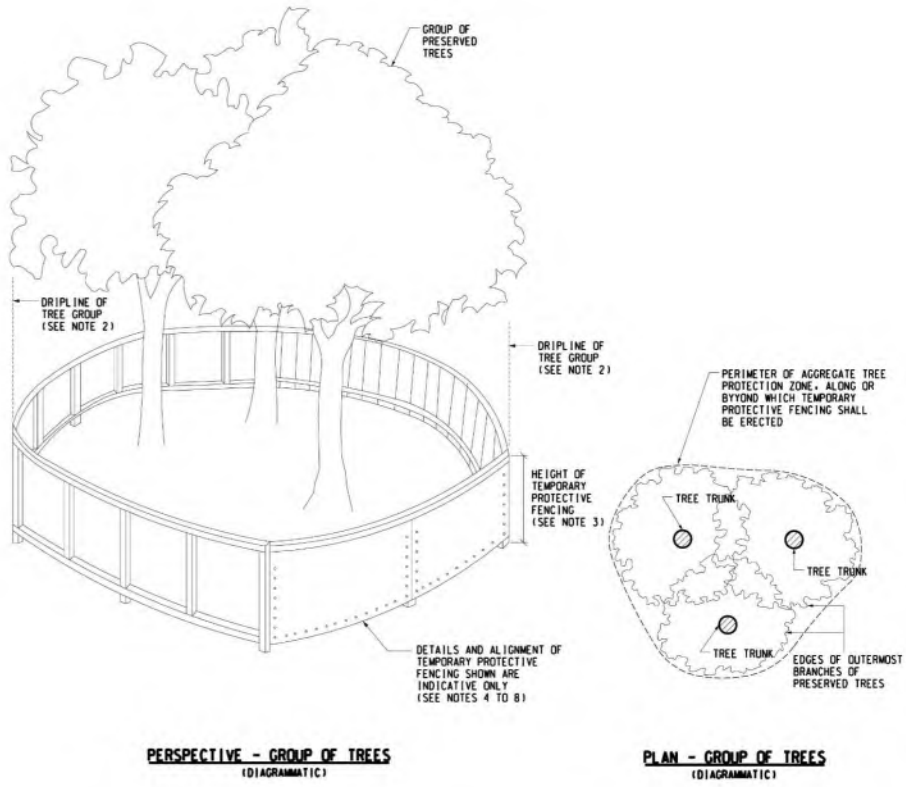


Figure 2 Typical temporary protective fencing for retained group of trees

APPENDIX VIII METHOD STATEMENT FOR TRANSPLANTING EXISTING TREE

Method Statement for Transplanting of Existing Trees

1 Introduction

A specialist landscape contractor from the "List of Approved Suppliers of Materials and Specialist Contractors for Public Works – Landscaping: Class I – General Landscape Work" shall be engaged to carry out the works relating to trees that shall include but not be limited to tree protection, tree surgery work, control of pests and diseases and transplanting.

The contractor shall assign tree protection issues to a suitably qualified and experienced full-time member of the site staff. This member of staff shall be responsible for monitoring and reporting on all tree related issues. Prior to DEVB's Guidelines for Tree Risk Management and Assessment, the contractor shall also responsible on conducting an annual Tree Risk Assessment for all trees within the Project Site. All tree survey work shall be supervised by a qualified Arborist (ISA Certified Arborist) or Landscape Architect.

The contractor shall submit a method statement for the engineer's approval prior to commencing any transplanting works including advance pruning and preparation works. The proposed method statement for transplant shall make reference with Greening, Landscape and Tree Management Section of DevB's latest Guidelines on Tree Transplanting (http://www.greening.gov.hk/en/index.html).

2 CROWN THINNING

The total extent of crown thinning should be minimized and should not exceed 1/4 of the original crown on leaf removal. The height of the tree shall not be reduced, unless crown reduction and thinning are considered appropriate. Under no circumstances should the central main leader of the trees should be pruned or interfered with. Should branch pruning be considered necessary, this should aim specifically at the removal of dead, decayed, diseased, infested, broken, crossed, competing or dangerous branches. The objective shall be to produce a clean, well-spaced, well-shaped and balanced head. Other than these conditions, all other healthy wood should not be cut or removed. To reduce transpiration through leaves in anticipation of root pruning, additional crown thinning shall be implemented by means of leaf picking. This minimum-impact approach will also prevent the loss of the original tree crown form. All work shall be carried out in accordance with good horticultural practice and British Standard 4043:1989 – Recommendations for Transplanting Root Balled Tree Work, ANSI A300 Part 6 – Transplanting Standard, and also based on the latest arboricultural concepts and best international practices, and shall be directed and supervised by the tree specialist or Certified Arborist (See **Fig 1.3**)

Safety precautions shall be taken to protect those engaged in operations as well as people and property in the vicinity. Pruning and removal of branches shall be done using sharp, clean implements to give a single flat, sloping face. Ragged edges of bark or wood are to be trimmed with a sharp knife. Large branches shall be removed in stages beginning with removal of the main weight of the branch with the final cut as close to the main stem as possible without damaging the bark. In the case of branch removal, the final cut should be aligned with the branch collar and the mid-point of the crotch. All cuts shall be made to avoid splintering or tearing of bark which would catch water and encourage rot. Branches less than 15mm diameter may be cut with sharp secateurs. Cuts and wounds shall be left open to the air to self-heal. Fungicidal bituminous sealing compounds shall not be used.

Cracks and cavities with rotten wood shall be cut back to healthy tissue. If necessary, a cavity that may accumulate water could be drained by drilling a small hole of 5mm diameter into it bottom at an angle of about 45 degrees taking as far as possible the shortest path and pointing downwards. If necessary, cracks may be secured by rot bracing.

3 Tree pruning

Trees should be checked prior to transplanting to determine the type and extent of pruning required. The following types of pruning may be required:

a) Hard pruning

This shall include the removal of a substantial number of branches of up to 200mm in diameter. The objectives for hard pruning may include raising the crown in a street situation or preparing a tree for transplanting. The final shape of the reduced crown should be even and balanced and provide the basis for the growth of a well-shaped new crown. No hard pruning on tree canopy is allowed.

b) Light prune

This shall include the removal of a few branches up to 75mm in diameter.

c) Thin crown

This shall include the picking of leaves of the crown with the extent not to exceed 1/4 of the original tree crown size. And removal of overcrowded branches up to 50mm in diameter in the crown of the tree. The overall shape of the tree should be preserved, but all weak, decaying, damaged or crossing branches should be removed. A proportion of other branches can be removed to create a balanced and attractive crown (See **Fig 1.4**).

d) Crown cleaning

The removal of dead, diseased or crossed branches

e) Where treatment of wounds is required, trim all damaged tissue, rotten and dead wood with a clean, sharp implement, with all margins rounded, leaving no pointed tips of the cut areas. Treat with an approved fungicidal gel (See **Fig 1.5**).

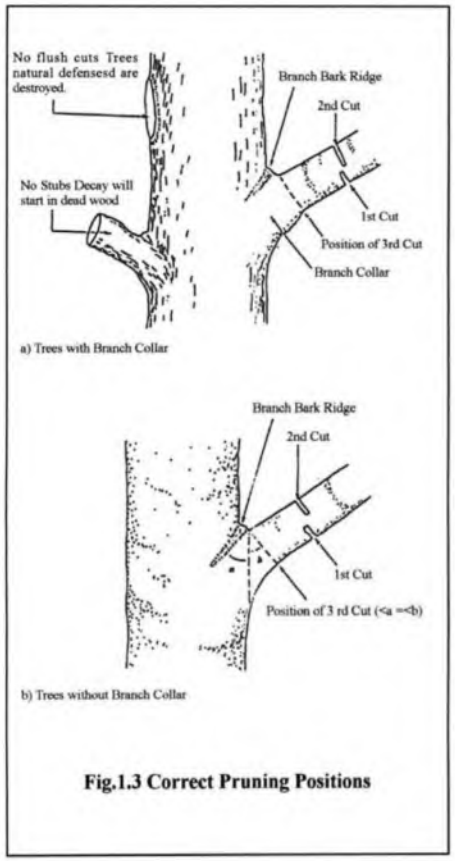


Fig.1.3 Correct Pruning Positions

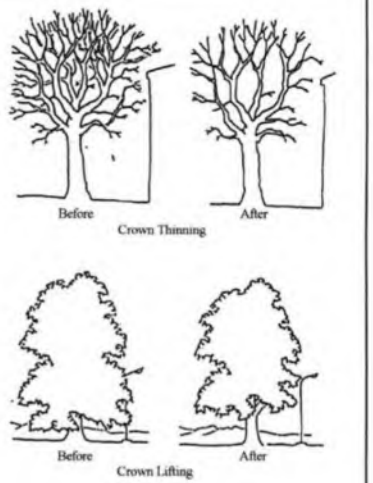


Fig.1.4 Crown Pruning

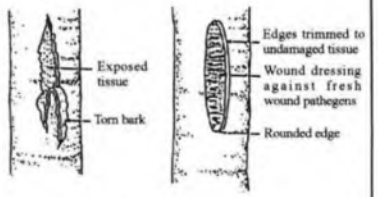


Fig.1.5 Wound Treatment

4 Preparation of root ball

The root ball size varies depending on species, habit, location and specific attributes which shall be as large as practicable to maximise the potential of survival during and after transplanting while balancing other logistical and cost concerns. In general, the root ball diameter to tree diameter ranges from 8:1 to 10:1 according to international standards (except for a palm which may require a smaller root ball). The root ball sizes should be of a diameter and depth to encompass enough of the root system as necessary for establishment. Normally the diameter of a root ball is larger than its depth which seldom exceeds 1 metre. There may be practical difficulties in forming a root ball of regular shape of recommended size due to intrinsic conditions of the site or tree, e.g. conflict with adjacent structures or utilities. In such cases the advice of a tree specialist has to be sought on the optimal dimensions of the root ball to be achieved specific to the situation.

5 Stage digging (See Fig 2.1)

- 1st stage – Dig a trench on the outside of the marked circumference in only two opposing segments;
- 2nd stage – After a period of no less than 1 month since the 1st root pruning (or other agreed period as proposed by the qualified Arborist of the Contractor), dig a trench on the outside of the marked circumference in the adjacent two opposing segments;
- 3rd stage – After another period of no less than 1 month since the 2nd root pruning (or other agreed period as proposed by the qualified Arborist of the Contractor), dig a trench on the outside of the marked circumference, in the remaining two opposing segments; and
- 4th stage – After a further period of not less than 1 month since the 3rd root pruning (or other agreed period as proposed by the qualified Arborist of the Contractor), prepare the root ball and cut the underside.

6 Preparation of the receptor site

At the receptor site, pits at pre-determined locations shall be dug in advance to appropriate width and depth to receive the transplanted trees. Tree pits should have a diameter of at least 500mm greater than that of the root ball and should be the same depth as the root ball. During digging operations, topsoil should be stripped and put to one side for reuse and as much of the indigenous soil as possible should be retained, to avoid a distinct interface between the planting pit and the surrounding soil. The base of the pit should be de-compacted to further improve the interface with the surrounding soil.

7 Tree uplifting and transit

The lifting, transplanting and planting of the trees shall be closely supervised on site by the tree specialist or Certified Arborist. The logistics of the transplanting operation shall be properly organized and timed in advance so as to enable transplanting of trees directly and promptly to the designated permanent receptor sites for planting.

The trees shall be lifted carefully to avoid damage to stem, foliage and roots. The lifting cables and harnesses shall only be anchored to the chain net wrapping around the root ball for the ball and burlap method. They should never be attached to the trunk or branches. The upper part of the lifting cable should be spread out by frame spacers to prevent the cable to stabilize the tree at the time or lifting. The trunk and the branch should be temporarily protected by burlap wrapping and be removed once complete.

After root ball preparation and during the process of transplanting to the receptor site, root balls are to be carefully protected against direct sunlight, wind, drought, mechanical, smoke, artificial heat and other damage. Damaged branches shall be carefully pruned using a sharp clean implement to give a single flat sloping face cut. Cuts and wounds shall be left open to the air to self-heal and not be painted with fungicidal bituminous sealing compounds.

The transplanted trees shall be planted in an upright position and allowing adequate space for future growth. A soil saucer of 150mm high shall be formed on the soil surface around the edge of the root ball to permit rain or irrigation water to be retained and to slowly infiltrate into the root ball. Immediately thereafter the trees shall be watered to ensure a through soaking of the root balls.

8 Securing and staking transplanted trees

All trees to be staked or guyed shall be wrapped above ground with pads of hessian or rubber to prevent from chafing the trunk or branches.

Transplanted trees shall be staked with 3 nos. of cables from the trunk with one end tied above the lowest branch of the trunk and the other end tied to metal stakes 1000mm long, driven 700mm into the ground.

9 Tree uplifting and transit

The transplanted trees shall be maintained immediately after transplanting and thereafter for a period of 12 more months. Maintenance shall include all measures necessary for the tree to establish and to recover from the transplant shock and to permit an acceptable vigorous healthy growing condition. This is to include watering, fertilizing, weeding, application of root activator, staking, application of insecticides, etc.

Should weather conditions be too dry or too hot, mist irrigation should be applied to each tree to upgrade the micro climatic condition surrounding the tree.

The performance of the transplanted trees shall be monitored throughout the maintenance period with monthly Tree Reports submitted with photographs recording: tree growth condition with reference to trunk, branches, foliage, soil and root, any arboricultural problems and associated remedial measures. Any construction activities that may impact the trees negatively shall be reported well in advance to the Landscape Architect for planning of preventive tree work to avoid possible damages.

The contractor shall report to the management office before and after carrying out each days' maintenance works on the transplanted trees and a countersigned record log nook of the work carried out shall be kept at the site office and made available for inspection. All non-routine tree problems are to be promptly reported to the Landscape Architect.

Photographs will be taken at the following stage of the tree works:

i. Before commencement;
ii. After crown thinning;
iii. 1st root pruning;
iv. 2nd root pruning;
v. Final root pruning (under-cutting);
vi. Forming of root ball;
vii. Excavation of tree pit at receptor site;
viii. Transit to final location at receptor site;
ix. Planting at receptor site;
x. Monthly record photographs during 12 months establishment and maintenance period after certificate of completion.

Monthly progress reports with progress photos on the status of the transplanted trees including all stages of transplanting works, their health and condition will be prepared by the contractor's tree specialist or Certified Arborist for the Landscape Architect's review and presented at the stage of certificate of completion.

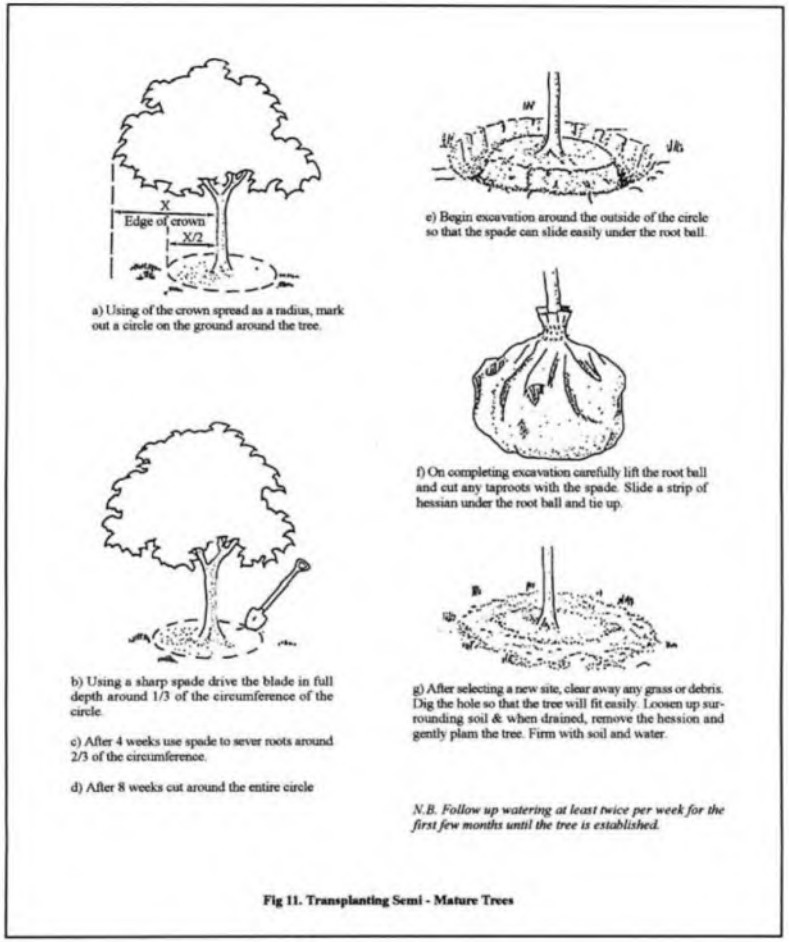


Fig 11. Transplanting Semi - Mature Trees

Fig.2.1 Transplanting Stages

Appendix M

Location Plan of Compensatory Trees

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

840700 N

CUT LINE 32-32

SEE DRAWING NO. 60624717/C3/210

828800 E

829000 E

829200 E

U27

U31

U29

LEGEND:

SITE BOUNDARY

LAYOUT

RETAINING WALL

PLANT CODE

TER. MAN. 21

PLANT NOS

TREE PLANTING

T1150(T)

LOCATION OF TRANSPLANTING

NOTES:

1. FOR NOTES AND LEGEND REFER TO DRAWING NO. 60624717/C3/191.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60624717/C3/191 TO 216.

N

R2

A

T01817(T)
T01484(T)
T01240(T)
T01485(T)
T00857(T)
T01248(T)
T01245(T)
T01237(T)

ILE. ROT. 10
CHU. TAB. 10
CIN. CAM. 12
PYR. CAL. 3
TAB. CHR. 11
TAB. CHR. 9
MEL. CAJ. 12

COMPENSATORY TREES FOR THE SITE

CUT LINE 33-33
SEE DRAWING NO. 60624717/C3/211

2SE-B/FR36

KWU TUNG ROAD

Cycling Track

Ramp

排水口 Outfall

SHEET 26 OF 26

THE APPLICATION SITE

SHEET 25 OF 26

NG TUNG RIVER

SHEET 18 OF 26

SHEUNG YUE RIVER

SHEET 17 OF 26

EAST RAIL LINE

LONG VALLEY

LOK MA CHAU SPUR

THE SITE FOR COMPENSATORY TREES

SHEET 21 OF 26

YIN KONG

Location Key Plan

Plot File by: PengY2
PATH F:\PROJECTS\60624717\Drawing\REPORT\C3\C3_214.dgn
2024/4/16

AECOM

PROJECT
項目

DEVELOPMENT OF
KWU TUNG NORTH
NEW DEVELOPMENT AREA,
REMAINING PHASE -
DESIGN & CONSTRUCTION

CLIENT
客戶

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

CONSULTANT
工程顧問公司

AECOM Asia Company Ltd.
www.aecom.com

SUB-CONSULTANTS
分判工程顧問公司

ISSUE/REVISION
修訂

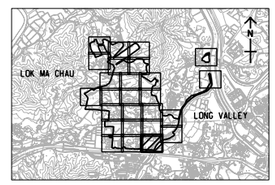
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核作

STATUS
狀況

SCALE 比例: A1 1 : 500

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖 A1 1 : 50000



PROJECT NO. 項目編號: 60624717

CONTRACT NO. 合約編號: CE 19/2019 (CE)

SHEET TITLE 圖紙名稱

OFF-SITE TREE
COMPENSATORY PLAN

SHEET 24 OF 26

SHEET NUMBER 圖紙編號

60624717/L04/Figure 2.4