

By Hand
7 August 2026

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Your ref 278463/06/WLL/TYAL/MKKW/05828

Dear Sir/ Madam,

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years in “Industrial” Zone and Area Shown as ‘Road’ of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area

On behalf of the Civil Engineering and Development Department, we hereby submit the captioned s.16 Planning Application. An original authorisation letter signed by the Applicant, a signed original copy of the application form, and 4 copies of the Supporting Planning Statement are enclosed. The soft copy of the Supporting Planning Statement as required for Non-EPASS submission will be uploaded upon the receipt of the hyperlink from the Town Planning Board.

We sincerely seek favourable consideration from the Town Planning Board to approve to the captioned s.16 Application.

Should you have any queries, please contact the undersigned or our Miss Anna LOK at [REDACTED] or Mr Koko WONG at [REDACTED].

Yours faithfully,



Wai Lam LEE
Director of Planning

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Enc - 1 Signed original authorisation letter
- 1 Signed original copy of the application form
- 4 Copies of the Supporting Planning Statement
cc - Client

Civil Engineering and Development
Department

**Application for Permission under
Section 16 of the Town Planning
Ordinance (Cap. 131) for
Proposed Temporary Centralised
Quarters for Imported Labour in
Construction Sector for a Period of
3 Years in “Industrial” Zone and
Area Shown as ‘Road’ of Planning
Area 36 of Hung Shui Kiu/ Ha
Tsuen New Development Area**

Supporting Planning Statement

This report takes into account the particular
instructions and requirements of our client.

It is not intended for and should not be relied
upon by any third party and no responsibility
is undertaken to any third party.

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ARUP

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Executive Summary

This Supporting Planning Statement is submitted under Section 16 of the Town Planning Ordinance (Cap. 131) in support of the Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years (the Proposed Development) in "Industrial" ("I") zone and area shown as 'Road' of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area (HSK/HT NDA). The Application Site, with an area of about 31,787m², is entirely on Government Land (GL).

The Application Site is situated at the western part of HSK/HT NDA adjacent to the planned high-density residential developments under the Second Phase Development. It falls within an area zoned "I" and area shown as 'Road' on the Draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/3, which is currently vacant.

To address the manpower shortage in the construction industry in a multi-pronged approach, the Government has launched the Labour Importation Scheme for the Construction Sector (Labour Importation Scheme) in 2023. In view of the keen manpower demand as anticipated by the Construction Industry Council (CIC) because of the gradual recovery of the economy and the real estate market, as well as the anticipated rising volume of public works including the Northern Metropolis (NM) development, the current Labour Importation Scheme will continue to be in place. Under the Labour Importation Scheme, centralised quarters (CQ) managed by CIC are provided as one of the accommodation options. In view that the existing quarters in Tam Mi, Yuen Long, will cease operation by end of October 2027, the Application Site is identified by the Government as a suitable site for reprovisioning the temporary labour quarters for imported labour in the construction sector.

The Proposed Development consists of eight residential blocks of two storeys each and six ancillary blocks ranging from one to two storeys in height. With the adoption of Modular Integrated Construction (MiC), the proposed CQ will provide about 450 residential units and accommodate about 1,800 imported labours, contributing to the Government's initiatives for steady manpower supply in construction sector.

Planning justifications and planning gains for the Proposed Development are summarised as follows:

- Providing Accommodation for the Imported Labour in Construction Sector;
- Optimising Land Resources and Leveraging Modular Integrated Construction for Time and Cost Efficiency;
- Compatible with the Surrounding Development;
- Not Violating the Planning Intention in Long Term; and
- No Adverse Technical Impacts

The Application confirms that the Proposed Development is technically feasible with no adverse impacts on the surrounding. In light of the planning merits and justifications put forward in the Supporting Planning Statement, we sincerely seek favourable consideration from the Town Planning Board on this Section 16 Application.

行政摘要

（內容如有任何差異，應以英文內文為準）

根據《城市規劃條例》（第 131 章）第 16 條，申請人現向城市規劃委員會（下稱「城規會」）就位於洪水橋/厦村新發展區規劃區第 36 區的「工業」地帶（下稱「申請地點」）及顯示為「道路」的地方擬議臨時中央宿舍（建造業輸入勞工宿舍）（下稱「擬議發展」）申請規劃許可。申請地點面積約 31,787 平方米，位於政府土地上。

申請地點位於洪水橋／厦村新發展區的西部，毗鄰第二期發展項目下規劃中的高密度住宅發展項目。申請地點位於洪水橋及厦村分區計劃大綱草圖編號 S/HSK/3 的「工業」地帶及顯示為「道路」的地方上。申請地點現時為閒置土地。

為多管齊下應對建造業人力不足的問題，政府於 2023 年推出「建造業輸入勞工計劃」。隨着本港經濟（包括房地產市場）逐步復甦，以及北部都會區發展等公共工程項目工程量預期增加，建造業議會（CIC）預計建造業將持續面對殷切的人力需求，現行的建造業輸入勞工計劃預計將持續推行。根據該計劃，由建造業議會管理的中央宿舍為輸入勞工提供其中一項住宿選擇。鑑於現時位於元朗潭尾的宿舍的營運期將於 2027 年 10 月底屆滿，政府已於洪水橋／厦村新發展區內物色一幅政府土地，以作遷置上述宿舍之用。

擬議發展將採用「組裝合成」建築法，共設有八座兩層高的住宅建築物及六座一至兩層高的附屬設施建築物，提供約 450 個單位，容納約 1,800 個輸入勞工。

擬議發展的主要規劃理據和規劃增益概述如下：

- 為建造業輸入勞工提供住宿；
- 善用土地資源及應用「組裝合成」建築法，大幅縮短施工時間及降低建築成本；
- 擬議發展與鄰近環境相容；
- 不會對地帶內土地用途的規劃意向帶來長遠影響；及
- 不會造成不良的技術影響。

本申請確認擬議發展在技術上是可行的，並不會對周邊環境造成不利影響。基於上述提出的規劃增益和理據，我們懇請城規會批准是次規劃申請。

1 INTRODUCTION

- 1.1.1 This Application is to seek approval from the Town Planning Board (TPB) under Section 16 (s.16) of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years (the Proposed Development) in "Industrial" Zone and area shown as 'Road' of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area (the Application Site).
- 1.1.2 The Application Site, with an area of about 31,787m², falls within an area zoned "Industrial" ("I") and an area shown as 'Road' on the Draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/3 (the OZP). It falls within the Second Phase Development of the Hung Shui Kiu/ Ha Tsuen New Development Area (HSK/HT NDA).
- 1.1.3 The Proposed Development, with a total Plot Ratio (PR) of 0.456, will consists of eight residential blocks of two storeys each and six ancillary blocks in one to two storey(s) height. With the adoption of Modular Integrated Construction (MiC), it will contribute to about 450 residential units and accommodate about 1,800 imported labours, with operation targeted to commence in Q3 2027. The Proposed Development aligns with the Government's policy to increase manpower supply in the construction sector and to facilitate the infrastructural and economic development of Hong Kong. Timely approval of this s.16 Application will support the keen manpower demand of the construction industry by providing suitable accommodations for imported labours.
- 1.1.4 The scheme for the proposed centralised quarters (CQ) has been demonstrated with technical feasibility from traffic, noise, air quality, water quality, drainage, sewerage, water supply, and geotechnics.
- 1.1.5 The structure of this Supporting Planning Statement is as below:
- **Section 2** provides information of the Application Site and its site context;
 - **Section 3** outlines the planning context of the Application Site;
 - **Section 4** discusses the key development parameters and design considerations of Proposed Development; and
 - **Section 5** presents the planning justifications in support of this Planning Application
- 1.1.6 We sincerely seek favourable consideration from the TPB to grant approval to this well-justified s.16 Application.

2 SITE CONTEXT

2.1 Site Location

- 2.1.1 The Application Site, with an area of about 31,787m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density residential developments under the Second Phase Development, of which the construction works have commenced since 2024. The Application Site is adjacent to the planned public and private housing developments to the east. It is located about 700m to the northwest of the planned MTR Tuen Ma Line (TML) Hung Shui Kiu (HSK) Station. According to the Planning and Land Use Framework of the HSK/HT NDA, the Application Site falls within the industrial area adjacent to residential area and Logistics, Enterprise and Technology Quarter.
- 2.1.2 Please refer to **Figure 2.1** for the location of the Application Site on the HSK/HT Outline Development Plan (ODP) No. D/HSK/2 and **Figure 2.2** for the Planning and Urban Design Concept extracted from the OZP.

2.2 Land Status

- 2.2.1 The Application Site is on Government Land (GL) allocated to the Civil Engineering and Development Department (CEDD) under Simplified Temporary Land Allocation (STLA) TYL No. 1053 for site formation and infrastructure work under the HSK/HT NDA Second Phase Development. Please refer to **Figure 2.3** for the lot index plan of the Application Site.

2.3 Existing Use and Condition

- 2.3.1 The Application Site is currently vacant. Please refer to **Figure 2.4** for the existing conditions of the Application Site.

2.4 Surrounding Land Uses

- 2.4.1 The site clearance works for the Application Site, and its surrounding areas have been carried out under the HSK/HT NDA Second Phase Development. The surrounding areas are at present mainly of a mixed rural landscape character comprising unused land, vegetated land, temporary structure, and graveyards.
- 2.4.2 To the **immediate east** of the Application Site is the "I" zone and Kong Sham Western Highway (KSWH). To the **further east** across the KSWH is a cluster of planned residential developments, including the Northern Site of Planning Area 34E zoned as "Government, Institution or Community(1)" ("G/IC(1)") which is the subject of approved planning application No. A/HSK/585 for proposed private residential

development¹ and areas designated as "Residential (Group A)" ("R(A)") sub-zones².

- 2.4.3 To the **immediate south** of the Application Site is the vegetated land and graveyards in the "Green Belt" ("GB") zone. To the southeast of the Application Site is the "G/IC" zone, reserved for a refuse collection point with a building height restriction (BHR) of five storeys.
- 2.4.4 To the **immediate west and north** of the Application Site is vast areas zoned as "Conservation Area" ("CA") zone on the Approved Ha Tsuen Fringe OZP No. S/YL-HTF/12, which is currently occupied by vegetated land and graveyards.
- 2.4.5 Please refer to **Figure 2.5** for the surrounding land uses of the Application Site.

2.5 Accessibility

- 2.5.1 At present, a vehicular and pedestrian access to the Application Site is available via a local access connected to KSWH, Tin Ha Road, and Yick Yuen Road. This access is located to the immediate east of the Application Site. As part of the Second Phase Development, the Application Site will be served by the planned road network of the HSK/HT NDA, including direct connections to the adjacent Road P1 which is a primary distributor running in north-south direction underneath KSWH, providing linkage to KSWH, Castle Peak Road and other district distributors.
- 2.5.2 For details, please refer to **Figures 2.6a-b**.

¹ The proposed private residential development with overall plot ratio (PR) of 6.5 has been approved by the Rural and New Town Planning Committee (RNTPC) of the Town Planning Board (TPB) on 21.11.2025.

² These sites (namely Planning Area 34D, 34A and 34B (partly)), reserved for public and private housing development in HSK/HT NDA, are the subject of an approved Planning Application No. A/HSK/452 for Proposed Minor Relaxation of PR and/or BHR for Proposed/Permitted Public and Private Housing Developments, which has been approved by the RNTPC of the TPB on 23.06.2023.

3 PLANNING CONTEXT

3.1 Statutory Land Use Zoning

- 3.1.1 The Application Site falls within an area zoned "I", subject to a BHR of 80mPD and a maximum non-domestic PR of 3, and an area shown as 'Road' on the OZP. According to the Notes of the OZP, the planning intention for the "I" zone is *"intended primarily for general industrial uses to ensure an adequate supply of industrial floor space to meet demand from production-oriented industries. Information technology and telecommunications industries, office related to industrial use, and selected uses akin to industrial production and would not compromise building and fire safety are also always permitted in this zone."*
- 3.1.2 According to Clause No. (8) of the covering Notes of the OZP, in any area shown as 'Road', all uses or development except those specified in the Notes of the OZP require permission from the Board.
- 3.1.3 Besides, in accordance with Clause No. (9)(b) of the covering Notes of the OZP, *"temporary use or development of any land or building not exceeding a period of three years requires permission from the Town Planning Board. Notwithstanding that the use or development is not provided for in terms of the Plan, the Town Planning Board may grant permission, with or without conditions, for a maximum period of three years, or refuse to grant permission"*. Hence, a s.16 application to seek the planning permission from the TPB for the proposed temporary development is submitted.
- 3.1.4 Please refer to **Figures 3.1 and 3.2a-c** for the extracted Covering Notes of the OZP and Schedule of Uses of the "I" zone.

3.2 Planning History of the Application Site

- 3.2.1 The Application Site is subject to three previous planning applications. Two s.16 Applications No. A/DPA/YL-HT/8 (proposed for open storage of new vehicles) and A/YL-PS/343 (proposed for temporary open storage of recyclable materials uses) were rejected by the Board in 1993 and 2011 respectively, as the proposed developments were considered inconsistent with the planning intention of the area and were anticipated to pose adverse impacts to the surrounding.
- 3.2.2 A s.12A Application No. Y/YL-HT/2 for proposed rezoning of the site from the "Residential (Group D)" and 'GB' on Approved Ha Tsuen Outline Zoning Plan No. S/YL-HT/10 and Approved Ping Shan Outline Zoning Plan No. S/YL-PS/16 to "R(A)" was rejected by the Board in 2016 due to insufficient supporting information and on the grounds that the approval of this application would be out of the context of the surrounding areas and pre-empt the recommendation of the on-going Planning and Engineering Study for HSK NDA.

3.3 Government's Staunch Commitment to the Development of Northern Metropolis (NM)

- 3.3.1 In response to the need of growing population and economic development, the Government promulgated the *Northern Metropolis Development Strategy* in 2021 Policy Address to transform the northern part of Hong Kong as the new engine for growth. According to the *Northern Metropolis Action Agenda* announced in 2023, the Northern Metropolis (NM) is envisioned to be a new international innovation and technology city injecting a new economic impetus for Hong Kong. As a major source of land supply in the future, one of the development goals of NM is to provide about 3,000 hectares (ha) of new development land and over 500,000 new resident units so as to accommodate a population of 2.5 million.
- 3.3.2 With the implementation of the NM as a major long-term development initiative of Hong Kong, a significant volume of development and infrastructure projects is expected to be delivered over the coming years.³ The sustained construction programme is anticipated to generate a continued demand for construction manpower, and the Labour Importation Scheme is expected to continue to supplement the local workforce. In this regard, there will be a need for suitable accommodation for imported workers. The proposed CQ at the Application Site will help meet such accommodation needs and facilitate the timely delivery and construction activities of NM and other strategic development projects in Hong Kong.

3.4 Positioning of HSK/HT NDA

- 3.4.1 HSK area was identified in the early 2000s as a strategic growth area to meet Hong Kong's long-term housing demand and provide employment opportunities. The HSK/ HT NDA is being implemented in three phases. The First Phase Development commenced in 2020 with the first population intake in 2024, while the Application Site falls within the Second Phase Development area, where works commenced in 2024 and population intake is targeted from 2030 onwards. The implementation programme of the Remaining Phase development is subject to the ongoing study for the Lau Fau Shan, Tsim Bei Tsui and Pak Nai area. Please refer to **Figure 3.3** for the Phasing Plan of HSK/HT NDA.
- 3.4.2 According to the OZP, the HSK/HT NDA is included in the High-end Professional Services and Logistics Hub of the NM. It is positioned as a next generation new town that create a desirable place to live, work, play and do business, serving as a regional economic hub for NM

³ According to the Construction Expenditure Forecast and Manpower Forecast for Hong Kong Construction Industry released by the CIC in April 2026, generally speaking, taking the Northern Metropolis development into account, the total construction expenditure of the industry could reach \$305 billion to \$360 billion in 2030/31. The medium-to long-term outlook for the construction industry remains robust, and the overall construction expenditure of the industry is expected to grow steadily. (Source: <https://www.info.gov.hk/gia/general/202607/08/P2026070800552.htm?fontSize=1>)

including a modern service centre, a modern logistics cluster and an industry park, with a focus on professional services and modern logistics, and contributing to the development of the entire Greater Bay Area. It will also be a major source of housing land supply in the medium to long term.

3.5 Responding to Government's Labour Importation Scheme for the Construction Sector

- 3.5.1 To address the temporary manpower shortage in the construction industry in a multi-pronged approach, the Government has launched the Labour Importation Scheme for the Construction Sector (Labour Importation Scheme) in 2023, with a quota ceiling of 12,000. The Labour Importation Scheme aims to fill in the temporary manpower gap to avoid any bottleneck caused by manpower shortage hindering the economic and infrastructural development of Hong Kong.
- 3.5.2 Under the Labour Importation Scheme, employers are required to provide accommodation for imported labour residing in Hong Kong at designated locations arranged by the government or at construction sites under the principal contractors. The CIC is responsible for the operation and management of the designated quarters for the imported labour, with the first one established in Tam Mi, Yuen Long which will cease operation by end of October 2027. To support rising volume of public works, including the NM development and other public projects, keen demand for labour in construction field is anticipated and the current Labour Importation Scheme will continue to be in place.⁴ In response to Government's initiatives and on-going need, the Proposed Development will provide necessary accommodation equipped with essential facilities, including common rooms, recreational facilities, to meet the imported labour's need.

⁴ LCQ11: Construction sector manpower required for development of Northern Metropolis (Jul 8, 2026) (Source: <https://www.info.gov.hk/gia/general/202607/08/P2026070800552.htm?fontSize=1>)

4 THE PROPOSED CENTRALISED QUARTERS FOR IMPORTED LABOUR

4.1 General Planning and Design Principles

- 4.1.1 **Site Characteristics** – The Application Site is located at a hillside. The proposed building layout has been carefully designed to respond to the site's topography, including the retention of portions of the existing natural terrain on the western side of the Application Site where practicable. In response to the surrounding natural setting and neighbourhood, the building façade of the proposed temporary CQ adopts a palette of calming and earthy tones, such as green, blue, white and beige, to soften the visual appearance of the building mass and to better integrate with the surrounding environment.
- 4.1.2 **Overall Layout of Blocks and Facilities** – Residential blocks are designed with adequate separation and are distributed evenly within the Application Site. Ancillary blocks are centralised and located adjacent to the main entrance for ease of management. An emergency vehicular access of not less than 7.3m wide is provided, ensuring adequate access for emergency services and supporting day-to-day logistics needs of the proposed temporary CQ.

4.2 Proposed Centralised Quarters for Imported Labour and Key Development Parameters

- 4.2.1 The proposed temporary CQ has been designed with a total PR of about 0.456 and a total gross floor area (GFA) of about 14,479m². The proposed CQ consists of eight residential blocks and six ancillary blocks⁵, providing about 450 modular residential units to accommodate about 1,800 imported labours. To support the shuttle bus service and arrangement, a total of 10 coach loading/unloading bays will be provided. The proposed temporary QC is anticipated to operate no later than 2027 Q3.
- 4.2.2 Key development parameters of the Proposed Development are summarised below.

Table 1 Development Parameters of the Proposed Development

Development Parameters	Proposed Development
Site Area (about)	31,787m ²
Total PR (about)	0.456
• Domestic PR	0.422

⁵ Ancillary facilities, including management offices, refuse collection point, main switch room, transformer room, street fire hydrant pump room and tank room, etc., will be provided. Vending machines will be available for convenience of the residences and to support their daily needs.

Development Parameters	Proposed Development
• <i>Non-domestic PR</i>	0.034
Total GFA (about)	14,479m ²
• <i>Domestic GFA</i>	13,414m ²
• <i>Non-domestic GFA</i>	1,065m ²
Building Height	Residential Blocks: 2 storeys Ancillary Blocks: 1 to 2 storey(s)
Number of Blocks	8 Residential Blocks 6 Ancillary Blocks (including 3 Management Office)
No. of Units	About 450
Population ⁽¹⁾	About 1,800
Local Open Space	Not less than 1,800m ²
Internal Transport Facilities	
• Coach Laybys / Loading/ Unloading Bays ⁽²⁾	10

Remarks:

⁽¹⁾ A person per flat (PPF) ratio of 4 is assumed.

⁽²⁾ Including 2 shared-use bays serving both coaches and goods vehicles.

4.2.3 Please also refer to the **Appendix A** for the General Layout Plans of the Proposed Development.

4.2.4 In terms of daily operation, similar to the existing arrangements at the Tam Mi Labour Quarters, the proposed temporary CQ at the Application Site in HSK/HT NDA will be operated and managed by CIC. Employers who rent accommodation units for imported workers will be required to pay rental fees to cover the operational costs of the accommodation facility. To ensure the smooth operation of the proposed CQ and to minimise any potential impact on the surrounding community, the CIC will adopt an operational arrangement similar to that of Tam Mi. Appropriate management and operational measures will be established in respect of access control, transportation, hygiene, and environmental management.

4.3 Design Concept

4.3.1 **Local Open Space Provision** – The Proposed Development will provide local open space of not less than 1m² per resident in accordance with the Hong Kong Planning Standards and Guidelines. With an anticipated population of about 1,800 persons, not less than 1,800m² local open space will be provided within the Application Site. Recognizing the importance of residences' physical and mental wellbeing and to create a vibrant, liveable, quality and sustainable community, a variety of outdoor communal spaces, including shaded sitting areas and playgrounds, have been provided. Besides, spaces in between the blocks can be served as focal points for social gathering. These facilities encourage social interaction, promote healthy lifestyles,

and offer opportunities for relaxation after working hours. The plan showing the provision of open space is provided in **Appendix A**.

- 4.3.2 **Tree Treatment Proposal** – The Application Site falls within the “I” zone which is a development zone intended primarily for general industrial uses. The tree removal at the Application Site, originally proposed for the site formation works for the HSK/HT NDA development, is not triggered by the Proposed Development. In accordance with the approved Tree Preservation and Removal Proposal (TPRP) No. REP-079-03 for the HSK/HT NDA development under the Second Phase Development of the Consultancy, the existing trees within the Application Site, which have been surveyed individually⁶ and assessed under Tree Group Survey⁷, comprise trees of common species. These trees are proposed to be removed due to low suitability for transplanting. According to the preliminary tree planting proposal under the TPRP, compensatory trees will be planted along roadsides and river sides, within amenity areas, as well as at designated location within HSK/HT NDA. The compensatory tree planting potential will be further explored in the remaining phase of the HSK/HT NDA project to achieve the 1:1 compensatory planting ratio as far as possible.

4.4 Traffic and Transport Arrangements

- 4.4.1 **Vehicular and Pedestrian Access** – The vehicular ingress/egress will be provided at the planned local road to the immediate east of the Application Site. Temporary haul roads will be provided to connect the site with the existing external road network during the construction phase. To minimise traffic impacts on the existing village clusters, a direct haul road connecting to Ha Tsuen Interchange will be provided, enabling shuttle buses to access KSWH directly without passing through local village roads. As part of the Second Phase Development, the Proposed Development will be well served by the planned road network of the HSK/HT NDA, including connections via Road L24 to the adjacent Road P1, providing linkage to KSWH, Castle Peak Road and other district distributors.
- 4.4.2 **Transport Arrangement and Internal Transport Facilities** – Shuttle bus services will be arranged as the primary mode of transport for workers to commute between the CQ and construction sites. Subject to prior coordination with the quarters management, the contractor may arrange shuttle bus services for imported labour to travel to various locations, including nearby public transport facilities, such as MTR Stations, during weekends. No residential car parking spaces are proposed within the Application Site. To facilitate the pick-up/drop-off of the labour, 10 loading/ unloading bays will be provided.

⁶ A total of 20 trees were surveyed individually within the Application Site, including T5532-T5538, T5553, T555-T5559, T5575, T5576, T5581, T5582, T5585, T5600, and T5603.

⁷ Tree Groups No. TG76, TG77, and TG78

- 4.4.3 Please refer to **Appendix B - Traffic Impact Assessment** for details on the traffic and transport arrangement for the Proposed Development.

4.5 Proposed Programme

- 4.5.1 The Proposed Development at the Application Site is targeted to commence operation in Q3 2027 to provide accommodation for imported construction workers. The submission and approval of this s.16 Application is therefore essential to support the construction sector's manpower requirements. In addition, the existing labour quarters at Tam Mi are currently expected to operate until the end of October 2027.⁸ The Proposed Development would provide a timely replacement to ensure the continued provision of worker accommodation and support the sustained manpower needs of ongoing and forthcoming construction projects in Hong Kong.

⁸ The planning permit for the Temporary Centralised Quarter for Imported Labour in Tam Mi under the Application No. A/YL-NSW/354 is valid until end October 2027.

5 PLANNING JUSTIFICATION

5.1 Providing Accommodation for the Imported Labour in Construction Sector

- 5.1.1 With the gradual recovery of the economy and real estate market, the volume of private sector development projects is expected to increase. Together with the anticipated growth in public works projects, including the NM development, railway projects and public housing developments, the demand for construction manpower is expected to remain strong in the coming years. To address the manpower shortage in the construction sector and support the timely delivery of strategic infrastructure and development projects, the Government has implemented the Labour Importation Scheme for the Construction Sector since 2023, which is expected to continue playing an important role in supplementing the local workforce.
- 5.1.2 In support of the Government's initiative and the continued need for accommodation for imported construction workers, the Proposed Development will provide approximately 450 modular residential units to accommodate around 1,800 imported workers. The proposed centralised quarters will facilitate the implementation of the Labour Importation Scheme and support the manpower requirements of ongoing and forthcoming construction projects. The CIC will operate and manage the proposed CQ upon commissioning Q3 2027, providing timely and suitable accommodation to meet the sector's operational needs.

5.2 Optimising Land Resources and Leveraging Modular Integrated Construction for Time and Cost Efficiency

- 5.2.1 The Application Site, which is currently vacant, has already undertaken site clearance. Site formation works is targeted to be carried out in Q4 2026. The Proposed Development makes use of available land resources in HSK/HT NDA to provide accommodation for imported labours in a timely manner to support the on-going Labour Importation Scheme. The proposed CQ will adopt MiC and reuse the modular units from other sites⁹, which can largely shorten the construction time and minimise the cost and generation of waste.

5.3 Compatible with the Surrounding Development

⁹ Including former community isolation facility site at southern end of Loop

- 5.3.2 The Application Site is located in the western part of HSK/ HT NDA, adjacent to the KSWH and planned high-density residential developments. The Proposed Development with low-rise blocks (one to two storeys) is considered compatible with the surrounding environment, which is proposed with site clearance, site formation and associated road and infrastructure works under the HSK/HT NDA development. While the site is currently in a rural setting, the proposed building blocks will be kept as 2 storey height and is well contained within the BHR 80mPD as stipulated on the Plan for the "I" zone.

5.4 Not Violating the Planning Intention in Long Term

- 5.4.1 The Application Site falls within an area zoned "I" and an area shown as 'Road' on the OZP. The Proposed Development is only temporary in nature, while the modular units are easy to be dismantled and removed after use. In this regard, the approval of this planning application will not jeopardise the long-term planning intention of "I" zone.

5.5 No Adverse Technical Impacts

- 5.5.1 Based on the General Layout Plans, various assessments have been conducted to ascertain the acceptability of the Proposed Development. These include Traffic Impact Assessment (**Appendix B**), Preliminary Environmental Assessment (**Appendix C**), Drainage Impact Assessment (**Appendix D**), Sewerage Impact Assessment (**Appendix E**), Water Supply Impact Assessment (**Appendix F**), and Geotechnical Planning Review Report (**Appendix G**).

Traffic Impact

- 5.5.2 Regarding the transport arrangement, shuttle service would be arranged for the workers to commute to/from the workplaces. Temporary haul roads will be provided to connect the site with the existing external road network during the construction phase. To minimise traffic impacts on the existing village clusters, a direct haul road connecting to Ha Tsuen Interchange will be provided, enabling shuttle buses to access KSWH directly without passing through local village roads. Based on the assessment results of the performance of key road links and junctions within and in the vicinity of HSK/ HT NDA, as well as the public transport demand, no insurmountable traffic and transport impact caused by the Proposed Development is anticipated.

Environmental Impact

- 5.5.3 Only one existing representative Air Sensitive Receiver is identified within 500m from the Application Site with a short overlapping period with the construction of the proposed development. With the implementation of good site practices and mitigation measures, no

adverse construction air quality impact is anticipated. As demonstrated in the General Layout Plans, potential vehicular emission impact on the Proposed Development is not anticipated with the incorporation of appropriate design measures. The current design scheme has allowed setbacks of at least 5m to 20m from the surrounding roads to ensure no air sensitive uses, including fresh air intake of mechanical ventilation and recreational uses in the open area, would be located within the buffer zones. With no existing and planned industrial emission identified within 200m from the Proposed Development, adverse air quality impact due to chimney emission is not anticipated. In addition, with proper implementation of odour mitigation measures and good site practices, adverse odour emission impacts arising from the planned refuse collection point and planned sewage pumping station (SPS) reserved in nearby sites in Planning Area 36 are not anticipated.

5.5.4 In terms of traffic noise impact, no existing representative noise sensitive receiver is identified within 300m from the Application Site. No adverse construction noise impact is anticipated from the Proposed Development with the implementation of good site practices and mitigation measures. With reference to the existing temporary CQ at Tam Mi, considering all proposed noise sensitive uses will be served by air conditioning units and not rely on openable windows for ventilation, no road traffic noise and fixed noise impact is anticipated on the Proposed Development. In addition, windows pane with 6mm in thickness is recommended to offer the future residences an option for a quieter indoor noise environment. The future residences should be informed of the potential noise impact and shall keep window closed during normal occupancy to achieve a suitable living environment.

5.5.5 Besides, no adverse construction water quality impact is anticipated from the Proposed Development with the implementation of good site practices and mitigation measures. With proper management practices for runoff and sewage in place, adverse water quality impact on surrounding channel and its tributaries during operational phase is not anticipated.

Drainage Impact

5.5.6 The Proposed Development will result in an increase in impermeable surfaces within the Application Site and consequently generate additional surface runoff. The proposed internal drainage system has been designed to accommodate the additional runoff generated by the development. Hydraulic assessments have been carried out and the result present that the existing downstream channels maintain adequate freeboard and possess sufficient hydraulic capacity to accommodate the additional runoff. As such, proposed drainage system will not give rise to any adverse drainage impacts arising from the Proposed Development.

Sewerage Impact

- 5.5.7 Given that there is no existing sewerage in the vicinity of the Proposed Development by the time of commissioning, it is proposed to construct sewage holding tanks within the development site for sewage disposal to nearby Pillar Point Sewage Treatment Works (PPSTW) and nearby Ha Tsuen SPS (HTSPS), with upstream SPSs of Yuen Long Effluent Polishing Plant serving as backup reception facility. Upon completion of the proposed sewerage works, no adverse impact on the existing sewerage system is anticipated. The tanks' design storage capacity will be equivalent to 1 day of Average Dry Weather Flow with 100% safety margin to cater for incidents (i.e. required total storage capacity of 708m³).

Water Supply

- 5.5.8 A new fresh water main is proposed to be teed off from the existing water main along KSWH. A hydraulic assessment has been conducted to assess the potential impact of the increased water demand to the existing fresh water supply network. It is considered that the existing surface reservoir has sufficient spare capacity to accommodate the additional fresh water demand arising from the Proposed Development. Upon the proposed water supply works, no adverse water supply impact would be imposed by the Proposed Development.

Geotechnical Impact

- 5.5.9 Based on the General Layout Plans, both cutting and filling from original ground level are required to form the levelled platform. The two-storey residential blocks are proposed to sit on shallow footing / raft foundation. As such, the Proposed Development is considered technically feasible from the geotechnical perspective.
- 5.5.10 In addition, the assessment concluded that all catchments overlooking the Application Site require further detailed study of natural terrain hazards. In this regard, Natural Terrian Hazard Study Report has been separately submitted to the GEO of CEDD to identify appropriate hazard mitigation strategies and ascertain the geotechnical feasibility of the Proposed Development.

6 CONCLUSION

- 6.1.1 This Application is to seek approval from the TPB under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector in "Industrial" Zone and area shown as 'Road' of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area for a Period of 3 Years.
- 6.1.2 The Application Site, which is currently vacant, falls within an area zoned "I" and an area shown as 'Road' on the Draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/3. This Supporting Planning Statement demonstrates the genuine significance of the Proposed Development by providing suitable accommodations in the form of temporary CQ (to be operated and managed by CIC) for imported labours under the Government's Labour Importation Scheme for Construction Sector. The Proposed Development will support the manpower demands arising from major infrastructure and development projects in Hong Kong, including those within the NM. Furthermore, the Proposed Development is temporary in nature and will adopt MiC technology, allowing the modular units to be dismantled easily after use, without compromising the long-term planning intention and future development potential of the Application Site.
- 6.1.3 The Proposed Development is considered compatible with the surrounding planned developments in the HSK/HT NDA. It has also been confirmed in the full set of technical assessments attached to this Supporting Planning Statement that no adverse impacts in terms of traffic, noise, air quality, water quality, drainage, sewerage, water supply, and geotechnical is anticipated.
- 6.1.4 Taking into account the need for accommodation for imported construction workers and the proven technical feasibility, we sincerely seek favourable consideration from the TPB to give support the proposed temporary CQ and the approval of this Section 16 Application.

Figures



LEGEND Application Site

Figure No. 2.1	Scale -	Figure Title Location Plan
ARUP	Date Jul 2026	Source Extracted from the Hung Shui Kiu and Ha Tsuen Outline Development Plan (No. D/HSK/2) gazetted on 20 August 2024

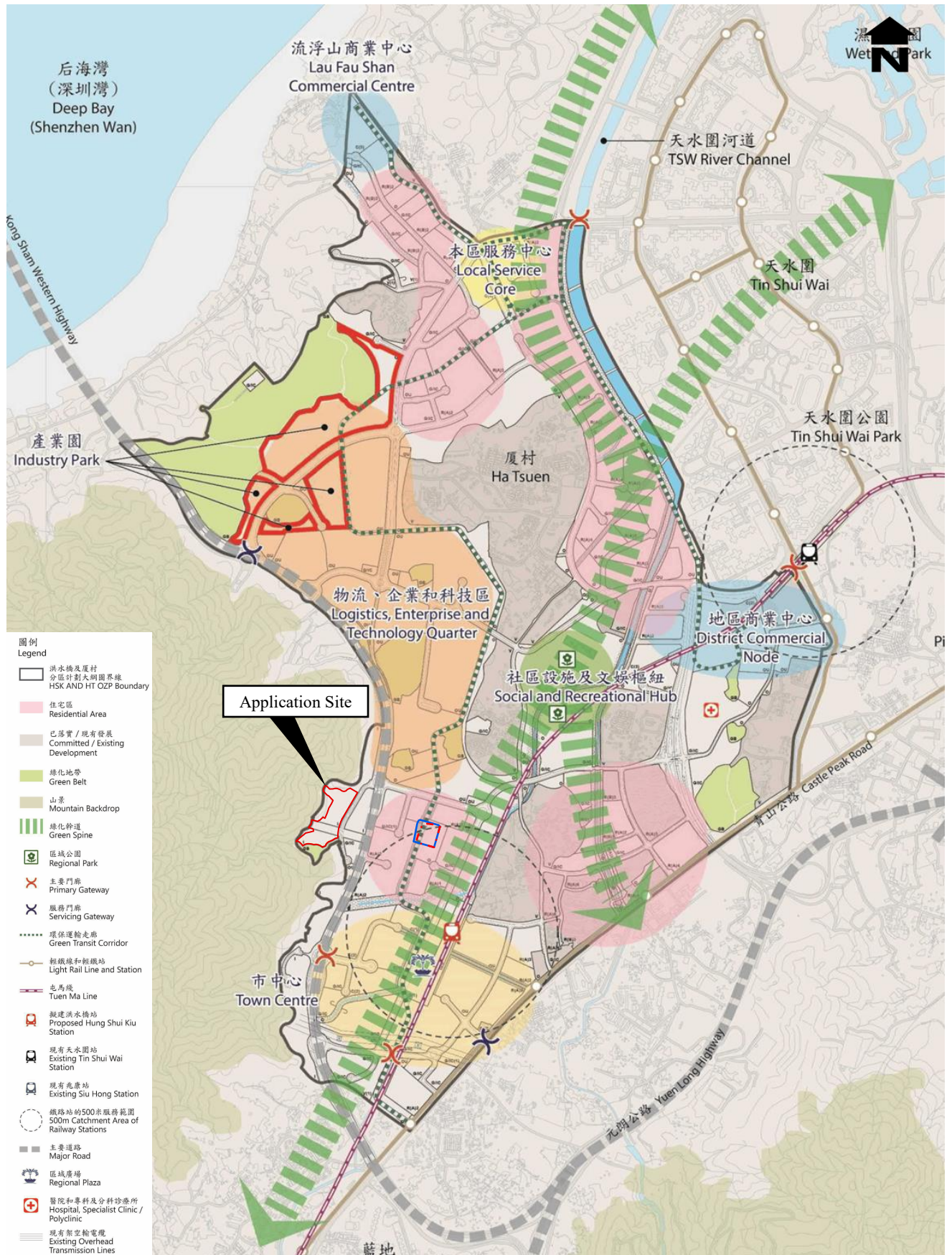
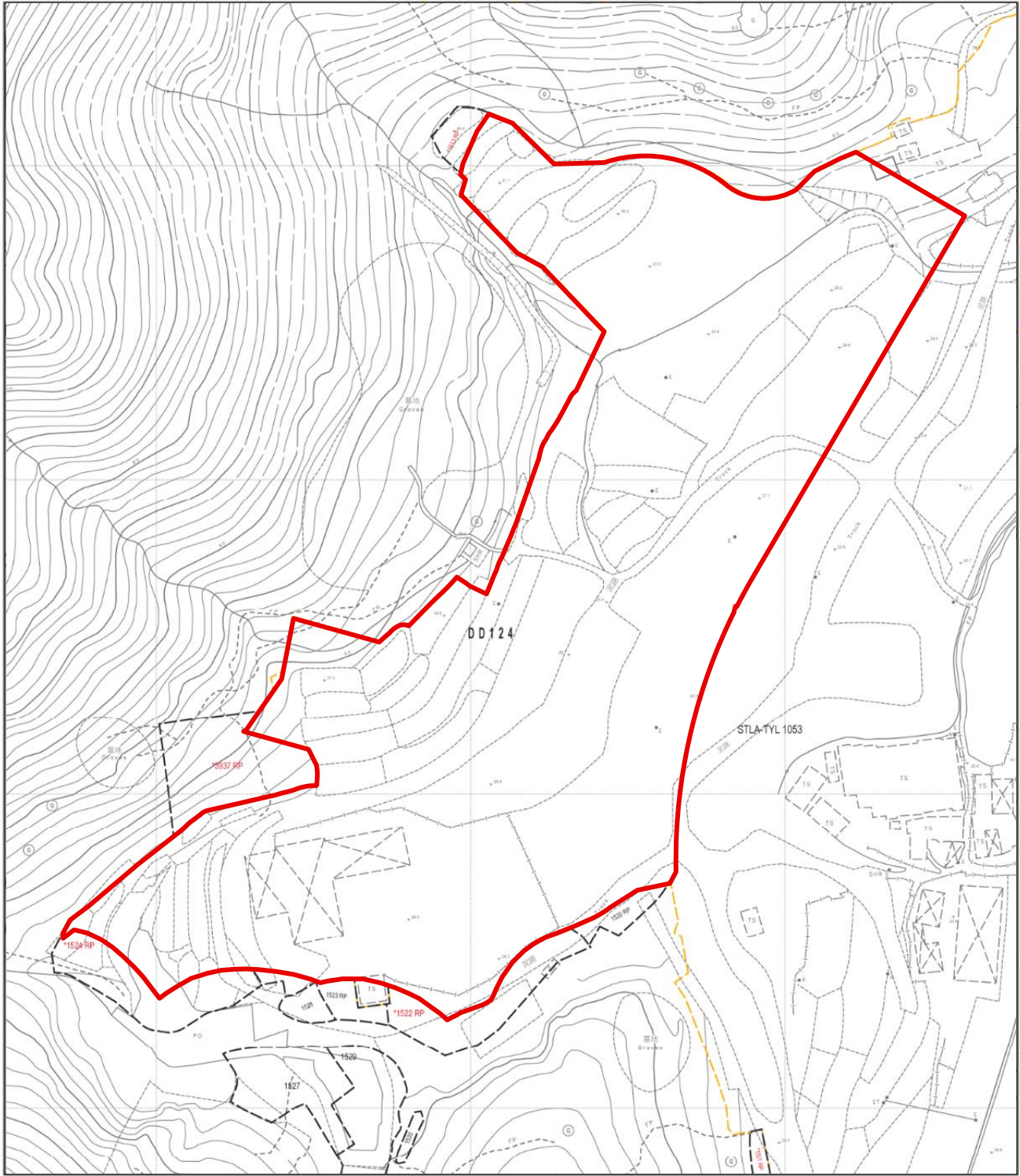


Figure No. 2.2	Scale As shown	Figure Title Planning and Urban Design Concept of Hung Shui Kiu/ Hai Tsuen NDA
ARUP	Date Aug 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

地段索引圖 LOT INDEX PLAN



地政總署測繪處 Survey and Mapping Office, Lands Department



LEGEND



Application Site

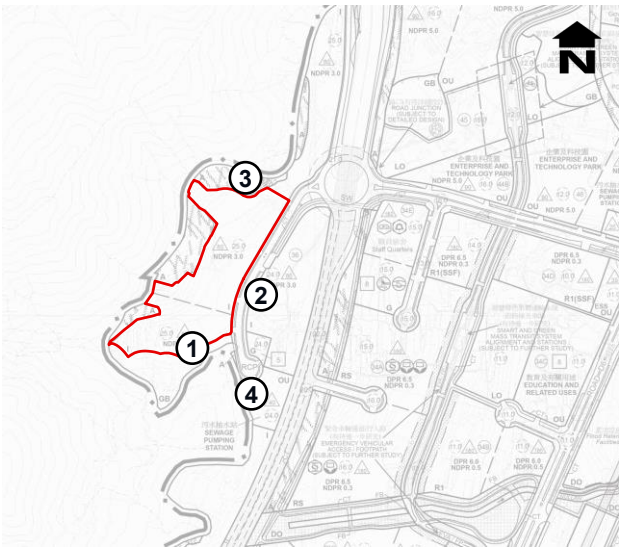
Figure No. 2.3	Scale As shown	Figure Title Lot Index Plan
ARUP	Date Jul 2026	Source -



LEGEND

Application Site

Figure No. 2.4	Scale -	Figure Title Existing Conditions of the Application Site
ARUP	Date Jul 2026	Source Aerial photo taken in June 2026



Key Plan

LEGEND

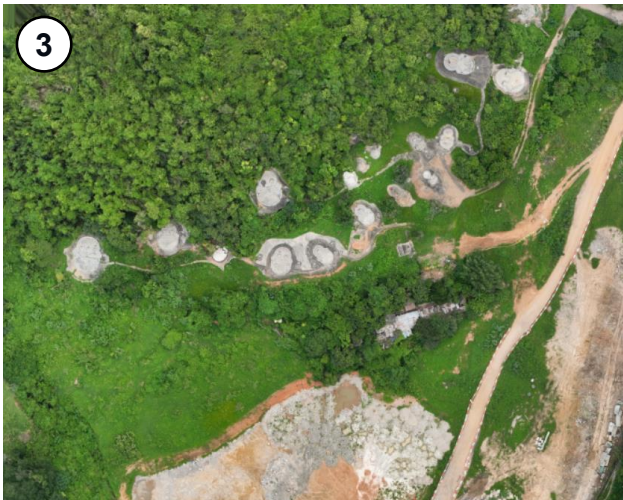
Application Site



Existing Vacant Land



Existing Temporary Structures



Existing Vegetated Land and Graveyard in
“CA” zone on OZP No. S/YL-HTF/2



Existing Access to the Site

Figure No.	Scale	Figure Title
2.5	-	Surrounding Context of the Application Site
ARUP	Date	Source
	Jul 2026	Site Photo taken in June and July 2026



LEGEND

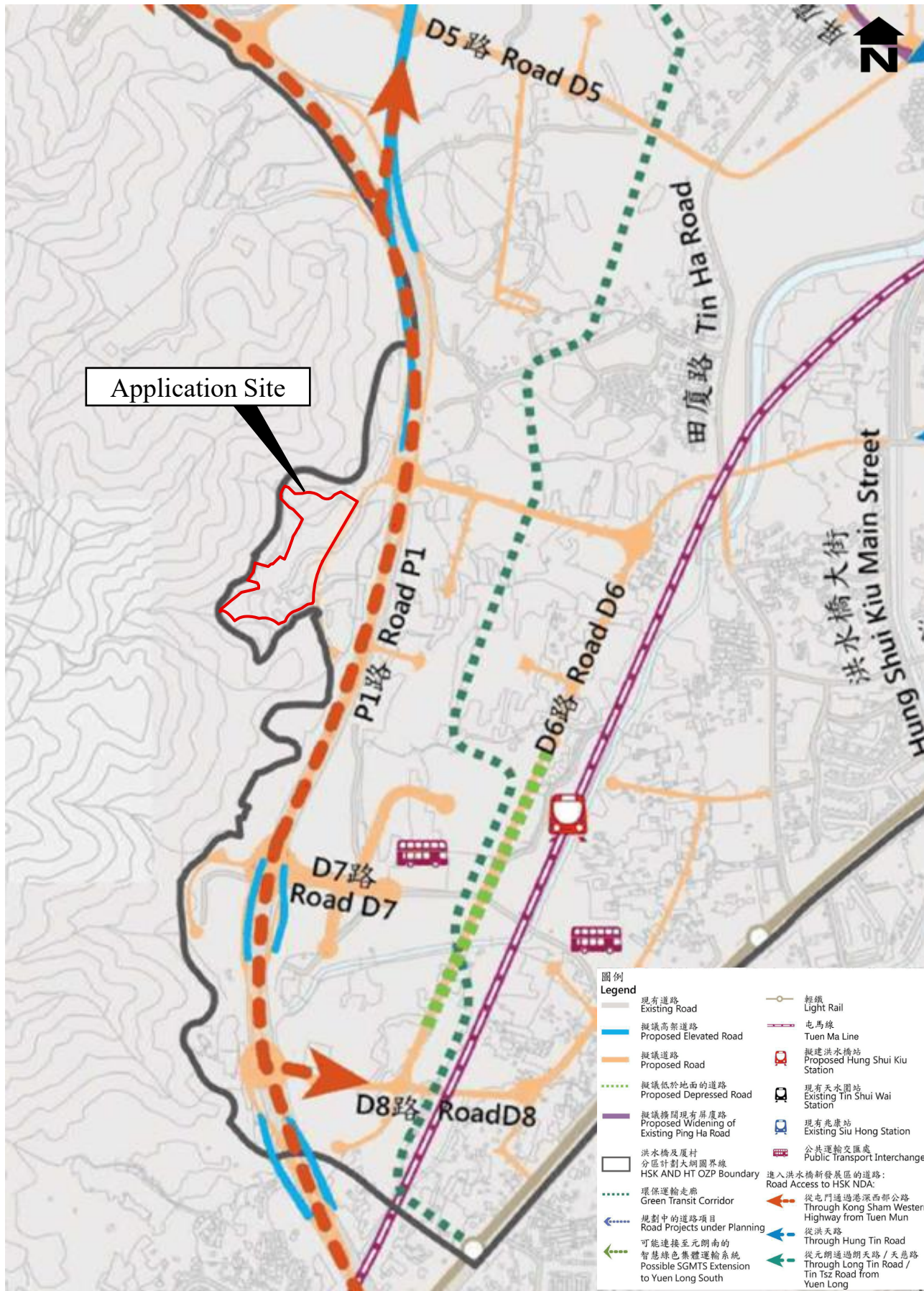


Application Site



Access Roads to Kong Sham Western Highway, Tin Ha Road, and Yick Yuen Road

Figure No. 2.6a	Scale -	Figure Title Accessibility of the Application Site (Existing) (Sheet 1 of 2)
ARUP	Date Jul 2026	Source Aerial photo taken in June 2026



LEGEND

Application Site

Figure No. 2.6b	Scale -	Figure Title Accessibility of the Application Site (Sheet 2 of 2)
ARUP	Date Aug 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

- (8) In any area shown as 'Road', all uses or developments except those specified in paragraphs (7)(a) to (7)(d) and (7)(g) above and those specified below require permission from the Town Planning Board:

road, toll plaza, on-street vehicle park, railway station and railway track.

- (9) (a) Temporary use or development of any land or temporary use of an existing building not exceeding a period of two months is always permitted provided that no site formation (filling or excavation) is carried out and that the use or development is a use or development specified below:

structures for carnivals, fairs, film shooting on locations, festival celebrations, religious functions or sports events.

- (b) Except as otherwise provided in subparagraph (a), temporary use or development of any land or building not exceeding a period of three years requires permission from the Town Planning Board. Notwithstanding that the use or development is not provided for in terms of the Plan, the Town Planning Board may grant permission, with or without conditions, for a maximum period of three years, or refuse to grant permission.

- (c) Temporary use or development of land or building exceeding three years requires permission from the Town Planning Board in accordance with the terms of the Plan.

- (10) Unless otherwise specified, all building, engineering and other operations incidental to and all uses directly related and ancillary to the permitted uses and developments within the same zone are always permitted and no separate permission is required.

- (11) In these Notes, unless the context otherwise requires or unless as expressly provided below, terms used in the Notes shall have the meanings as assigned under section 1A of the Town Planning Ordinance.

"Existing building" means a building, including a structure, which is physically existing and is in compliance with any relevant legislation and the conditions of the Government lease concerned.

"New Territories Exempted House" means a domestic building other than a guesthouse or a hotel; or a building primarily used for habitation, other than a guesthouse or a hotel, the ground floor of which may be used as 'Shop and Services' or 'Eating Place', the building works in respect of which are exempted by a certificate of exemption under Part III of the Buildings Ordinance (Application to the New Territories) Ordinance (Cap. 121).

Figure No. 3.1	Scale -	Figure Title Extracted Covering Notes of the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3
ARUP	Date Jul 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

INDUSTRIAL

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Art Studio (excluding those involving direct provision of services or goods) Bus Depot Cargo Handling and Forwarding Facility (not elsewhere specified) Eating Place (Canteen, Cooked Food Centre only) Government Refuse Collection Point Government Use (not elsewhere specified) Industrial Use (not elsewhere specified) Information Technology and Telecommunications Industries Office (Audio-visual Recording Studio, Design and Media Production, Office Related to Industrial Use only) Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Recyclable Collection Centre Research, Design and Development Centre Shop and Services (Motor-vehicle Showroom on ground floor, Service Trades only) Utility Installation for Private Project Vehicle Repair Workshop Warehouse (excluding Dangerous Goods Godown)	Asphalt Plant/Concrete Batching Plant Broadcasting, Television and/or Film Studio Cargo Handling and Forwarding Facility (Container Freight Station, free-standing purpose-designed Logistics Centre only) Container Vehicle Park/Container Vehicle Repair Yard Dangerous Goods Godown Eating Place (not elsewhere specified) (in wholesale conversion of an existing building only) Educational Institution (in wholesale conversion of an existing building only) Exhibition or Convention Hall Industrial Use (Bleaching and Dyeing Factory, Electroplating/Printed Circuit Board Manufacture Factory, Metal Casting and Treatment Factory/Workshop only) Institutional Use (not elsewhere specified) (in wholesale conversion of an existing building only) Mass Transit Railway Vent Shaft and/or Other Structure above Ground Level other than Entrances Off-course Betting Centre Offensive Trades Office (not elsewhere specified) Open Storage Petrol Filling Station Place of Entertainment (in wholesale conversion of an existing building only) Place of Recreation, Sports or Culture (not elsewhere specified) Private Club Public Clinic (in wholesale conversion of an existing building only) Refuse Disposal Installation Religious Institution (in wholesale conversion of an existing building only) Shop and Services (not elsewhere specified) (ground floor only, except in wholesale conversion of an existing building and Ancillary Showroom# which may be permitted on any floor) Training Centre (in wholesale conversion of an existing building only) Vehicle Stripping/Breaking Yard Wholesale Trade

(Please see next page)

Figure No. 3.2a	Scale -	Figure Title Extracted Schedule of Uses of the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3 – “Industrial” Zone (Sheet 1 of 3)
ARUP	Date Jul 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

INDUSTRIAL (Cont'd)

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
In addition, the following uses are always permitted in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the uses are separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:	In addition, the following use may be permitted with or without conditions on application to the Town Planning Board in the purpose-designed non-industrial portion on the lower floors (except basements and floors containing wholly or mainly car parking, loading/unloading bays and/or plant room) of an existing building, provided that the use is separated from the industrial uses located above by a buffer floor or floors and no industrial uses are located within the non-industrial portion:
Eating Place Educational Institution Exhibition or Convention Hall Institutional Use (not elsewhere specified) Off-course Betting Centre Office Place of Entertainment Place of Recreation, Sports or Culture Private Club Public Clinic Religious Institution Shop and Services Training Centre	Social Welfare Facility (excluding those involving residential care)

Ancillary Showroom requiring planning permission refers to showroom use of greater than 20% of the total usable floor area of an industrial firm in the same premises or building.

Planning Intention

This zone is intended primarily for general industrial uses to ensure an adequate supply of industrial floor space to meet demand from production-oriented industries. Information technology and telecommunications industries, office related to industrial use, and selected uses akin to industrial production and would not compromise building and fire safety are also always permitted in this zone.

(Please see next page)

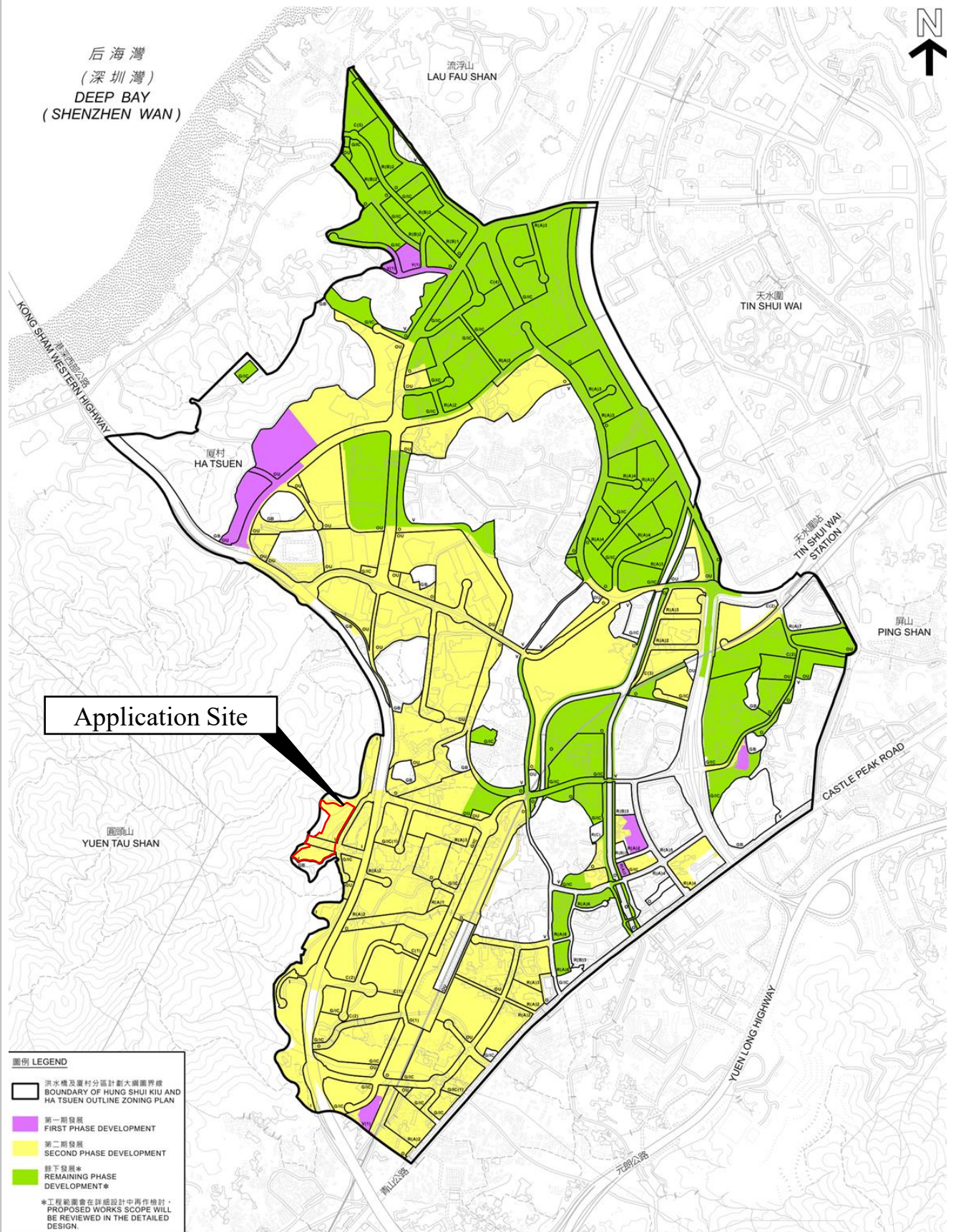
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ARUP	Date Jul 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

INDUSTRIAL (Cont'd)

Remarks

- (a) No new development, or addition, alteration and/or modification to or redevelopment of an existing building shall result in a total development and/or redevelopment in excess of a maximum plot ratio of 3, and the maximum building height in terms of metres above Principal Datum as stipulated on the Plan, or the plot ratio and height of the existing building, whichever is the greater.
- (b) In determining the maximum plot ratio for the purposes of paragraph (a) above, any floor space that is constructed or intended for use solely as car park, loading/unloading bay, plant room and caretaker's office, provided such uses and facilities are ancillary and directly related to the development or redevelopment, may be disregarded.
- (c) Based on the individual merits of a development or redevelopment proposal, minor relaxation of the plot ratio and/or building height restrictions stated in paragraph (a) above may be considered by the Town Planning Board on application under section 16 of the Town Planning Ordinance.

<i>Figure No.</i>	<i>Scale</i>	<i>Figure Title</i>	Extracted Schedule of Uses of the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3 – “Industrial” Zone (Sheet 3 of 3)
3.2c	-		
ARUP	<i>Date</i>	<i>Source</i>	Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026
	Jul 2026		



LEGEND



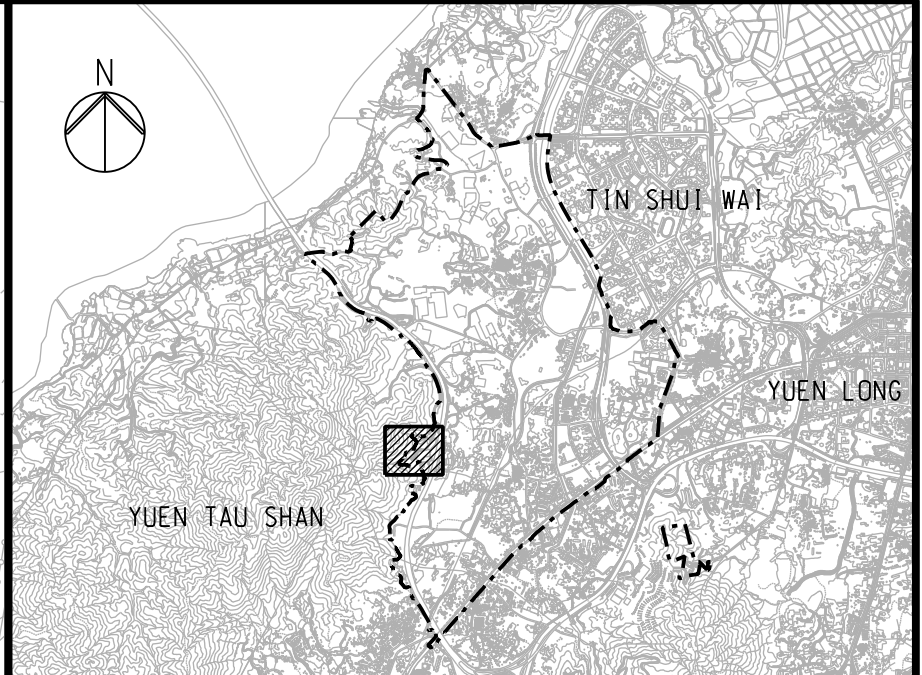
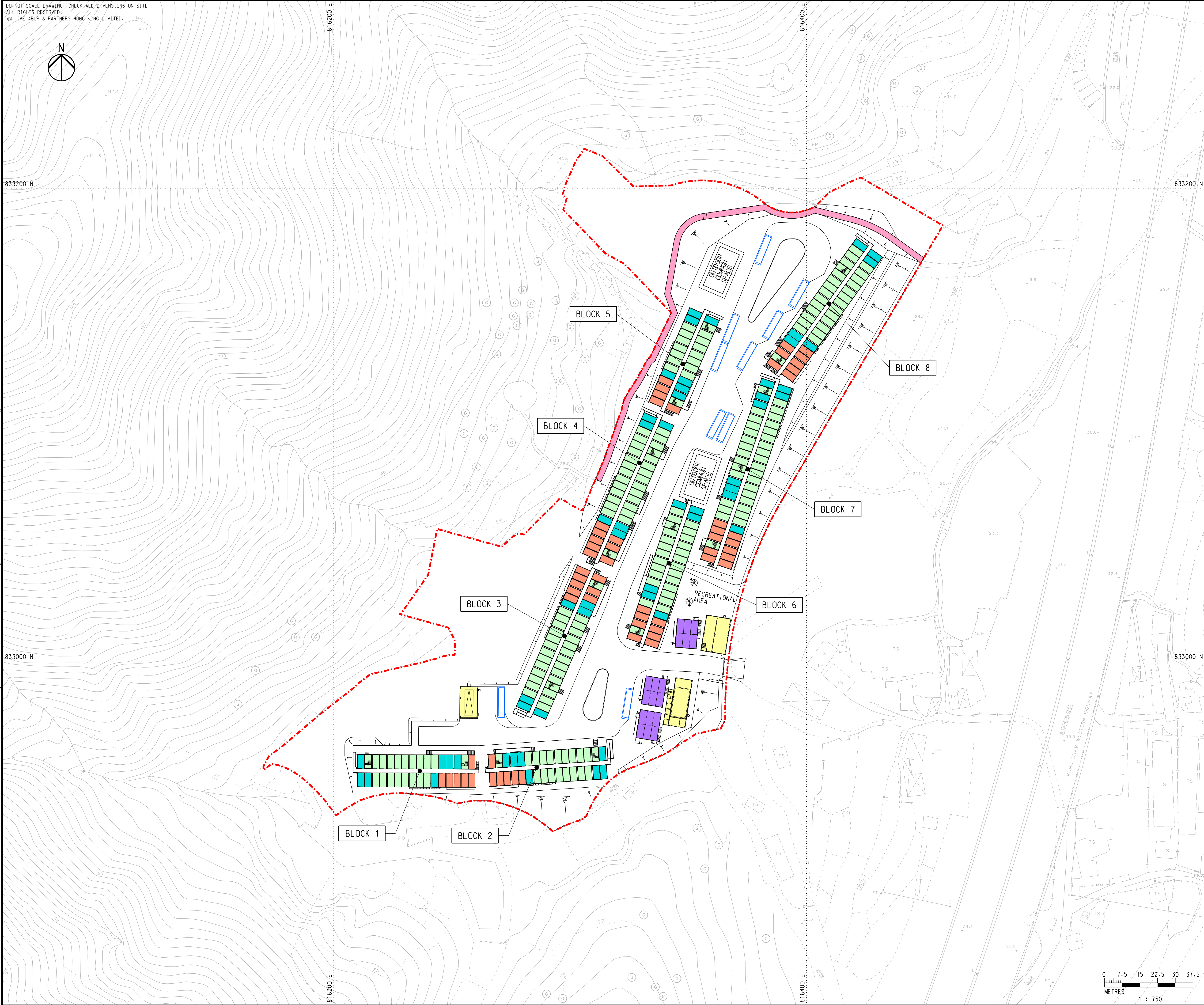
Application Site

Figure No. 3.3	Scale As shown	Figure Title Phasing Plan of Hung Shui Kiu/ Hai Tsuen NDA
ARUP	Date Aug 2026	Source Extracted from the Draft Hung Shui Kiu/ Ha Tsuen Outline Zoning Plan (No. S/HSK/3) gazetted on 20 March 2026

Appendix A

General Layout Plans

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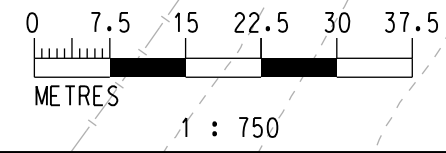


KEY PLAN

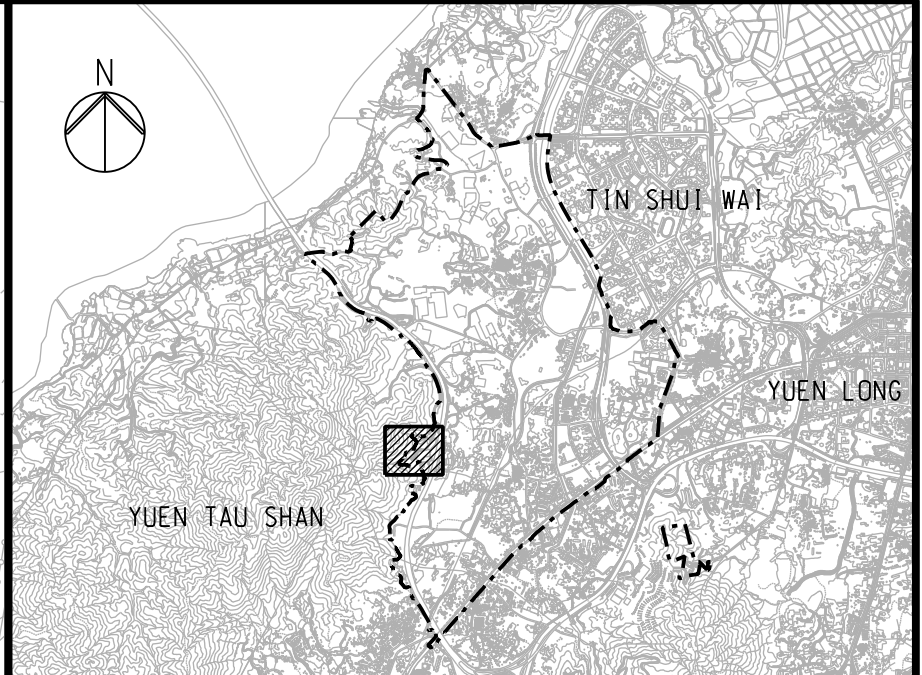
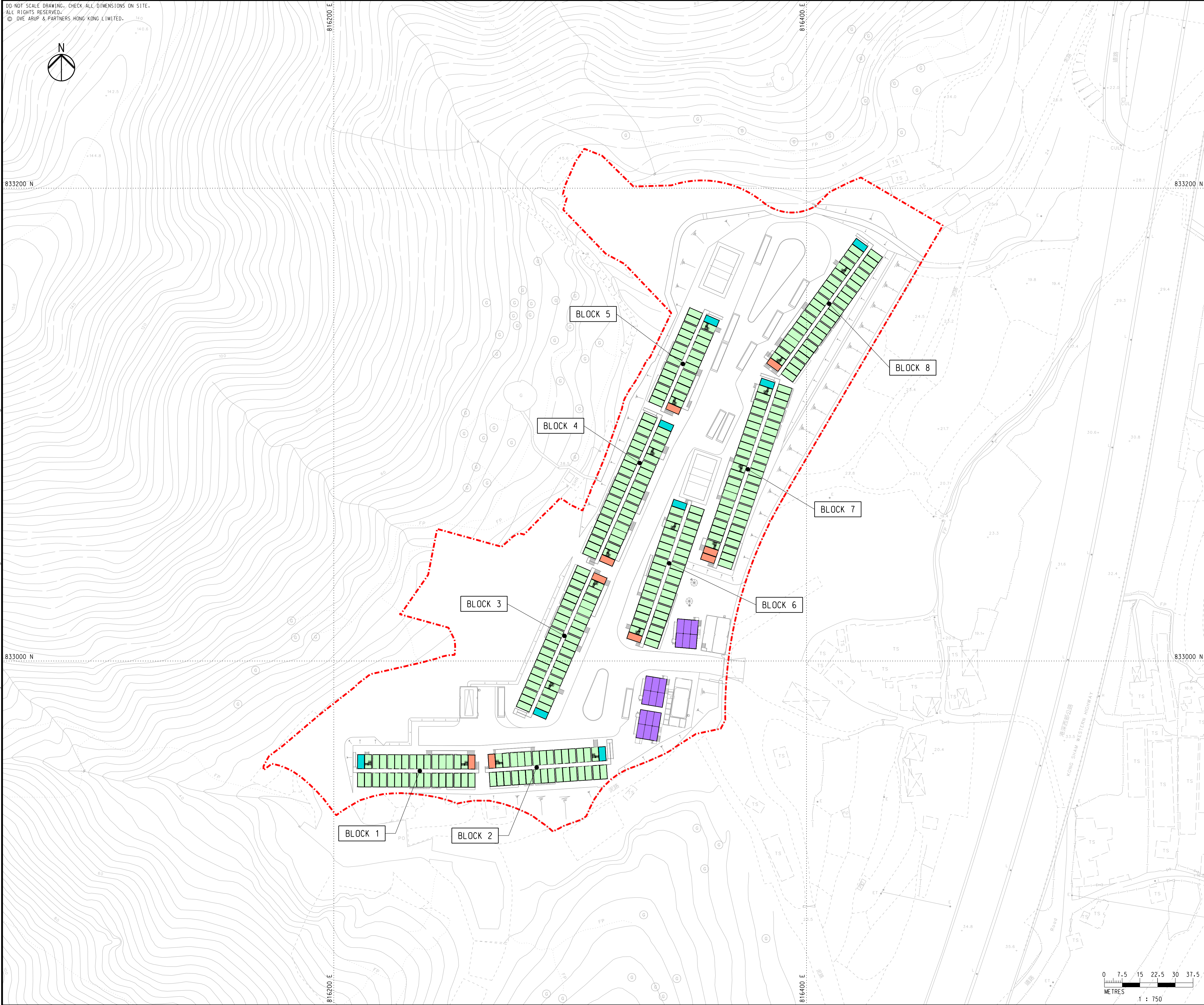
LEGEND

- APPLICATION SITE
- RESIDENTIAL BLOCK
- MULTI-FUNCTION ROOM, ACTIVITY ROOM, FIRST AID, LAUNDRY, REFUSE ROOM, ELV ROOM, FS WATER TANK & PUMP ROOM, STORE
- MANAGEMENT OFFICE
- BUILDING SERVICES AND FIRE SERVICES BUILDING
- TOILET FACILITIES AND CHANGING ROOM
- LOADING / UNLOADING FOR COACHES
- PROPOSED FOOTPATH

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE)			
Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development – Design and Construction			
Drawing title			
HSK / HT NDA			
SECOND PHASE DEVELOPMENT			
IMPORTED LABOUR QUARTERS			
GENERAL LAYOUT PLAN			
(GROUND FLOOR)			
Drawing no.		Rev.	
278463/SK/C/478		A	
Drawn	Date	Checked	Approved
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Scale	Status		PRELIMINARY
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KEY PLAN

- LEGEND**
- APPLICATION SITE
 - RESIDENTIAL BLOCK
 - MULTI-FUNCTION ROOM, ACTIVITY ROOM, FIRST AID, LAUNDRY, REFUSE ROOM, ELV ROOM, FS WATER TANK & PUMP ROOM, STORE
 - MANAGEMENT OFFICE
 - TOILET FACILITIES AND CHANGING ROOM

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date

Consultant

ARUP

Project Title

Agreement No. CE 1/2020 (CE)

Hung Shui Kiu / Ha Tsuen

New Development Area Package A

Works for Second Phase Development – Design and Construction

Drawing title

HSK / HT NDA

SECOND PHASE DEVELOPMENT

IMPORTED LABOUR QUARTERS

GENERAL LAYOUT PLAN

(FIRST FLOOR)

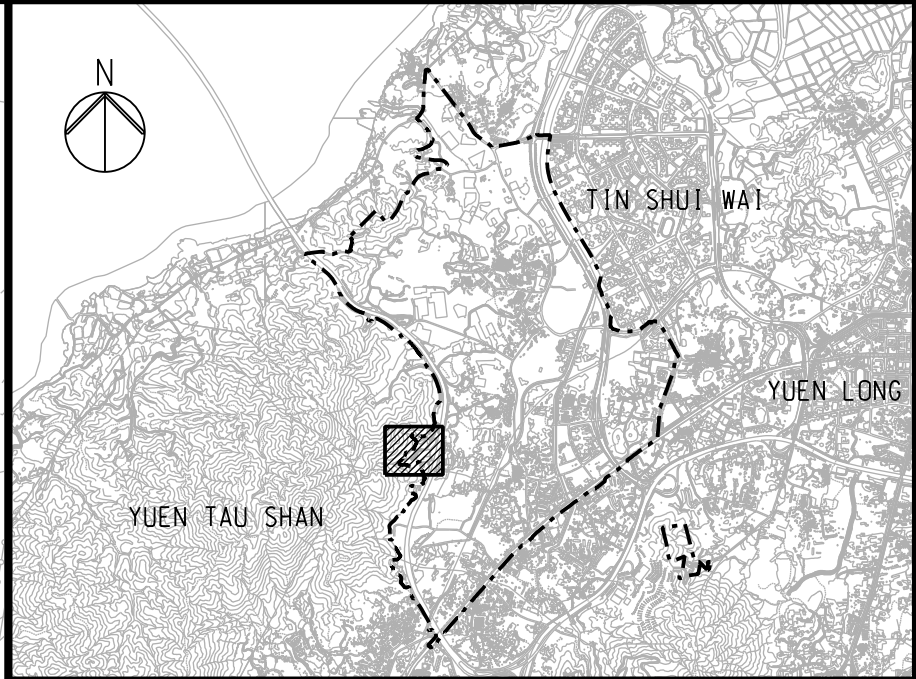
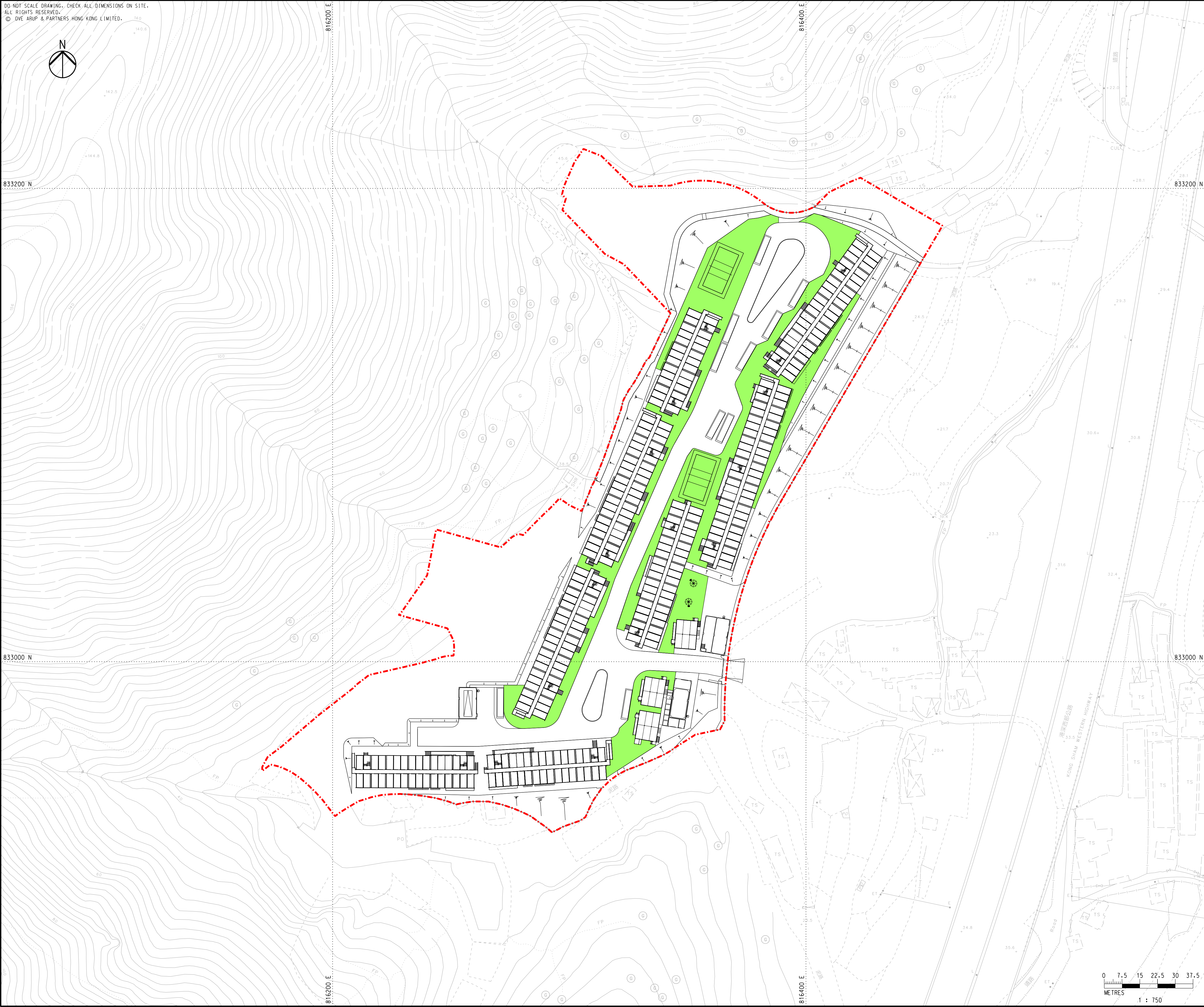
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KEY PLAN

LEGEND

- APPLICATION SITE
- LOCAL OPEN SPACE

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date
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Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development – Design and Construction			
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OPEN SPACE			
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Appendix B

Traffic Impact Assessment

Civil Engineering and Development Department

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years in “Industrial” Zone and Area Shown as ‘Road’ of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area

Traffic Impact Assessment

| August 2026

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 278463

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Kowloon
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ARUP

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Figure 5.1	Key Junctions for Assessment
Figure 5.2	2031 Peak Hour Reference Traffic Flow
Figure 5.3	2031 Peak Hour Design Traffic Flow

Appendices

Appendix A	Existing Junction Layouts
Appendix B	Overall Road Layout Plan of HSK/HT NDA
Appendix C	Junction Calculation Sheets
Appendix D	Future Junction Layouts
Appendix E	General Layout Plan (Contractor Design)

1. Introduction

1.1 General

- 1.1.1** Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within “Industrial” (“I”) Zone and area shown as 'Road' of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (“the HSK/HT OZP”) No. S/HSK/3 for a Period of 3 Years (“the proposed development”).
- 1.1.2** The 8 nos. of two-storey residential blocks will provide about 450 residential module of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.
- 1.1.3** The Application Site is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/NT NDA for implementation of site clearance/ site formation and associated infrastructure works.
- 1.1.4** This Traffic Impact Assessment (TIA) is to review the traffic impact against the approved TTIA Report No. REP-034-05 (F3C) under the Agreement No. CE1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction.

1.2 Development Proposal

- 1.2.1** The Proposed Development is located at the western side of Kong Sham Western Highway at Hung Shui Kiu. The development parameters (“Proposed Scheme”) upon the proposed amendment are summarized in **Table 1.1**. Two-storey quarter will be provided no later than Q3 2027. The technical assessments as shown in **Table 1.1** would be adopted for this S16 application.

Table 1.1 – Key Development Parameters of the Proposed Development

Key Development Parameters	Proposed Development
Site Area	About 31,787m ²
Maximum No. of Residential Module	About 450
Design Population	About 1,800
Target Year of Population Intake	No later than Q3 2027

Note: Development parameters are subject to detailed design.

1.3 Proposed Parking and Loading/ Unloading Facilities Provision

Private Car Parking Provision

- 1.3.1** Having regard to the temporary nature of the proposed development and the profile of the intended occupants, the likelihood of future tenants owning private cars is considered to be very low. Shuttle bus services are anticipated to serve as the primary mode of transport for commuting between the site and workplaces. Reference is made to a comparable existing construction sector imported labour quarters (CSILQ) at Tam Mi, Yuen Long, where no car parking provision is provided. Accordingly, no residential car parking spaces are proposed within the Site.

Shuttle Bus Service and Arrangement

- 1.3.2** Shuttle bus services will be provided to serve the future tenants travelling to and from their workplaces. Appropriate pick-up/drop-off facilities will be incorporated within the Proposed Development. Given the potentially diverse workplace locations of future tenants, the shuttle bus service catchment is not assumed to be confined to the Hung Shui Kiu area.
- 1.3.3** Assuming 60-seater shuttle would be adopted to serve the future population (i.e. ~1800 tenants), a fleet size of maximum of 30 no. of shuttles would be required to accommodate pick-up and drop-off demand during the commuting peaks of the tenants.
- 1.3.4** With reference to CSILQ, shuttle departures are primarily concentrated during the morning period (approximately 06:00–07:30). The return trips are more spread out during the evening period (approximately 17:30–22:00). This indicates that shuttle service demand would be more concentrated in the morning departure peak and comparatively dispersed during the afternoon/evening return period. In addition, the commuting peak of the CSILQ during the morning period was staggered from the general morning peak hours to minimise the traffic impact on the surrounding road network. It is anticipated that a similar travel pattern and operation arrangement will be adopted for the Proposed Development.
- 1.3.5** To facilitate the pick-up/drop-off of the tenants, L/UL bays would be provided within the site. Considering the tenant would depart in a narrower time period in AM (i.e. 1.5 hours) which is more critical than PM, the provision of L/UL bays would be determined based on the AM scenario. Assuming 10-minute boarding/alighting time for each shuttle and one bay would serve 6 shuttles per hour, the required no. of bays and provision is illustrated in **Table 1.2**.

Table 1.2 – Estimated Loading/ Unloading Provision for Proposed Development

Population	No. of shuttles per hour	No. of L/UL Bays		Sufficient (Y/N?)
		Required	Provision	
1800	20 ⁽¹⁾	4 ⁽²⁾	10 ⁽³⁾	Y

Note:

- (1) No. of shuttle per hour = 1,800 people/60-seat shuttle/1.5 hours departure period = 20
- (2) The required no. of L/UL bays = 20 shuttles/ 6 shuttles per bay per hour = 4
- (3)** A total of 10 coach L/UL Bays will be provided within the site, including 2 shared-use bays serving both coaches and goods vehicles. For reference, please refer to Appendix E Master Layout Plan (Contractor Design).

2. Traffic and Transport Network

2.1 Existing Road Network

- 2.1.1** The HSK/HT NDA is bounded by Castle Peak Road – Hung Shui Kiu section to the south, Kong Sham Western Highway (KSWH) to the west and Hung Shiu Kiu Main Street to the east. The existing road network within the area of influence (AOI) is shown in **Figure 1.1**.
- 2.1.2** Currently, Yuen Long Highway and KSWH as expressways are the major strategic roads connecting HSK/HT with New Territories and urban area. Castle Peak Road – Hung Shui Kiu as a rural trunk road parallel to Yuen Long Highway serves as an alternative inter-district connection between HSK/HT area and North-West New Territories (NWNT).
- 2.1.3** KSWH, Hung Tin Road and Long Tin Road are three major North-South connections carrying HSK/HT area and Tin Shui Wai traffic to Yuen Long Highway and the external road network.

2.2 Existing Public Transport

- 2.2.1** HSK/HT area is currently served with light railway transit (LRT) providing inter-district transportation to neighbouring areas of Tuen Mun, Yuen Long and Tin Shui Wai. LRT passengers can interchange with Tuen Ma Line (TML) at Tuen Mun Station, Siu Hong Station, Tin Shui Wai Station and Yuen Long Existing Use and Condition
- 2.2.2** The alignment of Tuen Ma Line runs across HSK/HT area. However, HSK/HT area is located to the east Tuen Mun and to the west of Tin Shui Wai districts and is outside 500m railway catchment. MTR feeder buses are currently provided to serve HSK passengers to the nearest MTR Tin Shui Wai (TSW) Station.
- 2.2.3** The existing road-based public transport services within HSK/HT area are provided along Hung Tin Road, Ping Ha Road, Tin Ha Road and Lau Fau Shan Road. The area is mainly served with franchised buses and green mini-buses.
- 2.2.4** As the Proposed Development is located on the fringe of HSK and has limited access to public transport services, shuttle bus services will be provided to serve future tenants.

2.3 Existing Junctions Performance

- 2.3.1** The existing traffic condition within AOI based on the approved TTIA are summarized in **Table 2.1** respectively. The assessed locations are presented in **Figure 1.1**. Existing junction layouts are shown in **Appendix A**.

Table 2.1 – Existing Key Junctions Performance from Approved TTIA

No.	Junction	Junction Type ⁽²⁾	Existing Junction Performance	
			AM	PM
J1	Junction of Castle Peak Road and Yick Yuen Road	S	>50%	>50%
J2	Kong Sham Western Highway Roundabout	R	0.47	0.13

Note:

- (1) “R” denotes roundabout, “P” denotes priority junction and “S” denotes signalized junction
(2) Performance is assessed with “Design Flow to Capacity” (D.F.C) ratio for priority junctions and roundabout and “Reserve Capacity” (R.C) for signalised junctions

2.3.2

In general, all junctions were operating with a R.C. of not less than 15% for signalized junctions.

3. Future Road Network in Hung Shui Kiu/ Ha Tsuen New Development

3.1 Introduction

3.1.1 The HSK/HT NDA will provide new primary and district roads to facilitate east-west and north-south movements within the NDA to enhance the internal connectivity of the NDA. A comprehensive local road network, cycle tracks, pedestrian walkways and pedestrian streets will also be provided to facilitate internal vehicular and pedestrian movements. **Appendix B** shows the overall road layout plan of HSK/HT NDA. The general function of each road type in the proposed highway hierarchy is shown in **Table 3.1**.

Table 3.1 – Road Hierarchy Function and Characteristic

Hierarchy	Function	Characteristic	Road in HSK/HT NDA
Expressway/ Trunk Road	Connecting the main centres of population	High capacity roads; No frontage access or development, Segregation of pedestrians, Widely spaced grade-separated junctions, 24 hour stopping restrictions.	- Kong Sham Western Highway (Expressway) - Castle Peak Road – Hung Shui Kiu Section (Rural Trunk)
Primary Distributor	Forming the major network of the urban area	Having high capacity junctions, though may be at-grade; Segregated pedestrian facilities wherever possible and frontage access limited if not entirely restricted; 24 hour stopping restrictions	Road P1
District Distributor	Linking Districts to the Primary Distributor Roads	High capacity at-grade junctions; Peak hour stopping restrictions; Parking restrictions throughout the day	Road D1 to D8, Hung Tin Road, Tin Ying Road
Local Distributor	Linking developments to the District Distributor Roads		Other local road network in HSK/HT NDA

3.2 Vehicular Access Arrangement

Access Arrangement with HSK/HT Second Phase Road Network

3.2.1 As part of the Second Phase Development, the Proposed Development will be served by the planned road network of the HSK/HT NDA, including connections to the adjacent Road P1 which is a primary distributor running in north-south direction underneath KSWH, providing linkage to KSWH, Castle Peak Road and other district distributors. Based on the best information available at the time of report preparation, Road P1 and Road L24 will be in

full operation in Q1 2030 tentatively. The future road network in the vicinity and the proposed vehicular access is shown in **Figure 3.1**.

Access Arrangement under existing network

3.2.2

Since the Proposed Development is tentatively scheduled to commence operation in 2027, the permanent road network under the Second Phase Development of the HSK/HT NDA is expected to remain under construction. As such, the traffic access arrangement to the Site during the interim period will vary depending on the construction programme and land resumption progress. Temporary haul roads will be provided to connect the site with the existing external road network during the construction phase. To minimise traffic impacts on the existing village clusters, a direct haul road connecting to Ha Tsuen Interchange will be provided, enabling shuttle buses to access KSWH directly without passing through local village roads.

4. Traffic Forecast and Methodology

4.1 Assessment Scenarios

4.1.1 The tentative year of population intake for the Proposed Development will be no later than 2027. Under this Application, the Proposed Development will operate for a period not exceeding three years, and any continued operation beyond this period will be subject to a separate extension application. As the Proposed Development is expected to remain in operation until Q3 2030, 2031 has been adopted as the design year for the traffic impact assessment and traffic forecasting.

4.1.2 Two scenarios with two design years and road network assumption have been used in the assessment:

4.1.3 Reference Scenario:

- Year 2031 – Design Case under “Approved TTIA”

4.1.4 Design Scenario:

- Year 2031 Reference Scenario + Withdraw the total traffic generation from Proposed Development (Original Scheme as Industrial) + Add total traffic generation from Proposed Development (Proposed Scheme as labour quarter)

4.1.5 The development parameters as presented in **Section 1.2** were adopted for Design scenario (Proposed Scheme). The changes of the trip generation are presented in **Section 4.2**.

4.2 Traffic Generation Assumption

4.2.1 For the Proposed Development trip generation and attraction, it will be determined based on the numbers of shuttles during AM and PM Peak periods. For analysis the net increase of traffic demand, the trip rates and trip generation for the original scheme as industrial are summarized in **Table 4.1**.

Table 4.1 – Estimated Development Traffic under Original Scheme(PCU/hr)

Development Type	Unit	Trip Rate ⁽¹⁾				Trip Generation (PCU/hr)			
		AM Peak		PM Peak		AM Peak	PM Peak	AM Peak	PM Peak
		Gen	Att	Gen	Att	Gen	Att	Gen	Att
Industrial (80796m ² GFA) ⁽²⁾	pcu/hr/100m ²	0.0450	0.0870	0.0790	0.0490	36	70	64	40

Note:

- (1) Trip rates adopted in the approved TTIA under Agreement No. CE1/2020 (CE) HSK/HT NDA Package A Works for Second Phase Development – Design and Construction
- (2) Based on previous TTIA assumption

- 4.2.2** Based on the proposed shuttle service as described in Section 1.3, the estimated traffic volume induced by the Proposed Development are tabulated in **Table 4.2**. As the forecast traffic generation during the AM peak hour is higher than that during the PM peak hour, the AM peak traffic generation has been adopted for both the AM and PM peak period assessments as a conservative assumption.

Table 4.2 – Estimated Development Traffic (PCU/hr)

Development Type	Shuttle / hour	AM Peak		PM Peak	
		Gen	Att	Gen	Att
Shuttle service	20	50	50	50	50

Note:

- (1) A pcu factor of 2.5 is applied (i.e. 20 veh/hr x 2.5 pcu/hr = 50 pcu/hr)

- 4.2.3** Based on the traffic generation estimates in **Table 4.1** and **Table 4.2**, the total additional trips induced by the Original Scheme and Proposed Scheme are estimated in **Table 4.3**.

Table 4.3 – Estimated Traffic Generation and Attraction (PCU/hr)

Schemes	Development	AM Peak		PM Peak	
		Gen	Att	Gen	Att
Original Scheme	Industrial	-36	-70	-64	-40
Proposed Scheme	Labour Quarter	50	50	50	50
Total (Net Increase)		+14	-20	-14	+10

- 4.2.4** The Proposed Scheme will generate around 100 two-way pcu/hr during the AM and PM peak periods respectively. The changes of the traffic generation between the Original Scheme and Proposed Scheme are around -6 and -4 two-way pcu/hr during the AM and PM peak periods respectively.

5. Traffic Impact Assessment

5.1 Reference and Design Scenario for Assessment

- 5.1.1** Traffic impact assessment has been conducted for design year 2031 for reference and design scenarios.

5.2 Key Junctions Performance

- 5.2.1** The performance of key junctions within and in the vicinity of the Proposed Development have been assessed and the assessment results are presented in **Table 5.1**. The assessment location for key junctions is shown in **Figure 5.1**. Detailed junction calculations for design year 2031 are shown in **Appendix C** and the future junction layouts are shown in **Appendix D**. The traffic flow diagrams are shown in **Figure 5.2 – 5.3**.

Table 5.1 – Key Junctions Performance at Peak Hour in 2031

No.	Junction	Existing/ New Junction (1)	Junction Type (2)	Junction Performance (3)			
				2031 Ref		2031 Des	
				AM	PM	AM	PM
J1	Junction of Castle Peak Road and Yick Yuen Road	E	S	19%	32%	19%	32%
J2	Kong Sham Western Highway Roundabout	E	R	0.69	0.74	0.69	0.74
J3	Road P1 and Road D6	N	R	0.26	0.24	0.26	0.27
J4	Road P1 and Road D7	N	R	0.71	0.62	0.70	0.60
J5	Road P1 and Road D8	N	R	0.70	0.64	0.71	0.63

Note:

- (1) “E” denotes existing junction and “N” denotes new junction in HSK/HT NDA
 (2) “R” denotes roundabout, “P” denotes priority junction and “S” denotes signalized junction
 (3) Performance is assessed with “Design Flow to Capacity” (D.F.C.) ratio for priority junctions and roundabout and “Reserve Capacity” (R.C.) for signalized junctions

- 5.2.2** By comparing the results between reference (Original Scheme) and design (Proposed Scheme) scenarios, the impact induced by the Proposed Development is insignificant.

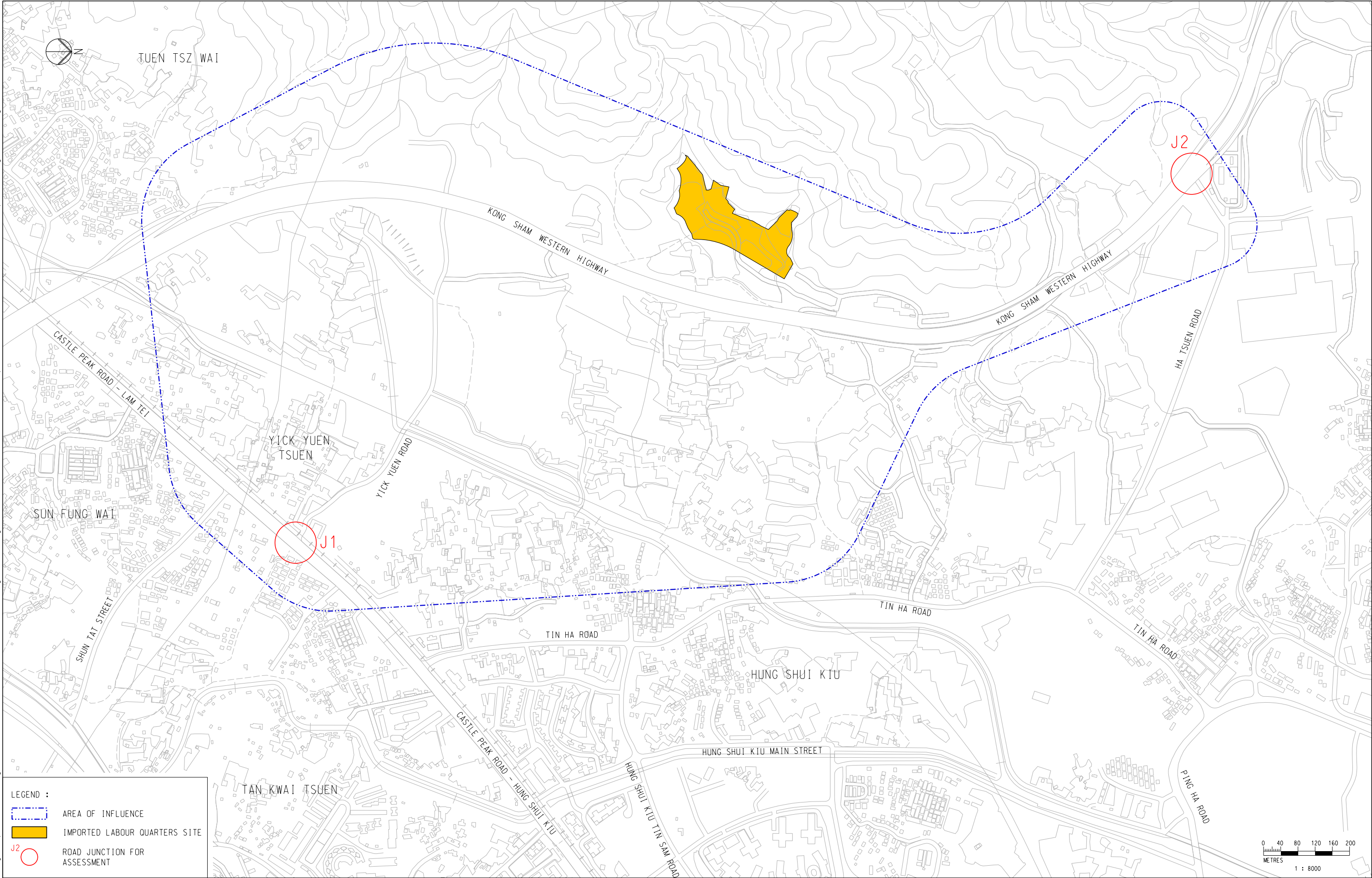
- 5.2.3** In general, all existing junctions will be operating with a R.C. of not less than 15% for signalized junctions or D.F.C. ratio of not more than 0.85 for priority junctions and roundabouts in the peak hours for all scenarios with the planned junction improvement measures. New junctions within HSK/HT NDA will be operating with a R.C. of not less than 25% or D.F.C. ratio of not more than 0.75 in the peak hours and therefore the impacts induced by the Proposed Development are negligible.

6. Conclusion

- 6.1.1** This TIA Report is to ascertain the potential traffic impact by the Proposed Development. The development is located at the western side of Kong Sham Western Highway at Hung Shui Kiu.
- 6.1.2** The population intake is tentatively scheduled to commence operation in Q3 2027 to serve about 1800 population.
- 6.1.3** Shuttle service would be provided to serve the future tenants to/from the workplaces. Shuttle buses will be arranged for transport future tenants between the construction sites in Hong Kong and the Proposed Development. To facilitate pick-up/drop-off, adequate loading/unloading area of shuttle buses would be provided within the site.
- 6.1.4** Since the Proposed Development is tentatively scheduled to commence operation in Q3 2027, the permanent road network under the Second Phase Development of the HSK/HT NDA is expected to remain under construction. As such, the traffic access arrangement to the Site during the interim period will vary depending on the construction programme and land resumption progress. Temporary haul roads will be provided to connect the site with the existing external road network during the construction phase. To minimise traffic impacts on the existing village clusters, a direct haul road connecting to Ha Tsuen Interchange will be provided, enabling shuttle buses to access KSWH directly without passing through local village roads.
- 6.1.5** Upon commissioning of the HSK/HT NDA planned road network, the Proposed Development will be served by Road L24 and adjacent Road P1 which is a primary distributor running in north-south direction underneath KSWH, providing linkage to KSWH, Castle Peak Road and other district distributors. Based on the best information available at the time of report preparation, Road P1 and Road L24 will be in full operation in Q1 2030 tentatively.
- 6.1.6** The performance of key junctions within and in the vicinity of HSK/HT NDA have been assessed for Design Year 2031. The assessment results reveal that the assessed junctions would operate with sufficient capacity in Design Year 2031 with and without HSK/HT road network.
- 6.1.7** Based on the assessment under this report, no insurmountable traffic and transport impact will be induced by the Proposed Development under this Application.

Figures

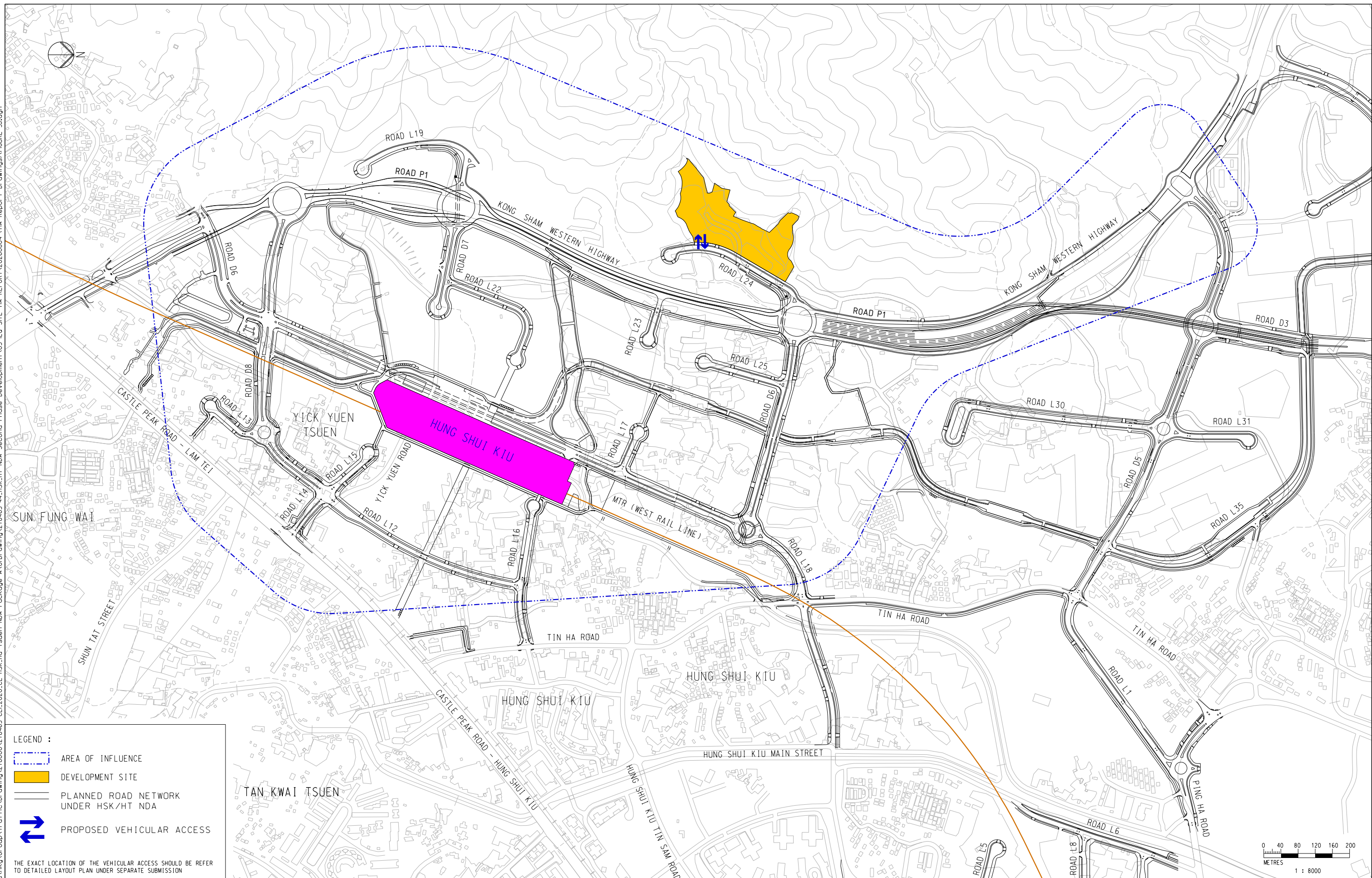
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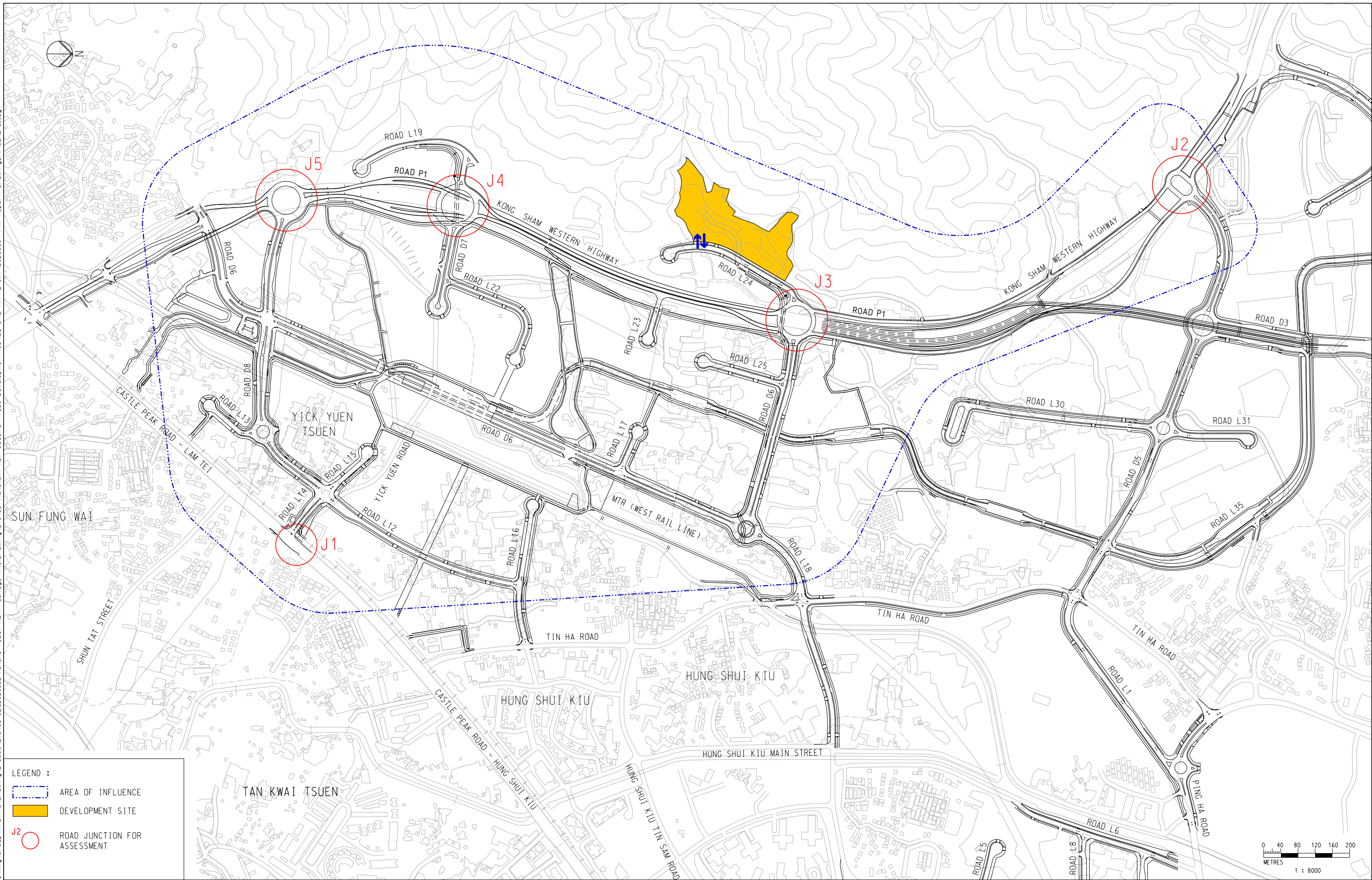
Job Title CE01/2020 (CE) HUNG SHUI KIU/ HA TSUEN NEW DEVELOPMENT AREA PACKAGE A WORKS FOR SECOND PHASE DEVELOPMENT - DESIGN AND CONSTRUCTION			Figure 1.1
Date 07/26	Scale 1 : 8000 @ A3	Drawing Title EXISTING ROAD NETWORK AND AREA OF INFLUENCE	
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FILENAME: \\global\EastAsia\hkg\Group\trac\file\Drawing\278000\278463 CE\2020 CE HSK-Ha Tsuen NDA Package A\01Drawing\278463-44_HSK_HT_NDA Second Phase Development\03 ILO SITE TIA REPORT\20260804 TIA Report Drawings\FIGURE 31.dgn



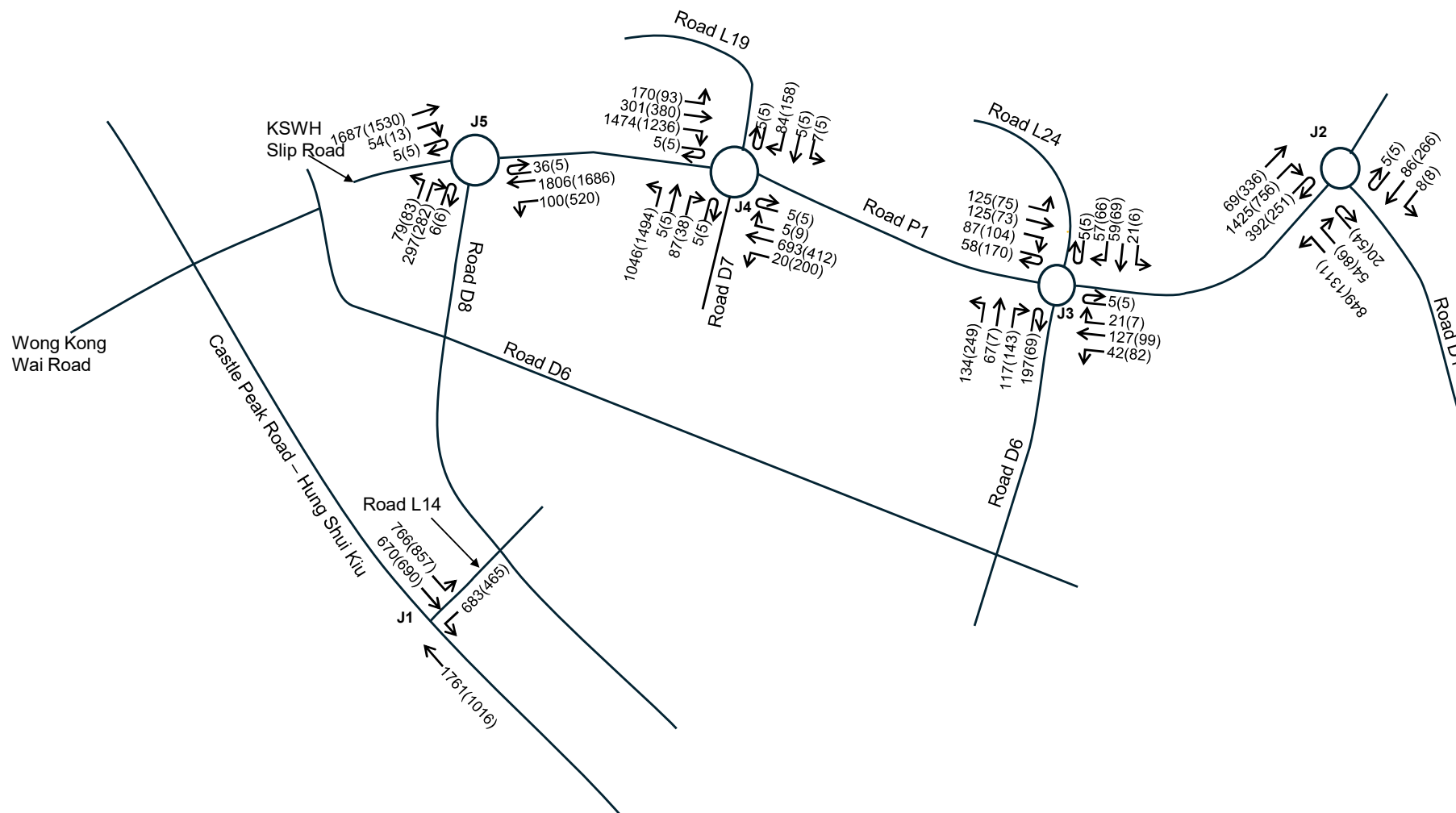
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Legend:

← 123 (123)
AM Peak Hour Flows PM Peak Hour Flows



Job Title
CE01/2020 (CE) HUNG SHUI KIU/ HA TSUEN NEW DEVELOPMENT AREA PACKAGE A WORKS FOR SECOND PHASE DEVELOPMENT - DESIGN AND CONSTRUCTION

Figure 5.2

Date
09/25

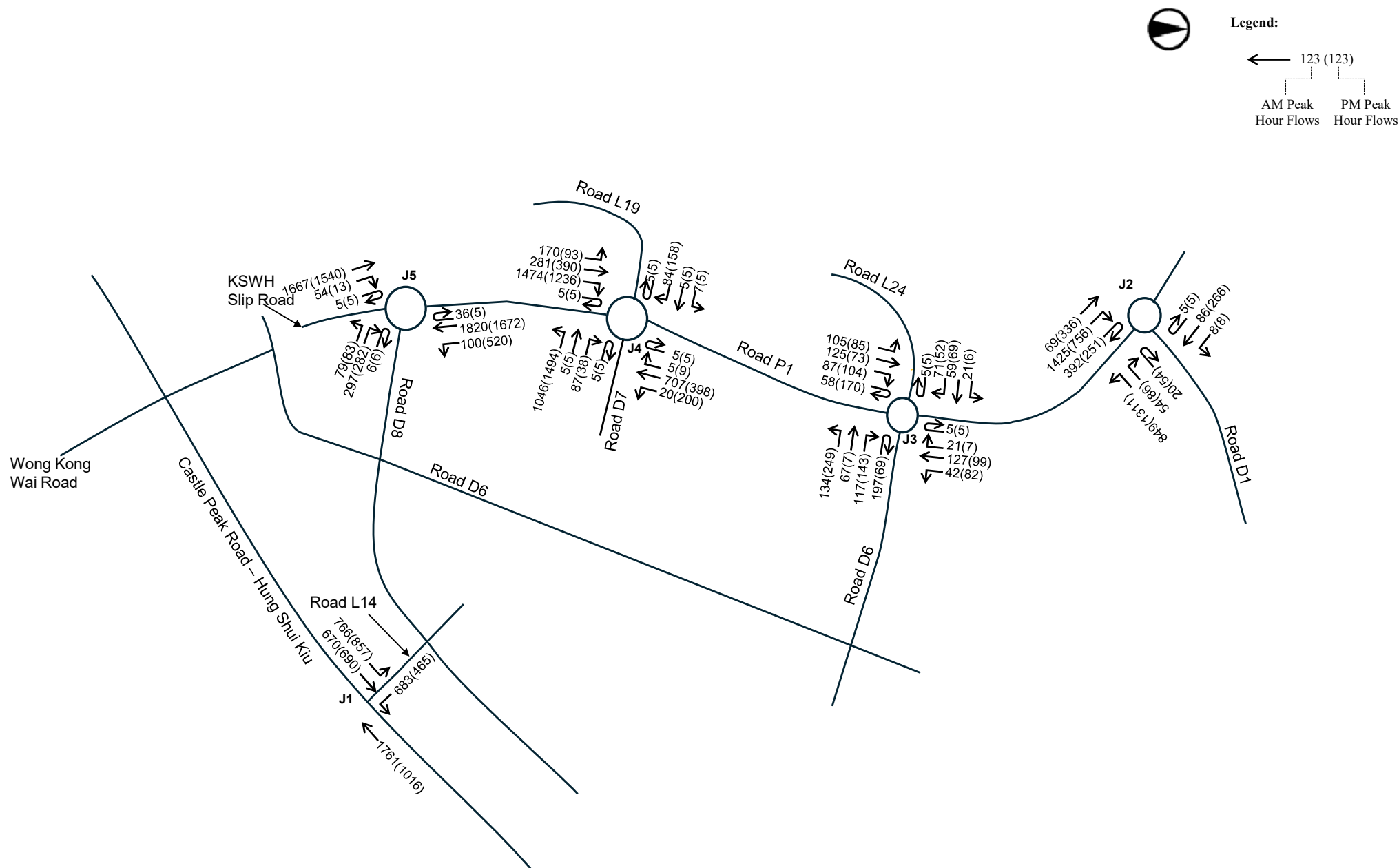
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Drawing Title
2031 PEAK HOUR REFERENCE TRAFFIC FLOW

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Job No.
278463

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Job Title
 CE01/2020 (CE) HUNG SHUI KIU/ HA TSUEN NEW DEVELOPMENT AREA PACKAGE A WORKS FOR SECOND PHASE DEVELOPMENT - DESIGN AND CONSTRUCTION

Figure 5.3

Date
 09/25

Scale
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Job No.
 278463

2031 PEAK HOUR DESIGN TRAFFIC FLOW

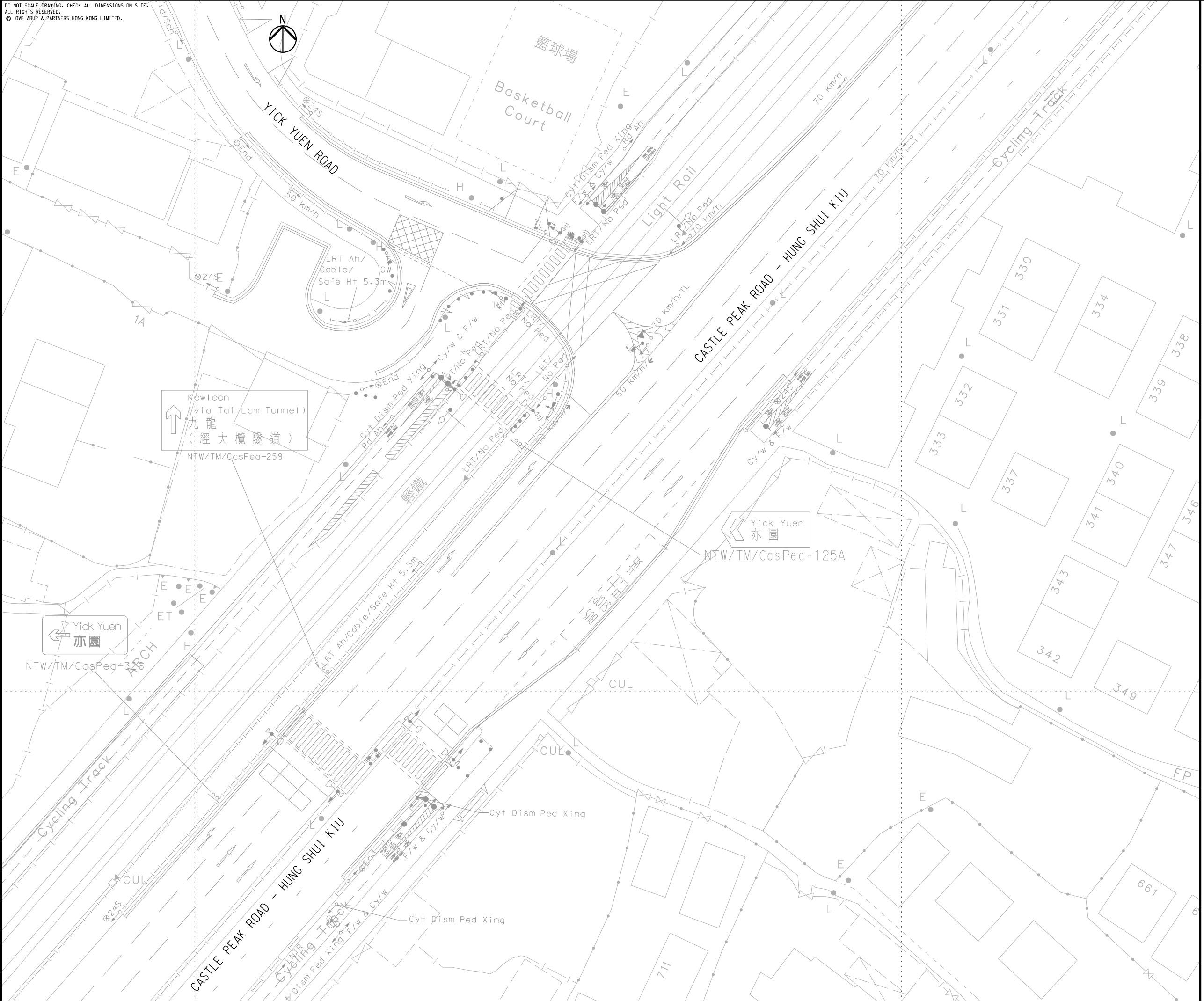
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Appendix A

Existing Junction Layouts

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NOTES:
1. FOR NOTES AND LEGEND, REFER TO DWG.NO. 278463/T/0001.



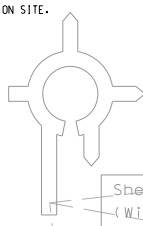
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Project Title			
Agreement No. CE 1/2020 (CE)			
Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development			
– Design and Construction			
Drawing title			
JUNCTION LAYOUT PLAN - J1			
CASTLE PEAK ROAD / YICK YUEN ROAD			
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			PRELIMINARY

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Weigh Station
秤車站
Helipad
直升機停機坪

Shenzhen Bay
(With Permit Only)
深圳灣
(祇限持有許可證者)

NTW/YL/KonShaWH-39

Exp/w End
No Ped/Cyt
NE

Exp/w End
No Ped/Cyt
NE

Rd Closed/
N-TS46WP

Exp/w Sta/
No Ped/Cyt
End

Exp/w Sta/
No Ped/Cyt
End

Rd Closed/
N-TS46WP

Shenzhen Bay
(With Permit Only)
深圳灣
(祇限持有許可證者)

NTW/YL/KonShaWH-38



Tuen Mun
屯門
Yuen Long
元朗
Tin Shui Wai
天水圍
Ha Tsuen
廈村

有許可證者)

NTW/YL/KonShaWH-35

Out

NE

NE

NE

NE

NE
GW
NE

NE
GW
NE

NE
GW
NE

Weigh Station
秤車站

Shenzhen Bay
(With Permit Only)
深圳灣
(祇限持有許可證者)

Weigh Station
秤車站

Ha Tsuen
廈村

Tuen Mun
屯門
Yuen Long
元朗
Tin Shui Wai
天水圍

NTW/YL/KonShaWH-37

NTW/YL/KonShaWH-36

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NOTES:

1. FOR NOTES AND LEGEND, REFER TO DWG.NO. 278463/T/0001.

Rev	Description	By	Date
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Consultant
ARUP

Project Title
Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
– Design and Construction

Drawing title
**JUNCTION LAYOUT PLAN - J2
KONG SHAM WESTERN HIGHWAY
ROUNDBOUT**

Drawing no.	Rev.
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Appendix B

Overall Road Layout Plan of HSK/HT NDA

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818000 E

820000 E

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834000 N

832000 N

832000 N

814000 E

816000 E

818000 E

820000 E

KONG SHAM WESTERN HIGHWAY

NGAU HOM SHEK

LAU FAU SHAN

TIN WA ROAD

TIN SHUI WAI

ROAD ALONG WESTERN
BOUNDARY OF HA TSUEN

YUEN TAU SHAN

DIRECT ROAD CONNECTION
BETWEEN ROAD P1 & ROAD D6

ROAD L33

ROAD L32

ROAD D1

ROAD D1

ROAD D4

HA TSUEN

HA TSUEN ROAD
(ROAD D5)

ROAD L35

ROAD L31

ROAD L6

ROAD L1

ROAD L7

ROAD L9

ROAD L5

ROAD L10

PING SHAN
CASTLE PEAK ROAD - PING SHAN

HUNG TIN ROAD

ROAD L25

ROAD L24

ROAD L23

ROAD L22

ROAD L21

ROAD L19

ROAD D7

ROAD D8

ROAD L13

ROAD L14

ROAD L12

ROAD L15

ROAD L16

HUNG SHUI KIU

ROAD L17

ROAD L18

ROAD D6

ROAD P1

ROAD L30

ROAD L31

ROAD L32

ROAD L33

ROAD L34

ROAD L35

ROAD L36

ROAD L37

ROAD L38

ROAD L39

ROAD L40

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ROAD L290

ROAD L291

ROAD L292

ROAD L293

ROAD L294

ROAD L295

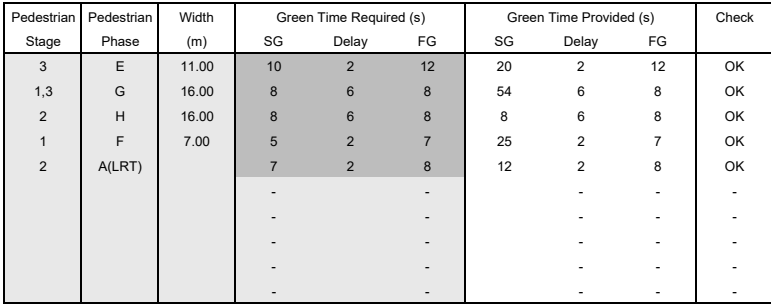
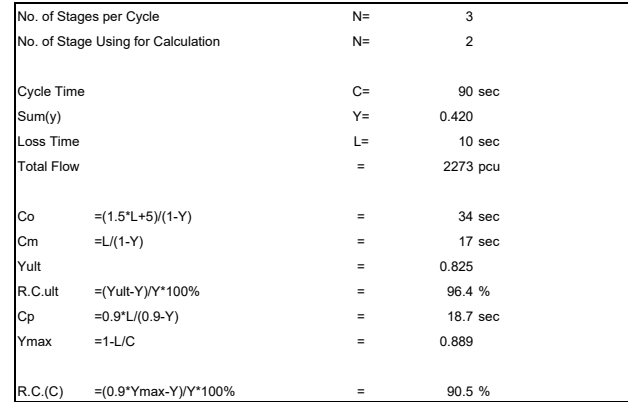
ROAD L296

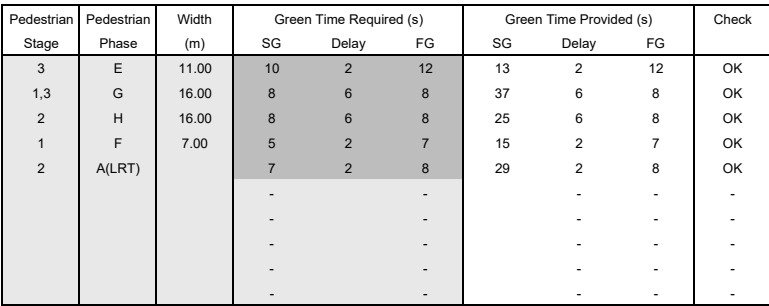
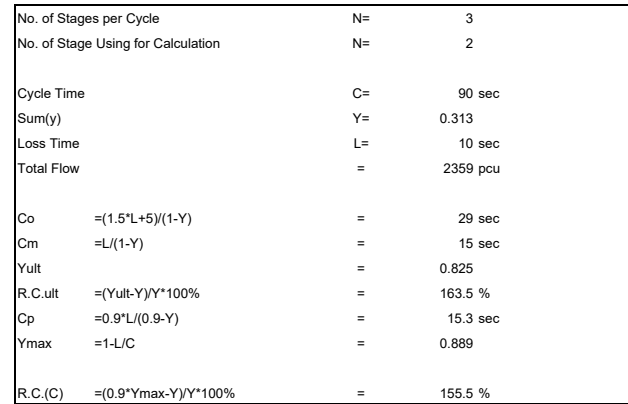
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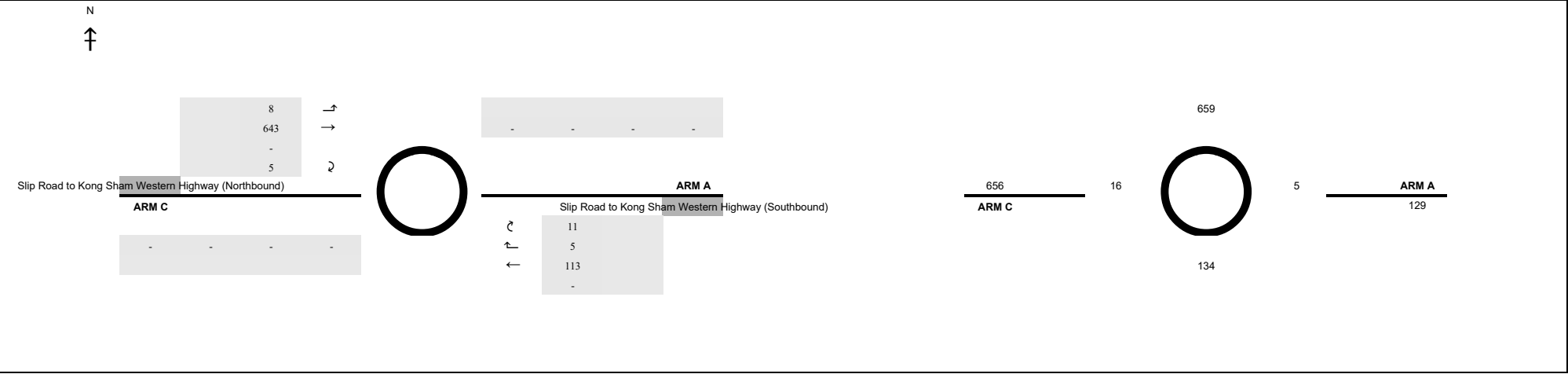
Appendix C

Junction Calculation Sheets

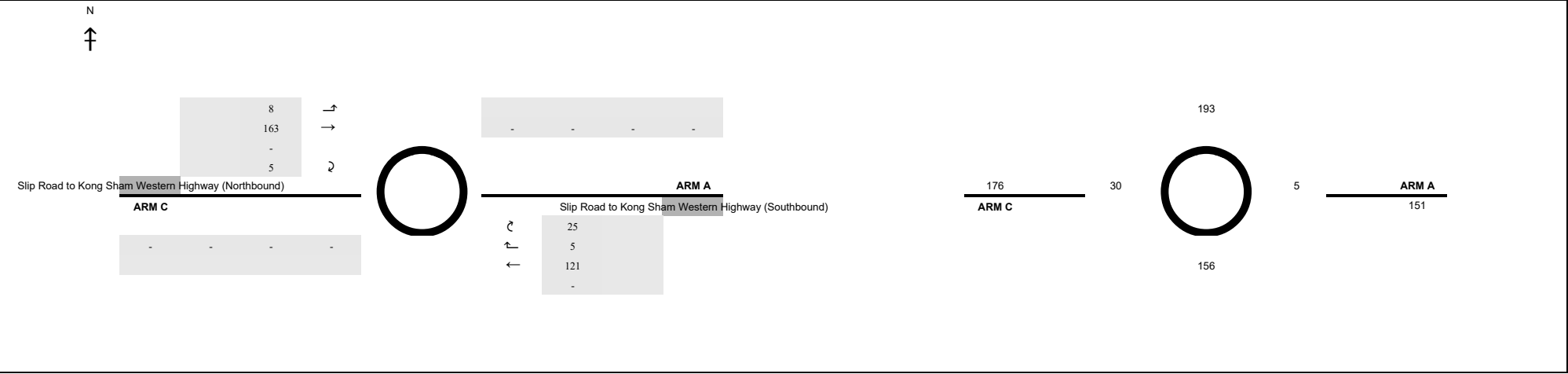
Existing Case

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[illegible]

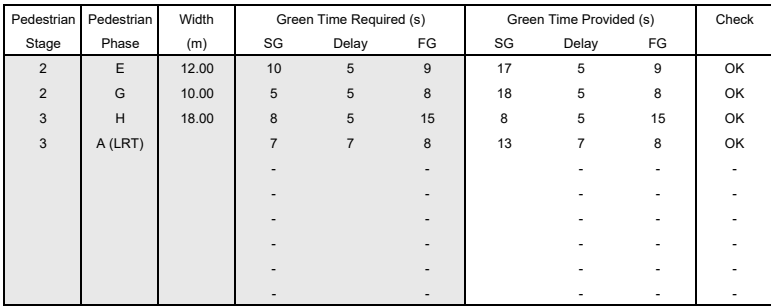
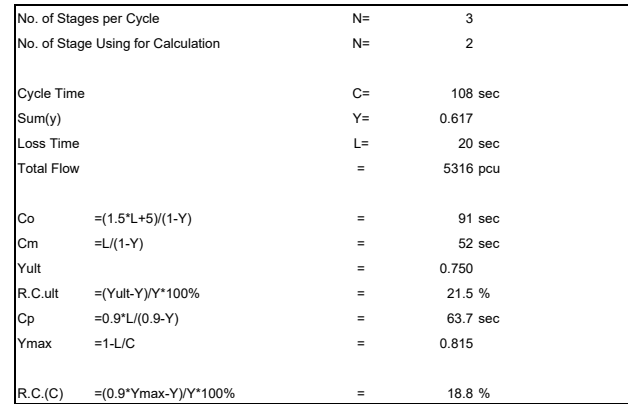


ARM	A	B	C
INPUT PARAMETERS:			
V	=	Approach half width (m)	4.00
E	=	Entry width (m)	6.00
L	=	Effective length of flare (m)	11
R	=	Entry radius (m)	33
D	=	Inscribed circle diameter (m)	68
A	=	Entry angle (degree)	25
Q	=	Entry flow (pcu/h)	129
Qc	=	Circulating flow across entry (pcu/h)	5
OUTPUT PARAMETERS:			
S	=	Sharpness of flare = 1.6(E-V)/L	0.29
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.04
X2	=	V + ((E-V)/(1+2S))	5.26
M	=	EXP((D-60)/10)	2.23
F	=	303*X2	1595
Td	=	1+(0.5/(1+M))	1.16
Fc	=	0.21*Td(1+0.2*X2)	0.50
Qe	=	K(F-Fc*Qc)	1651
DFC	=	Design flow/Capacity = Q/Qe	0.08
Total In Sum = 785 PCU			
DFC of Critical Approach = 0.47			

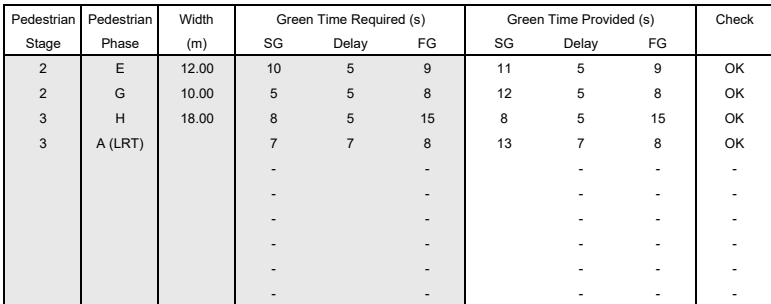
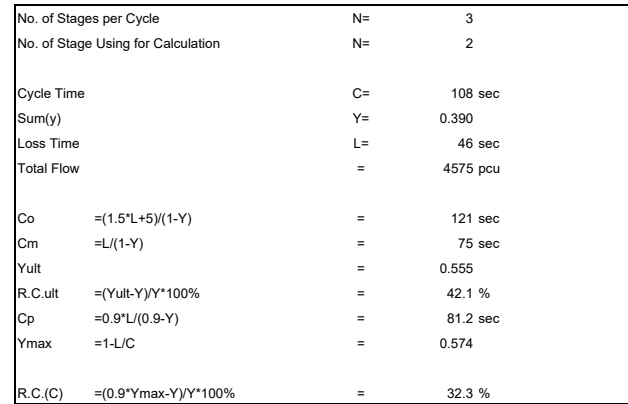


ARM	A	B	C
INPUT PARAMETERS:			
V	=	Approach half width (m)	4.00
E	=	Entry width (m)	6.00
L	=	Effective length of flare (m)	11
R	=	Entry radius (m)	33
D	=	Inscribed circle diameter (m)	68
A	=	Entry angle (degree)	25
Q	=	Entry flow (pcu/h)	151
Qc	=	Circulating flow across entry (pcu/h)	5
OUTPUT PARAMETERS:			
S	=	Sharpness of flare = 1.6(E-V)/L	0.29
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.04
X2	=	V + ((E-V)/(1+2S))	5.26
M	=	EXP((D-60)/10)	2.23
F	=	303*X2	1595
Td	=	1+(0.5/(1+M))	1.16
Fc	=	0.21*Td(1+0.2*X2)	0.50
Qe	=	K(F-Fc*Qc)	1651
DFC	=	Design flow/Capacity = Q/Qe	0.09
Total In Sum = 327 PCU			
DFC of Critical Approach = 0.13			

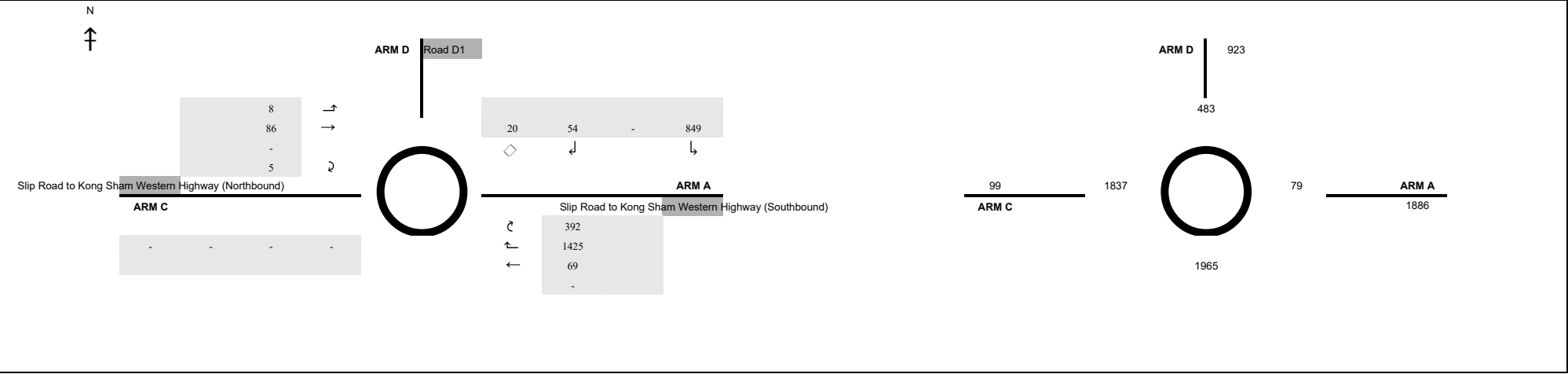
2031 Reference Case



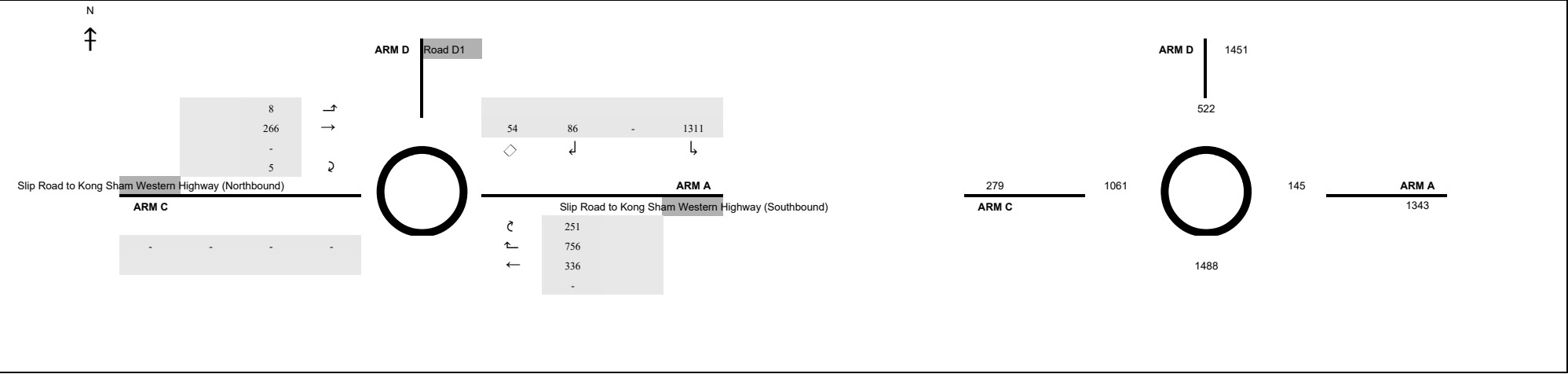
TRAFFIC SIGNAL CALCULATION



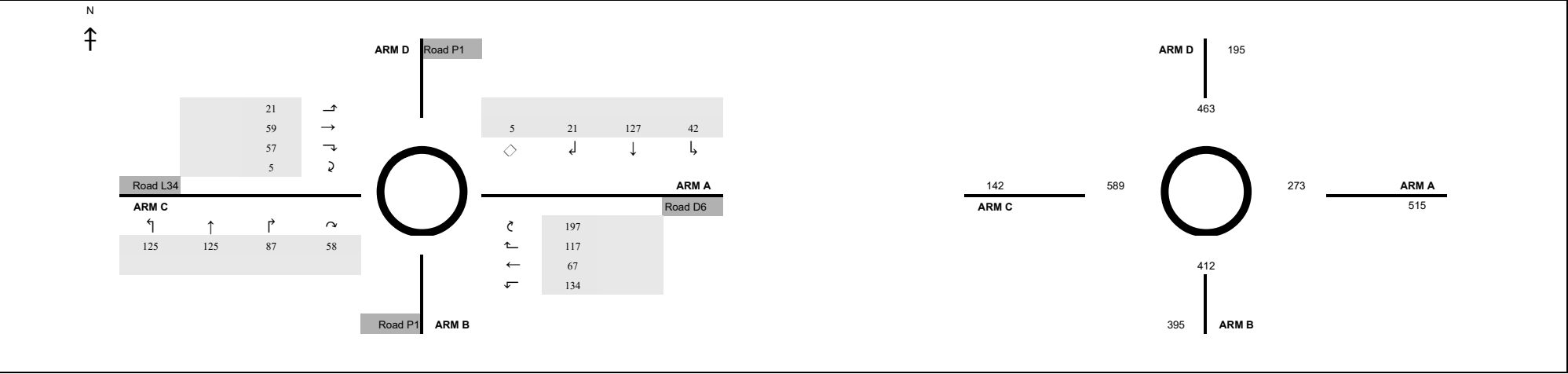
TRAFFIC SIGNAL CALCULATION



ARM	A	B	C	D
INPUT PARAMETERS:				
V	=	Approach half width (m)	7.30	7.30
E	=	Entry width (m)	9.60	8.00
L	=	Effective length of flare (m)	30	15
R	=	Entry radius (m)	100	40
D	=	Inscribed circle diameter (m)	68	68
A	=	Entry angle (degree)	40	25
Q	=	Entry flow (pcu/h)	1886	99
Qc	=	Circulating flow across entry (pcu/h)	79	1837
OUTPUT PARAMETERS:				
S	=	Sharpness of flare = 1.6(E-V)/L	0.12	0.07
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.00	1.04
X2	=	V + ((E-V)/(1+2S))	9.15	7.91
M	=	EXP((D-60)/10)	2.23	2.23
F	=	303*X2	2772	2396
Td	=	1+(0.5/(1+M))	1.16	1.16
Fc	=	0.21*Td(1+0.2*X2)	0.69	0.63
Qe	=	K(F-Fc*Qc)	2729	1298
DFC	=	Design flow/Capacity = Q/Qe	0.69	0.08
Total In Sum = 2908 PCU				
DFC of Critical Approach = 0.69				



ARM	A	B	C	D
INPUT PARAMETERS:				
V	=	Approach half width (m)	7.30	7.30
E	=	Entry width (m)	9.60	8.00
L	=	Effective length of flare (m)	30	15
R	=	Entry radius (m)	100	40
D	=	Inscribed circle diameter (m)	68	68
A	=	Entry angle (degree)	40	25
Q	=	Entry flow (pcu/h)	1343	279
Qc	=	Circulating flow across entry (pcu/h)	145	1061
OUTPUT PARAMETERS:				
S	=	Sharpness of flare = 1.6(E-V)/L	0.12	0.07
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.00	1.04
X2	=	V + ((E-V)/(1+2S))	9.15	7.91
M	=	EXP((D-60)/10)	2.23	2.23
F	=	303*X2	2772	2396
Td	=	1+(0.5/(1+M))	1.16	1.16
Fc	=	0.21*Td(1+0.2*X2)	0.69	0.63
Qe	=	K(F-Fc*Qc)	2684	1804
DFC	=	Design flow/Capacity = Q/Qe	0.50	0.15
Total In Sum = 3073 PCU				
DFC of Critical Approach = 0.74				



ARM

A

B

C

D

INPUT PARAMETERS:

V

=

Approach half width (m)

E

=

Entry width (m)

L

=

Effective length of flare (m)

R

=

Entry radius (m)

D

=

Inscribed circle diameter (m)

A

=

Entry angle (degree)

Q

=

Entry flow (pcu/h)

Qc

=

Circulating flow across entry (pcu/h)

7.30

6.75

3.65

7.30

7.30

6.75

5.75

7.30

1

1

22

1

20

15

40

30

74

74

74

74

40

42

25

27

515

395

142

195

273

412

589

463

OUTPUT PARAMETERS:

S

=

Sharpness of flare = $1.6(E-V)/L$

K

=

$1-0.00347(A-30)-0.978(1/R-0.05)$

X2

=

$V + ((E-V)/(1+2S))$

M

=

$EXP((D-60)/10)$

F

=

$303 \times X2$

Td

=

$1+(0.5/(1+M))$

Fc

=

$0.21 \times Td(1+0.2 \times X2)$

Qe

=

$K(F-Fc \times Qc)$

DFC

=

Design flow/Capacity = Q/Qe

0.00

0.00

0.15

0.00

0.97

0.94

1.04

1.03

7.30

6.75

5.26

7.30

4.06

4.06

4.06

4.06

2212

2045

1593

2212

1.10

1.10

1.10

1.10

0.57

0.54

0.47

0.57

1986

1716

1369

2001

0.26

0.23

0.10

0.10

Total In Sum

=

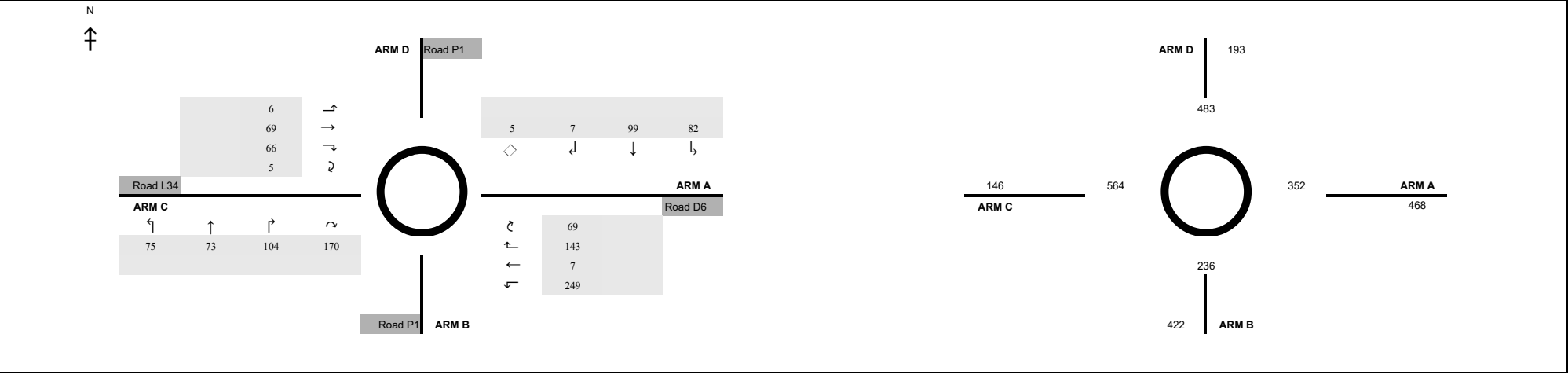
1247

PCU

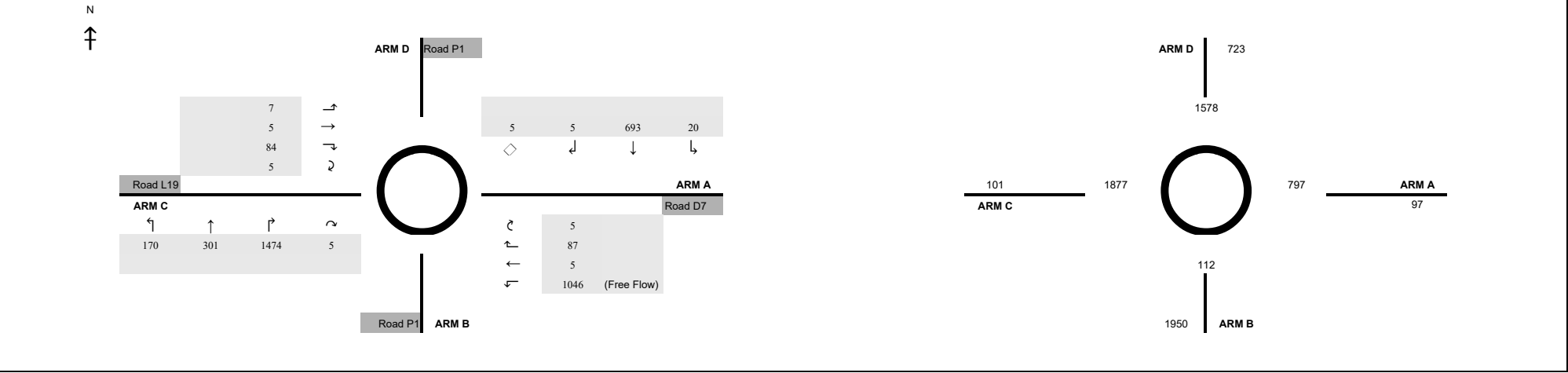
DFC of Critical Approach

=

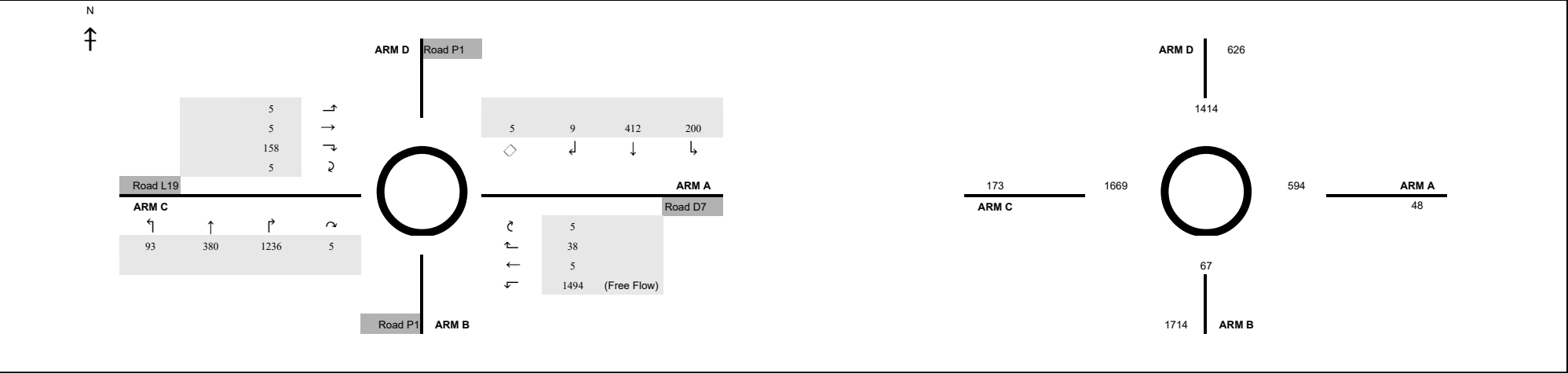
0.26



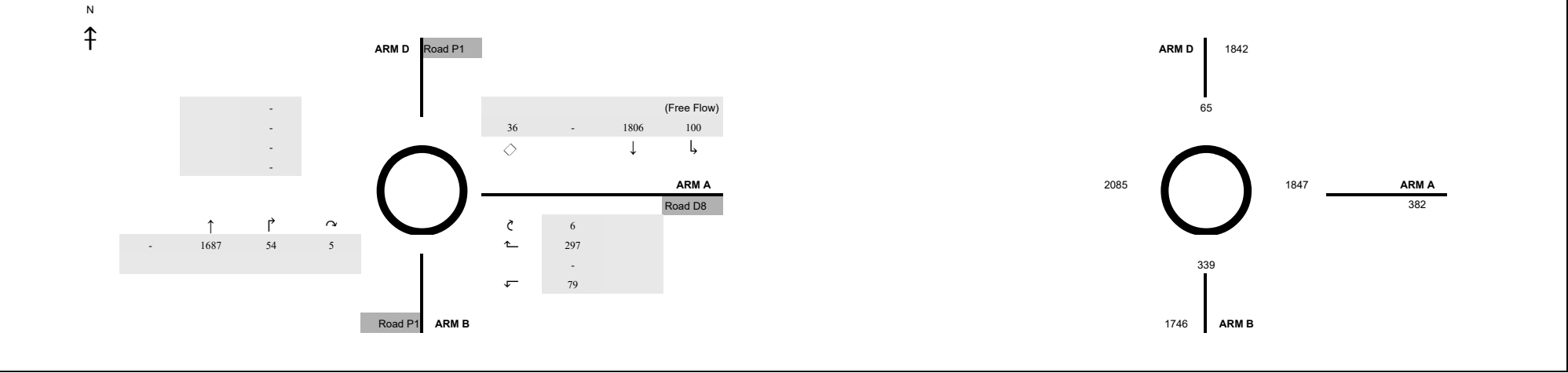
ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.30	6.75	3.65	7.30
E	=	Entry width (m)	7.30	6.75	5.75	7.30
L	=	Effective length of flare (m)	1	1	22	1
R	=	Entry radius (m)	20	15	40	30
D	=	Inscribed circle diameter (m)	74	74	74	74
A	=	Entry angle (degree)	40	42	25	27
Q	=	Entry flow (pcu/h)	468	422	146	193
Qc	=	Circulating flow across entry (pcu/h)	352	236	564	483
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.00	0.00	0.15	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	0.97	0.94	1.04	1.03
X2	=	$V + ((E-V)/(1+2S))$	7.30	6.75	5.26	7.30
M	=	$EXP((D-60)/10)$	4.06	4.06	4.06	4.06
F	=	$303 \times X2$	2212	2045	1593	2212
Td	=	$1+(0.5/(1+M))$	1.10	1.10	1.10	1.10
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.57	0.54	0.47	0.57
Qe	=	$K(F-Fc \times Qc)$	1942	1806	1382	1989
DFC	=	Design flow/Capacity = Q/Qe	0.24	0.23	0.11	0.10
Total In Sum					=	1229 PCU
DFC of Critical Approach					=	0.24



ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	3.65	7.30	3.65	6.75
E	=	Entry width (m)	6.00	10.00	6.00	6.75
L	=	Effective length of flare (m)	5	8.8	8	1
R	=	Entry radius (m)	20	40	20	20
D	=	Inscribed circle diameter (m)	100	100	100	100
A	=	Entry angle (degree)	15	15	15	25
Q	=	Entry flow (pcu/h)	97	1950	101	723
Qc	=	Circulating flow across entry (pcu/h)	797	112	1877	1578
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.75	0.49	0.47	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.05	1.08	1.05	1.02
X2	=	$V + ((E-V)/(1+2S))$	4.59	8.66	4.86	6.75
M	=	$EXP((D-60)/10)$	54.60	54.60	54.60	54.60
F	=	$303 \times X2$	1390	2625	1473	2045
Td	=	$1+(0.5/(1+M))$	1.01	1.01	1.01	1.01
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.41	0.58	0.42	0.50
Qe	=	$K(F-Fc \times Qc)$	1122	2756	724	1281
DFC	=	Design flow/Capacity = Q/Qe	0.09	0.71	0.14	0.56
Total In Sum					=	2871 PCU
DFC of Critical Approach					=	0.71



ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	3.65	7.30	3.65	6.75
E	=	Entry width (m)	6.00	10.00	6.00	6.75
L	=	Effective length of flare (m)	5	8.8	8	1
R	=	Entry radius (m)	20	40	20	20
D	=	Inscribed circle diameter (m)	100	100	100	100
A	=	Entry angle (degree)	15	15	15	25
Q	=	Entry flow (pcu/h)	48	1714	173	626
Qc	=	Circulating flow across entry (pcu/h)	594	67	1669	1414
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.75	0.49	0.47	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.05	1.08	1.05	1.02
X2	=	$V + ((E-V)/(1+2S))$	4.59	8.66	4.86	6.75
M	=	$EXP((D-60)/10)$	54.60	54.60	54.60	54.60
F	=	$303 \times X2$	1390	2625	1473	2045
Td	=	$1+(0.5/(1+M))$	1.01	1.01	1.01	1.01
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.41	0.58	0.42	0.50
Qe	=	$K(F-Fc \times Qc)$	1209	2784	816	1364
DFC	=	Design flow/Capacity = Q/Qe	0.04	0.62	0.21	0.46
Total In Sum					=	2561 PCU
DFC of Critical Approach					=	0.62



ARM

A

B

C

D

INPUT PARAMETERS:

V

=

Approach half width (m)

E

=

Entry width (m)

L

=

Effective length of flare (m)

R

=

Entry radius (m)

D

=

Inscribed circle diameter (m)

A

=

Entry angle (degree)

Q

=

Entry flow (pcu/h)

Qc

=

Circulating flow across entry (pcu/h)

7.30

7.30

7.30

10.50

10.70

10.70

5.5

9.2

9.2

30

50

30

66

66

66

30

20

36

382

1746

1842

1847

339

65

OUTPUT PARAMETERS:

S

=

Sharpness of flare = $1.6(E-V)/L$

K

=

$1-0.00347(A-30)-0.978(1/R-0.05)$

X2

=

$V + ((E-V)/(1+2S))$

M

=

$EXP((D-60)/10)$

F

=

$303 \times X2$

Td

=

$1+(0.5/(1+M))$

Fc

=

$0.21 \times Td(1+0.2 \times X2)$

Qe

=

$K(F-Fc \times Qc)$

DFC

=

Design flow/Capacity = Q/Qe

0.93

0.59

0.59

1.02

1.06

1.00

8.42

8.86

8.86

1.82

1.82

1.82

2551

2684

2684

1.18

1.18

1.18

0.66

0.69

0.69

1347

2609

2627

0.28

0.67

0.70

Total In Sum

=

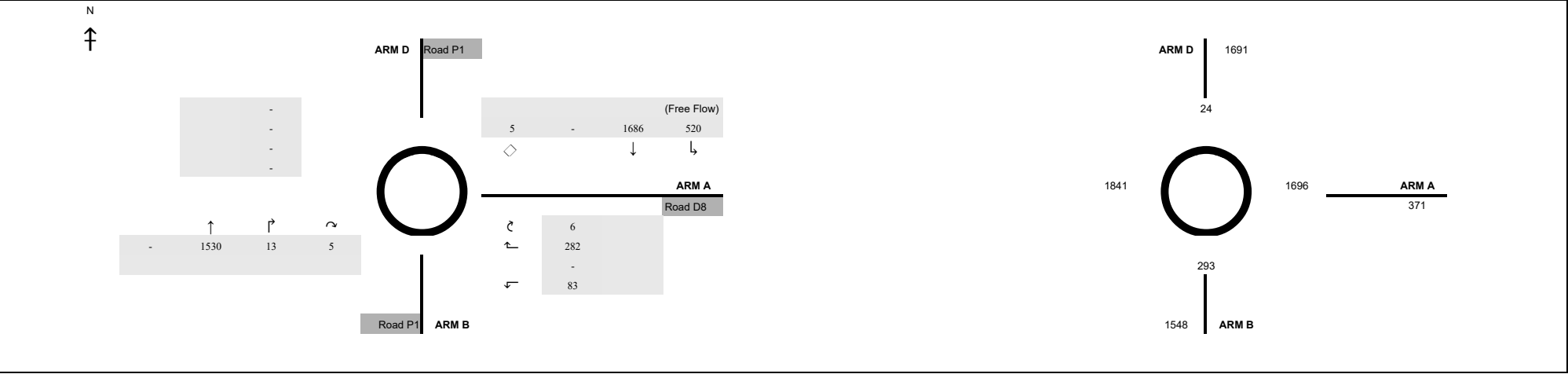
3970

PCU

DFC of Critical Approach

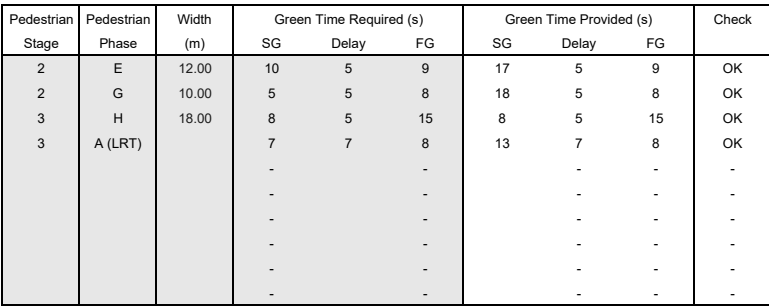
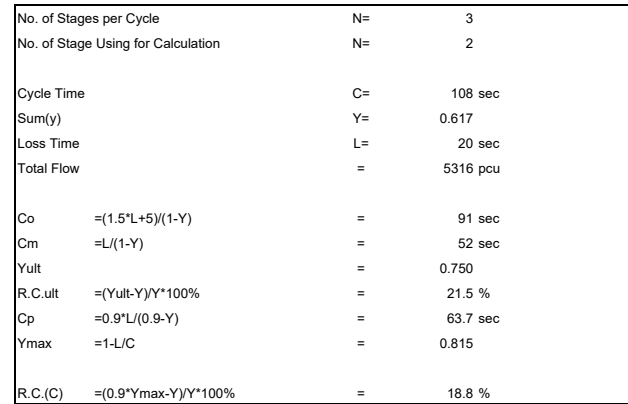
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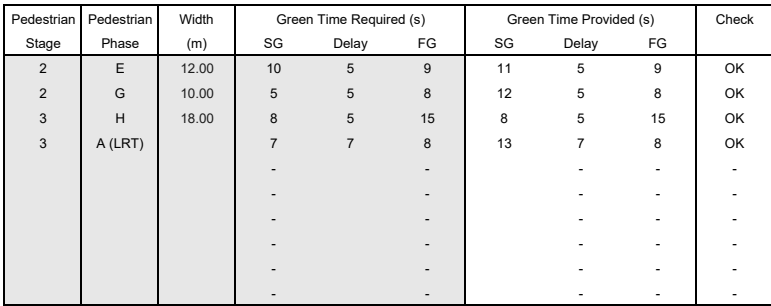
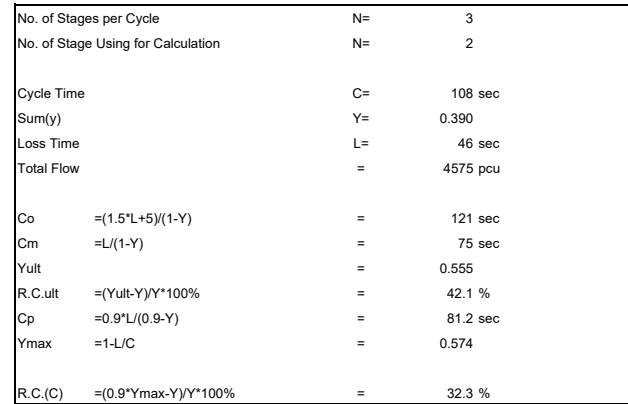
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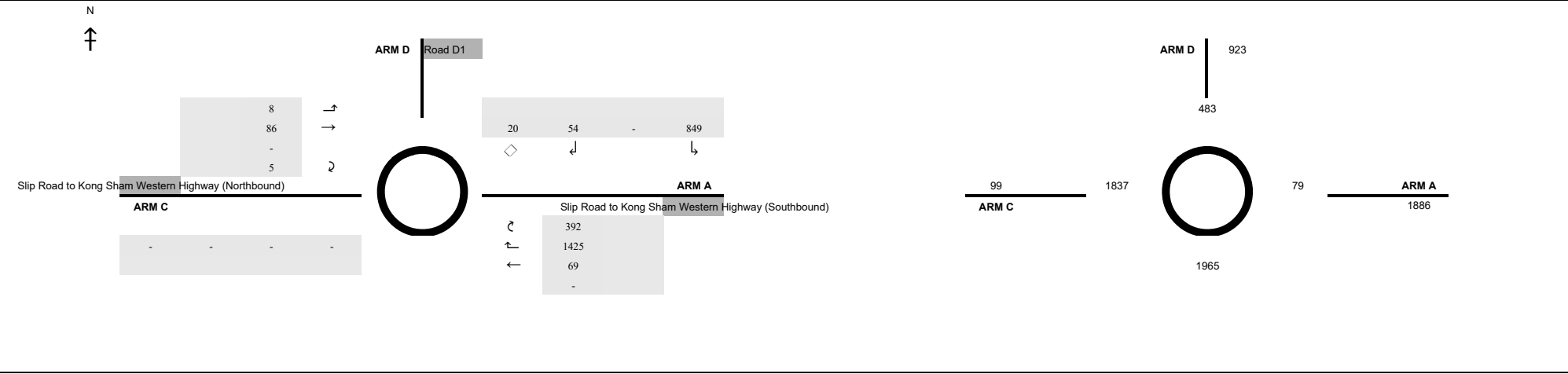
ARM		A	B	C	D		
INPUT PARAMETERS:							
V	=	Approach half width (m)	7.30	7.30	7.30		
E	=	Entry width (m)	10.50	10.70	10.70		
L	=	Effective length of flare (m)	5.5	9.2	9.2		
R	=	Entry radius (m)	30	50	30		
D	=	Inscribed circle diameter (m)	66	66	66		
A	=	Entry angle (degree)	30	20	36		
Q	=	Entry flow (pcu/h)	371	1548	1691		
Qc	=	Circulating flow across entry (pcu/h)	1696	293	24		
OUTPUT PARAMETERS:							
S	=	Sharpness of flare = $1.6(E-V)/L$	0.93	0.59	0.59		
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.02	1.06	1.00		
X2	=	$V + ((E-V)/(1+2S))$	8.42	8.86	8.86		
M	=	$EXP((D-60)/10)$	1.82	1.82	1.82		
F	=	$303 \times X2$	2551	2684	2684		
Td	=	$1+(0.5/(1+M))$	1.18	1.18	1.18		
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.66	0.69	0.69		
Qe	=	$K(F-Fc \times Qc)$	1449	2642	2655		
DFC	=	Design flow/Capacity = Q/Qe	0.26	0.59	0.64		
Total In Sum						=	3610 PCU
DFC of Critical Approach						=	0.64

2031 Design Case

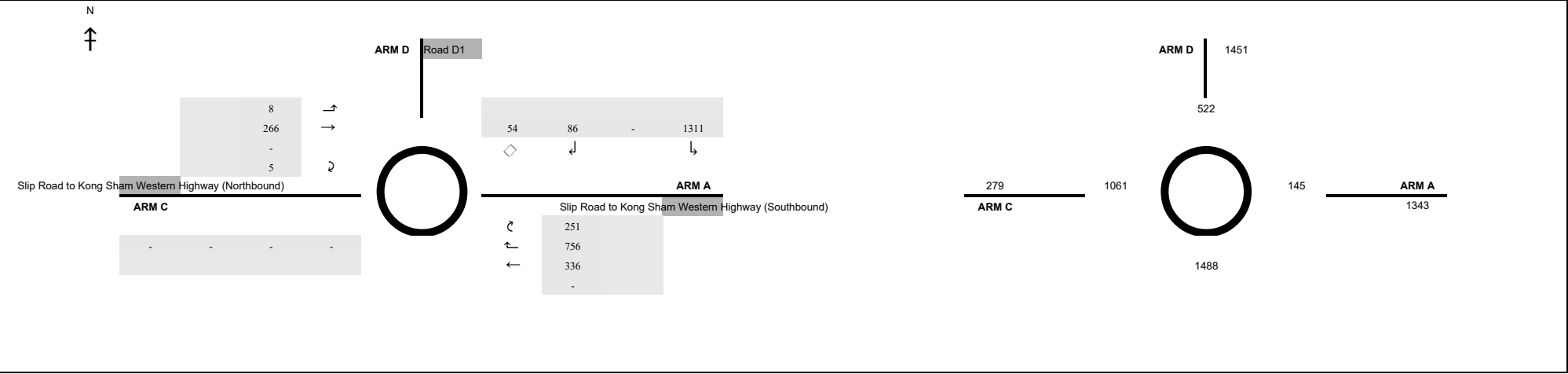
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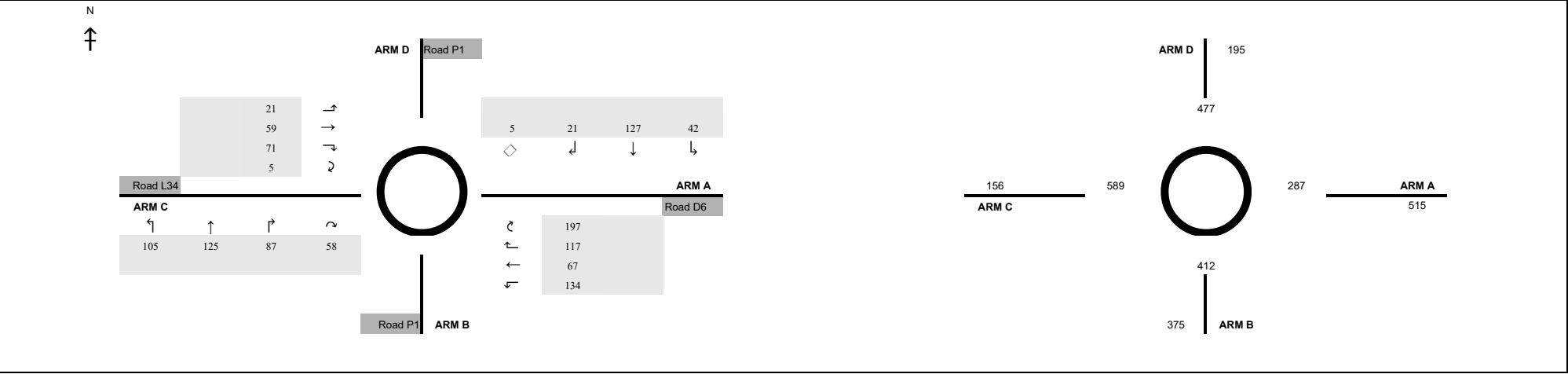
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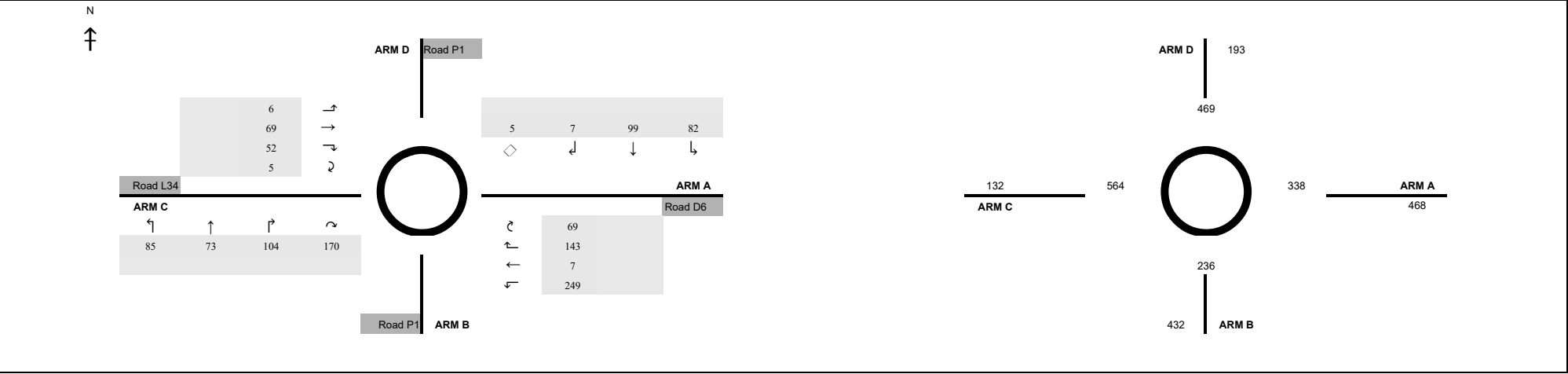
ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	7.30		7.30	7.30
E	=	Entry width (m)	9.60		8.00	7.30
L	=	Effective length of flare (m)	30		15	1
R	=	Entry radius (m)	100		40	60
D	=	Inscribed circle diameter (m)	68		68	68
A	=	Entry angle (degree)	40		25	30
Q	=	Entry flow (pcu/h)	1886		99	923
Qc	=	Circulating flow across entry (pcu/h)	79		1837	483
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.12		0.07	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.00		1.04	1.03
X2	=	$V + ((E-V)/(1+2S))$	9.15		7.91	7.30
M	=	$EXP((D-60)/10)$	2.23		2.23	2.23
F	=	$303 \times X2$	2772		2396	2212
Td	=	$1+(0.5/(1+M))$	1.16		1.16	1.16
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.69		0.63	0.60
Qe	=	$K(F-Fc \times Qc)$	2729		1298	1986
DFC	=	Design flow/Capacity = Q/Qe	0.69		0.08	0.46
Total In Sum					=	2908 PCU
DFC of Critical Approach					=	0.69



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.30		7.30	7.30			
E	=	Entry width (m)	9.60		8.00	7.30			
L	=	Effective length of flare (m)	30		15	1			
R	=	Entry radius (m)	100		40	60			
D	=	Inscribed circle diameter (m)	68		68	68			
A	=	Entry angle (degree)	40		25	30			
Q	=	Entry flow (pcu/h)	1343		279	1451			
Qc	=	Circulating flow across entry (pcu/h)	145		1061	522			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.12		0.07	0.00			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.00		1.04	1.03			
X2	=	V + ((E-V)/(1+2S))	9.15		7.91	7.30			
M	=	EXP((D-60)/10)	2.23		2.23	2.23			
F	=	303*X2	2772		2396	2212			
Td	=	1+(0.5/(1+M))	1.16		1.16	1.16			
Fc	=	0.21*Td(1+0.2*X2)	0.69		0.63	0.60			
Qe	=	K(F-Fc*Qc)	2684		1804	1962			
DFC	=	Design flow/Capacity = Q/Qe	0.50		0.15	0.74			
Total In Sum							=	3073	PCU
DFC of Critical Approach							=	0.74	



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.30	6.75	3.65	7.30			
E	=	Entry width (m)	7.30	6.75	5.75	7.30			
L	=	Effective length of flare (m)	1	1	22	1			
R	=	Entry radius (m)	20	15	40	30			
D	=	Inscribed circle diameter (m)	74	74	74	74			
A	=	Entry angle (degree)	40	42	25	27			
Q	=	Entry flow (pcu/h)	515	375	156	195			
Qc	=	Circulating flow across entry (pcu/h)	287	412	589	477			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = $1.6(E-V)/L$	0.00	0.00	0.15	0.00			
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	0.97	0.94	1.04	1.03			
X2	=	$V + ((E-V)/(1+2S))$	7.30	6.75	5.26	7.30			
M	=	$EXP((D-60)/10)$	4.06	4.06	4.06	4.06			
F	=	$303 \times X2$	2212	2045	1593	2212			
Td	=	$1+(0.5/(1+M))$	1.10	1.10	1.10	1.10			
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.57	0.54	0.47	0.57			
Qe	=	$K(F-Fc \times Qc)$	1978	1716	1369	1993			
DFC	=	Design flow/Capacity = Q/Qe	0.26	0.22	0.11	0.10			
							Total In Sum	=	1241 PCU
							DFC of Critical Approach	=	0.26



ARM

A

B

C

D

INPUT PARAMETERS:

V

=

Approach half width (m)

E

=

Entry width (m)

L

=

Effective length of flare (m)

R

=

Entry radius (m)

D

=

Inscribed circle diameter (m)

A

=

Entry angle (degree)

Q

=

Entry flow (pcu/h)

Qc

=

Circulating flow across entry (pcu/h)

7.30

6.75

3.65

7.30

7.30

6.75

5.75

7.30

1

1

22

1

20

15

40

30

74

74

74

74

40

42

25

27

468

432

132

193

338

236

564

469

OUTPUT PARAMETERS:

S

=

Sharpness of flare = $1.6(E-V)/L$

K

=

$1-0.00347(A-30)-0.978(1/R-0.05)$

X2

=

$V + ((E-V)/(1+2S))$

M

=

$EXP((D-60)/10)$

F

=

$303 \times X2$

Td

=

$1+(0.5/(1+M))$

Fc

=

$0.21 \times Td(1+0.2 \times X2)$

Qe

=

$K(F-Fc \times Qc)$

DFC

=

Design flow/Capacity = Q/Qe

0.00

0.00

0.15

0.00

0.97

0.94

1.04

1.03

7.30

6.75

5.26

7.30

4.06

4.06

4.06

4.06

2212

2045

1593

2212

1.10

1.10

1.10

1.10

0.57

0.54

0.47

0.57

1950

1806

1382

1998

0.24

0.24

0.10

0.10

Total In Sum

=

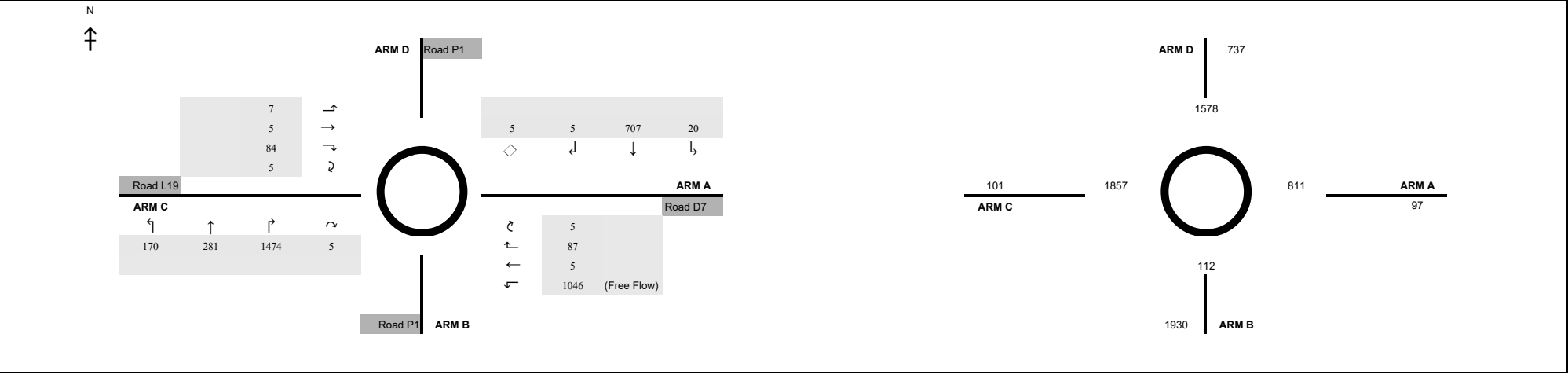
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PCU

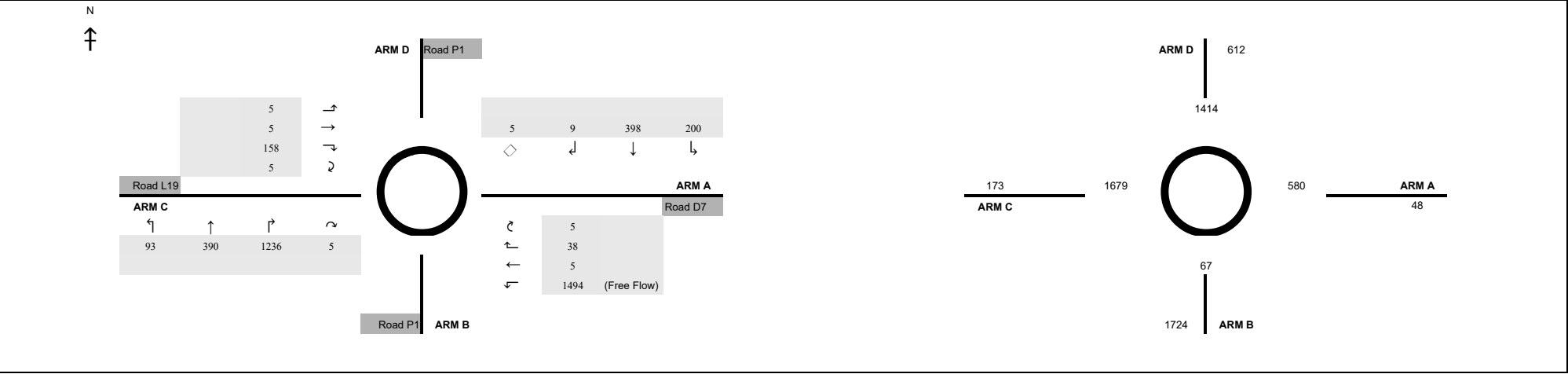
DFC of Critical Approach

=

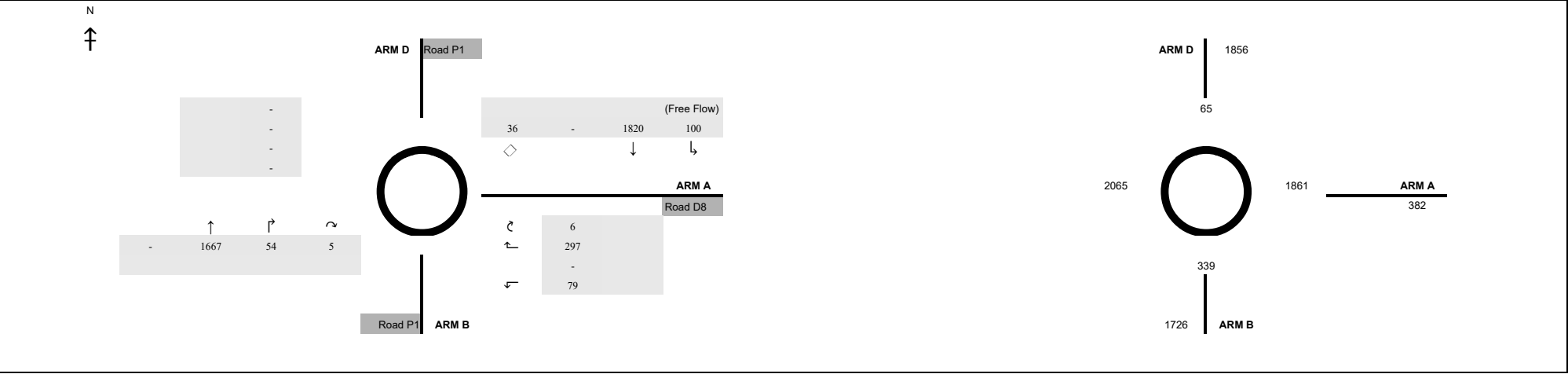
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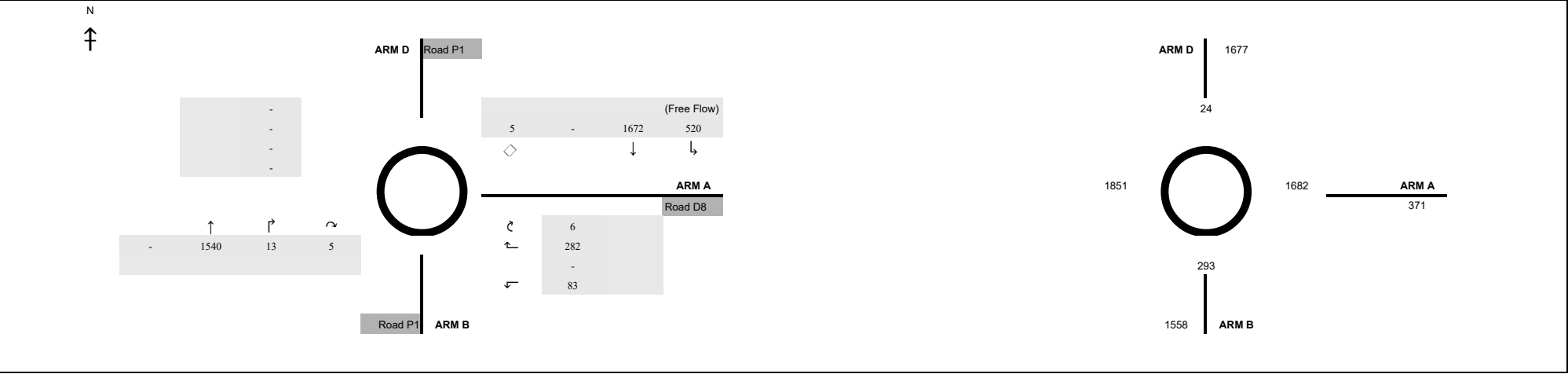
ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	3.65	7.30	3.65	6.75
E	=	Entry width (m)	6.00	10.00	6.00	6.75
L	=	Effective length of flare (m)	5	8.8	8	1
R	=	Entry radius (m)	20	40	20	20
D	=	Inscribed circle diameter (m)	100	100	100	100
A	=	Entry angle (degree)	15	15	15	25
Q	=	Entry flow (pcu/h)	97	1930	101	737
Qc	=	Circulating flow across entry (pcu/h)	811	112	1857	1578
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.75	0.49	0.47	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.05	1.08	1.05	1.02
X2	=	$V + ((E-V)/(1+2S))$	4.59	8.66	4.86	6.75
M	=	$EXP((D-60)/10)$	54.60	54.60	54.60	54.60
F	=	$303 \times X2$	1390	2625	1473	2045
Td	=	$1+(0.5/(1+M))$	1.01	1.01	1.01	1.01
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.41	0.58	0.42	0.50
Qe	=	$K(F-Fc \times Qc)$	1116	2756	733	1281
DFC	=	Design flow/Capacity = Q/Qe	0.09	0.70	0.14	0.58
Total In Sum					=	2865 PCU
DFC of Critical Approach					=	0.70



ARM			A	B	C	D
INPUT PARAMETERS:						
V	=	Approach half width (m)	3.65	7.30	3.65	6.75
E	=	Entry width (m)	6.00	10.00	6.00	6.75
L	=	Effective length of flare (m)	5	8.8	8	1
R	=	Entry radius (m)	20	40	20	20
D	=	Inscribed circle diameter (m)	100	100	100	100
A	=	Entry angle (degree)	15	15	15	25
Q	=	Entry flow (pcu/h)	48	1724	173	612
Qc	=	Circulating flow across entry (pcu/h)	580	67	1679	1414
OUTPUT PARAMETERS:						
S	=	Sharpness of flare = $1.6(E-V)/L$	0.75	0.49	0.47	0.00
K	=	$1-0.00347(A-30)-0.978(1/R-0.05)$	1.05	1.08	1.05	1.02
X2	=	$V + ((E-V)/(1+2S))$	4.59	8.66	4.86	6.75
M	=	$EXP((D-60)/10)$	54.60	54.60	54.60	54.60
F	=	$303 \times X2$	1390	2625	1473	2045
Td	=	$1+(0.5/(1+M))$	1.01	1.01	1.01	1.01
Fc	=	$0.21 \times Td(1+0.2 \times X2)$	0.41	0.58	0.42	0.50
Qe	=	$K(F-Fc \times Qc)$	1215	2784	811	1364
DFC	=	Design flow/Capacity = Q/Qe	0.04	0.62	0.21	0.45
Total In Sum					=	2557 PCU
DFC of Critical Approach					=	0.62



ARM			A	B	C	D			
INPUT PARAMETERS:									
V	=	Approach half width (m)	7.30	7.30		7.30			
E	=	Entry width (m)	10.50	10.70		10.70			
L	=	Effective length of flare (m)	5.5	9.2		9.2			
R	=	Entry radius (m)	30	50		30			
D	=	Inscribed circle diameter (m)	66	66		66			
A	=	Entry angle (degree)	30	20		36			
Q	=	Entry flow (pcu/h)	382	1726		1856			
Qc	=	Circulating flow across entry (pcu/h)	1861	339		65			
OUTPUT PARAMETERS:									
S	=	Sharpness of flare = 1.6(E-V)/L	0.93	0.59		0.59			
K	=	1-0.00347(A-30)-0.978(1/R-0.05)	1.02	1.06		1.00			
X2	=	V + ((E-V)/(1+2S))	8.42	8.86		8.86			
M	=	EXP((D-60)/10)	1.82	1.82		1.82			
F	=	303*X2	2551	2684		2684			
Td	=	1+(0.5/(1+M))	1.18	1.18		1.18			
Fc	=	0.21*Td(1+0.2*X2)	0.66	0.69		0.69			
Qe	=	K(F-Fc*Qc)	1338	2609		2627			
DFC	=	Design flow/Capacity = Q/Qe	0.29	0.66		0.71			
							Total In Sum	=	3964 PCU
							DFC of Critical Approach	=	0.71



ARM

A

B

C

D

INPUT PARAMETERS:

V

=

Approach half width (m)

E

=

Entry width (m)

L

=

Effective length of flare (m)

R

=

Entry radius (m)

D

=

Inscribed circle diameter (m)

A

=

Entry angle (degree)

Q

=

Entry flow (pcu/h)

Qc

=

Circulating flow across entry (pcu/h)

7.30

7.30

7.30

10.50

10.70

10.70

5.5

9.2

9.2

30

50

30

66

66

66

30

20

36

371

1558

1677

1682

293

24

OUTPUT PARAMETERS:

S

=

Sharpness of flare = $1.6(E-V)/L$

K

=

$1-0.00347(A-30)-0.978(1/R-0.05)$

X2

=

$V + ((E-V)/(1+2S))$

M

=

$EXP((D-60)/10)$

F

=

$303 \times X2$

Td

=

$1+(0.5/(1+M))$

Fc

=

$0.21 \times Td(1+0.2 \times X2)$

Qe

=

$K(F-Fc \times Qc)$

DFC

=

Design flow/Capacity = Q/Qe

0.93

0.59

0.59

1.02

1.06

1.00

8.42

8.86

8.86

1.82

1.82

1.82

2551

2684

2684

1.18

1.18

1.18

0.66

0.69

0.69

1458

2642

2655

0.25

0.59

0.63

Total In Sum

=

3606

PCU

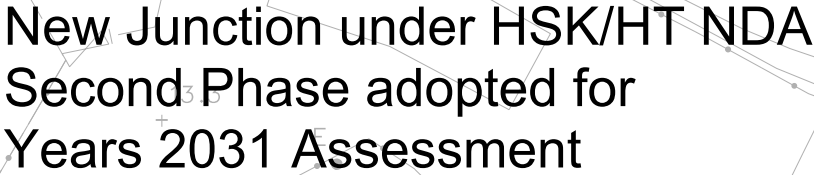
DFC of Critical Approach

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Appendix D

Future Junction Layouts



Rev	Description		By	Date	
Consultant					
ARUP					
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development					
– Design and Construction					
Drawing title					
JUNCTION LAYOUT PLAN - J1					
CASTLE PEAK ROAD / YICK					
YUEN ROAD					
Drawing no.				Rev.	—
Drawn WKKL	Date 04/21	Checked CFEI	Approved DL		
Scale 1:250 @ A1		Status	PRELIMINARY		
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27.3
+



New Junction under HSK/HT NDA Second Phase adopted for Years 2031 Assessment

Open Storage

KONG SHAM WESTERN HIGHWAY

ROAD P1

ROAD D7

ROAD P1

ROAD P1

An 3603

33.5
+

25.1
+

22.7
+

23.5
+

26.6
+

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DWG.NO. 278463/T/0001.

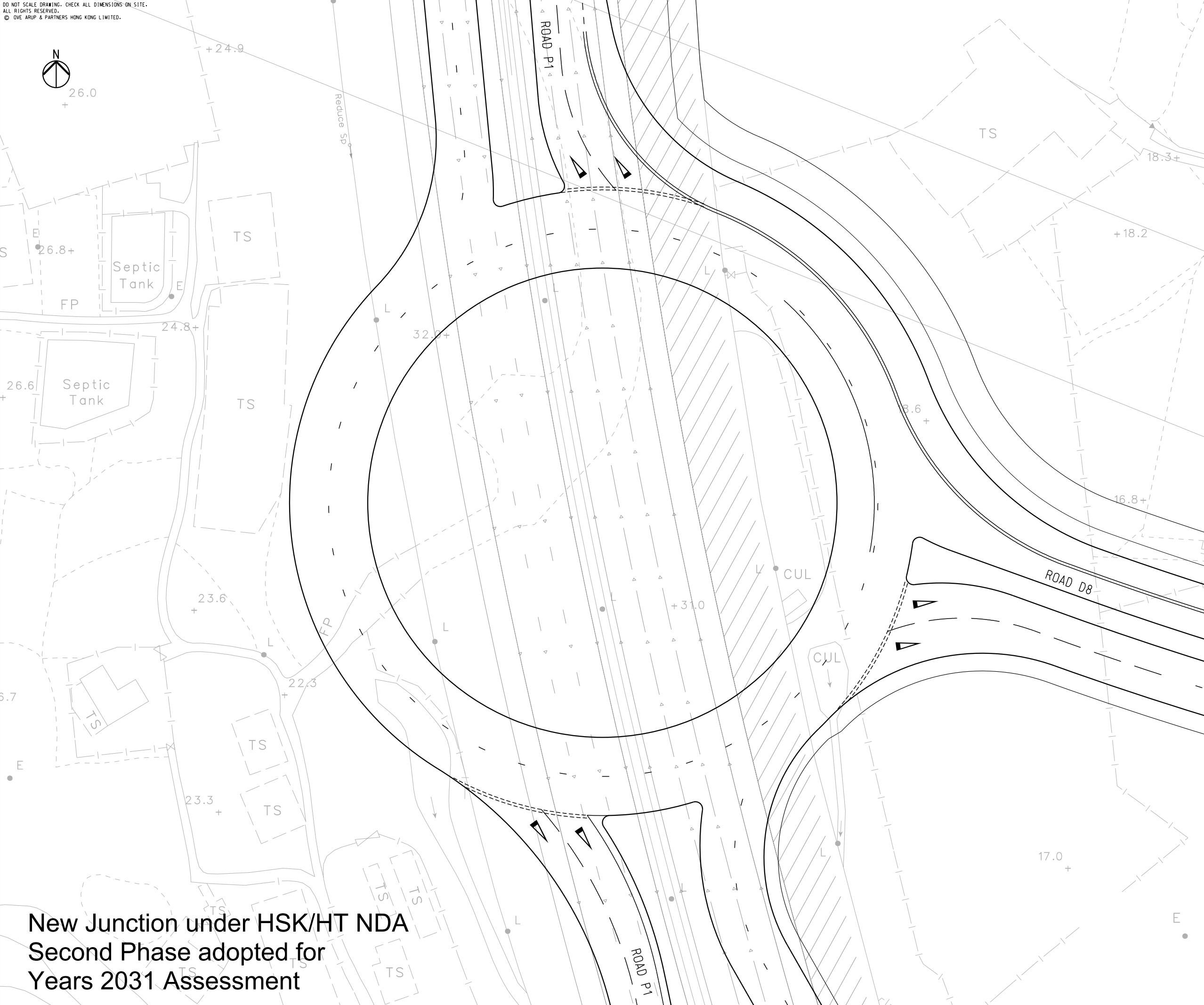
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Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
JUNCTION LAYOUT PLAN - J3 ROAD P1 / ROAD D7			
Drawing no.			Rev. —
Drawn WKKL	Date 04/21	Checked CFE I	Approved DL
Scale 1:250 @ A1		Status	PRELIMINARY

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Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
JUNCTION LAYOUT PLAN - J4 ROAD P1 / ROAD D8			
Drawing no.			Rev.
			-
Drawn WKL	Date 04/21	Checked CFE I	Approved DL
Scale 1:250 @ A1		Status PRELIMINARY	

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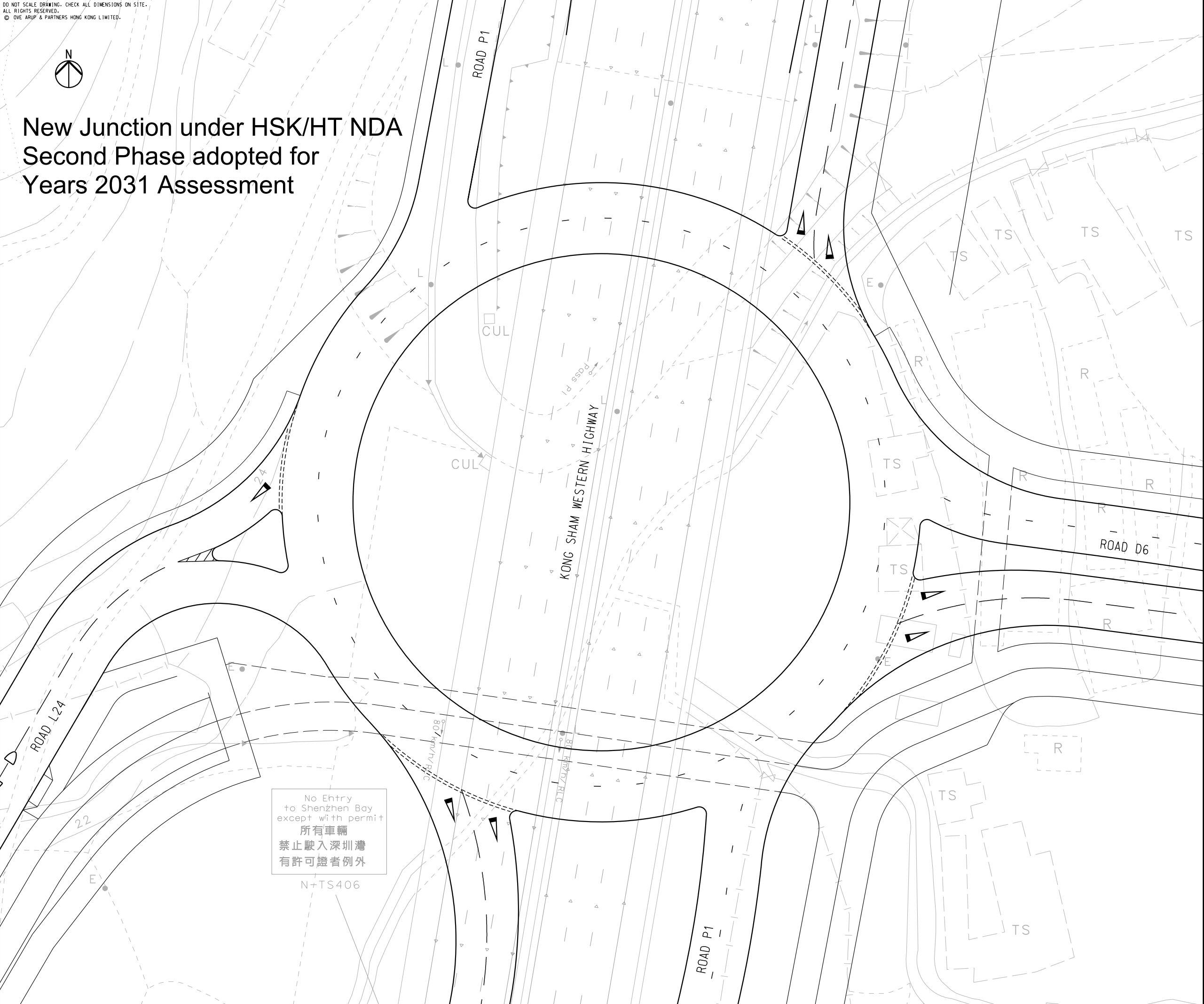
New Junction under HSK/HT NDA
Second Phase adopted for
Years 2031 Assessment

Printed by : 27/9/2022
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Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
JUNCTION LAYOUT PLAN - J5 ROAD P1/ROAD D6			
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			-
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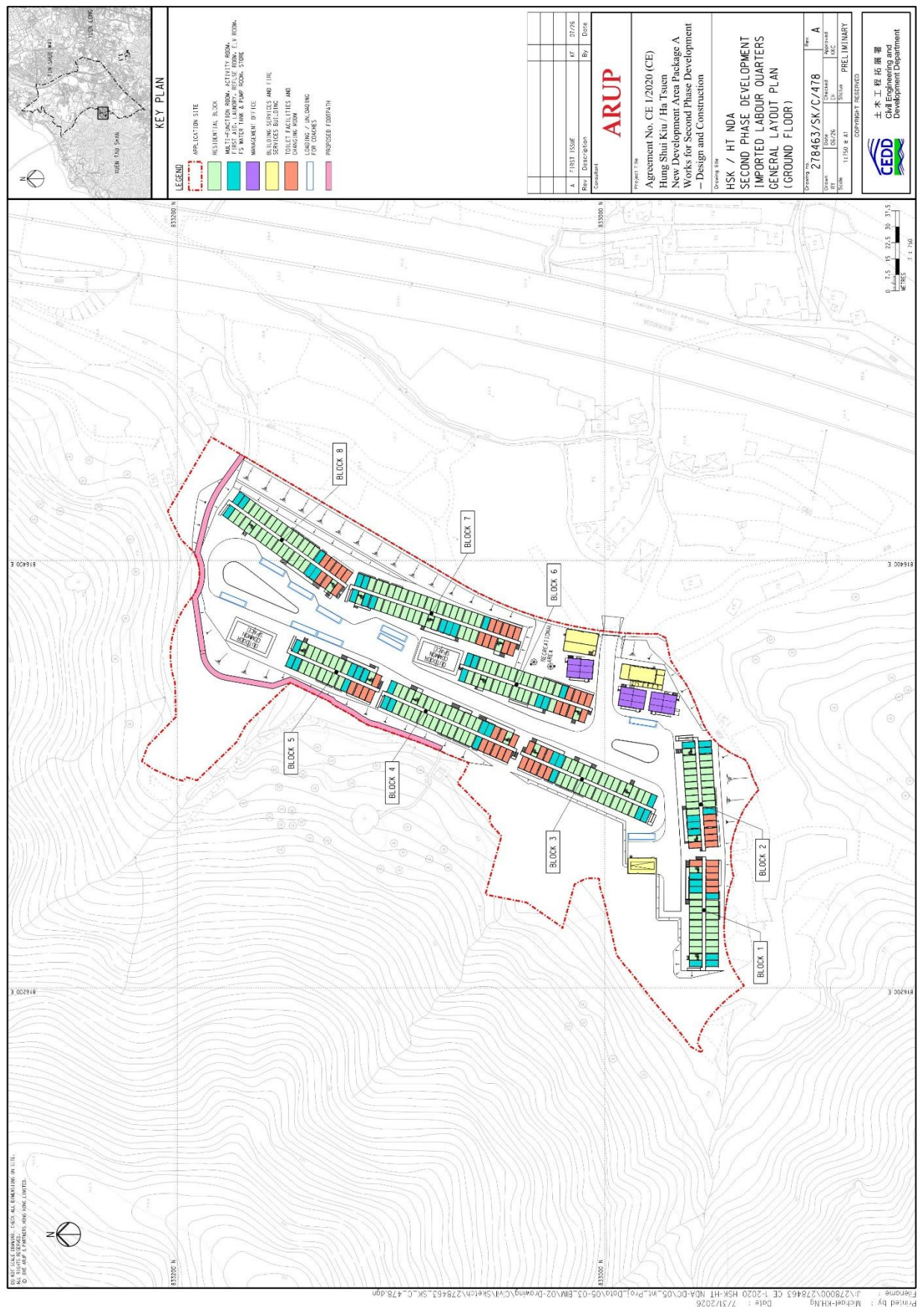
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Appendix E

General Layout Plan (Contractor Design)



Appendix C

Preliminary Environmental Assessment

Civil Engineering and Development Department

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years in “Industrial” Zone and Area Shown as ‘Road’ of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area

Preliminary Environmental Assessment Report

This report takes into account the particular
instructions and requirements of our client.

It is not intended for and should not be relied
upon by any third party and no responsibility
is undertaken to any third party.

Job number 278463

Ove Arup & Partners Hong Kong Ltd
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80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong
www.arup.com

ARUP

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Figure 2.1	Locations of Industrial Emission
Figure 2.2	Location of Representative Air Sensitive Receivers
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Figure 2.4	Locations of Planned Odour Sources
Figure 3.1	Locations of Representative Noise Sensitive Receivers
Figure 3.2	Locations of Fixed Plant Noise Sources

1 INTRODUCTION

1.1 Background

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within "Industrial" ("I") Zone and area shown as "Road" of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan ("the HSK/HT OZP") No. S/HSK/3 for a Period of 3 Years ("the proposed development").

1.1.2 The proposed development will have a total PR of about 0.456 with domestic GFA of about 13,414m² and non-domestic GFA of about 1,065m² respectively. The 8 nos. of two-storey residential blocks will provide about 450 residential modules of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.

1.1.3 This PEA presents a study of the potential air quality, noise, water quality, waste implications and land contamination issues according to the current scheme and timeframe and recommends necessary mitigation measures in order to confirm the environmental suitability of the proposed development.

1.2 Site Location and Project Description

1.2.1 The Application Site, with an area of about 31,787 m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/HT NDA for implementation of site clearance/ site formation and associated infrastructure works. The location of the Application Site is shown in **Figure 1.1**.

1.2.2 All of these modular units will be equipped with air conditioning (A/C) units and basic furniture. Ancillary facilities including toilets, washing basins and shower facilities will also be provided.

1.3 Purpose and Structure of this Report

1.3.1 The purpose of this PEA Report is to evaluate the identified potential environmental impacts on the proposed development with respect to the guidance for environmental considerations provided in Chapter 9 – Environment of the Hong Kong Planning Standards & Guidelines (HKPSG).

1.3.2 The structure of this Report is as follows:

Chapter	Title	Aims
1	Introduction	To give a general introduction of the Project.

Chapter	Title	Aims
2	Air Quality	To review the potential air quality impacts of the proposed development.
3	Noise	To review the potential noise impacts of the proposed development.
4	Water Quality	To review the potential water quality impacts of the proposed development.
5	Waste Management	To review the potential waste implications of the proposed development.
6	Other Environmental Issue	To review the potential land contamination issue of the proposed development.
7	Conclusion	To conclude the findings of this PEA.

2 AIR QUALITY

2.1 Legislation, Standards and Guidelines

2.1.1 This PEA has been made reference to the following relevant legislation, standards and guidelines:

- Air Pollution Control Ordinance (APCO) (Cap. 311);
- Hong Kong Air Quality Objectives (AQOs);
- Air Pollution Control (Construction Dust) Regulation;
- Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation;
- Air Pollution Control (Fuel Restriction) Regulation;
- Recommended Pollution Control Clauses for Construction Contracts; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

Air Pollution Control Ordinance (APCO) (Cap. 311)

2.1.2 The principal legislation for controlling air pollutants is the APCO (Cap. 311) and its subsidiary regulations, which defines statutory Air Quality Objectives (AQOs).

2.1.3 The APCO (Cap.311) provides the power for controlling air pollutants from a variety of stationary and mobile sources and encompasses a number of AQOs. In addition to the APCO, the following overall policy objectives are laid down in Chapter 9 of the HKPSG as follows:

- Limit the contamination of the air in Hong Kong, through land use planning and through the enforcement of the APCO to safeguard the health and well-being of the community; and
- Ensure that the AQOs for 7 common air pollutants are met as soon as possible.

2.1.4 Prevailing AQOs are listed in **Table 2.1** below.

Table 2.1 Hong Kong Air Quality Objectives

Pollutant	Limits on Concentration, $\mu\text{g}/\text{m}^3$ ^[1] (Number of Exceedance per year allowed in brackets)					
	10-min	1-hr	8-hr	24-hr ^[2]	Annual ^[2]	Peak season
Sulphur Dioxide (SO ₂)	500 (3)			40 (3)		
Respirable Suspended Particulates (RSP, or PM ₁₀) ^[3]				75 (9)	30	
Fine Suspended Particulates (FSP, or PM _{2.5}) ^[4]				37.5 (18)	15	

Pollutant	Limits on Concentration, $\mu\text{g}/\text{m}^3$ ^[1] (Number of Exceedance per year allowed in brackets)					
	10-min	1-hr	8-hr	24-hr ^[2]	Annual ^[2]	Peak season
Carbon Monoxide (CO)		30,000 (0)	10,000 (0)	4,000 (0)		
Nitrogen Dioxide (NO ₂)		200 (18)		120 (9)	40	
Ozone (O ₃)			160 (9)			100
Lead (Pb)					0.5	

Note:

[1] Measured at 293K and 101.325 kPa (for gaseous pollutants only).

[2] Arithmetic mean.

[3] RSP means suspended particulates in air with a nominal aerodynamic diameter of 10 micrometres or smaller.

[4] FSP means suspended particulates in air with a nominal aerodynamic diameter of 2.5 micrometres or smaller.

Air Pollution Control (Construction Dust) Regulation

2.1.5

The Air Pollution Control (Construction Dust) Regulation specifies processes that require special dust control. The Contractors are required to inform the Environmental Protection Department (EPD) and adopt proper dust suppression measures while carrying out "Notifiable Works" (which requires prior notification by the regulation) and "Regulatory Works" to meet the requirements as defined under the regulation.

Air Pollution Control (Non-road mobile Machinery) (Emission) Regulation

2.1.6

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation specifies that all Non-road Mobile Machinery (NRMMS), except those exempted, used in specified activities and locations including construction sites, container terminals and back up facilities, restricted areas of the airport, designated waste disposal facilities and specified processes are required to comply with the prescribed emission standards.

Air Pollution Control (Fuel Restriction) Regulations

2.1.7

Air Pollution Control (Fuel Restriction) Regulations controls the types of fuel allowed for use and their sulphur contents in commercial and industrial processes to reduce SO₂ emissions. Under Air Pollution Control (Fuel Restriction) Regulations, it is restricted to use any liquid fuel that has a sulphur content of more than 0.001% by weight.

Recommended Pollution Control Clauses for Construction Contracts

2.1.8

The recommended pollution control clauses are generally good engineering practice to minimise inconvenience and environmental nuisance to nearby residents and other sensitive receivers. The Contractors shall design, construct, operate and maintain pollution control measures to ensure compliance with the contract provisions as well as the environmental ordinances and their regulations.

Hong Kong Planning Standards and Guidelines

2.1.9

Chapter 9 of HKPSG outlines the environmental requirements that need to be considered in land use planning. The HKPSG lists out environmental factors influencing land use

planning and recommend buffer distances for land uses. It also recommends minimum setback distance from different categories of air pollution sources. **Table 2.2** shows these minimum setback distances.

Table 2.2 Guidelines on buffer distance between air pollution sources and different land uses

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	Type of Road		
	Trunk Road and Primary Distributor	> 20m	Active and passive recreational uses
		3 – 20m	Passive recreational uses
		< 3m	Amenity areas
	District Distributor	> 10m	Active and passive recreational uses
		< 10m	Passive recreational uses
	Local Distributor	> 5m	Active and passive recreational uses
		< 5m	Passive recreational uses
Industrial Areas	Difference in Height between Industrial Chimney Exit and the Site		
	< 20m	> 200m	Active and passive recreational uses
		5 – 200m	Passive recreational uses
	20 – 30m (*)	> 100m	Active and passive recreational uses
		5 – 100m	Passive recreational uses
	30m – 40m	> 50m	Active and passive recreational uses
		5 – 50m	Passive recreational uses
	> 40m	> 10m	Active and passive recreational uses
Construction and Earth Moving Activities	-	< 50m	Passive recreational uses
		> 50m	Active and passive recreational uses

Note:

- [1] In situations where the height of chimneys is not known, use the set of guidelines marked with an asterisk for preliminary planning purpose and refine as and when more information is available.
- [2] The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites.
- [3] The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishments which are likely to be significant air pollution sources. Consult EPD when planning open space sites close to such establishments.
- [4] Amenity areas are permitted in any situation.

2.2 Description of the Environment

Existing Ambient Air Quality Conditions

2.2.1 Currently, there are 18 Air Quality Monitoring Stations (AQMS) in Hong Kong, including 15 General Monitoring Stations and 3 Roadside Monitoring Stations, operated by EPD to monitor the air quality in Hong Kong.

2.2.2 This Project is located at HSK/HT NDA. The existing ambient air quality could be referred to the EPD's Yuen Long AQMS which is the nearest one to the Application Site. The air quality monitoring data between Year 2021 and Year 2025 of various air pollutants monitored at Yuen Long AQMS is presented in **Table 2.3** and compared with the AQOs.

Table 2.3 Air Quality Monitoring Data (Yuen Long AQMS, Year 2021-2025)

Pollutant	Parameter	Concentration ($\mu\text{g}/\text{m}^3$) ^[1]						AQO ($\mu\text{g}/\text{m}^3$) ^[2]
		2021	2022	2023	2024	2025	5-year Mean ^[2]	
SO ₂	4 th highest 10-minute	24	21	20	14	22	20 [4%]	500 (3)
	4 th highest 24-hour	14	7	10	5	5	8 [20%]	50 (3)
RSP	Annual	30	25	26	25	26	26 [87%]	30
	10 th highest 24-hour	73	56	59	61	63	62 [83%]	75 (9)
FSP	Annual	<u>17</u>	<u>16</u>	<u>16</u>	<u>17</u>	<u>16</u>	<u>16</u> [107%]	15
	19 th highest 24-hour	36	<u>38</u>	34	<u>38</u>	37	37 [99%]	37.5 (18)
NO ₂	Annual	40	37	37	35	36	37 [93%]	40
	10 th highest 24-hour	78	68	67	66	72	70 [58%]	120 (9)
	19 th highest 1-hour	148	122	130	125	134	132 [66%]	200 (18)
O ₃	10 th highest 8-hour	<u>178</u>	<u>194</u>	155	<u>168</u>	141	<u>167</u> [104%]	160 (9)
	Peak season	84	95	84	92	84	88 [88%]	100
CO	Max. 1-hour	2,090	1,700	1,580	1,920	2,000	1,858 [6%]	30,000 (0)
	Max. 8-hour	1,591	1,519	1,273	1,778	1,500	1,532 [15%]	10,000 (0)
	Max. 24-hour	1,183	1,159	1,047	1,342	1,400	1,226 [31%]	4,000 (0)

Notes:

[1] Monitoring results exceeding the AQOs are **bold and underlined**.

[2] Number of exceedance allowed under the AQO is shown in (). % of the AQO is shown in [].

- 2.2.3** The NO₂ concentrations can comply with the AQOs for all 5 years, with the 19th highest 1-hour NO₂ levels ranging from 122 to 148 µg/m³, 10th highest daily NO₂ levels ranging from 66 to 78 µg/m³ and annual NO₂ levels ranging from 35 to 40 µg/m³.
- 2.2.4** The RSP concentrations can comply with the AQOs for all 5 years, with the 10th highest daily RSP levels ranging from 61 to 73 µg/m³, and annual RSP levels ranging from 25 to 30 µg/m³.
- 2.2.5** The 19th highest daily FSP levels were at a level of 34 to 38 µg/m³, and exceedances were found in Year 2022 and 2024. The annual FSP levels were found high in the range of 16 to 17 µg/m³, with exceedances recorded for all 5 years.
- 2.2.6** The 4th highest 10-minute SO₂, 4th highest daily SO₂, maximum 1-hour CO, maximum 8-hour CO and maximum daily CO levels were well within the corresponding AQOs, with the five year means about 31% of the AQO.
- 2.2.7** The 10th highest 8-hour O₃ levels ranged from 141 to 194 µg/m³. Exceedances were found in Year 2021, 2022 and 2024. The peak season O₃ levels ranged from 84 to 95 µg/m³, and no exceedance was recorded in the past 5 years.
- 2.2.8** The best available information has been evaluated to verify the status of the nearby industrial developments, i.e. desktop review and site surveys were conducted in July 2026 to review the validity of the existing chimneys in the vicinity of the Application Site as identified in the approved HSK EIA report. No existing and planned industrial emission was identified within 200 m from the Application Site as shown in **Figure 2.1**. The setback distance requirements as stipulated in HKPSG could be well satisfied, and air quality impact from industrial emission is not considered to be of concern to the proposed development. Therefore, this section addresses the potential air quality impact associated with road vehicular emissions and odour emission on and/or from the proposed development.

2.3 Air Sensitive Receivers

- 2.3.1** As the major construction activities, i.e. site formation works, that would generate fugitive dust, of the Application Site are targeted to complete by Year 2027, existing Air Sensitive Receivers (ASRs) and planned/ committed ASRs (Year 2019 – 2030), with the year of population intake by 2027 in the approved HSK EIA report were reviewed, with consideration of the tentative land resumption programme. Existing ASRs identified in the approved HSK EIA report have been reviewed by means of reviewing topographic maps, aerial photos and land status plans. They mainly include place of worship, residential, educational and recreational uses. Planned/committed ASRs have been identified by referring to the approved HSK EIA report.
- 2.3.2** No committed or planned ASRs are identified within the 500m assessment area for construction phase. Considering the land resumption programme of nearby area, the target land resumption will be by end 2026, and would temporarily overlap with the construction of the proposed development. Within this area, one representative ASR is identified, which is an existing farm house (i.e. A01) located at about 80m away from the boundary of the Application Site. Following the completion of land resumption process, A01 would no longer be considered as a representative ASR, and the nearest representative ASR from the Application Site would be an existing farm house (i.e. A603 identified under the

approved HSK EIA report) which is located at about 590m away from the boundary of the Application Site. During the operational phase, the proposed development within the Application Site is identified as ASR (i.e. PA01). Locations of the identified representative ASRs are shown in **Figure 2.2**

2.4 Construction Air Quality Impact

2.4.1 As mentioned in **Section 2.3**, no committed or planned ASRs are identified within the 500m assessment area. An existing representative ASR (i.e. farm house (A01) located at about 80m away from the boundary of the Application Site) is identified with a short overlapping period with the construction of the proposed development before the completion of land resumption. Upon the completion of land resumption process, the nearest representative ASR from the Application Site would be an existing farm house, which is located at about 590m away from the boundary of the Application Site.

2.4.2 According to the construction air quality impact assessment in the approved HSK EIA report, the construction air quality impacts of current footprint of the proposed development are included under the same assessment scenario, i.e. within Year 2019 and Year 2030. The major dusty construction activities, i.e. site formation works, for the proposed development have therefore been addressed in the approved HSK EIA report. As confirmed with the Project Engineer, the construction details, the construction period, the construction methods, the total area for site formation and excavation, the amount of excavated material, the number of dump trucks needed per time over work sites as well as the number of on-site mechanical equipment to be used, would be the same as that assumed in the approved HSK EIA report. Besides, based on the latest development timeline of HSK/HT NDA, the overall timeline for the developments included in the approved HSK EIA report will be shifted but remains generally consistent with the original planning framework and will not significantly deviate from the approved HSK EIA report. With the implementation of mitigation measures as recommended in the approved HSK EIA report, no adverse construction air quality impacts would be anticipated.

2.4.3 Moreover, the proposed development will comprise reused Modular Integrated Construction (MiC) units supplied by CEDD. The superstructure works would mainly involve the installation and assembly of reused MiC modules, rather than dusty construction activities. Therefore, significant dust impacts from superstructure works are not anticipated.

2.4.4 With the implementation of good site practices and mitigation measures as recommended in the approved HSK EIA report, no adverse construction air quality impact is anticipated from the proposed development.

2.5 Vehicular Emission Impact

2.5.1 The best information available at the time of report preparation has been evaluated for the road networks in the surrounding environment of the proposed development. Based on the best available information, Road P1 and Road L24 planned under the approved HSK EIA nearby the proposed development will be in full operation in 2030 Q1. Therefore, considering the proposed development will operate from 2027 Q3 to 2030 Q3, there will be short overlapping period with the operation of the planned roads. The recommended

minimum buffer distances in the HKPSG for the surrounding roads are considered and summarized in **Table 2.5** below.

Table 2.5 Classification of type of road and buffer distance for nearby major roads

Name of Road	Type of Road ^[1]	HKPSG Recommended Setback Distance (m)
KSWH ^[2]	EX	>20
Road P1	PD	>20
Road L24	LD	>5

Notes:

[1] EX – Expressway; PD – Primary Distributor; LD – Local Distributor.

[2] The road type is referred to AADT 2024.

[3] The road type of planned roads is determined from the road configuration by traffic engineer in the Traffic Impact Assessment Report under this Study.

2.5.2 **Figure 2.3** shows the minimum setback distances from the surrounding roads. Based on the latest preliminary building layout plan for the proposed development at the time of this PEA submission, all air-sensitive uses could comply with the HKPSG's minimum setback distance requirement. Adverse vehicular emission impact on the proposed development is not anticipated.

2.6 Odour Emission Impact

2.6.1 According to the approved HSK EIA report, a refuse collection point (RCP) is planned in Site 3-46, which is located at about 24m from the Application Site as shown in **Figure 2.4**. In order to minimize the potential odour nuisance on the proposed residential blocks, proper ventilation, deodorizing unit with 95% odour removal efficiency and exhaust system shall be provided at the planned and proposed RCPs. Good site practices will be also adopted to enhance the hygiene of the refuse collection point by frequent washing, proper covering of refuse bins, closing of roller shutters and proper maintenance of the ventilation, deodourising and exhaust systems. Given the mitigation measures to be implemented for potential odour emissions, no adverse odour impact from the planned and proposed RCPs is anticipated.

2.6.2 Besides, a sewage pumping station (SPS) with designed capacity of 12,000 m³ per day is planned at Site 3-48 under HSK/HT NDA, which is located at around 68m from the nearest air sensitive use within the Application Site as shown in **Figure 2.4**.

2.6.3 In order to minimize the potential odour nuisance, all facilities and areas with potential odour emission such as wet wells, inlet chamber and screen chambers should be covered by reinforced concrete structure. The exhausted air should be conveyed to a deodouriser with improved odour removal efficiency of at least 90% for treatment before discharge to the environment as stated in the approved HSK EIA report. The ventilation system would also maintain a slight negative pressure within the facilities.

2.6.4 A desktop review of the Tuen Mun Area 54 SPS (AEIAR-122/2008), which has a greater design capacities (90,000 m³/day), shorter separation distances from the nearest ASRs to the SPS site boundary (10 m), and a deodorizer with similar odour removal efficiency (at least 90%), has concluded that there are no adverse odour impacts on ASRs. Considering large separation distances between the proposed development and the proposed SPS with

proper implementation of odour mitigation measure, no adverse odour impact arising from the proposed SPS is anticipated.

3 NOISE

3.1 Legislation, Standards and Guidelines

3.1.1 This PEA has been made reference to the following relevant legislation, standards and guidelines:

- Noise Control Ordinance (NCO) (Cap.400);
- Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM);
- Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM);
- Practice Note for Professional Persons: Minimizing Noise from Construction Activities (ProPECC PN 1/24); and
- Hong Kong Planning Standards and Guidelines (HKPSG);

Construction Noise during Non-restricted Hours

3.1.2 For construction activities other than percussive piling, there is no statutory limit on daytime construction noise under the NCO and related TMs, except during the restricted hours which cover daytime on general holidays (including Sundays). Nevertheless, the Environmental Protection Department's Practice Note For Professional Persons: "Minimizing Noise from Construction Activities – Non-statutory Controls (Practice Note PN 1/24)" stipulates noise standards of 65 – 75dB(A) for daytime construction activities, as shown in the following table:

Table 3.1 Noise Standards for Construction Activities

Noise Sensitive Receivers	Noise Standards ^[1] ^[2] , Leq (30 mins) dB(A)
	0700 to 1900 hours on any day not being a Sunday or general holiday
All domestic premises Temporary housing accommodation Hostels Convalescences homes Home for the aged	75
Places of public worship Courts of law Hospitals and medical clinics	70
Educational institutions (including kindergartens and nurseries)	70 65 (During examinations)

Note:

[1] The above standards apply to uses that rely on opened windows for ventilation.

[2] The standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

Construction Noise during Restricted Hours

- 3.1.3** The NCO also provides statutory control on general construction works during restricted hours (i.e. 1900 to 0700 hours (of the next day) from Monday to Saturday and at any time on Sundays or public holidays). The use of Powered Mechanical Equipment (PME) for construction works during restricted hours would require a Construction Noise Permit (CNP). The TM-GW details the procedures adopted by Noise Control Authority (NCA) for assessing such application. The granting of a CNP is subject to conditions stated in the CNP and it may be revoked at any time for failure to comply with the permit conditions.
- 3.1.4** In addition to the general controls on the use of PME during restricted hours, the use of Specified Powered Mechanical Equipment (SPME) and the undertaking of Prescribed Construction Work (PCW) during the restricted hours in a designated area are controlled by the TM-DA. Construction plants or equipment classified as SPME under the TM-DA includes hand-held breakers, bulldozers, concrete lorry mixers, dump trucks and hand-held vibratory pokers. The PCW includes the erection or dismantling of formwork or scaffolding, hammering and loading, unloading or handling of rubble, wooden boards, steel bars, wood or scaffolding material. The TM-DA details the procedures that should generally be adopted by the NCA for assessing the use of SPME during restricted hours and for determining whether a CNP would be issued.
- 3.1.5** Maximum noise level from construction activities during restricted hours at affected Noise Sensitive Receivers (NSRs) are controlled under the TMs and shall not exceed the specified Acceptable Noise Levels (ANLs). These ANLs are stipulated in accordance with the Area Sensitivity Ratings established for the NSRs. The definitions of Area Sensitivity Ratings "A", "B" and "C" are summarised in **Table 3.2**. The ANLs for construction works in Designated Areas are more stringent than those given in the TM-GW and summarised in **Table 3.3**.

Table 3.2 Area Sensitivity Rating

Type of Area Containing NSR ^[1]	Degree to Which NSR Is Affected by Influencing Factor (IF) ^{[1] [2]}		
	Not Affected	Indirectly Affected	Directly Affected
(i) Rural area, including country parks or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
(iii) Urban area	B	C	C
(iv) Area other than those above	B	B	C

Notes:

[1] For the purpose of **Table 3.2**, the following definitions shall apply:

"country park" means an area that is designated as a country park pursuant to section 14 of the Country Parks Ordinance;

"directly affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR;

"indirectly affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR;

"not affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR; and

"urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.

- [2] Influencing Factors include any industrial area, major road or the area within the boundary of Hong Kong International Airport.

Table 3.3 ANLs for Construction Works during Restricted Hours

Time Period	ANLs for Area Sensitive Ratings ^[1] , dB(A)		
	A	B	C
All weekdays during the evening (1900 to 2300 hours), and general holidays (including Sundays) during the day and evening (0700 to 2300 hours)	60 (45)	65 (50)	70 (55)
All days during the night-time (2300 to 0700 hours)	45 (30)	50 (35)	55 (40)

Note:

- [1] Figures in brackets are ANLs for SPME construction work in designated areas.

3.1.6

The issue of CNP for the project construction is subject to the decision of the NCA. The NCA will consider a well-justified CNP application, once filed, for construction works within restricted hours as guided by the relevant TMs issued under the NCO. The NCA will take into account contemporary conditions/ situations of adjoining land uses and any previous complaints against construction activities at the Project before making a decision in granting a CNP. Nothing in this Report shall bind the NCA in making a decision. If a CNP is to be issued, the NCA shall include in it any conditions demanded. Failure to comply with any such conditions will lead to cancellation of the CNP and prosecution under the NCO.

Noise Standards for Road Traffic Noise

3.1.7

The criteria for assessing road traffic noise follows the HKPSG and is in L₁₀ (1 hour). For domestic premises, hotels, hostels and offices, the criterion is 70dB(A). For educational institutions and places of public worship, the criterion is 65dB(A). For hospitals, clinics etc., a more stringent criterion of 55dB(A) is stipulated. It should be noted that all these L₁₀ (1 hour) criteria only apply to uses that rely on openable windows for ventilation.

Noise Standards for Fixed Noise

3.1.8

The HKPSG states that in order to plan for a better environment, all planned fixed noise sources should be located and designed that when assessed in accordance with the IND-TM, the level of intruding noise at the façade of the nearest sensitive use should be at least 5dB(A) below the appropriate Acceptable Noise Levels (ANLs) shown in Table 2 of the IND-TM or, in the case of the background being 5dB(A) lower than the ANL, should not be higher than the background.

3.1.9

The ANL for a particular NSR is dependent upon the Area Sensitive Rating of the area within which the NSR is located, and the time period under consideration.

3.1.10

Area Sensitivity Rating is defined in the IND-TM issued under the NCO. The Area Sensitivity Rating depends on the type of area and the degree of impact that Influencing Factors (IFs) have on the NSRs. Industrial area, major road (with an annual average daily traffic (AADT) flow in excess of 30,000) or the area within the boundary of Hong Kong International Airport shall be considered to be an IF.

- 3.1.11** The appropriate Area Sensitivity Rating for the NSR shall be assigned on the basis of **Table 3.1**. Having regard to the appropriate Area Sensitivity Rating and the time period under consideration, the appropriate ANL for a given NSR could be determined from **Table 3.4**. All these criteria only apply to NSRs relying on openable windows for ventilation.

Table 3.4 Acceptable Noise Level for Different Area Sensitivity Ratings

Time Period	Area Sensitivity Rating		
	A ^[1]	B ^[1]	C ^[1]
Day (0700 to 1900 hours)	60 (55)	65 (60)	70 (65)
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50 (45)	55 (50)	60 (55)

Notes:

- [1] The brackets show the permissible noise levels at NSRs for any planned fixed plant noise sources, i.e. 5 dB(A) below the corresponding ANLs.

3.2 Representative Noise Sensitive Receiver

- 3.2.1** With reference to HKPSG, Noise Sensitive Receivers (NSRs) shall include residential uses (all domestic premises including temporary housing), institutional uses (educational institutions including kindergarten and nurseries), hospitals, medical clinics, homes for the aged, convalescent homes, places of worship, libraries, court of law, performing arts centres, auditoria and amphitheatres, country park and others.
- 3.2.2** The Assessment Area is defined as within 300m from the boundary of Application Site for noise impact assessment. The first layer of representative existing, committed and planned NSRs within 300m from the boundary of the Project has been identified. Existing NSRs are identified by means of reviewing topographic maps, aerial photos, land status plans, supplemented by site inspection. Committed/planned NSRs have been identified by making reference to the relevant OZP, and other development layout plans where available.
- 3.2.3** No existing, committed or planned NSRs are identified within the 300m assessment area for construction phase. The nearest representative NSR from the Application Site is an existing village house at Tin Sum Tsuen (i.e. E4-IA identified under the approved HSK EIA report), which is located at about 720m away from the boundary of the Application Site, as shown in **Figure 3.1**. During the operational phase, the proposed residential use within the Application Site is identified as NSR (i.e. PN01).

3.3 Construction Noise Impact

- 3.3.1** As mentioned in **Section 3.2**, no existing, committed or planned NSRs are identified within the 300m assessment area. The nearest representative NSR from the Application Site is an existing village house at Tin Sum Tsuen, which is located at more than 700m away from the boundary of the Application Site. Given the large separation, adverse construction noise impact from the proposed development is not anticipated.
- 3.3.2** Notwithstanding this, good site practice and suitable mitigation measures as recommended in the approved HSK EIA report and in the following sections will still be

implemented to avoid and minimise the potential construction noise impact to the nearby NSRs as far as practicable.

3.3.3 It is recommended that good site practices and mitigation measures stipulated in the Recommended Pollution Control Clauses for Construction Contracts shall be implemented. The following recommended practices would be considered in all work sites as good practices to limit noise emissions at the source include:

- good site practices to limit noise emissions at the source;
- use of quality powered mechanical equipment (QPME); and
- use of movable noise barriers, noise enclosure and acoustic mat to screen noise from relatively static PME.

3.3.4 The above mitigation measures would need to be implemented in work sites as good practices where appropriate. Detailed descriptions of these mitigation measures are given in the following sections.

Good Site Management Practices

3.3.5 Good site practice and noise management techniques could considerably reduce the noise impacts from construction site activities on nearby NSRs. The following measures should be practised during each phase of construction:

- only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;
- machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;
- silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works;
- mobile plant should be sited as far away from NSRs as far as practicable; and
- material stockpiles, site office and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.

3.3.6 The benefits of these techniques can vary according to specific site conditions and operations. The environmental noise climate would certainly be improved with these control practices, although the improvement can only be quantified during implementation when specific site parameters are known.

Use of Quality Powered Mechanical Equipment (QPME)

3.3.7 The use of quiet plant associated with the construction works should make reference to the PME listed in the TM or the QPME/ other commonly used PME listed in EPD web pages as far as possible which includes the SWLs for specific quiet PME. It is generally known (supported by field measurement) that particular models of construction equipment are quieter than standard types given in the TM-GW. Whilst it is generally considered too restrictive to specify that the Contractor has to use specific models or items of plant, it is reasonable and practicable to set plant noise performance specifications for specific PME so that some flexibility in selection of plant is allowed. A pragmatic

approach would be to request the Contractor independently verifies the noise level of the plant proposed to be used and demonstrates through furnishing of these results, that the plant proposed to be used on the Project site meets the requirements.

Use of Movable Noise Barrier & Full Enclosure for Relatively Fixed Plant Sources

- 3.3.8** Movable temporary noise barriers that can be located close to noisy plant and be moved concurrently with the plant along a worksite can be very effective for screening noise from NSRs. A typical design which has been used locally is a wooden framed barrier with a small-cantilevered upper portion of superficial density no less than 10kg/m² on a skid footing with 25mm thick internal sound absorptive lining. This measure is particularly effective for low level zone of NSRs. A cantilevered top cover would be required to achieve screening benefits at upper floors of NSRs.
- 3.3.9** Movable temporary noise barriers will be used for some PME items. The use of standard enclosure shall be considered to shelter relatively fixed plant such as generator.
- 3.3.10** The Recommended Pollution Control Clauses for Construction Contracts will be strictly enforced through the construction contracts. In addition, the construction noise criteria enumerating in **Table 3.1** shall be specified in the contract document for the Contractor to follow. HKHA will manage the construction contracts to ensure that the recommended good site practices and mitigation measures will be implemented.

3.4 Road Traffic Noise Impact

- 3.4.1** The nearby road network within 300m from the Application Site is shown in **Figure 3.1**. Surrounding roads include the existing Kong Sham Western Highway, and planned access road L24 and planned Road P1 under the approved HSK EIA report. With reference to the proposed temporary centralised quarter at Tam Mi, considering all proposed noise sensitive uses will be served by A/C units and not rely on openable windows for ventilation, no road traffic noise impact is anticipated on the proposed development. Nevertheless, it is recommended that the windows pane should be with 6mm in thickness to offer the future occupants an option for a quieter indoor noise environment. In addition, the future occupants will be informed of the potential noise impact and shall keep window closed during normal occupancy to achieve a suitable living environment.
- 3.4.2** Based on the latest available information, to cater for the future population, there would be about 20 vehicles/hour/ direction induced traffic flow at peak on the planned access road. Considering the nearest representative NSR (i.e. the existing village house at Tin Sum Tsuen) is located at about 650m away from the planned access road, and that its existing noise climate is dominated by the rail noise from the West Rail Line, adverse road traffic noise impact induced from the proposed development to the nearby NSRs is not anticipated.

3.5 Fixed Noise Impact

- 3.5.1** According to the approved HSK EIA report and based on best available information, no existing fixed noise sources are identified, while there are various potential planned fixed noise sources within 300m from the Application Site as shown in **Figure 3.2**. Fixed plants, including air-conditioning units, primary air-handling units and water pumps will

be provided within the proposed development. These fixed plants may have potential noise impact on the nearby NSRs. With reference to the proposed temporary centralised quarter at Tam Mi, considering all proposed noise sensitive uses will be served by A/C units and not rely on openable windows for ventilation, no fixed noise impact is anticipated on the proposed development. Nevertheless, it is recommended that the windows pane should be with 6mm in thickness to offer the future occupants an option for a quieter indoor noise environment. In addition, the future occupants will be informed of the potential noise impact and shall keep window closed during normal occupancy to achieve a suitable living environment.

4 WATER QUALITY

4.1 Legislation, Standards and Guidelines

4.1.1 This PEA has been made reference to the following relevant legislation, standards and guidelines:

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems Inland and Coastal Waters (TM-DSS);
- Hong Kong Planning Standards and Guidelines (HKPSG);
- Environment, Transport and Works Bureau Technical Circular (ETWB TC) (Works) No. 5/2005 "Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works";
- Professional Persons Environmental Consultative Committee Practice Note (ProPECC) PN 2/24 "Construction Site Drainage"; and
- Professional Persons Environmental Consultative Committee Practice Note (ProPECC) PN 1/23 "Drainage Plans subject to Comment by the EPD".

4.2 Water Sensitive Receivers

4.2.1 Key Water Sensitive Receivers (WSRs) within 500m from the Application Site include tributaries of Tin Shui Wai Main Channel and Conservation Area designated under the Ha Tsuen Fringe OZP (Statutory Plan No. S/YL-HTF/12), which have been identified in the water quality and ecological impact assessments under the approved HSK EIA report.

4.3 Construction Water Quality Impact

4.3.1 According to construction water quality impact assessment conducted in the approved HSK EIA report, major potential pollution sources associated with the construction works for the proposed development include construction site run-off, accidental spillage, and sewage effluent from construction workforce. With the implementation of recommended mitigation measures in the approved HSK EIA report such as adopting good site practices as outlined in the ProPECCPN 2/24 "Construction Site Drainage" and the ETWB TC (Works) No. 5/2005 "Protection of natural streams / rivers from adverse impacts arising from construction works", adverse water quality impact on surrounding WSRs during construction phase is not anticipated.

4.3.2 With the provision of portable toilets as well as appropriate disposal and maintenance of the toilets by licensed contractor as recommended in the approved HSK EIA report, adverse water quality impact on surrounding WSRs due to sewage generation during construction phase is not anticipated.

4.3.3 Therefore, with the implementation of good site practices and mitigation measures as recommended in the approved HSK EIA report, no adverse construction water quality impact is anticipated from the proposed development.

4.4 Operational Water Quality Impact

- 4.4.1** The major potential water pollution sources associated with operational phase of the proposed development include sewage and surface runoff. Based on the current development scheme, sewage holding tanks are proposed within the Application Site. A separate Sewage Impact Assessment (SIA) has been conducted to assess the impact of sewage generation as a result of the proposed development. Details of the proposed sewer network shall be referred to the separated SIA report.
- 4.4.2** All sewage generated from the proposed development would be discharged to sewage holding tanks, with regular removal by tanker to the nearby sewage pumping station or sewage treatment works for disposal. Details to be referred to the SIA. Adverse water quality impact on surrounding WSRs due to the sewage from the proposed development during operational phase is not anticipated.
- 4.4.3** Surface runoff from the proposed development will lead to an increase in area of impermeable surfaces and hence the peak surface runoff rates. Besides, vehicle dust, tyre scraps and oils might be washed away from the road surface to the nearby water courses by surface runoff or road surface cleaning. Proper drainage systems with silt traps and oil interceptors should be installed and connected to the existing drainage system. A separate Drainage Impact Assessment (DIA) has been conducted to for the proposed drainage system as a result of the proposed development. Details shall be referred to the separated DIA report.
- 4.4.4** Runoff will be controlled by best management practice. Runoff will be intercepted by properly designed and managed silt traps at appropriate spacings so that common roadside debris, refuse and fallen leaves etc. can be captured before allowing the runoff to drain into the drainage system. Adverse water quality impact on surrounding WSRs due to the surface runoff from the proposed development during operational phase is not anticipated.

5 WASTE MANAGEMENT

5.1 Legislation, Standards and Guidelines

5.1.1 This PEA has been made reference to the following relevant legislation, standards and guidelines:

- Waste Disposal Ordinance (Cap. 354) and subsidiary regulations;
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N);
- Waste Disposal (Chemical Waste) (General) Regulation of (Cap. 354C);
- Land (Miscellaneous Provisions) Ordinance (Cap. 28);
- Public Health and Municipal Service Ordinance (Cap. 132); and
- Public Cleansing and Prevention of Nuisance Regulation.

5.1.2 The documents and guidelines listed in **Table 5.1** are also related to waste management and disposal during construction.

Table 5.1: Other relevant documents and information

Bureau / Department	Documents / Guidelines / Technical Circulars
Environmental Protection Department (EPD)	• Monitoring of Solid Waste in Hong Kong 2024 • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes • A Guide to the Chemical Waste Control Scheme • A Guide to the Registration of Chemical Waste Producers
Civil Engineering and Development Department (CEDD)	• Project Administration Handbook for Civil Engineering Works, 2022 Edition • CEDD TC No. 11/2019, Management of Construction and Demolition Materials
Development Bureau (DEVB)	• Works Branch Technical Circular (WBTC) No. 2/93, Public Dumps • WBTC No 2/93B, Public Filling Facilities • WBTC No. 16/96, Wet Soil in Public Dumps • WBTC Nos. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Project • WBTC No. 19/2001, Metallic Site Hoardings and Signboards • ETWB TCW No. 19/2005, Environmental Management on Construction Sites • Development Bureau Technical Circular (Works) (DEVB TCW) No. 6/2010, Trip-ticket System for Disposal of Construction and Demolition Material • DEVB TCW No. 8/2010, Enhanced Specification for Site Cleanliness and Tidiness

Bureau / Department	Documents / Guidelines / Technical Circulars
	DEVB TCW No. 9/2011, Enhanced Control Measures for Management of Public Fill
Planning Department (PlanD)	Chapter 9 Environment, Hong Kong Planning Standards and Guidelines (HKPSG)

5.2 Construction Phase

5.2.1

According to the waste management implication assessment in the approved HSK EIA report, the waste management implications of current footprint of the proposed development are included and have therefore been addressed in the approved HSK EIA report. As confirmed with the Project Engineer, the construction details, the construction period, the construction methods, the total area for site formation and excavation, the amount of excavated material, the number of dump trucks needed per time over work sites as well as the number of on-site mechanical equipment to be used, would be similar to that assumed in the approved HSK EIA report.

5.2.2

Moreover, the proposed development will comprise reused MiC units supplied by CEDD. As the superstructure works would mainly involve the installation and assembly of reused MiC modules, significant waste management implications arising from superstructure works are not anticipated.

5.2.3

The typical waste types associated with these activities include both inert and non-inert construction and demolition (C&D) materials, chemical wastes and general refuse from the on-site workforce, etc. Based on the best available information, there will be approximately 16,000m³ inert C&D materials generated, with approximately 3,800m³ for on-site reuse, while approximately 900m³ of non-inert C&D material will be generated throughout the construction phase. Waste management hierarchy principle will be followed and the amount of waste generation could be reduced through good site practices and management.

5.2.4

It is difficult to quantify the amount of chemical waste as it will be highly dependent on the Contractor's on-site maintenance practice and the quantities of plant and vehicles utilized. Nevertheless, it is anticipated that the quantity of chemical waste, such as lubricating oil and solvent produced from plant maintenance, will be small (i.e. as low as few litres per month only) due to small scale of Project. Chemical waste would be collected by a licensed waste collector and to be disposed of at a licensed chemical treatment and disposal facility (e.g. Chemical Waste Treatment Centre).

5.2.5

General refuse is mainly generated from construction workforce during the construction period and mainly comprises food waste, wastepaper, aluminium cans and plastics bottles. The workforce to be deployed on site for the Project is approximately 100 at peak during the 12-month construction. Based on the generation rate of 0.65 kg/person/day and assuming 24 working days per month, the total refuse generated would be about 18.7 tonnes at maximum during the construction phase. To minimise the quantities of general refuse for final disposal, recycle bins will be provided together with general refuse bins. Arrangements should be made with the recycling companies to collect the recyclable waste, whilst the rest will be collected by waste collectors for disposal to landfill (i.e. West New Territories Landfill).

5.2.6 Adverse waste management implications are not anticipated, provided that good site practices are implemented. The following good site practices are also recommended throughout the construction phase:

- nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;
- training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;
- appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; and
- the contractor should prepare an Environmental Management Plan (EMP), which includes a Waste Management Plan (WMP), as recommended in the ETWB TCW No. 19/2005 Environmental Management on Construction Sites. The EMP should be submitted to the Engineer for approval.

5.2.7 Waste reduction is best achieved at the site planning and design phase, as well as by ensuring the implementation of good site practices by the Contractor. The following good site practices are recommended:

General

- provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling; and
- segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and ensure proper disposal.

C&D Waste and Excavated Inert Material

- exercise proper storage and site practices to minimise the potential for damage and contamination of construction materials;
- devise a system for on-site sorting of C&D materials and remove all sorted and processed material arising from the construction activities promptly to optimise temporary stockpiling on-site;
- reuse the excavated material on-site as far as practicable;
- plan stocking of the construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; and
- carry out sorting of the demolition debris and excavated materials to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.).

5.2.8 Storage of waste on site may induce adverse environmental implications if not properly managed. The following recommendation should be implemented to minimise the impacts:

C&D Waste and Excavated Inert Material

- any stockpiling area should be provided with covers and water spraying system to prevent materials being washed away or blown by wind; and
- suitable locations should be identified and designated for stockpiling the materials to enhance reuse.

Chemical Waste

- chemical waste such as oil should be handled and stored in accordance with the “*Code of Practice on Packaging, Labelling and Storage of Chemical Wastes*”.

5.2.9

Collection and transportation of waste from works area to respective disposal sites may also induce adverse environmental impacts if not properly managed. The following recommendation should be implemented to minimise the impacts:

General

- remove waste in timely manner; and
- dispose wastes at licensed waste disposal facilities.

C&D Waste and Excavated Inert Material

- employ the trucks with cover or enclosed containers for waste transportation;
- obtain relevant waste disposal permits from the appropriate authorities;
- implement a trip-ticket system for the works contract to ensure that the delivery of C&D materials are properly documented and verified;
- equip waste collection trucks with Global Positioning System (GPS) or equivalent system for real-time tracking the off-site delivery of inert and non-inert C&D materials;
- non-inert C&D waste to be disposed off-site at landfill (SENT landfill); and
- excavated inert material to be disposed off-site at Public Fill Reception Facility (Tseung Kwan O Area 137 Fill Bank).

Chemical Waste

- collection, transportation and disposal of chemical waste should be in compliance with the Waste Disposal (Chemical Waste) (General) Regulation.

5.2.10

With the implementation of good site practice above, no adverse waste management implications are expected during construction phase of the Project.

5.3**Operational Phase****5.3.1**

The operational phase of the proposed development would generate municipal solid waste. With reference to the latest data from “Monitoring of Solid Waste in Hong Kong 2024” by EPD, the MSW disposal rate was 1.40 kg/person/day in Year 2024, and the recovery rate for recycling was 34% of the MSW generation. By calculation, the MSW generation rate, disposal rate and recycled rate were 2.12 kg/person/day, 1.40 kg/person/day and 0.72 kg/person/day in 2024 respectively. The estimated MSW based

on planned residential and employment populations respectively is summarized in **Table 5.3**.

Table 5.3 Estimated quantities of MSW from planned Residential and Employment Population during operation phase

Estimated MSW from Residential Population (tpd) ^[1]			
Residential Population	Generated ^[2]	Required Disposal ^[2]	Recycled ^[2]
1,800	3.8	2.5	1.3

Note:

[1] tpd: tonne per day

[2] MSW disposal rate was 1.40kg/person/day according to "Monitoring of Solid Waste in Hong Kong 2024" by EPD. By calculation, the MSW generation rate was 2.12kg/person/day. MSW recovery rate for recycling was 34% of the MSW generation. By calculation, the MSW recycling rate was 0.72kg/person/day.

5.3.2 A reputable waste collector should be employed to provide routine cleaning of the proposed development to minimize odour, pest and litter impacts associated with the generation of general refuse. Recycling bins should also be provided to encourage recycling.

5.3.3 With the implementation of the recommended mitigation measures for the handling, transportation and disposal of the identified waste, adverse residual waste management implications are not anticipated for the operational phase.

5.3.4 The following good practices are recommended:

Waste Collection and Disposal

5.3.5 An effective and efficient waste handling system is essential in order to minimize potential adverse environmental impacts during waste storage, collection and transport, such impacts may include odour if waste is not collected frequently; water quality if waste enters storm water drains; aesthetics and vermin problems if the waste storage area is not well maintained and cleaned regularly. The waste handling system may also facilitate materials recovery and recycling.

5.3.6 A refuse collection point would be installed at the ground floor for localized refuse collection and the waste would be transported to a refuse transfer station (RFS). To avoid potential odour nuisance during transport of waste, enclosed waste collection trucks should be used and the collection route and time should be properly planned. At least daily collection should be arranged by the waste collector.

Waste Recycling

5.3.7 In order to facilitate recycling, a 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers. Food waste recycling bins should be set up at a designated location to collect food waste during operational phase. The collected food waste should be delivered to the EPD's food waste recycling facilities (i.e. Organic Resources Recovery Centre (ORRC)) for turning into energy or resources.

6 OTHER ENVIRONMENTAL ISSUE

6.1 Land Contamination

6.1.1 The potential contaminated sites and land contamination impacts of current footprint of the proposed development are identified and addressed under the land contamination impact assessment in the approved HSK EIA report.

6.1.2 According to the approved HSK EIA report, two potentially contaminated sites have been identified within the Application Site, which were inaccessible during the EIA stage to assess the site conditions/ hotspots, formulate the detailed sampling and testing plan or conduct the actual site inspection works. Prior to the commencement of construction, a site re-appraisal has been conducted by the Contractor in the Supplementary Contamination Assessment Plan under CEDD's contract No. YL/2023/05 HSK/HT NDA Second Phase Development Contract 5 – Site Formation and Engineering Infrastructure Works, and no land contamination issue is anticipated.

7 CONCLUSION

7.1 Air Quality

- 7.1.1** Only one existing representative ASR is identified within 500m from the Application Site with a short overlapping period with the construction of the proposed development. With the implementation of good site practices and mitigation measures as recommended in the approved HSK EIA report, no adverse construction air quality impact is anticipated from the proposed development.
- 7.1.2** The current design scheme has allowed sufficient setback from the surrounding roads to ensure no air sensitive uses, including fresh air intake of mechanical ventilation and recreational uses in the open area, would be located within the buffer zones, in order to meet the minimum requirement as stipulated in the HKPSG. Hence potential vehicular emission impact to the proposed development is not anticipated, subject to further review to be undertaken in detailed design stage where necessary.
- 7.1.3** No existing and planned industrial emission was identified within 200 m from the proposed development. Hence, adverse air quality impact due to chimney emission is not anticipated.
- 7.1.4** With proper implementation of odour mitigation measures and good site practices, adverse odour emission impacts arising from planned RCP, and planned SPS at the nearby sites are not anticipated.

7.2 Noise

- 7.2.1** Given that no existing representative NSR is identified within 300m from the Application Site and with the implementation of good site practices and mitigation measures as recommended in the approved HSK EIA report, no adverse construction noise impact is anticipated from the proposed development.
- 7.2.2** With reference to the proposed temporary centralised quarter at Tam Mi, considering all proposed noise sensitive uses will be served by A/C units and not rely on openable windows for ventilation, no road traffic noise and fixed noise impact is anticipated on the proposed development. Nevertheless, it is recommended that the windows pane should be with 6mm in thickness to offer the future occupants an option for a quieter indoor noise environment. In addition, the future occupants should be informed of the potential noise impact and shall keep window closed during normal occupancy to achieve a suitable living environment.

7.3 Water Quality

- 7.3.1** With the implementation of good site practices and mitigation measures as recommended in the approved HSK EIA report, no adverse construction water quality impact is anticipated from the proposed development.
- 7.3.2** Operational impacts associated with runoff and sewage from the proposed development would be insignificant with proper management practices in place. All sewage generated from the proposed development would be discharged to sewage holding tanks, with

regular removal by tanker to the nearby sewage pumping station or sewage treatment works for disposal. Adverse water quality impact on surrounding WSRs due to the sewage from the proposed development during operational phase is therefore not anticipated.

7.4 Waste Management

- 7.4.1** With the implementation of good site practices and the recommended mitigation measures, adverse waste management implications are not anticipated during both construction and operational phases.

7.5 Land Contamination

- 7.5.1** Prior to the commencement of construction, a site re-appraisal has been conducted by the Contractor, and no land contamination issue is anticipated.

Figures of Environmental Review Report

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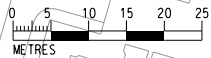
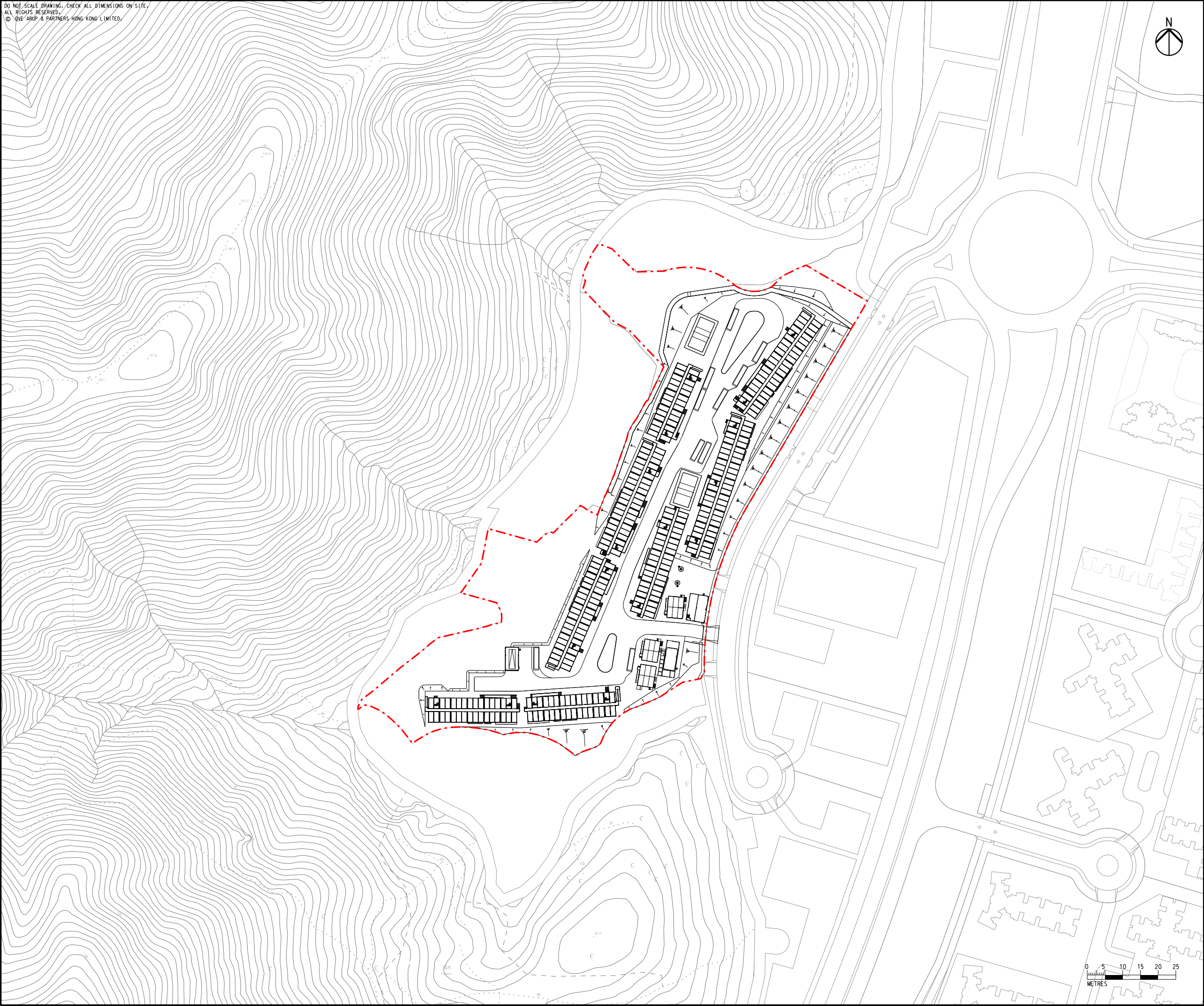


LEGEND



APPLICATION SITE

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Filename : \\global-eastasia\HKG Group\C\ENV\env\Project\278463\13 Drawing Deliverables\Report\21 S16 for Construction Staff Quarter\Figure 1.1 - Location of Application Site.dgn



A	FIRST ISSUE	GL	07/26
Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
LOCATION OF APPLICATION SITE			
Drawing no.			Rev.
FIGURE 1.1			A
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GL	07/26	JS	FC
Scale	Status		
1:2000 @ A3	PRELIMINARY		

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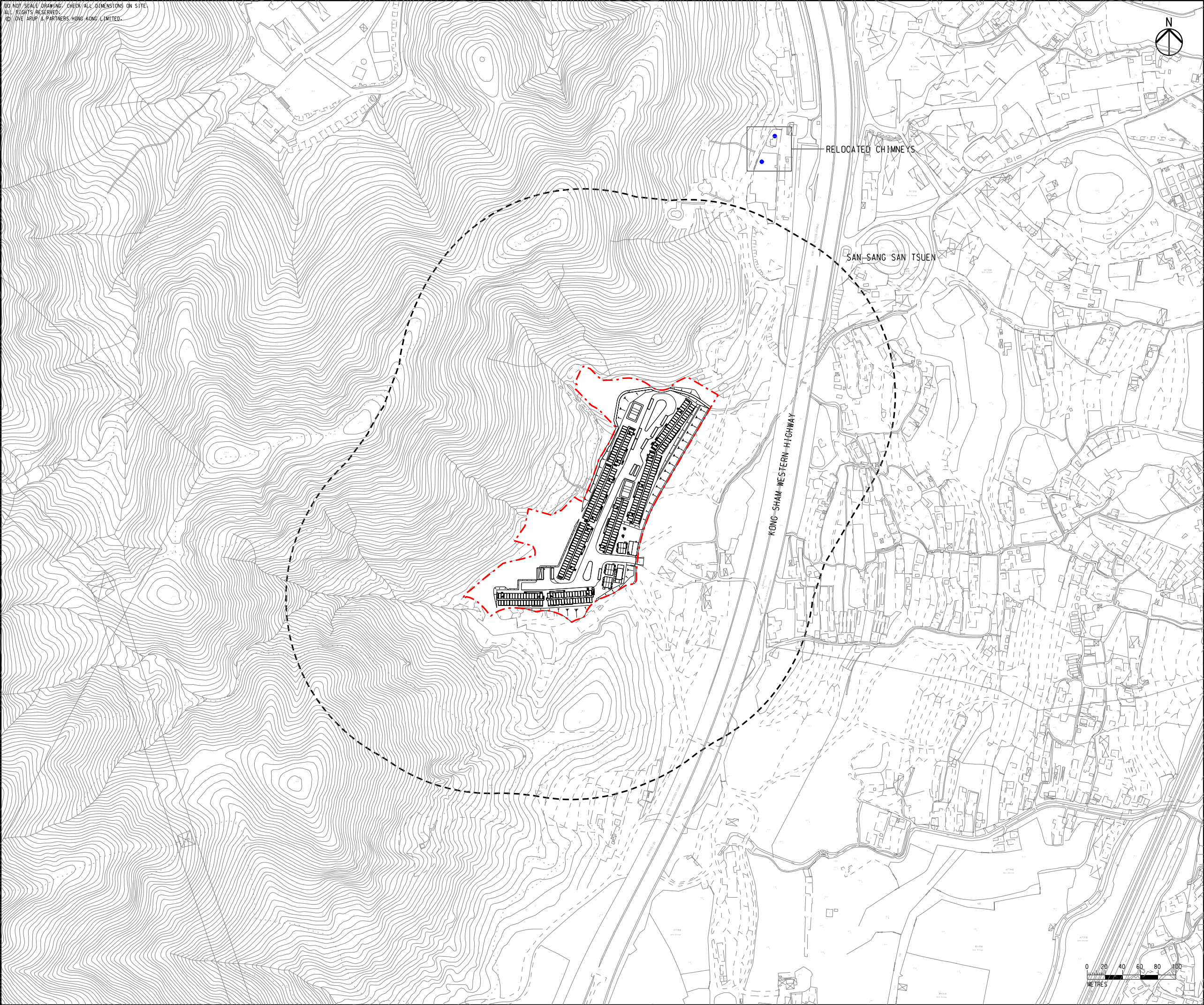
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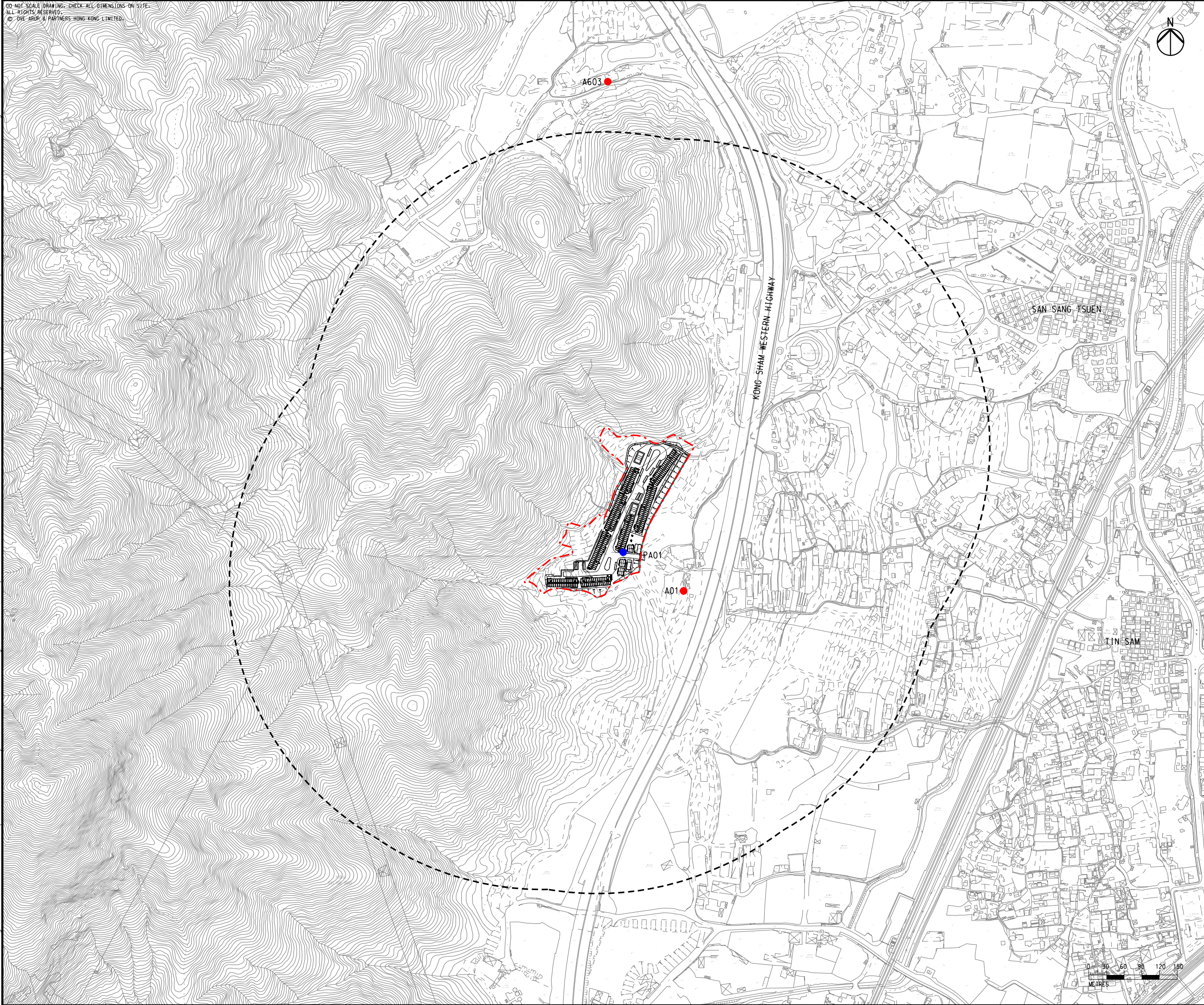
-  APPLICATION SITE
-  200m BUFFER DISTANCE
-  RELOCATED CHIMNEY



A		FIRST ISSUE		GL	07/26
Rev	Description	By	Date		
Consultant		ARUP			
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development					
– Design and Construction					
Drawing title					
LOCATION OF INDUSTRIAL EMISSION					
Drawing no.		FIGURE 2.1		Rev. A	
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Printed by : 3/8/2026
Filename : \\global\\EastAsia\\HKG\\Group\\C\\ENV\\env\\Project\\278463\\13 Drawing Deliverables\\report\\21 S16 for Construction Staff Quarter\\Figure 2.2 - Locations of Representative Air Sensitive Receivers.dgn

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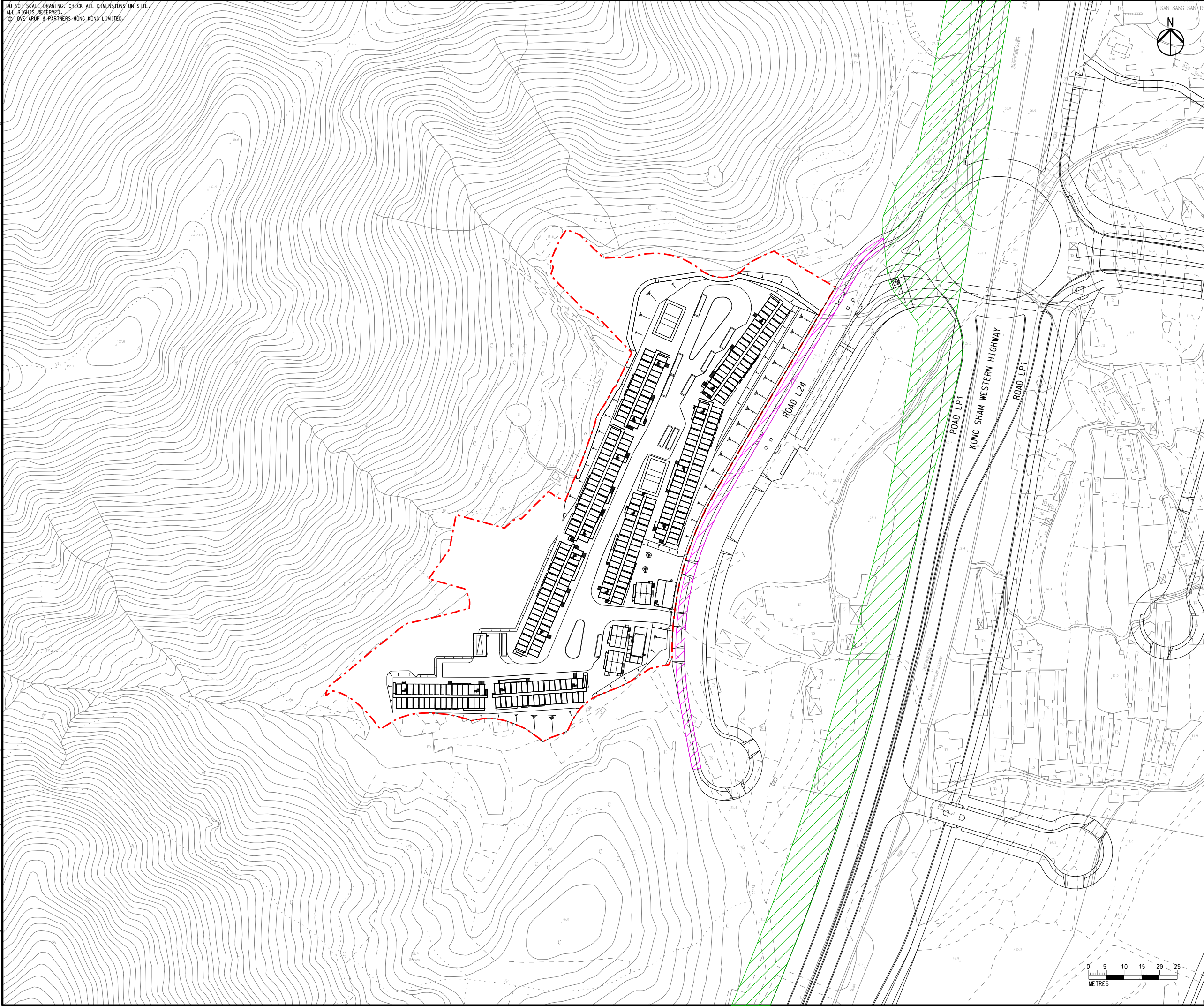


- LEGEND
- APPLICATION SITE
 - 500m ASSESSMENT AREA
 - EXISTING AIR SENSITIVE RECEIVERS
 - PLANNED AIR SENSITIVE RECEIVERS

A		FIRST ISSUE		GL	07/26
Rev	Description	By	Date		
Consultant		ARUP			
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development – Design and Construction					
Drawing title					
LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS					
Drawing no.		FIGURE 2.2		Rev. A	
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Filename : \\global\\EastAsia\\HK\\Group\\CIENV\\env\\Project\\278463\\13 Drawing Deliverables\\report\\21 S16 for Construction Staff Quarter\\Figure 2.3 - Separation Distance from Nearby Road Networks.dgn

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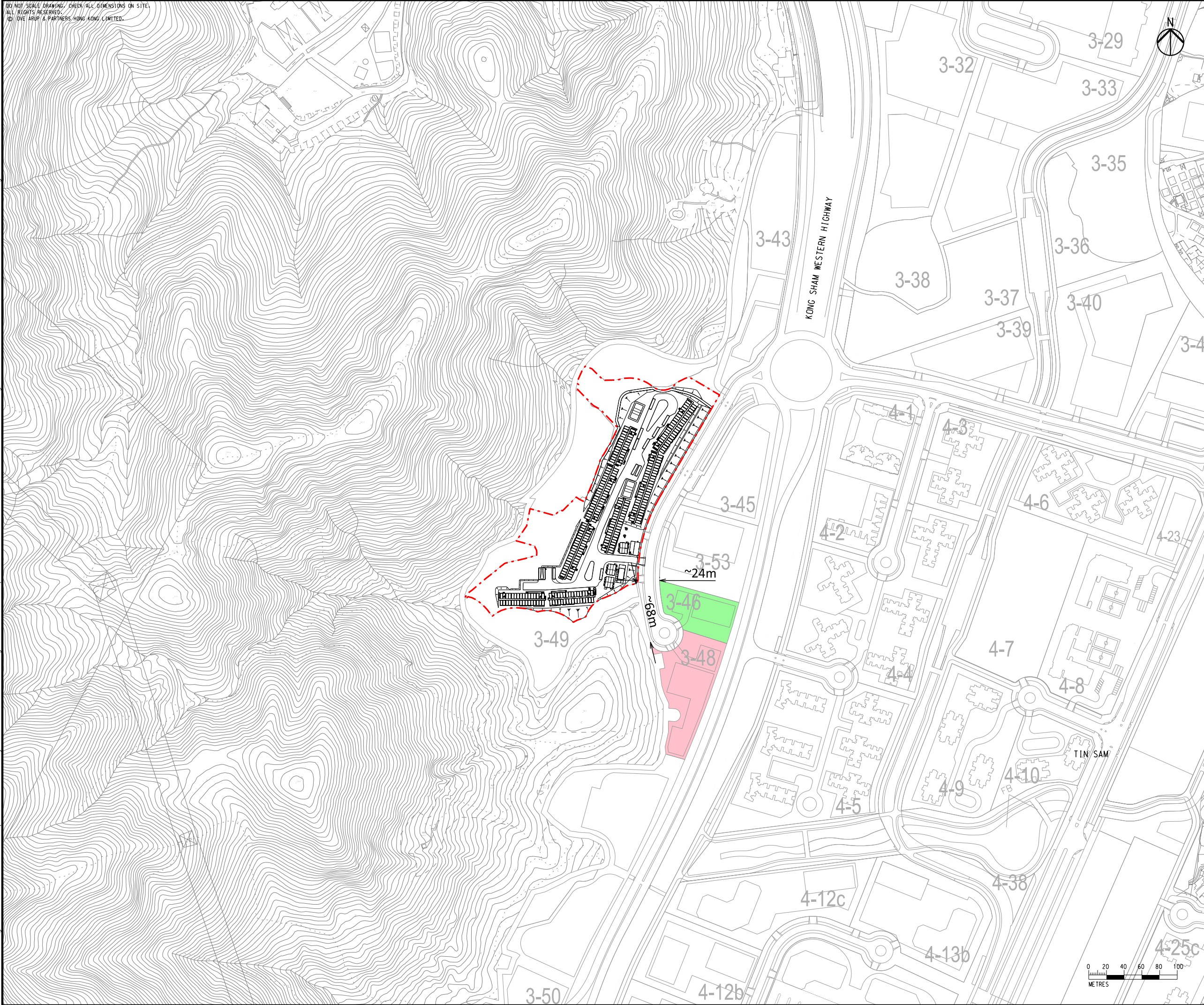
LEGEND

- APPLICATION SITE
- 20m SETBACK DISTANCE
- 5m SETBACK DISTANCE

A	FIRST ISSUE	GL	07/26
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Consultant			
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Project Title			
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Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development			
– Design and Construction			
Drawing title			
SEPARATION DISTANCE			
FROM NEARBY ROAD NETWORKS			
Drawing no.		Rev.	
FIGURE 2.3		A	
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Filename : \\global-eastasia\HKG Group\CEN\env\Project\278463\13 Drawing Deliverables\Report\21 S16 for Construction Staff Quarter\Figure 2.4 - Locations of Planned Odour Sources.dgn

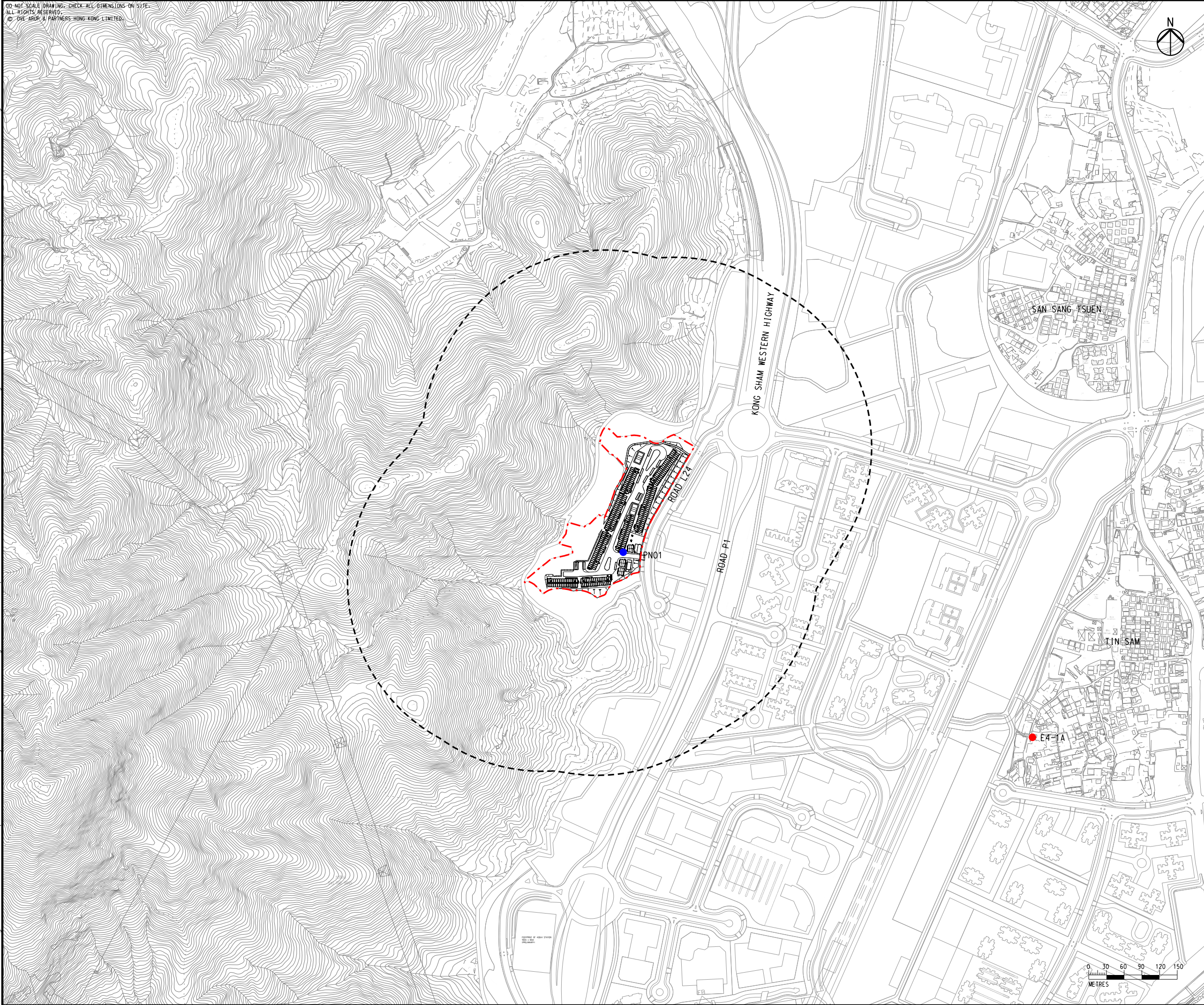


- LEGEND
- APPLICATION SITE
 - PLANNED REFUSE COLLECTION POINT (RCP)
 - PLANNED SEWAGE PUMPING STATION (SPS)

A		FIRST ISSUE		GL	07/26
Rev	Description	By	Date		
Consultant					
ARUP					
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development – Design and Construction					
Drawing title					
LOCATIONS OF PLANNED ODOUR SOURCES					
Drawing no.				Rev.	
FIGURE 2.4				A	
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Filename : \\global-eastasia-HK Group\CEN\env\Project\278463\13 Drawing Deliverables\report\21 S16 for Construction Staff Quarter\Figure 3.1- Locations of Representative Noise Sensitive Receivers.dgn

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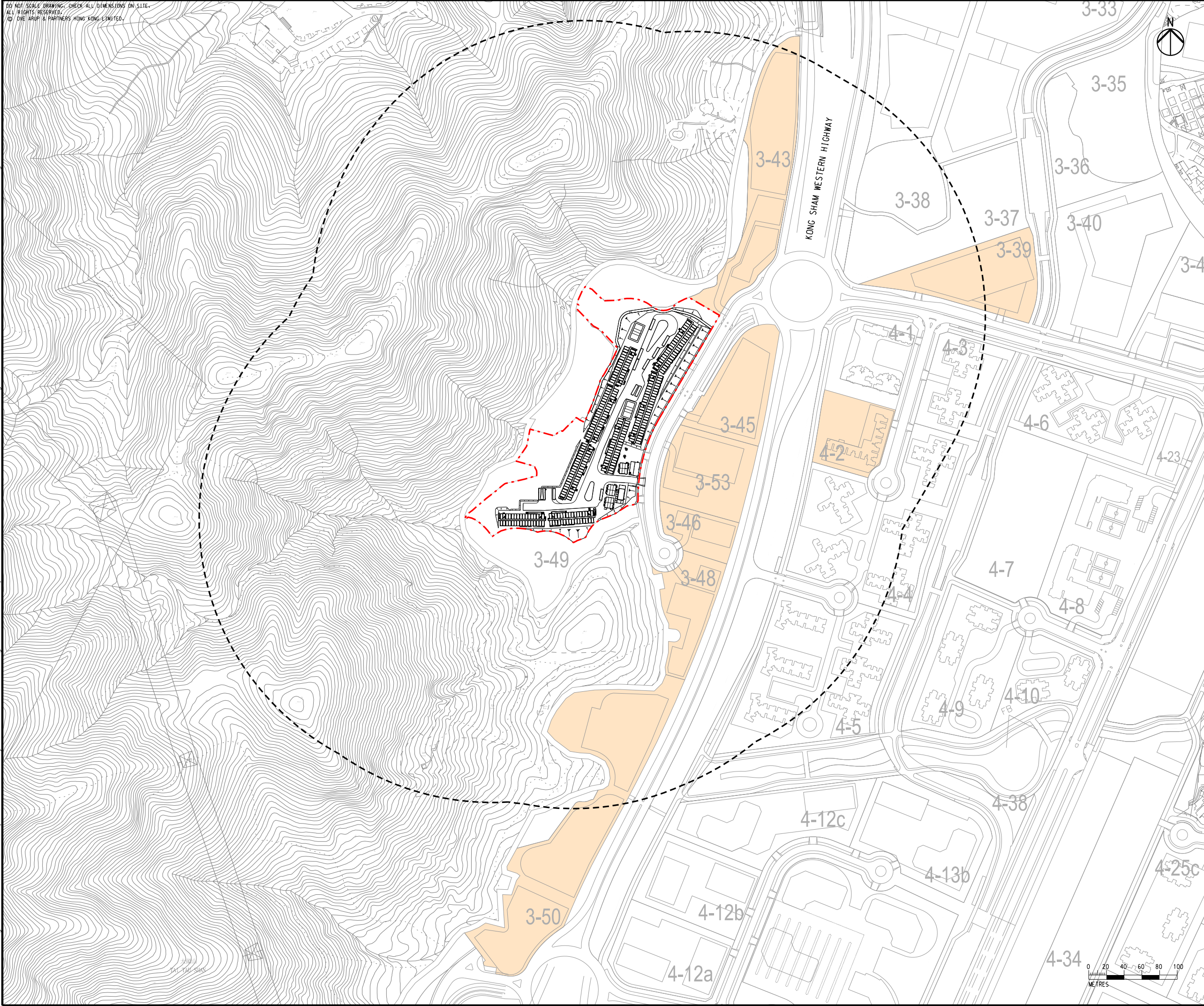
LEGEND

- APPLICATION SITE
- 300m ASSESSMENT AREA
- EXISTING NOISE SENSITIVE RECEIVERS
- PLANNED NOISE SENSITIVE RECEIVERS

A	FIRST ISSUE	GL	07/26
Rev	Description	By	Date
Consultant		ARUP	
Project Title			
Agreement No. CE 1/2020 (CE)			
Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development – Design and Construction			
Drawing title			
LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS			
Drawing no.		Rev.	
FIGURE 3.1		A	
Drawn	Date	Checked	Approved
GL	07/26	JS	FC
Scale	Status		PRELIMINARY
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Printed by : 3/8/2026
Filename : \\global\\EastAsia\\HK Group\\CIENV\\env\\Project\\278463\\13 Drawing Deliverables\\report\\21 S16 for Construction Staff Quarter\\Figure 3.2 - Locations of Fixed Plant Noise Sources.dgn

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LEGEND

- APPLICATION SITE
- 300m ASSESSMENT AREA
- PLANNED FIXED PLANT NOISE SOURCES

A	FIRST ISSUE	GL	07/26
Rev	Description	By	Date

Consultant

ARUP

Project Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
– Design and Construction

Drawing title

**LOCATIONS OF FIXED PLANT
NOISE SOURCES**

Drawing no.		Rev.	
FIGURE 3.2		A	
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Civil Engineering and
Development Department

Appendix D

Drainage Impact Assessment

Civil Engineering and Development Department

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years in “Industrial” Zone and Area Shown as ‘Road’ of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area

Drainage Impact Assessment

| August 2026

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 278463

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ARUP

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Appendix A	Indicative Scheme for the Proposed Development
Appendix B	Proposed Drainage Layout Plan
Appendix C	Results of Hydraulic Checking

1 Introduction

1.1 General

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within "Industrial" ("I") Zone and area shown as 'Road' of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan ("the HSK/HT OZP") No. S/HSK/3 for a Period of 3 Years ("the proposed development").

1.1.2 The proposed development will have a total PR of about 0.456 with domestic GFA of about 13,414m² and non-domestic GFA of about 1,065m² respectively. The 8 nos. of two-storey residential blocks will provide about 450 residential module of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.

1.2 Site Location

1.2.1 The Application Site, with an area of about 31,787 m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/NT NDA for implementation of site clearance/ site formation and associated infrastructure works.

1.3 Scope of Updated Technical Assessments

1.3.1 The scope of updated technical assessment for drainage comprises the following:

- Undertake a review of the proposed drainage network and identify if there would be any deficiency / inadequate capacity based on the new development parameters;
- Propose the preliminary modification measures for the purpose of the DIA; and
- Submit the DIA to support the S16 Application.

1.3.2 This section outlines the assessment of the drainage impact potentially induced by the proposed development and includes:

- Estimation of drainage catchment arising from the proposed development;

- Assessment of potential impact on the existing and planned drainage system imposed by the proposed development; and
- Proposed preliminary drainage modification works, if considered necessary.

2 Planning Data and Drainage Design Parameters

2.1 Proposed Development

2.1.1 The development information is summarized in **Table 2.1**. The Indicative Scheme of the proposed development is shown in **Appendix A**.

Table 2.1 Proposed Development Parameters

Site Area (about)	31,787 m ²
Total Plot Ratio (about)	0.456
• Domestic PR	0.422
• Non-domestic PR	0.034
Total GFA (about)	14,479 m ²
• Domestic GFA	13,414 m ²
• Non-domestic GFA	1,065 m ²
Building Height	Residential Blocks: 2 storeys Ancillary Blocks: 1 to 2 storey(s)
Number of Blocks	8 Residential Blocks 6 Ancillary Blocks (including 3 Management Offices)
Population	About 1,800
Employment	About 100

2.2 Drainage Parameters and Assumptions

2.2.1 The DIA has been prepared in accordance with the following design manuals and information:

- ETWB TCW No. 2/2006 "Drainage Impact Assessment Process for Public Sector Projects";
- Stormwater Drainage Manual (SDM) Fifth Edition, January 2018;
- Stormwater Drainage Manual – Corrigendum No. 1/2022;
- Stormwater Drainage Manual – Corrigendum No. 1/2024;
- Stormwater Drainage Manual – Corrigendum No. 2/2024;
- DSD Technical Circulars and Practice Notes;
- Hong Kong Planning Standards and Guidelines, May 2016;

- CEDD GEO – Technical Guidance Note No. 39 (TGN 39) “Guidelines for Estimation of surface Runoff from Natural Terrain Catchments for Drainage Design Purposes”;
- EN 12056-3:2000 “Gravity drainage systems inside buildings - Roof drainage, layout and calculation”;
- Drainage Record Plans obtained from the GeoInfo Map services of the Lands Department; and
- Construction Drainage Impact Assessment (CDIA) Report (Report No. 4110616/BIN/CDIA/C58/Issue 1) submitted under construction stage of Second Phase Development of HSK/HT NDA.

2.3 Design Return Period

2.3.1 According to Table 10 of SDM, the existing watercourses near San Sang San Tsuen and nearby drainage system is considered as village drainage in view of the land use characteristics. With reference to Note 1 of Table 10 of SDM, 50-year event (i.e. a higher standard than 10-year event) will be adopted for the hydraulic assessment. The hydraulic performance of the drainage system was checked against the design flood protection levels as shown in **Table 2.2**.

Table 2.2 Design Return Periods for Flood Protection

Drainage System Category	Return Period (Years)
Main Rural Catchment Drainage Channels	50
Urban Drainage Branch Systems	50

2.4 Method of Analysis and Design Parameters

2.4.1 The rational method or classical theory of unit hydrograph with constant proportional losses (runoff coefficient) were used to calculate the catchment run-offs.

Design Rainfall Intensity

2.4.2 The design rainfall intensity has been obtained through the Intensity-Duration-Frequency (IDF) Relationship, as per SDM section 4.3. The IDF data can be expressed by the following algebraic equation:

$$i = \frac{a}{(t_d + b)^c}$$

Where:

- i = extreme mean intensity in mm/hr
- t_d = duration in minutes (t_d ≤ 240), and
- a, b, c = storm constants per DSD SDM

Design Runoff Flows

2.4.3 The catchment runoff has been assessed through the adoption of the Rational Method as specified in section 7.5.2 of SDM. The peak runoff is given by the following expression:

$$Q_P = 0.278 C i A$$

Where:

Q_P	= peak runoff in m ³ /s
C	= runoff coefficient (dimensionless)
i	= rainfall intensity in mm/hr
A	= catchment area in km ²

2.4.4 The unit hydrograph used to simulate the rainfall events was derived synthetically using the symmetrically distributed rainfall based on RO (1991) as recommended in Section 4.3.5 of the DSD SDM. The formulation is shown below:

$$F(t) = \begin{cases} \frac{a[b + 2(1 - c)t]}{(2t + b)^{c+1}} & , \quad 0 \leq t \leq \frac{t_d}{2} \\ F(-t) & , \quad -\frac{t_d}{2} \leq t \leq 0 \end{cases}$$

where: $F(t)$ = rate of rainfall or instantaneous intensity in mm/hr at time t (in minutes)
 t_d = rainstorm duration (in minutes) ($t_d \leq 240$)
 a, b, c = storm constants are given in Table 3a of DSD SDM, which are the same as those given of the algebraic equation of the IDF relationship

2.4.5 The inlet time, or time of concentration of a natural catchment has been assessed with Brandsby William's Equation as per SDM section 7.5.2.

2.4.6 The inlet times, or time of concentration of the catchments considered in this DIA Report were estimated using the Brandsby William's Equation as presented below:

$$t_0 = \frac{0.14465L}{H^{0.2}A^{0.1}}$$

where: t_0 = time of concentration of the catchment (min)
 L = distance (on plan) measured on the line of natural flow between the summit and the point under consideration (m)
 A = Catchment area (m²)
 H = Average slope (m per 100m), measured along the line of natural flow, from the summit of the catchment to the point under consideration

Design Climate Change Scenario

2.4.7 The proposed imported labour will be operated for a period of 3 years. As such, climate change effect is not considered in the hydraulic analysis. **Table 2.3** summarises the design assumptions related to climate change effect.

Table 2.3 Adopted Rainfall Increase

Scenario	Rainfall Increase	Design Allowance	Adopted Total Increase
No climate change effect	0%	0%	0%

Drainage Network Performance

2.4.8 The performance the stormwater drainage network has been assessed as per SDM 2024 Section 8.3 and Table 12. Underground stormwater network has been assessed through Colebrook-White formula, river and channels have been assessed through Manning’s formula.

Design Siltation Allowance

2.4.9 The following reduction of pipe flow areas was adopted to assess the pipe hydraulic performance of both existing public drainage system and the proposed drainage system for the Site:

- a 5% reduction in flow area if the channel or pipe gradient is greater than 1 in 25; and
- a 10% reduction in flow area for other parts of the drainage network.

Design Extreme Sea Level

2.4.10 The existing drainage systems are within fluvial-tidal zones. The design extreme sea levels at Tsim Bei Tsui recommended in Corrigendum No. 1/2022 to SDM is adopted in the hydraulic analysis of this Project as shown in **Table 2.4**.

Table 2.3 Design Extreme Sea Levels

Return Period T (Year)	Design Extreme Sea Level (mPD)
50	4.09
10	3.52

Design Rainfall

2.4.11 The assessed catchments fall within SDM defined rainfall zone “HKO Headquarters”. The adopted rainfall parameters are obtained from SDM 2024 Table 3a and summarised in **Table 2.5**.

Table 2.5 Adopted Rainfall IDF Parameters

Parameter	Return Period: 50 years
a	505.5
b	3.29
c	0.355

2.4.12 The assessed catchment areas are less than 25km², hence no aerial reduction factor has been applied.

Design Runoff Coefficients

2.4.13 The adopted runoff coefficients are summarised in **Table 2.6** and are consistent with SDM section 7.5.

Table 2.6 Adopted Runoff Coefficients

Surface	Runoff Coefficients
Paved Areas and Roofs	0.95
Green/Unpaved Areas	0.35

Design Inlet Time

2.4.14 The times of concentration (tc) for the different types of catchments are summarized in **Table 2.7**.

Table 2.7 Times of concentration for Different Types of Catchments

Type of Catchment	Time of Concentration
Natural Steep Slope	Based on Brandsby William's equation with a maximum of 5 minutes
Paved surface	Based on Brandsby William's equation with a maximum of 5 minutes

Design Roughness

2.4.15 The adopted roughness coefficients are consistent with SDM Table 13 and Table 14; and are summarised in **Table 2.8**.

Table 2.8 Adopted Roughness Coefficients

Drainage Network Element	Colebrook Roughness (mm)
Concrete Drainage Pipes	0.6
Drainage Network Element	Manning's Roughness
Concrete Channels	0.016

3 Assessment of Drainage Impact

3.1 Existing and Planned Drainage Infrastructure

3.1.1 Under the existing condition, runoff from the Yuen Tau Shan hillside catchments, including the proposed development site, is conveyed eastward through an existing channel crossing beneath Kong Sham Western Highway. The runoff then flows through the existing channel network to the nullah along Sha Chau Lei Road and ultimately discharges into the sea via the Tin Sam Channel.

3.1.2 Under the proposed development scenario, runoff from both the upstream hillside catchment and the development site will be collected and conveyed through a network of new surface channels and drainage pipes within the site. The collected runoff will subsequently be discharged via two proposed 1050 mm diameter pipes to the existing 2.25 m × 1.25 m and 1.2 m × 1.2 m rectangular channels, respectively, before ultimately discharging into the Tin Sam Channel.

3.1.3 The proposed drainage layout plan is presented in **Appendix B**.

3.2 Drainage Impact under Proposed Condition

3.2.1 The proposed development will involve the conversion of the existing unpaved area into paved surfaces and building footprints. As a result, the impermeable area within the site will increase, leading to an increase in surface runoff generated from the development site during rainfall events. Notwithstanding the increase in impermeable area, the proposed drainage system has been designed to collect and convey the additional runoff generated by the proposed development.

3.2.2 Meanwhile, the drainage impact to existing external drainage system is verified using the updated InfoWorks ICM model with reference to Stage 2 of the Construction Drainage Impact Assessment (CDIA) Report (Report No. 4110616/BIN/CDIA/C58/Issue 1) submitted under construction stage of Second Phase Development of HSK/HT NDA. A comparison of the flood levels under the baseline scenario and the proposed drainage scenario has been undertaken and is presented in **Appendix C**. Under the proposed development scenario, the existing downstream channels retain adequate freeboard and have sufficient hydraulic capacity to convey the additional runoff generated by the proposed development.

3.2.3 Based on the hydraulic assessment, no adverse drainage impact on the downstream drainage network is anticipated.

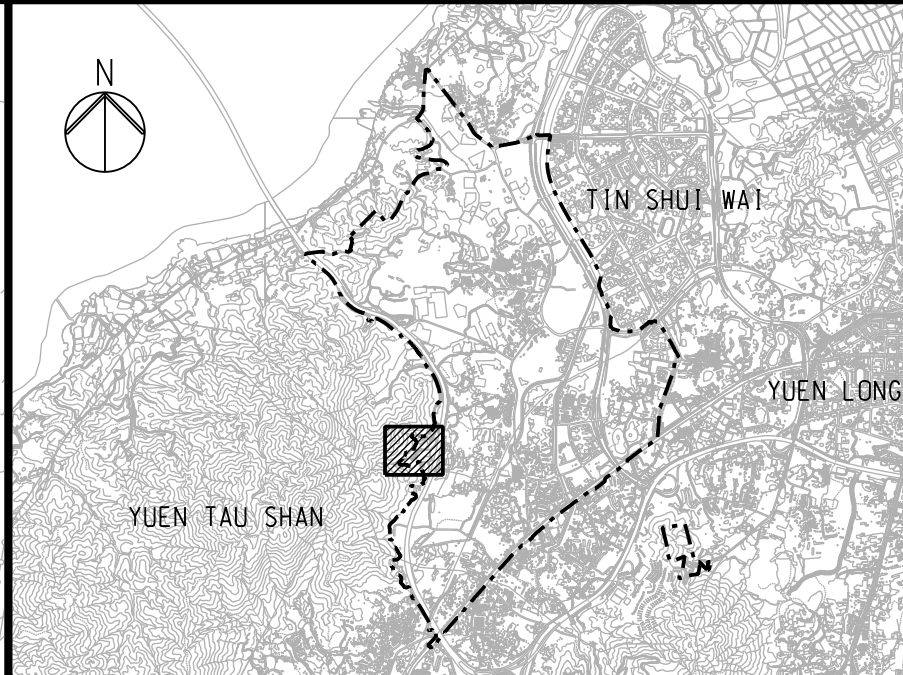
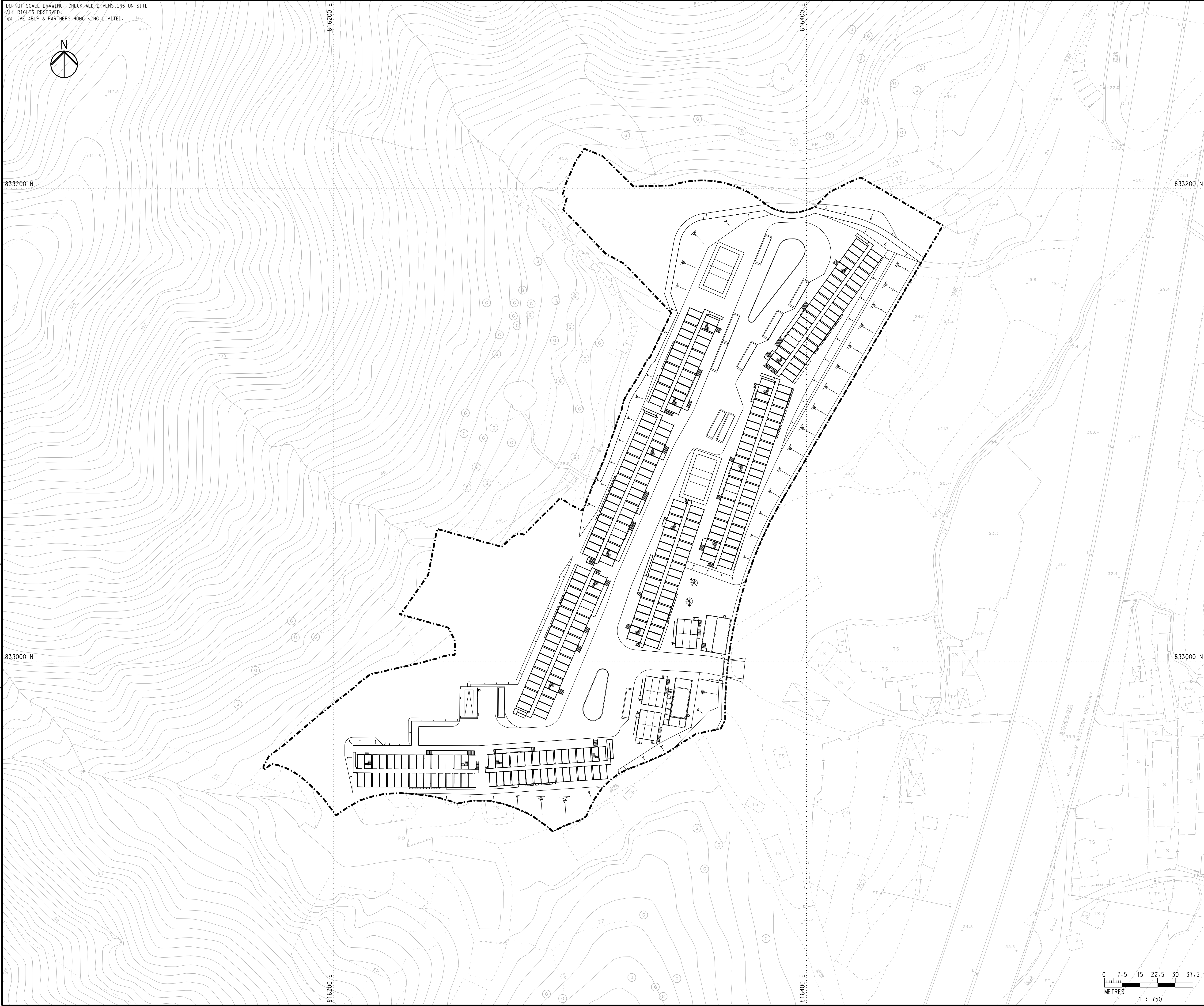
4 Summary

- 4.1.1** This DIA has been undertaken to assess the potential drainage impacts associated with the proposed Temporary Centralised Quarter for Imported Labour within Planning Area 36 of the HSK/HT NDA. The assessment reviewed the proposed drainage arrangement, evaluated the hydraulic performance of the drainage system, and assessed its potential impact on the existing downstream drainage network.
- 4.1.2** Under the existing condition, runoff from the Yuen Tau Shan hillside catchments, including the proposed development site, is conveyed eastward through the existing drainage system and ultimately discharged to the sea via the Tin Sam Channel. Under the proposed development scenario, runoff from both the upstream hillside catchment and the development site will be collected and conveyed through new surface channels and drainage pipes within the site before discharging into the existing downstream drainage network.
- 4.1.3** The proposed development will result in an increase in impermeable surfaces within the site and consequently generate additional surface runoff. The proposed internal drainage system has been designed to accommodate the additional runoff generated by the development.
- 4.1.4** Hydraulic assessments were carried out with reference to the CDIA using the updated InfoWorks ICM model. The assessment results indicate that the existing downstream channels maintain adequate freeboard and possess sufficient hydraulic capacity to accommodate the additional runoff generated by the proposed development.
- 4.1.5** In conclusion, the proposed drainage system is considered adequate to serve the proposed development, and no adverse drainage impact on the existing downstream drainage network is anticipated as a result of the proposed development.

Appendix A

Indicative Scheme for the Proposed Development

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KEY PLAN

LEGEND
APPLICATION SITE

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE)			
Hung Shui Kiu / Ha Tsuen			
New Development Area Package A			
Works for Second Phase Development			
– Design and Construction			
Drawing title			
HSK / HT NDA			
SECOND PHASE DEVELOPMENT			
IMPORTED LABOUR QUARTERS			
GENERAL LAYOUT PLAN			
Drawing no.			Rev.
278463/SK/C/479			A
Drawn	Date	Checked	Approved
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Scale	Status		
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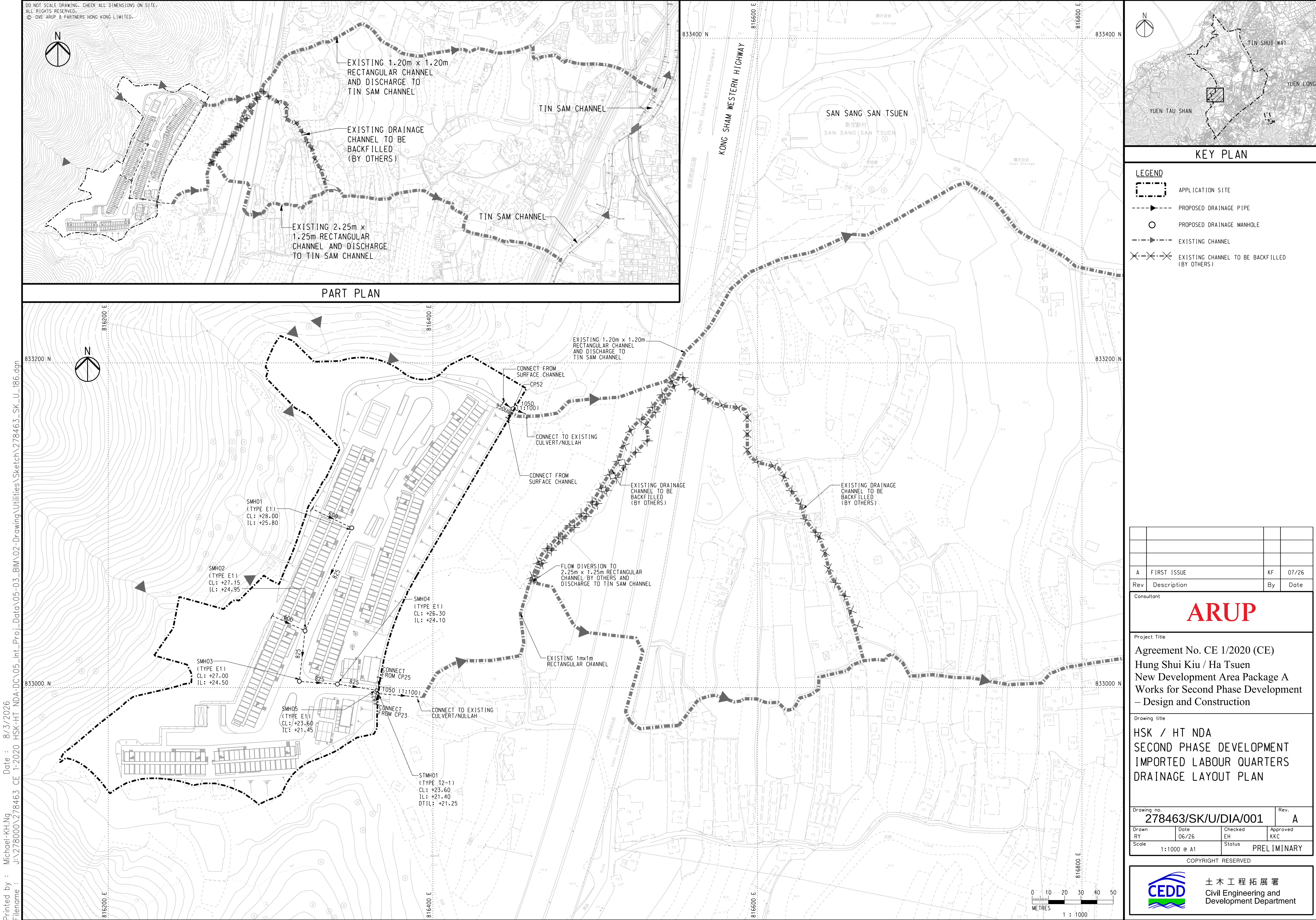
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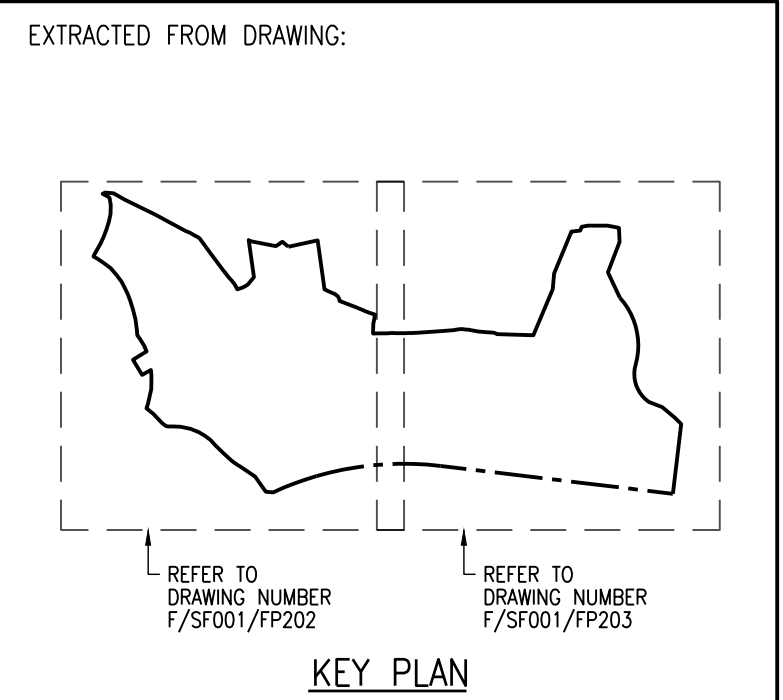
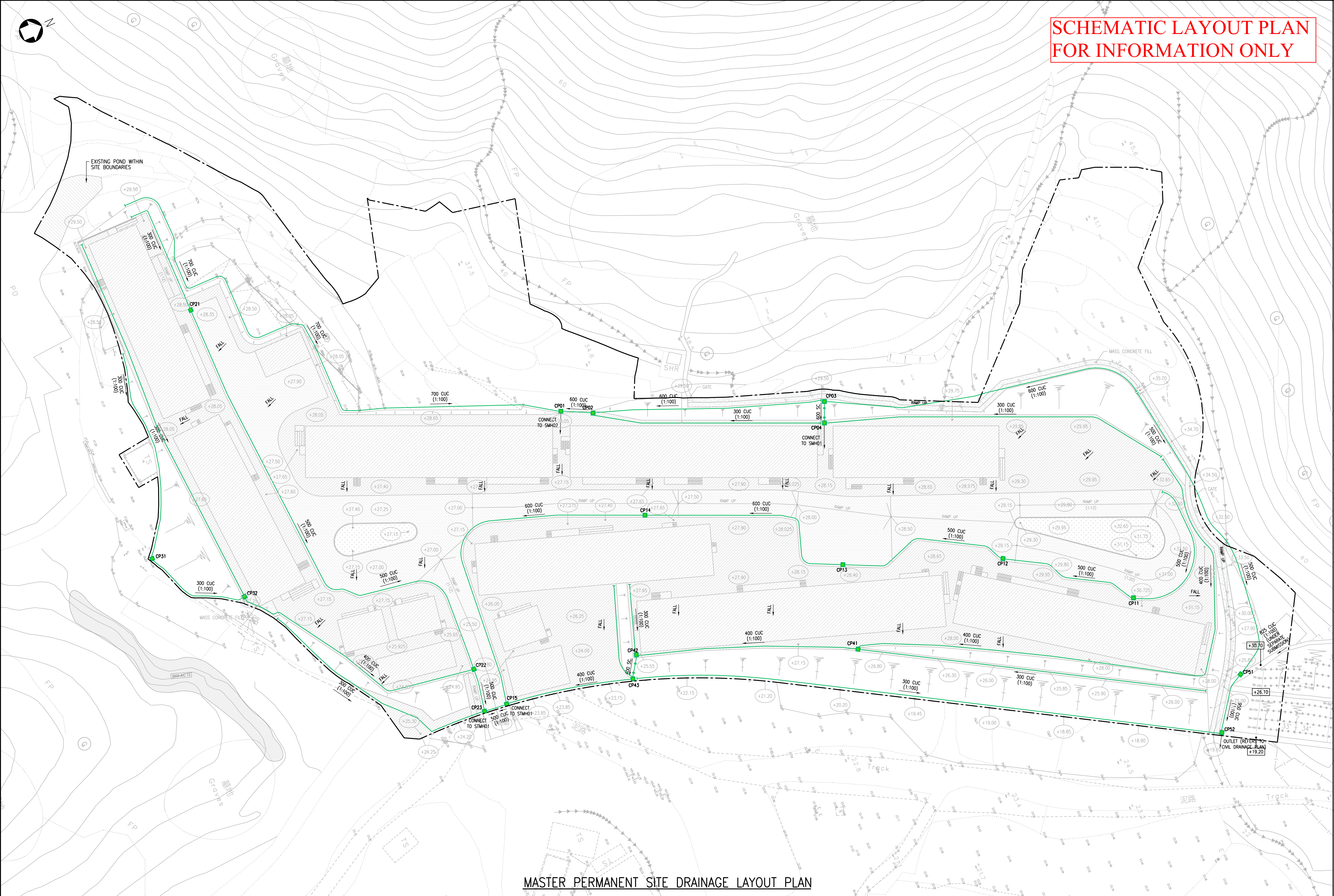
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Appendix B

Proposed Drainage Layout Plan



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MASTER PERMANENT SITE DRAINAGE LAYOUT PLAN

LEGEND

- SITE BOUNDARY LINE
- PROPOSED CATCHPIT
- PROPOSED U-CHANNEL WITH COVER
DIAMETER (mm) OF COVER U-CHANNEL
MINIMUM DEGREE OF FLOW
- PROPOSED STEPPED U-CHANNEL
DIAMETER (mm) OF STEPPED U-CHANNEL
- RAINWATER OUTLINE
- EXISTING GROUND LEVEL (mPD)

CATCHPIT SCHEDULE

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP01	+28.05	+26.85	CATCHPIT TYPE (B) - CP(B)
CP02	+28.05	+27.05	CATCHPIT TYPE (B) - CP(B)
CP03	+30.8	+29.8	CATCHPIT TYPE (B) - CP(B)
CP04	+29.5	+28.7	CATCHPIT TYPE (B) - CP(B)
CP11	+31	+30.2	CATCHPIT TYPE (B) - CP(B)
CP12	+29	+28.2	CATCHPIT TYPE (B) - CP(B)
CP13	+28.25	+27.45	CATCHPIT TYPE (B) - CP(B)
CP14	+27.4	+26.4	CATCHPIT TYPE (B) - CP(B)
CP15	+23.6	+22.1	CATCHPIT TYPE (B) - CP(B)

NOTE: CATCHPIT DETAILS REFER TO DRAWING NO. F/RW001/00001.

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP21	+28.35	+27.55	CATCHPIT TYPE (B) - CP(B)
CP22	+24.8	+24	CATCHPIT TYPE (B) - CP(B)
CP23	+23.6	+22.6	CATCHPIT TYPE (B) - CP(B)
CP31	+26.8	+26	CATCHPIT TYPE (B) - CP(B)
CP32	+27.15	+25	CATCHPIT TYPE (B) - CP(B)
CP41	+27.15	+26.35	CATCHPIT TYPE (B) - CP(B)
CP42	+27.65	+26.25	CATCHPIT TYPE (B) - CP(B)
CP43	+23.2	+22.4	CATCHPIT TYPE (B) - CP(B)
CP51	+19	+18	CATCHPIT TYPE (B) - CP(B)

AMENDED DRAWING

0 5 10 15 20 25 m
1 : 500 SCALE BAR

Drawing Title

SITE FORMATION WORKS –
MASTER PERMANENT SITE DRAINAGE
LAYOUT PLAN

Status

SUBMISSION

Drawn

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KC

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Scale

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CAD File No.

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Date

JUNE 2026

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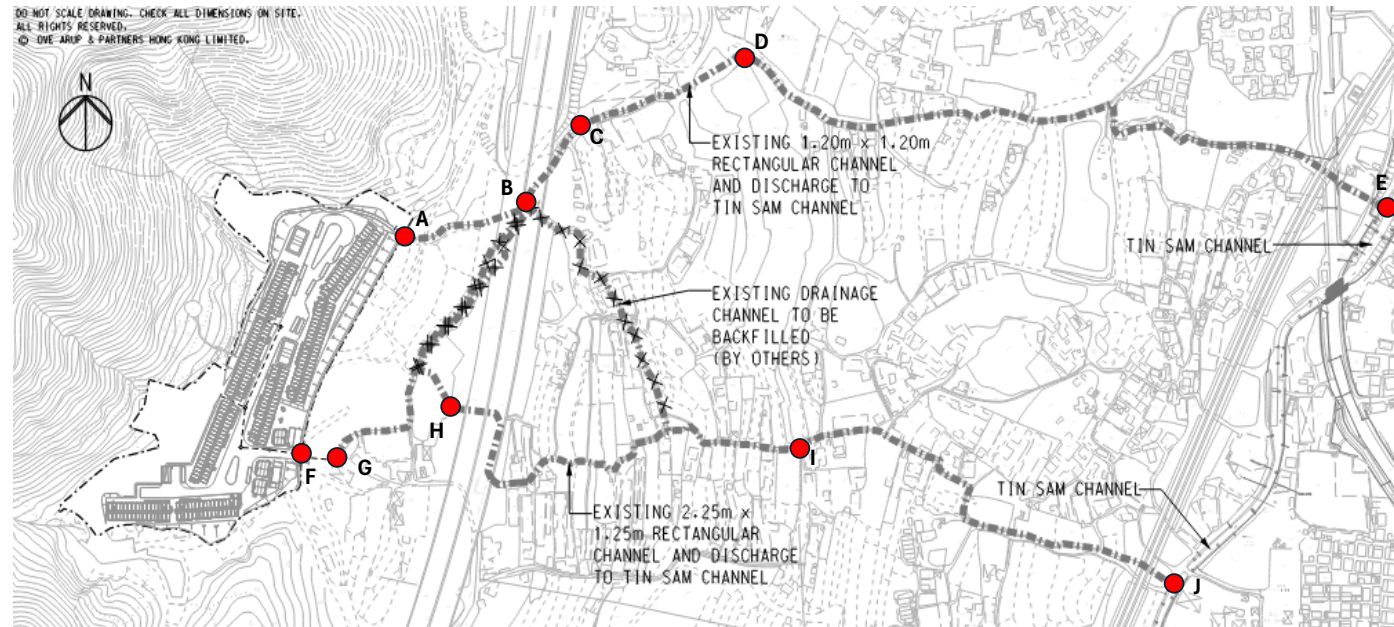
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F/SF001/FP201

Appendix C

Results of Hydraulic Checking



Maximum Water Levels at Existing Drainage Channels

Existing Channel	Location ID	ICM ID	Description	Bank Level (mPD)	Scenario - Baseline						Scenario - Post Development					
					Water Level (mPD)			Freeboard (m)			Water Level (mPD)			Freeboard (m)		
					10A	50A	50B	10A	50A	50B	10A	50A	50B	10A	50A	50B
Existing 1.2m x 1.2m Rectangular Channel	A	816448833168	CP 52 (1050mm dia. discharge pipe from development site)	20.15	19.44	19.48	19.441	0.71	0.67	0.71	19.44	19.48	19.44	0.71	0.67	0.71
	B	OF 5A.2	Along the existing channel	17.30	16.17	16.31	16.172	1.13	0.99	1.13	15.87	15.93	15.87	1.43	1.37	1.43
	C	816600833254	Along the existing channel	16.50	15.05	15.19	15.048	1.45	1.31	1.45	14.86	14.99	14.86	1.64	1.52	1.64
	D	816706833313	Along the existing channel	14.60	12.96	13.10	12.963	1.64	1.51	1.64	12.84	12.95	12.84	1.76	1.65	1.76
	E	817246833173	Tin Sam Channel	6.65	4.84	5.20	5.05	1.81	1.46	1.60	4.91	5.25	5.10	1.74	1.40	1.55

Existing Channel	Location ID	ICM ID	Description	Bank Level (mPD)	Scenario - Baseline						Scenario - Post Development					
					Water Level (mPD)			Freeboard (m)			Water Level (mPD)			Freeboard (m)		
					10A	50A	50B	10A	50A	50B	10A	50A	50B	10A	50A	50B
Existing 2.25m x 1.25m Rectangular Channel	F	STMH06	STMH01 (1050mm dia. discharge pipe from development site)	23.60	22.42	22.60	22.418	1.18	1.00	1.18	22.41	22.59	22.41	1.19	1.01	1.19
	G	816510833135	Along the existing channel	21.20	20.64	20.82	20.653	0.56	0.38	0.55	20.74	20.89	20.74	0.46	0.31	0.46
	H	816462833046	Along the existing channel	21.05	17.45	17.50	17.453	3.59	3.55	3.59	18.52	18.62	18.52	2.53	2.43	2.53
	I	816701833008	Along the existing channel	11.33	10.72	10.88	10.721	0.61	0.45	0.61	10.88	11.01	10.88	0.46	0.32	0.46
	J	817079832893	Tin Sam Channel	7.68	6.10	6.48	6.108	1.58	1.21	1.58	6.31	6.70	6.31	1.38	0.99	1.38

Notes:

- (1) Bank levels and water levels for the baseline scenario are extracted from the hydraulic model provided by DSD/LD in November 2025.
- (2) Effects of climate change on rainfall intensity and sea level are not considered in the post-development scenarios.

Key:
Freeboard $\geq 300\text{mm}$
$0 \leq \text{Freeboard} \leq 299\text{mm}$
Freeboard < 0 (i.e. overtopping)

Appendix E

Sewerage Impact Assessment

Civil Engineering and Development Department

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed Temporary Centralised Quarters for Imported Labour in Construction Sector for a Period of 3 Years in “Industrial” Zone and Area Shown as ‘Road’ of Planning Area 36 of Hung Shui Kiu/ Ha Tsuen New Development Area

Sewerage Impact Assessment

| August 2026

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Job number 278463

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ARUP

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Appendices

Appendix A	Indicative Scheme for the Proposed Development
Appendix B	Proposed Sewerage Layout Plan
Appendix C	Sewerage Calculations

1. Introduction

1.1 Background

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within “Industrial” (“I”) Zone and area shown as 'Road' of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (“the HSK/HT OZP”) No. S/HSK/3 for a Period of 3 Years (“the proposed development”).

1.1.2 The proposed development will have a total PR of about 0.456 with domestic GFA of about 13,414m² and non-domestic GFA of about 1,065m² respectively. The 8 nos. of two-storey residential blocks will provide about 450 residential module of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.

1.2 Site Location

1.2.1 The Application Site, with an area of about 31,787 m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/NT NDA for implementation of site clearance/ site formation and associated infrastructure works.

1.3 Scope of Updated Technical Assessments

1.3.1 The scope of updated technical assessment for sewerage comprises the following:

- Undertake a review of the proposed sewerage network and identify if there would be any deficiency / inadequate capacity based on the development parameters;
- Propose the preliminary modification measures for the purpose of the SIA; and
- Submit the SIA to support S16 application.

1.3.2 This section outlines the assessment of the sewerage impact potentially induced by the proposed development and includes:

- Estimation of sewage flows arising from the proposed development;

- Assessment of potential impact on the existing and planned sewerage system imposed by the proposed development; and
- Proposed preliminary sewerage system modification works, if considered necessary.

2. Planning Data and Sewage Flow Estimation

2.1 Proposed Development

2.1.1 The development information is summarized in **Table 2.1**. The Indicative Scheme of the proposed development is shown in **Appendix A**.

Table 2.1 Proposed Development Parameters

Site Area (about)	31,787 m ²
Total Plot Ratio (about)	0.456
• Domestic PR	0.422
• Non-domestic PR	0.034
Total GFA (about)	14,479 m ²
• Domestic GFA	13,414 m ²
• Non-domestic GFA	1,065 m ²
Building Height	Residential Blocks: 2 storeys Ancillary Blocks: 1 to 2 storey(s)
Number of Blocks	8 Residential Blocks 6 Ancillary Blocks (including 3 Management Offices)
Population	About 1,800
Employment	About 100

2.2 Sewerage Parameters and Assumptions

2.2.1 The following unit flow factors for domestic and commercial activities in accordance with EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) are adopted:

Table 2.2 Unit flow Factors for Different Land Uses

Land Use specified in GESF	Unit Flow Factor (m³/person/day)	Remark
<i>Domestic</i>		
Public rental	0.19 ⁽¹⁾	Adopted for residents in labour quarters
<i>Commercial</i>		

Land Use specified in GESF	Unit Flow Factor (m ³ /person/day)	Remark
J11 – Community, Social & Personal Services	0.28 ⁽¹⁾	Sum of flows due to employee (0.08m ³ /person/day) & commercial activities (0.20m ³ /person/day)
J12 – Public Administration	0.08 ⁽¹⁾	Sum of flows due to employee (0.08m ³ /person/day)

Notes:

(1) Referenced from EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Table T-1 and T-2.

2.2.2

As human activities fluctuate throughout the day, sewage flow is likewise not uniform with peaks in certain periods. As such, peaking factor is proposed to accommodate for potential spike in sewage flow. Peaking factor serves to cater for seasonal/diurnal fluctuation and normal amount of infiltration and inflow. Peaking factors (including stormwater allowance) have been adopted in accordance with EPD's GESF as shown in **Table 2.3**.

Table 2.3 Peaking Factors for Various Population Ranges

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
<i>Sewers</i>		
< 1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3
> 50,000	Max (7.3/N ^{0.15} , 2.4)	Max (6/N ^{0.175} , 1.6)
<i>Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations</i>		
< 10,000	4	3
10,000 – 25,000	3.5	2.5
25,000 – 50,000	3	2
> 50,000	Max (3.9/N ^{0.065} , 2.4)	Max (2.6/N ^{0.065} , 1.6)

Notes:

(1) Referenced from EPD's GESF Table T-5; N = Contributing population in thousands.

2.2.3

Average dry weather flows (ADWF) were estimated by applying appropriate unit sewage flow factors according to their development type, and peak flows were calculated by multiplying the ADWF by the

peaking factor, which account for the peak flows and provide adequate safety margin in planning sewage facilities.

3. Assessment of Sewerage Impact

3.1 Existing and Planned Sewerage Infrastructure

- 3.1.1** The sewerage system in North-west New Territories (NWNT) serves the major urban developments in Tin Shui Wai and Tuen Mun - Yuen Long Corridor and small developments on the periphery of Yuen Long. Two sewerage catchments, Yuen Long Sewerage Catchment and San Wai Sewerage Catchment, correspond to two sewage treatment works, Yuen Long Sewage Treatment Works (YLSTW) and San Wai Sewage Treatment Works (SWSTW) respectively.
- 3.1.2** SWSTW is planned to serve major developments in Yuen Long Town, Au Tau, Tin Shui Wai, Ping Shan, Lau Fau Shan, Shap Pat Heung and covered part of the area within HSK/HT NDA including Hung Shui Kiu and Ha Tsuen. The remaining areas within HSK/HT NDA are unsewered areas. YLSTW serves the eastern part of the NWNT.
- 3.1.3** To cater for the forecast sewage flow due to population growth in the NWNT, DSD commenced the works contract no. DC/2013/10 in May 2016 - "Upgrading of San Wai Sewage Treatment Works – Phase 1" to upgrade the SWSTW from preliminary treatment to chemically enhanced primary treatment plus disinfection facilities and increase the ADWF treatment capacity to 200,000 m³/day. Phase 1 upgrading works of SWSTW at a site adjacent to the existing SWSTW had been completed in the end of 2020.
- 3.1.4** Under DSD Agreement No. CE30/2006 (DS), Ha Tsuen Sewage Pumping Station (HTSPS) was expanded with an additional 1200mm diameter rising main constructed in parallel with the existing twin 1200mm diameter rising mains. Upon completion of the expansion works in 2014, the design capacity of HTSPS has been increased to 193,100 m³/day.
- 3.1.5** Four new sewage pumping stations (SPS) (i.e. SPS1 to SPS4) are proposed to convey sewage flow from the HSK/HT NDA to the upgraded SWSTW – Phase 1 and the planned Hung Shui Kiu Effluent Polishing Plant (HSKEPP) (ADWF treatment capacity of 90,000 m³/day).
- 3.1.6** The effluent of the upgraded SWSTW and the HSKEPP will be discharged to the existing NWNT Effluent Tunnel which has a total hydraulic capacity of 440,000 m³/day and subsequently discharged via the existing Urmston Road Submarine Outfall.
- 3.1.7** The proposed development will be implemented before the commissioning of the aforementioned new SPSs. There is also no existing sewerage network in the vicinity for sewage conveyance.

3.2 Sewerage Impact

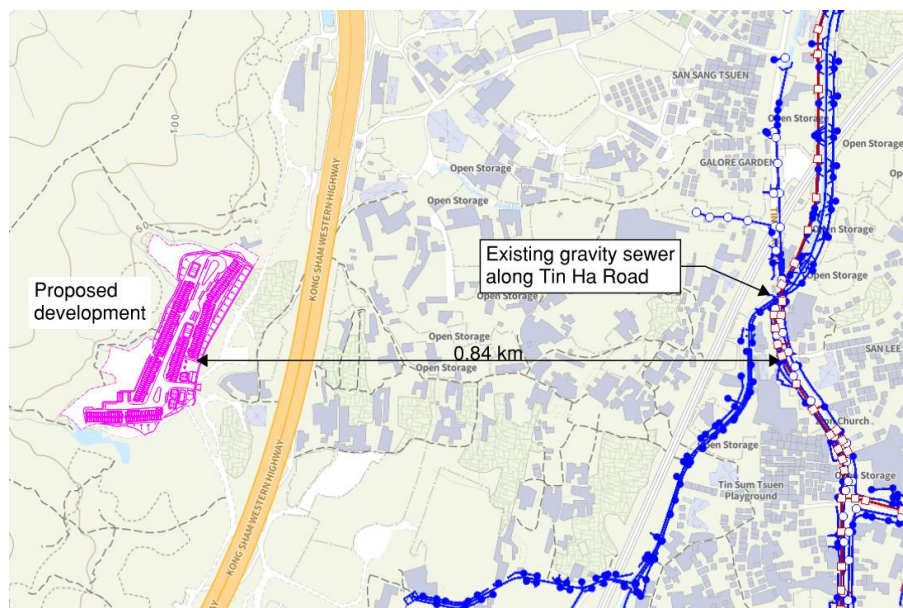
3.2.1 The ADWF generated from the proposed development is estimated in accordance with EPD's GESF. **Table 3.1** below summarises the sewage flow generation.

Table 3.1 Summary of ADWF from the Proposed Development

Flow Generation	Population	UFF	ADWF (m ³ /day)
Domestic (R1)	1,800	0.19	342
Cleaners (J11)	20	0.28	5.6
Office staff, security, technician (J12)	80	0.08	6.4
Total			354

3.2.2 According to **Section 3.1.7**, there is no existing sewerage network near the proposed development by the time of commissioning. The nearest existing gravity sewer is located approximately 850m away from the proposed development, as illustrated in **Figure 3.1**.

Figure 3.1 Distance between Proposed Development and Existing Sewer



3.2.3 Given the temporary nature of the development and limited space for application site, a sewage holding tank scheme is proposed to tank away the sewage to the nearby sewage pumping station or sewage treatment works for disposal.

3.2.4 Based on the coordination with DSD, it is identified that there are 3 existing designated DSD disposal plants for discharge of domestic liquid waste with limited capacity, including Pillar Point Sewage Treatment Works (PPSTW), Ap Lei Chau Preliminary Treatment Works (ALCPTW) and Sai Kung Sewage Treatment Works (SKSTW). DSD advised that the design capacity of septic waste reception facilities

at PPSTW is 1,200 m³/day with a remaining capacity of approximately 220m³/day as of 31 March 2026. It is also noted that the reception capacity of domestic liquid waste at SKSTW has already been overloaded. HTSPS's reception facilities are only for temporary measures in basic design for receiving a limited volume of domestic liquid waste (currently approximately 180 m³/day being receipted is the upper limit). The reception capacity at HTSPS is constrained by potential odour nuisance and traffic impacts on the surrounding area, rendering it insufficient to fully accommodate the ADWF generated from the proposed development.

With consideration of various constraints including odour control and impact to surrounding, traffic impact due to additional tankers and septic waste reception capacity at HTSPS and PTSTW, the total discharge is proposed to be diverted to PPSTW (location 1) and HTSPS (location 2). The upstream SPSs of Yuen Long Effluent Polishing Plant (YLEPP) (location 3) would be used as backup reception facility in case HTSPS or PPSTW could not handle the above assigned reception volume due to conditions such as severe operation conditions, public complaints or other constraints. For details, please refer to **Section 0**.

3.2.5

Table 3.2 summarises the proposed sewage flow to the aforesaid sewerage infrastructures. Based on the proposed discharge volume, no adverse sewerage impact is envisaged.

Table 3.2 Existing Sewage Infrastructure Capacities and Sewage Flow Comparison

Location	Sewerage Infrastructures	Capacity of Septic Waste Reception Facilities (m ³ /day)	Flow Increment in ADWF (m ³ /day) ⁽¹⁾
1	PPSTW	220	174
2	HTSPS	180	180
3	Upstream SPSs of YLEPP	To be confirmed with DSD	Back-up
Total			354

Notes:

- (1) Assume volume of sewage truck to be 12 m³ and maximum 6 nos. sewage trucks in operation.

4. Proposed Sewerage Works

4.1.1 The design guidelines, standards and criteria used for the preliminary design of the proposed sewerage system and the proposed sewerage improvement schemes are as follows:

- EPD's Technical Paper Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure Planning Version 1.0; and
- DSD's Sewerage Manual Part 1 (Key Planning Issues and Gravity Collection System) and Part 2 (Pumping Stations and Rising Mains), Third Edition, May 2013.

4.1.2 Referencing **Section 3.2.3**, sewage holding tanks are proposed within the development site for sewage disposal. Based on DSD's advice, since all STWs and SPSs, including the designated plants, will be closed during the period of typhoon signal no. 8 or above, the capacity of the on-site buffer / storage tank(s) shall be able to store the sewage generated for a period of at least 24 hours in order to prevent the risks of sewage overflow. As such, the tanks design storage capacity will be equivalent to 1 day of ADWF with 100% safety margin to cater for incidents. Two sewage holding tanks are proposed such that sewage trucks can perform desludging operation concurrently. The corresponding sewerage catchment of each sewage holding tank is summarised in the **Table 4.1**. The proposed sewerage layout plan is shown in **Appendix B**.

Table 4.1 Sewerage Catchment of Sewage Holding Tanks

Sewage Holding Tank No.	Sewerage Catchment	ADWF (m ³ /day)	Required Storage Volume (m ³) ⁽¹⁾
1	Block 6 to 8	151	302
2	Office 1 to 3, Block 1 to 5	203	406
Total			708

Notes:

(1) Storage volume is provided based on 1 day of design ADWF which includes a 100% safety margin.

4.1.3 The frequency of tank-away operation is presented in **Table 4.2**. The estimated tank-away duration per day is approximately 7 hours. The actual sewage generation will vary depending on the resident population. Accordingly, desludging and tanker collection will be carried out on a need basis, subject to the actual sewage accumulation rate, to ensure adequate storage capacity is maintained and no overflow occurs. Regular inspection and maintenance of the sewage holding tank system will be undertaken throughout the operation period.

Table 4.2 Envisaged Frequency of Tank-away Operation

Septic Waste Reception Facilities	Location	
	1 – PPSTW	2 – HTSPS
Maximum ADWF for discharge (m ³)	220	180
No. of trips ⁽¹⁾ (truck no. [A] x trip no. [B])	6 x 2 + 3 x 1 (Total 15 nos.)	6 x 2 + 3 x 1 (Total 15 nos.)
Estimated tank- away volume (m ³)	174	180
Assumed duration for sewage suction and discharge per trip (hours)	0.75	0.75
Assumed commuting time per trip (hours) ⁽²⁾	0.5	0.25
Total duration per trip (hours) [T]	1.25	1
Tank-away duration (hours/day) ⁽³⁾ [B] / [T]	3.75	3

Notes:

- (1) Assume volume of sewage truck to be 12 m³ and maximum 6 nos. sewage trucks in operation.
- (2) Assume each sewage truck undertakes a single trip to the septic waste reception facility.
- (3) DSD advised that the opening hour (Monday to Sunday, include public holidays) of PPSTW and HTSPS is 9:00 to 18:00 hours and 9:00 to 16:00 hours respectively.

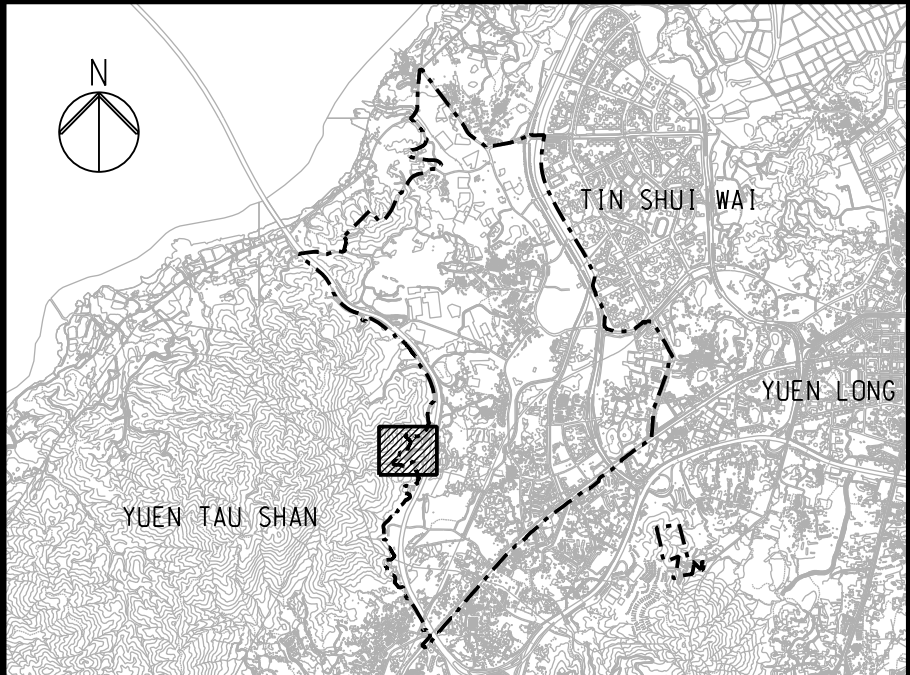
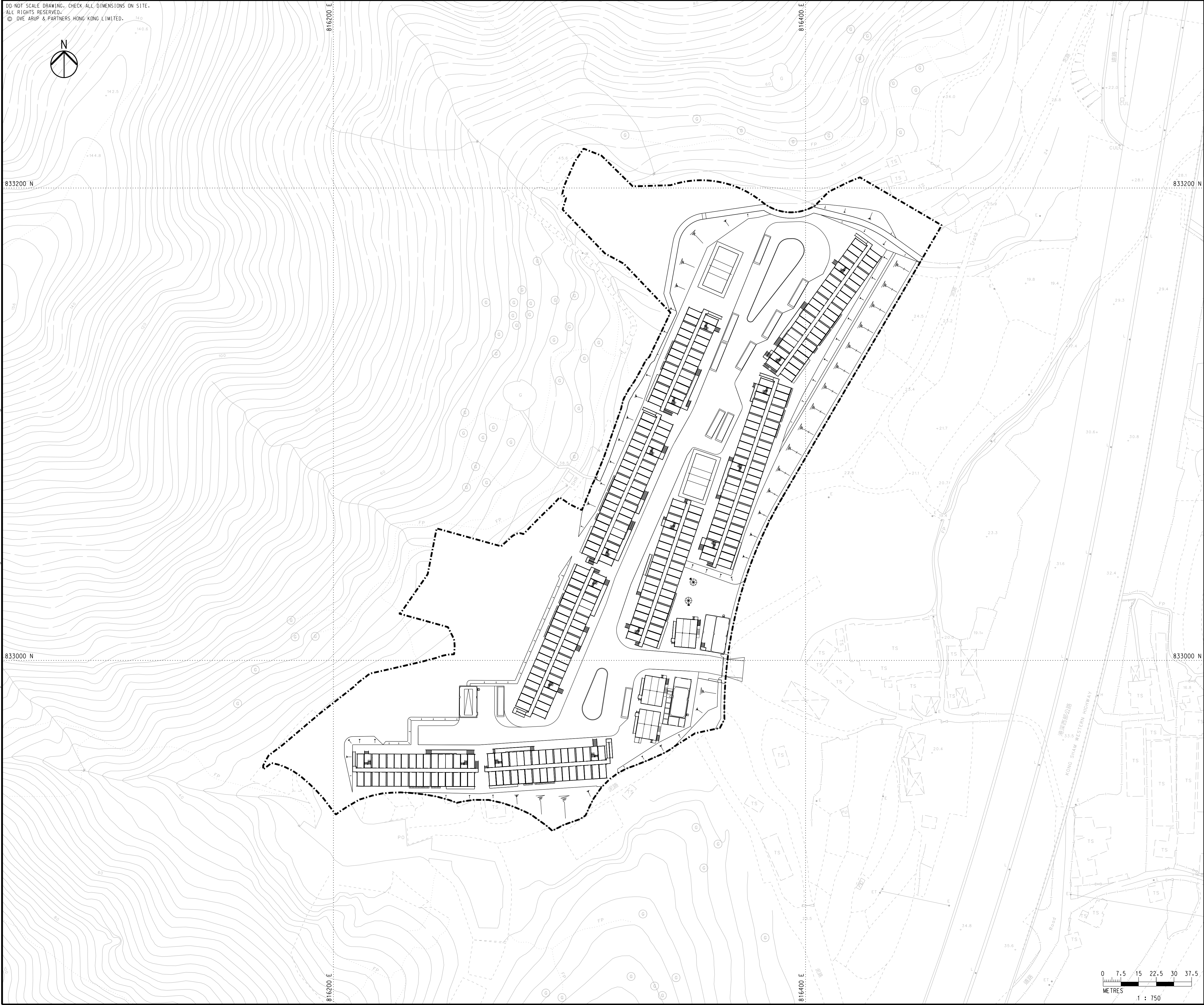
5. Summary

- 5.1.1** This report estimated the sewage flow generated from the proposed development, assessed the potential impact and recommended sewerage modification works to mitigate the potential impact.
- 5.1.2** According to the assessment, the proposed development would induce an ADWF of 354 m³/day.
- 5.1.3** Given that there is no existing sewerage in the vicinity of the proposed development by the time of commissioning, it is proposed to construct sewage holding tanks within the development site for sewage disposal. The tanks' design storage capacity will be equivalent to 1 day of ADWF with 100% safety margin to cater for incidents (i.e. required total storage capacity of 708 m³). The future proponent will be responsible for the operation and maintenance of the proposed sewage holding tanks.
- 5.1.4** The sewage will be tanked away to the nearby PPSTW (location 1) and HTSPS (location 2) for disposal. The upstream SPSs of YLEPP (location 3) would be used as backup reception facility in case HTSPS or PPSTW could not handle the above assigned reception volume due to conditions such as severe operation conditions, public complaints or other constraints.
- 5.1.5** Consider the order of sewage flow increment, the sewerage impact to existing sewerage infrastructures under the proposed condition is insignificant.
- 5.1.6** Upon implementing the proposed sewerage works, no adverse impact to the existing sewerage system is envisaged due to the proposed development.

Appendix A

Indicative Scheme for the Proposed Development

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KEY PLAN

LEGEND
[Dashed Box] APPLICATION SITE

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
HSK / HT NDA SECOND PHASE DEVELOPMENT IMPORTED LABOUR QUARTERS GENERAL LAYOUT PLAN			
Drawing no.		Rev.	
278463/SK/C/479		A	
Drawn	Date	Checked	Approved
RY	06/26	EH	KKC
Scale	Status		PRELIMINARY
1:750 @ A1			
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Appendix B

Proposed Sewerage Layout Plan

DO NOT SCALE DRAWING. CHECK ALL DIMENSIONS ON SITE.
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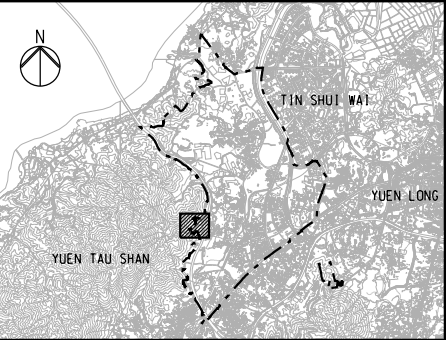
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LEGEND

- APPLICATION SITE
- PROPOSED SEWERAGE CATCHMENT
- PROPOSED SEWERAGE HOLDING TANK
- PROPOSED SEWERAGE CONNECTION

KEY PLAN



Rev	Description	By	Date
A	FIRST ISSUE	KF	07/26

ARUP

Project Title
Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
– Design and Construction

Drawing title
HSK / HT NDA
SECOND PHASE DEVELOPMENT
IMPORTED LABOUR QUARTERS
PROPOSED SEWERAGE
LAYOUT PLAN

Drawing no. 278463/SK/C/SIA/001		Rev. A	
Drawn RY	Date 06/26	Checked EH	Approved KKC
Scale 1:750 @ A1		Status PRELIMINARY	

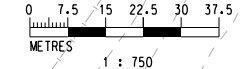
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土木工程拓展署
Civil Engineering and
Development Department

Sewerage Catchment and Design Storage Volume of Holding Tanks

Sewage Holding Tank	Sewerage Catchment of Respective Tank	Total ADWF (m ³ /day)	Design Storage (m ³ /day)
1	Block 6 - 8	151	302
2	Office 1 - 3, Block 1 - 5	203	406



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Date : 31/7/2026

Appendix C

Sewerage Calculations

Appendix C - Sewerage Calculation

Flow Build Up for Proposed Labour Quarter							
Catchment	Use	Population / Employment	UFF (m ³ /head/day)	ADWF (m ³ /day)	Safety Margin	Design Storage (m ³)	Convey to Sewage Holding Tank No.
Office 1, 2, 3	Cleaners (J11)	20	0.28	5.6	100%	11.2	2
	Office staff, security, technician (J12)	80	0.08	6.4	100%	12.8	2
Block 1	Domestic (R1)	176	0.19	33.4	100%	66.9	2
Block 2	Domestic (R1)	176	0.19	33.4	100%	66.9	2
Block 3	Domestic (R1)	252	0.19	47.9	100%	95.8	2
Block 4	Domestic (R1)	252	0.19	47.9	100%	95.8	2
Block 5	Domestic (R1)	148	0.19	28.1	100%	56.2	2
Block 6	Domestic (R1)	240	0.19	45.6	100%	91.2	1
Block 7	Domestic (R1)	304	0.19	57.8	100%	115.5	1
Block 8	Domestic (R1)	252	0.19	47.9	100%	95.8	1
Sum				354	Sum	708	

Sewerage Catchment and Design Storage Volume of Holding Tanks			
Sewage Holding Tank	Sewerage Catchment of Respective Tank	Total ADWF (m ³ /day)	Design Storage (m ³ /day)
1	Block 6 - 8	151	302
2	Office 1 - 3, Block 1 - 5	203	406

Appendix F

Water Supply Impact Assessment

Civil Engineering and Development Department

**Application for Permission under
Section 16 of the Town Planning
Ordinance (Cap. 131) for Proposed
Temporary Centralised Quarters for
Imported Labour in Construction
Sector for a Period of 3 Years in
“Industrial” Zone and Area Shown as
‘Road’ of Planning Area 36 of Hung
Shui Kiu/ Ha Tsuen New Development
Area**

Water Supply Impact Assessment

| August 2026

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 278463

Ove Arup & Partners Hong Kong Ltd
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Kowloon Tong
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Hong Kong
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ARUP

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Appendices

Appendix A	Indicative Scheme for the Proposed Development
Appendix B	Proposed Water Supply Layout Plan

1. Introduction

1.1 Background

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within “Industrial” (“I”) Zone and area shown as 'Road' of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (“the HSK/HT OZP”) No. S/HSK/3 for a Period of 3 Years (“the proposed development”).

1.1.2 The proposed development will have a total PR of about 0.456 with domestic GFA of about 13,414m² and non-domestic GFA of about 1,065m² respectively. The 8 nos. of two-storey residential blocks will provide about 450 residential module of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.

1.2 Site Location

1.2.1 The Application Site, with an area of about 31,787 m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/NT NDA for implementation of site clearance/ site formation and associated infrastructure works.

1.3 Scope of Updated Technical Assessments

1.3.1 The scope of updated technical assessment for water supplies comprises the following:

- Undertake a review of the proposed water supply network and identify if there would be any deficiency / inadequate capacity based on the development parameters;
- Propose the preliminary modification measures for the purpose of the WSIA; and
- Submit the WSIA to support S16 application.

1.3.2 This section outlines the assessment of the sewerage impact potentially induced by the proposed development and includes:

- Estimation of fresh and flushing water demand arising from the Application Site;

- Assessment of potential impact on the existing water supply network imposed by the Application Site; and
- Proposed preliminary water supply works, if considered necessary.

2. Planning Data and Water Demand Estimation

2.1 Proposed Development

2.1.1 The development information is summarized in **Table 2.1**. The Indicative Scheme of the proposed development is shown in **Appendix A**.

Table 2.1 Proposed Development Parameters

Site Area (about)	About 31,787 m ²
Total Plot Ratio (about)	0.456
• Domestic PR	0.422
• Non-domestic PR	0.034
Total GFA (about)	14,479 m ²
• Domestic GFA	13,414 m ²
• Non-domestic GFA	1,065 m ²
Building Height	Residential Blocks: 2 storeys Ancillary Blocks: 1 to 2 storey(s)
Number of Blocks	8 Residential Blocks 6 Ancillary Blocks (including 3 Management Offices)
Population	About 1,800
Employment	About 100

2.2 Water Demand Parameters and Assumptions

2.2.1 The unit water demands are generally based on Water Supplies Department (WSD)'s Departmental Instruction (DI) No. 1309. The residential and non-residential unit water demands are presented below.

Unit Water Demand

2.2.2 The unit fresh and flushing water demands for residential users adopted in this assessment are summarised in **Table 2.2**. The proposed temporary quarters are intended to provide short-term accommodation for imported labour in the construction sector. The anticipated water usage is therefore broadly similar to a typical residential development, covering domestic uses such as drinking, cooking, washing, bathing, laundry and toilet flushing. No commercial, industrial or other high water-consumption activities are proposed within the site.

Table 2.2 Unit Water Demand

Fresh Water (m ³ /head/day)		Flushing Water (m ³ /head/day)	
Resident	Employment	Resident	Employment
0.14 ¹	0.05	0.07 ¹	0.05
Note: 1. The unit fresh water and flushing water demands adopted from Water Supply Impact Assessment (WSIA) of Agreement No. CE 47/2020 (CE) – Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing Development in Zone 2 (2021–2024) – Feasibility Study Task Order No.8 Tam Mei.			

2.2.3 The unit fresh and flushing water demands for non-residential users are summarised in the following paragraphs.

Service Trade – Fresh Water Supply

2.2.4 Since no non-residential/commercial activities are proposed for these sites, the fresh water demand does not consider a factor for service trade.

Service Trade – Flushing Water Supply

2.2.5 No unit daily demand for flushing water demand is provided with reference to WSD's DI No. 1309 for this category of user.

Peaking Factors

2.2.6 The following peak demand factors are adopted:

- Peak flow rate in fresh water trunk main supplying from water treatment works to single service reservoir = 1.5 x mean daily fresh water demand of reservoir supply zone;
- Peak flow rate in fresh water distribution mains = 3 x mean daily fresh water demand;
- Peak flow rate in flushing water distribution mains = 2 x mean daily flushing water demand.

2.2.7 The maximum desirable flow velocity limit in **Table 2.3** below will be adopted for ultimate stage under normal water demand scenario (i.e. excluding fire-fighting demand scenario).

Table 2.3 Desirable Flow Velocity Limit

Fresh Water System		Flushing Water System	
Pipe Diameter	Flow Velocity Limit (m/s)	Pipe Diameter	Flow Velocity Limit (m/s)
> DN700	3	> DN1000	3
DN525 to DN700	2.5	DN800 to DN900	2.5
DN375 to DN450	2	DN525 to DN700	2
DN200 to DN300	1.5	DN300 to DN450	1.5

Residual Heads

- 2.2.8** The minimum residual heads for the proposed fresh water and flushing water supply systems, based on the requirements of WSD DI No. 1309, are shown in **Table 2.4**.

Table 2.4 Minimum Residual Heads in Water Supply System

Water Supply System	Minimum Residual Heads (m)
Fresh water – Normal	20
Fresh water – Firefighting	17
Flushing water	15

Reservoir Volume

- 2.2.9** To determine the fresh water storage volume, a 10% contingency is firstly applied to the average daily demand. Further, the storage volume is estimated as 80% of mean daily demand in accordance with the WSD's guidelines.
- 2.2.10** The required capacity of flushing water storage volume is calculated as 64% of mean daily demand of flushing water service reservoir.

3. Assessment of Water Supply Impact

3.1 Existing Fresh Water Supply System

3.1.1 Existing fresh water supply infrastructure is available in the vicinity of the proposed site.

3.1.2 Details of the existing fresh water main in the vicinity of the proposed site are presented in **Appendix B**.

3.2 Existing Flushing Water Supply System

3.2.1 Existing salt or flushing water supply system is not available in the vicinity of the proposed development.

3.3 Water Supply Impact

3.3.1 The fresh water and flushing water demands from the development site, based on the development parameters are summarised in **Table 3.1**.

Table 3.1 Water Demand from the Proposed Site

User	Population (head)	Unit Demand (m ³ /head/day)		Water Demand (m ³ /day)	
		Fresh Water	Flushing Water	Fresh Water	Flushing Water
Resident	1800	0.14	0.07	252.0	126.0
Employment	100	0.05	0.05	5.0	5.0
Total				257.0	131.0

3.3.2 It is noted that there is a fresh and flushing water demand of 257.0 m³/day and 131.0 m³/day for the development site.

3.3.3 As mentioned in **Section 3.1** and **3.2**, only the existing fresh water main will be available to serve the site for fresh water, fire-fighting, and flushing water purposes. As such, it is proposed to connect new fresh water main to the existing DN300 pipe along Kong Sham Western Highway.

3.3.4 **Table 3.2** summarises the storage volume required for the proposed development. Given that the increase in water demand represents only a small proportion of the overall storage capacity of the existing reservoirs, the existing Tan Kwai Tsuen South Fresh Water Service Reservoir (TKTSFSR) are considered to have sufficient spare capacity to accommodate the additional fresh water demand.

Table 3.2 Reservoir Volume Requirement

Required Storage Volume (m ³)			Occupancy to TKTSFWSR (%)
Fresh Water (m ³)	Fresh Water for Flushing (m ³)	Total (m ³)	
205.6	83.8	289.4	0.37

3.3.5

A hydraulic assessment was carried out in accordance with WSD's Guidelines for Hydraulic Modelling to estimate the head loss, and the results are presented in **Table 3.3**. Assuming a minimum residual head of 20 m in the existing DN300 water main, the additional water demand from the proposed development would result in only a marginal increase in head loss. Given that the existing water main is located at approximately +33.5 mPD, while the proposed development is situated at approximately +22.0 mPD, the available elevation difference is sufficient to accommodate the associated head loss. Therefore, the residual head at the development site is expected to remain above the minimum requirement of 20 m.

Table 3.3 Hydraulic Assessment for Proposed Fresh Water Main

Peak Flow (L/s)	Velocity (m/s)	Pipe Size (mm)	Pipe Inner Dia. (mm)	Pipe Length (m)	Head Loss (m)
12.0	0.80	NS180 (DN150)	138	130	1.13

4. Proposed Water Supply Works

- 4.1.1** To accommodate the additional fresh and flushing water demands arising from the proposed development, new water mains are proposed. A new NS180 (DN150) fresh water main will be connected to the existing DN300 fresh water main along Kong Sham Western Highway. NS125 (DN100), NS90 (DN80) temporary main for flushing (TMF), and NS180 (DN150) lead-ins are proposed to support fresh water, flushing water, and fire-fighting water demands. The proposed fresh water main layout is shown in **Appendix B**.

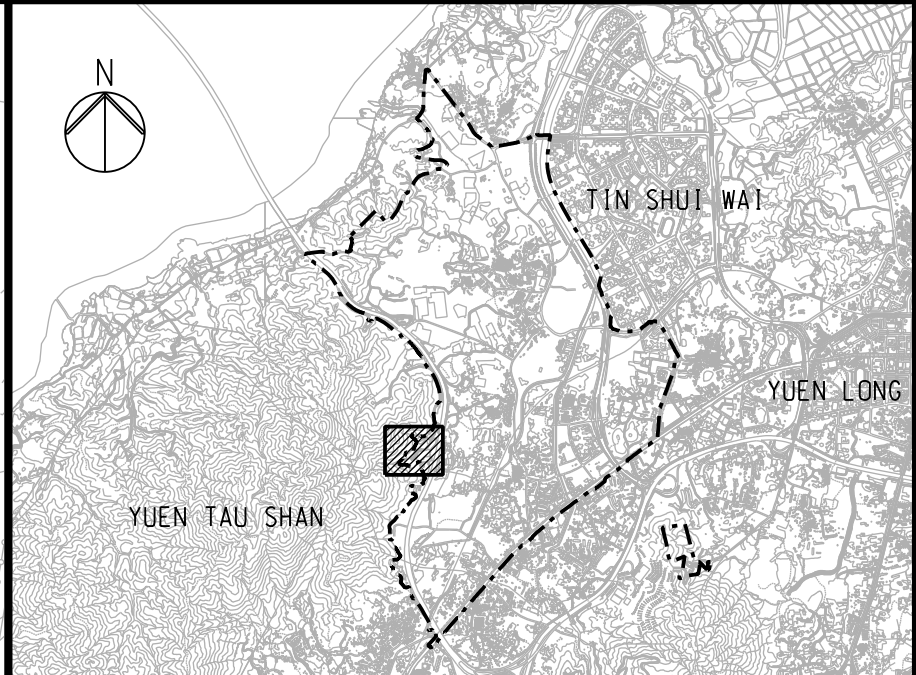
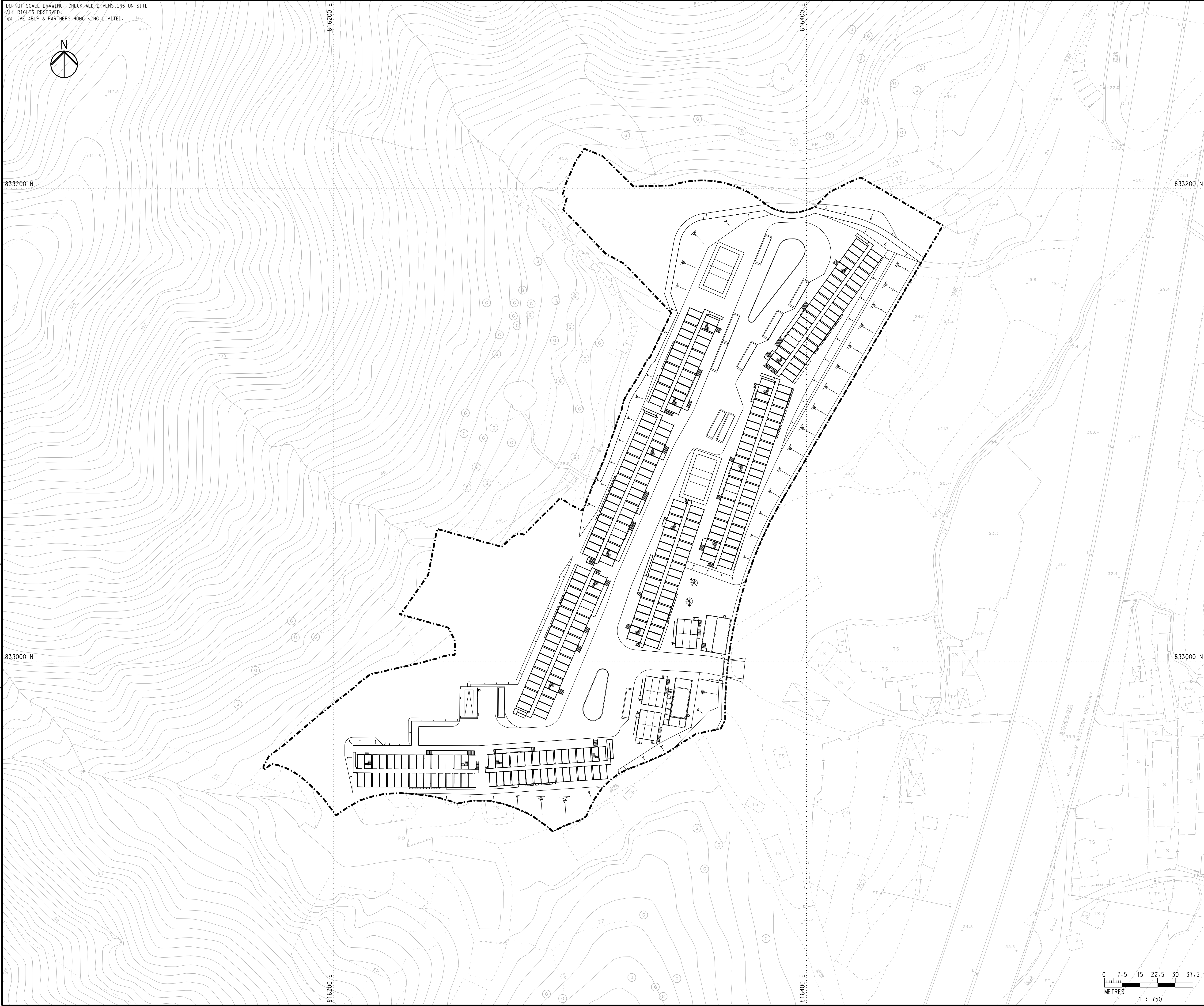
5. Summary

- 5.1.1** This report estimated the fresh and flushing water demands generated from the proposed development assessed the potential impact and recommended water supply works.
- 5.1.2** According to the assessment, the updated development parameters from the proposed project will result in an additional fresh water demand of 257 m³/day. For flushing water, the demand will be increased by 131 m³/day.
- 5.1.3** Since there is only an existing DN300 fresh water main in the vicinity of the proposed development, it is proposed to utilize this water main for supplying fresh water, fire-fighting, and flushing water for the proposed development.
- 5.1.4** A new NS180 (DN150) fresh water main is proposed to be teed off from the existing DN300 fresh water main along Kong Sham Western Highway.
- 5.1.5** A hydraulic assessment was conducted to assess the potential impact of the increased water demand to the existing fresh water supply network. It is considered that the existing surface reservoir have sufficient spare capacity to accommodate the additional fresh water demand. Regarding the impact to the existing DN300 fresh water main, the results indicated that the reduction in residual head due to the increased demand is minimal. In addition, since the elevation at the proposed site is at lower level comparing with the existing water main, the residual head at the development site is expected to remain above the minimum requirement of 20 m.
- 5.1.6** Upon the proposed water supply works, it is concluded that no adverse water supply impact would be imposed by the proposed development.

Appendix A

Indicative Scheme for the Proposed Development

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KEY PLAN

LEGEND
[Dashed Box] APPLICATION SITE

A	FIRST ISSUE	KF	07/26
Rev	Description	By	Date
Consultant			
ARUP			
Project Title			
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing title			
HSK / HT NDA SECOND PHASE DEVELOPMENT IMPORTED LABOUR QUARTERS GENERAL LAYOUT PLAN			
Drawing no.		Rev.	
278463/SK/C/479		A	
Drawn	Date	Checked	Approved
RY	06/26	EH	KKC
Scale	Status		
1:750 @ A1	PRELIMINARY		

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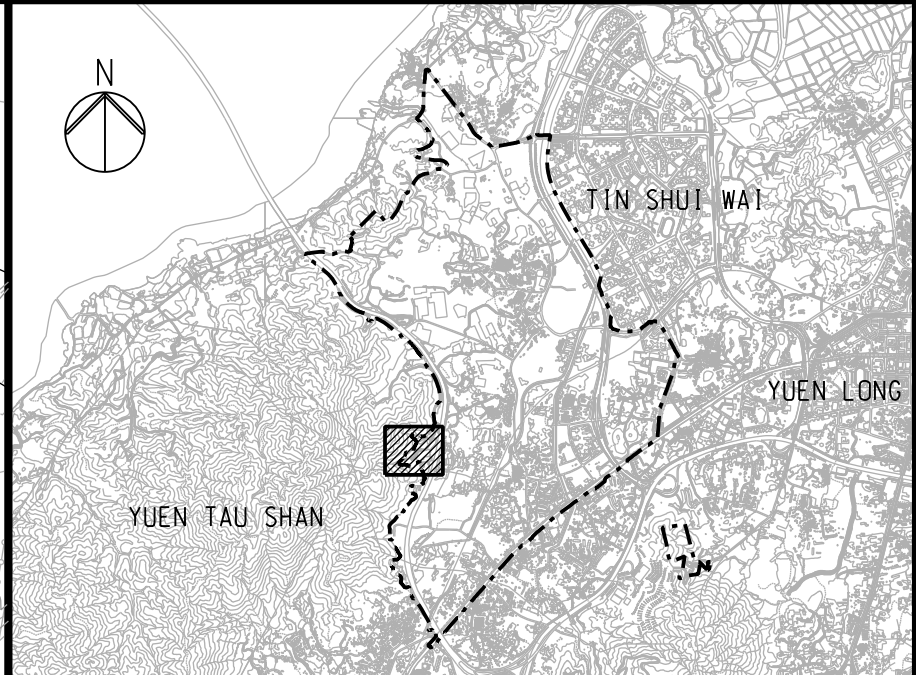
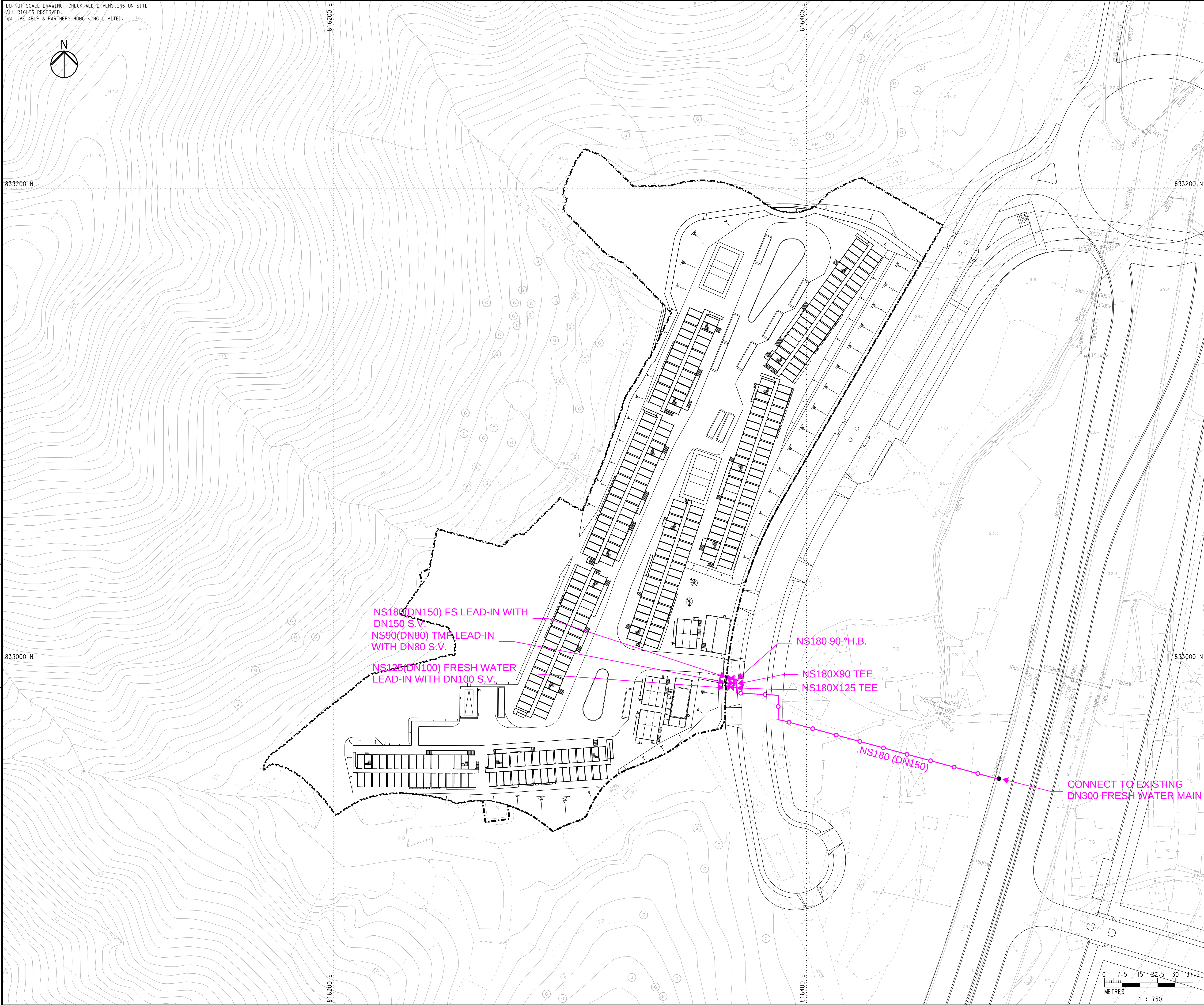
CEDD

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Civil Engineering and
Development Department

Appendix B

Proposed Water Supply Layout Plan

Printed by : wai-man.cheung Date : 7/8/2026
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KEY PLAN

LEGEND

- APPLICATION SITE
- EXISTING FRESH WATER MAIN
- PROPOSED FRESH WATER MAIN
- PROPOSED GATE VALVE

A		FIRST ISSUE		KF	07/26
Rev	Description	By	Date		
Consultant					
ARUP					
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development – Design and Construction					
Drawing title					
HSK / HT NDA					
SECOND PHASE DEVELOPMENT					
IMPORTED LABOUR QUARTERS					
PROPOSED WATER SUPPLY					
LAYOUT PLAN					
Drawing no.				Rev.	
278463/SK/C/WSIA/001				A	
Drawn	Date	Checked	Approved		
RY	07/ 26	EH	KKC		
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Appendix G

Geotechnical Planning Review Report

Civil Engineering and Development
Department

**Application for Permission under
Section 16 of the Town Planning
Ordinance (Cap. 131) for
Proposed Temporary Centralised
Quarters for Imported Labour in
Construction Sector for a Period of
3 Years in “Industrial” Zone and
Area Shown as ‘Road’ of Planning
Area 36 of Hung Shui Kiu/ Ha
Tsuen New Development Area**

**Geotechnical Planning Review
Report**

| Aug 2026

This report takes into account the particular
instructions and requirements of our client.

It is not intended for and should not be relied
upon by any third party and no responsibility
is undertaken to any third party.

Job number 278463

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ARUP

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Appendices

- Appendix A Aerial Photograph Interpretation Report
- Appendix B Natural Terrain Screening Section
- Appendix C Preliminary Site Formation Plan
- Appendix D Existing Ground Investigation Logs

1 Introduction

1.1 Background

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the Civil Engineering and Development Department (CEDD) to submit a Section 16 Planning Application for Proposed Temporary Centralised Quarter for Imported Labour in Construction Sector within "Industrial" ("I") Zone and area shown as 'Road' of Planning Area 36 of the draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan ("the HSK/HT OZP") No. S/HSK/3 for a Period of 3 Years ("the proposed development").

1.1.2 The Proposed Development will have a total PR of about 0.456 with domestic GFA of about 13,414m² and non-domestic GFA of about 1,065m² respectively. The 8 nos. of two-storey residential blocks will provide about 450 residential module of Modular Integrated Construction (MiC) to provide accommodation for about 1,800 numbers of imported labour. The Proposed Development is targeted to commence operation in Q3 2027.

1.2 Site Location

1.2.1 The Application Site, with an area of about 31,787 m², is situated at the western part of HSK/HT NDA adjacent to the planned high-density development under the Second Phase Development of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA), of which the construction works have commenced since 2024. The Application Site itself is part of the Advance Works phase 3 of HSK/NT NDA for implementation of site clearance/ site formation and associated infrastructure works. The location of the Application Site is shown in **Figure 1.1**.

1.3 Purpose of the Report

1.3.1 The indicative scheme of the proposed development is shown in **Figure 1.1** respectively.

1.3.2 This geotechnical planning review report provides the following assessment to support the planning application for the proposed redevelopment works:

- Summary of the available geotechnical information for the Application Site;
- Initial review of the geotechnical issues relating to the proposed redevelopment;
- Review of the natural terrain hazards overlooking the site; and
- Proposed works and the corresponding impact on the existing slope features.

2 Site Description

2.1 Site Topography

- 2.1.1** The Application Site is situated at the western part of HSK/HT NDA, at the downslope area of the natural terrain. It is located at Site 3-44 and Site 3-47 of HSK/HT NDA Development. The western boundary of the site adjoins the natural hillside, with level varying from approx. +32mPD to +45mPD. For the eastern boundary of the site, the existing ground level varies from approx. +23mPD to +25mPD. Under HSK/NT NDA, the eastern boundary of the site will be modified to match with the proposed Road L24 under the HSK/HT NDA development with proposed road level varying from +24.2mPD at the southern part to +19.1mPD in the northern part.

3 Geotechnical Review

3.1 General

- 3.1.1** A desk study has been carried out to support geotechnical appraisal. The study comprised a review of the general site history via aerial photograph interpretation (API); review of regional geology; evaluation of the condition and engineering status of man-made features within and adjacent to the Sites; and a review of existing ground investigation (GI) records.
- 3.1.2** The Natural Terrain Hazard Study (NTHS) is discussed in **Section 4**.

3.2 Site Development History

- 3.2.1** The API report is enclosed in **Appendix A**, identifying all salient geological features, hydrology, land use changes, past instability, ground conditions, and potential landslide hazards.
- 3.2.2** The Application Site is located at Site 3-44 and Site 3-47 of HSK/HT NDA Development. It is overlooked by several well-defined natural terrain catchments. The natural terrain is characterized by distinct ridgelines, spurlines and incised drainage lines. Numerous relict and recent landslide features have been identified within the catchments. The demarcations of natural terrain catchments are shown in **Appendix A** and **Figure 4.1**.
- 3.2.3** Presence of incised natural drainage channels are noted within Catchment Nos. YTS-6, YTS-7, YTS-9 and YTS-10. Within Catchment No. YTS-10, several drainage tributaries join together to form a major channel in the middle and lower portions of the catchment.
- 3.2.4** In early 1960s, the Sites were predominantly rural in character, comprising extensive farmland with footpaths and a limited number of village houses. The surrounding natural terrain catchments appeared largely undisturbed and remained

covered by natural vegetation, with little evidence of significant human activities.

- 3.2.5** By early 1970s, portions of the farmland appeared to have been abandoned. This trend continued into early 1980s when much of the agricultural land had become overgrown, indicating a substantial decline in farming activities within the area. During the same period, additional squatters and village houses were established.
- 3.2.6** No major terrain modification, large-scale excavation or substantial urban development was evident during late 1980s to early 1990s. The adjoining natural terrain catchments also remained largely unaffected by anthropogenic activities.
- 3.2.7** By 2020s, extensive vegetation clearance had been carried out across significant portions of the Sites. A structure was also constructed within the western part of Site 3-47, and its footprint subsequently expanded. Notwithstanding these recent changes, the natural terrain catchments overlooking the Sites continued to exhibit minimal signs of anthropogenic disturbance throughout this period.

3.3 Published Geology

Superficial Geology

- 3.3.1** Based on the 1:20,000 Solid and Superficial Geological Map Sheets 6 (GEO, 2019) and HKGS 1:5,000 superficial geological map, the Sites are underlain by extensive deposits of Quaternary colluvium (Qcd) of Check Lap Kok Formation of Pleistocene age.

Solid Geology

- 3.3.2** Based on the 1:20,000 Solid Geological Map Sheet 6, the Sites are overlain on bedrock of Jurassic Tuen Mun Formation, particularly the Siu Hang Tsuen Member (Jus).

Tuen Mun Formation - Siu Hang Tsuen Member (Jus)

- 3.3.3** The Siu Hang Tsuen Member (Jus) is predominantly present at the central to eastern portion of the HSK/HT NDA, comprising dominantly polymictic (including marble clasts), tuffaceous/epiclastic conglomerate, sandstone and siltstone with minor andesite peperite.

Structural Geology

- 3.3.4** Based on the 1:20,000 Solid Geological Map Sheet 6, an east to northeast trending inferred fault intersects the southern portion of the Sites.
- 3.3.5** The Sites are located between two major faults, namely the Yuen Tau Shan Fault and East Tuen Mun Fault with distance over 400 m.

Metamorphism

3.3.6 With reference to the published geological maps, mylonite and low-grade metamorphism are documented along the abovementioned Yuen Tau Shan Fault and East Tuen Mun Fault and not evident within the Sites.

3.3.7 The 1:100,000 Geological Map, 1:20,000 Geological Map, 1:5,000 Geological Map (Solid Geology and Superficial geology) are shown in **Figure 3.1, 3.2, 3.3a and 3.3b**.

3.4 Previous Ground Investigation Records

3.4.1 A search of existing ground investigation (GI) records was conducted at the Geological Information Unit (GIU) of the Geotechnical Engineering Office (GEO). No existing GI records were identified within 25 m of the site boundary.

3.4.2 Project-specific GI works were conducted within and near the vicinity of the Site under different stages of the HSK NDA Projects including: (i) *Contract No. YL/2021/02 "Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development"* and (ii) *Contract No. YL/2023/05 "Hung Shui Kiu / Ha Tsuen New Development Area Second Phase Development – Contract 5 – Site Formation and Engineering Infrastructure Works"*. A total of 10 nos. of drillholes and 7 nos. of trial pits have been completed. Layout plan indicating the location of the project-specific GI is presented in **Figure 3.4**. A summary of the relevant GI records is presented in **Table 3.1** and the logs are in **Appendix D** for reference.

Table 3.1 – Summary on Projects-specific GI Information

Contract No.	Drillhole/ Trial pit No.	Within/O outside Site Boundary ^[1]	Ground Level (mPD)	Depth (m)	Thickness of Strata (m)			
					Fill	Colluvium	Alluvium	Saprolite
YL/2021/02	A15	Within	+26.42	11.55	-	2.00	-	9.55
YL/2021/02	A16	Within	+27.11	11.55	-	6.00	-	5.55
YL/2021/02	A17	Within	+27.46	11.55	-	6.00	-	5.55
YL/2021/02	DH2031	Outside	+23.78	24.30	2.00	2.00	4.90	5.60
YL/2021/02	TP2009	Within	+27.14	2.80	-	1.80	-	1.00
YL/2021/02	TP2010	Within	+26.84	3.00	0.70	-	-	2.30
YL/2021/02	TIP3001	Outside	+31.32	2.05	-	2.05	-	-
YL/2021/02	TIP3002	Outside	+42.28	3.00	-	3.00	-	-
YL/2021/02	TIP3006	Outside	+31.87	3.00	0.20	2.80	-	-
YL/2021/02	TIP3008	Outside	+42.95	3.00	0.35	1.95	-	0.70
YL/2021/02	TIP3009	Outside	+41.12	3.00	-	2.70	-	0.30
YL/2023/05	BHC5-044	Outside	+29.42	26.88	1.00	3.00	-	17.11
YL/2023/05	BHC5-054	Outside	+24.15	30.93	2.00	5.10	2.90	19.76
YL/2023/05	BHC5-212	Outside	+33.65	24.35	-	2.00	-	16.91
YL/2023/05	BHC5-213	Within	+26.81	25.21	1.60	6.00	-	11.49
YL/2023/05	BHC5-214	Within	+26.89	33.38	3.00	4.00	-	23.80
YL/2023/05	BHC5-215	Within	+24.13	18.76	2.50	2.20	2.00	6.63

[1] The GI located outside the site boundary is identified within 25m of the site boundary.

- 3.4.3** Based on the above GI records, the Sites comprises fill, colluvium, alluvium, and completely to slightly decomposed in-situ materials.
- 3.4.4** Fill comprising silt, sand and cobble-sized materials has been encountered, with thicknesses ranging from approximately 0.2 m to 3.0 m, forming the uppermost stratum across the Site.
- 3.4.5** Colluvium has been encountered extensively across almost the entire Site, with thicknesses ranging from approximately 1.8 m to 6.0 m. The colluvial deposits generally comprise a heterogeneous mixture of clay, silt, sand and cobble-sized materials.
- 3.4.6** Alluvial deposits comprising clay, silt, sand and cobble-sized materials have been locally encountered in DH2031, BHC5-215 and BHC5-054. These deposits are generally found beneath the colluvium layer, with thicknesses ranging from approximately 2.0 m to 4.9 m.
- 3.4.7** In-situ materials of varying lithologies have been encountered beneath the superficial deposits across the Site.
- 3.4.8** No major fault-related features have been identified from the available GI records. Nevertheless, highly fractured rock was encountered in BHC5-212, while silicified bedrock and a locally deepened rockhead profile were recorded in BHC5-214.
- 3.4.9** The aforementioned GI findings are generally consistent with the published solid and superficial geological information presented in the available geological maps and relevant publications.

3.5 Registered Man-made Features

- 3.5.1** All available information regarding existing man-made features which may affect or be affected by the proposed redevelopment have been reviewed through inspection of the records maintained in the Geotechnical Information Infrastructure (GInfo) of the Geotechnical Engineering Office (GEO) and Slope Maintenance Responsibility Information System (SMRIS) of the District Lands Department (DLO).
- 3.5.2** No registered man-made features are located within the Site. Two registered man-made features have been identified within 50m of the site boundary. Existing feature 6NW-A/C13 is located to the north, while feature 6NW-C/C30 is situated to the south. The locations of the features are shown in **Figure 3.1**. A summary of the responsible maintenance parties and slope information is shown in **Table 3.2**.

Table 3.2 – Summary on Registered Man-made Feature

Feature No.	Maintenance Party	Maintenance Agent	Max. Height (m)	Length (m)	Average Slope Angle (Degree)	Affected by proposed redevelopment? (Yes/No)
6NW-C/C30	LandsD	LandsD	6	70	45	No
6NW-A/C13	LandsD	LandsD	3	25	30	No

3.5.3 The detail description of the registered features is presented as follows:

Feature No. 6NW-C/C30

3.5.4 The feature is located at a minimum distance of 16m from the southern site boundary. It comprises a soil cut slope with maximum height of approx. 6m, an average inclination of 45. Given the large offset distance, the existing feature will not affect / be affected by the proposed development.

Feature No. 6NW-A/C13

3.5.5 The feature is located at a minimum distance of 42m from the northern site boundary. It has maximum height of approx. 3 m and an average inclination of 30°. The feature will be demolished by the proposed site formation works under separate CEDD Contract No. YL/2023/05 under the HSK/HT NDA.

4 Natural Terrain Hazard Study

4.1 Natural Terrain Catchment Area

4.1.1 The extent of the natural terrain catchments affecting the Sites has been defined in accordance with GEO Report No. 138 (Edition II) (Ho & Roberts, 2016).

4.1.2 11 natural terrain catchments, namely Catchment Nos. YTS-5, YTS-6, YTS-7, YTS-8, YTS-9, sub catchment YTS-9A, YTS-10, sub catchment YTS-10A and YTS-10B, YTS-11 and sub catchment YTS-11A, overlooking the Sites have been identified. These areas have been delineated based on the extent of hillside directly overlooking and with flow paths leading to the proposed site boundary. The layout plan of the catchment is enclosed in **Figure 4.1**.

4.2 Natural Terrain Hazard Screening

4.2.1 Natural Terrain Hazard Screening has been undertaken for the various catchments delineated to determine whether they have notable potential to contribute hazards to the Sites. The screening has been conducted in accordance with the criteria laid out in GEO Report No. 138 (Edition II), namely:

- i. Inclusion Guidelines
- ii. In-principle Objection Criteria
- iii. Alert Criteria

Inclusion Guidelines

4.2.2 According to the GEO Report No. 138 (Edition II), there are two conditions to fulfill to identify whether a site may require further study, comprising:

- (a) *The proposed development involves Group 1, 2 or 3 facilities, and*
- (b) *There is a 'hillside' sloping at more than 15° within 100 m horizontally upslope of the site boundary.*

4.2.3 The Sites are identified as a Group 1(a) facility as it comprises 'residential building'. The Sites are also within 100 m of hillsides with slope angles over 15°. Therefore, the inclusion criteria are satisfied, and further screening of the Sites is required.

In-principle Objection Criteria

4.2.4 According to GEO Report No.138 (Edition II), GEO would object in-principle to proposals for the zoning and disposal of a site that falls under the following conditions:

- (a) *A site is faced with severe natural terrain hazards. A site falls within this category if any proposed Facility Groups 1(a), 1(b) and 2(a) is either:*
 - (i) *located within an angle of reach of 35° from any natural terrain at an elevation of 50 m or more above the proposed site formation level, or*
 - (ii) *located on, or immediately below, terrain that is known to be affected by active, large-scale movement (e.g. Tuen Mun Area 19).*
- (b) *The site is proposed for small-scale New Territories Exempted House (NTEH) and is subject to potential natural terrain hazards.*

4.2.5 The maximum angle of reach for all natural terrain catchments is less than 35° (**Appendix B**). Additionally, the Sites do not fall within an area that is known to be affected by active, large-scale movement and is not proposed for NTEH type development. As such, the Sites do not satisfy the in-principle objection criteria.

Alert Criteria

4.2.6 The "Alert Criteria" is defined as follows:

- (a) *It is a new development site involving provision of Group 1 to 3 facilities, or it is a redevelopment that requires modification of the lease conditions and involves either a significant population at risk or a significant increase in population at risk.*
- (b) *Where there is natural terrain outside the site, but within the same catchment, that is at an angular elevation of 20° or more from the site and where there is ground sloping at more than 15° within 50 m horizontally upslope of the site boundary, provided that there is a credible debris flow path to the site.*

4.2.7 A detailed assessment of natural terrain hazards will be required for any catchments satisfying the Alert Criteria.

4.2.8 Cross sections showing that the maximum angular elevation for each of the natural terrain catchment affecting the Sites are shown in **Appendix B**, with a summary of

the findings provided in **Table 4.1** below. The assessment found that all catchments meet the "Alert Criteria" or having the prominent natural drainage course as additional consideration, and thus require further detailed study of natural terrain hazards.

Table 4.1 – Summary of Catchments overlooking the Site

Catchment No.	Inclusion Criteria Satisfied	Angular Elevation (°)	Result of Proximity Assessment	Other Consideration	NTHA Required ?
YTS-5	Y	27	Satisfy Alert Criteria	-	Y
YTS-6	Y	24	Satisfy Alert Criteria	-	Y
YTS-7	Y	23	Satisfy Alert Criteria	-	Y
YTS-8	Y	21	Satisfy Alert Criteria	-	Y
YTS-9 (including sub catchment YTS-9A)	Y	28	Satisfy Alert Criteria	-	Y
YTS-10 (including sub catchments YTS-10A and YTS-10B)	Y	18	Not Satisfy Alert Criteria	Presence of prominent natural drainage and past instability record	Y
YTS-11 (including sub catchment YTS-11A)	Y	20	Satisfy Alert Criteria	-	Y

4.3 Mitigation Strategies for Natural Terrain Hazard

4.3.1 With due consideration of the possible type and magnitude of the hazards as well as the site conditions present, the following are the possible hazard mitigation strategies for the Application Sites:

4.3.2 *Avoidance:* Considering the temporary nature of proposed land use, avoidance approaches such as adjustments to the facility layout and providing buffer zones, are considered realistic strategies in terms of cost effectiveness.

4.3.3 *Debris Containment / Diversion:* Depending on the magnitude of the landslide in question, debris can be prevented from impacting on facilities through provision of flexible or rigid barriers or through provision of debris diversion walls to deflect the debris away from any affected facilities.

4.3.4 Mitigation strategy for natural terrain hazards will be discussed in separate NTHS report.

5 Proposed Geotechnical Works

5.1 Proposed Site Formation Works

- 5.1.1** The Application Site composes of a platform with level varying from +27.0mPD to +28.5mPD in most part of the Site and ramping up to +32.5mPD near the northern end to match with the adjacent ground level.
- 5.1.2** To form a levelled platform for the proposed redevelopment, cut and fill slopes are proposed at the periphery of the platform to cater for the level difference with the adjacent ground. The maximum slope height is approx. 9m at the eastern part of the Site. Schematic site formation layout plan is shown in **Appendix C**.
- 5.1.3** Both cutting and filling from original ground level are proposed to form the levelled platform. Cut and fill slopes are tentatively proposed with a max. gradient of 33 degrees and 30 degrees respectively.
- 5.1.4** In detailed design stage, proposed slopes will be designed to meet the current geotechnical standards and requirements from the Geotechnical Engineering Office (GEO). For slopes with building foundation located near the crest, the vertical load and lateral load of the building foundation will be taken into account in the slope stability analysis. In addition, the surface drainage works will be designed in accordance with the requirements of the Geotechnical Manual for Slopes.

5.2 Proposed Foundation Works

- 5.2.1** In view of the relatively small loading, shallow footing / raft foundation is envisaged for the two-storey residential blocks by Modular Integrated Construction (MiC). For shallow footing / raft foundation located near the crest of slope, the bearing capacity will be estimated with due consideration of the slope profile.
- 5.2.2** Details of the proposed shallow footing / raft foundations will be presented in the foundation design submission.
- 5.2.3** Temporary excavation for the proposed foundation construction will be presented in separate design submission in the detailed design stage. The use of temporary open cut slope will be deployed as far as possible.

6 Conclusion and Recommendation

- 6.1.1** A geotechnical planning review has been conducted for the proposed Application Site that may affect, or be affected by, natural terrain, man-made slope or retaining wall features in accordance with GEO Advice Note for Planning Application under Town Planning Ordinance (Cap. 131). The indicative scheme of the Site comprises 8 nos. of two-storey residential blocks and the associated works.
- 6.1.2** The review has been carried out based on the findings of desk studies, aerial photo interpretation (API) and inspection of Site and the adjacent natural terrain catchments. The Application Site is located at the toe of few natural terrain catchments.
- 6.1.3** Initial natural terrain hazard screening indicated that the site falls into the "Alert Criteria" for the Application Sites. Further study of natural terrain hazards in accordance with GEO Report No. 138 is required. Suitable mitigation measures, including avoidance and debris containment/diversion strategies, will be developed to manage the identified natural terrain hazard risks, and will be covered under separate report.
- 6.1.4** Schematic site formation plan has been proposed. Both cutting and filling from original ground level are required to form the levelled platform. Cut and fill slopes are proposed to retain level difference between proposed platform and adjacent ground level. The two-storey residential blocks are proposed to sit on shallow footing / raft foundation.
- 6.1.5** In conclusion, the proposed redevelopment is considered to be feasible from the geotechnical perspective.

7 Reference

Geotechnical Control Office, (1989). 1:5,000 Geological Map Sheet 6-NW-A (Series HGP5A and HGP5B), Hong Kong Geological Survey;

Sewell et al. (2000). The Pre-Quaternary Geology of Hong Kong. Geological Map of Hong Kong. Series HGM100. Scale 1:100,000;

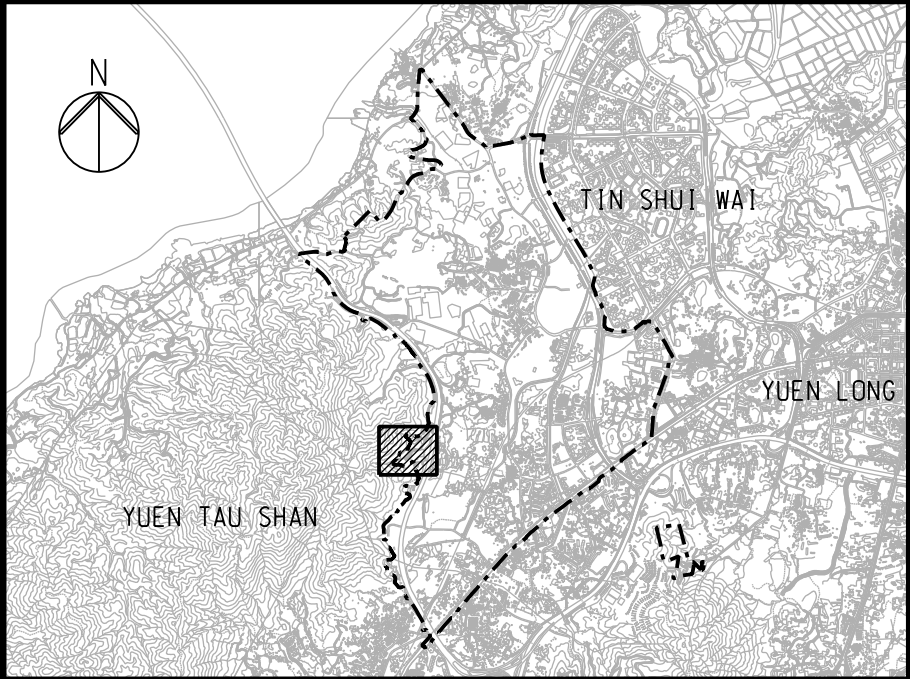
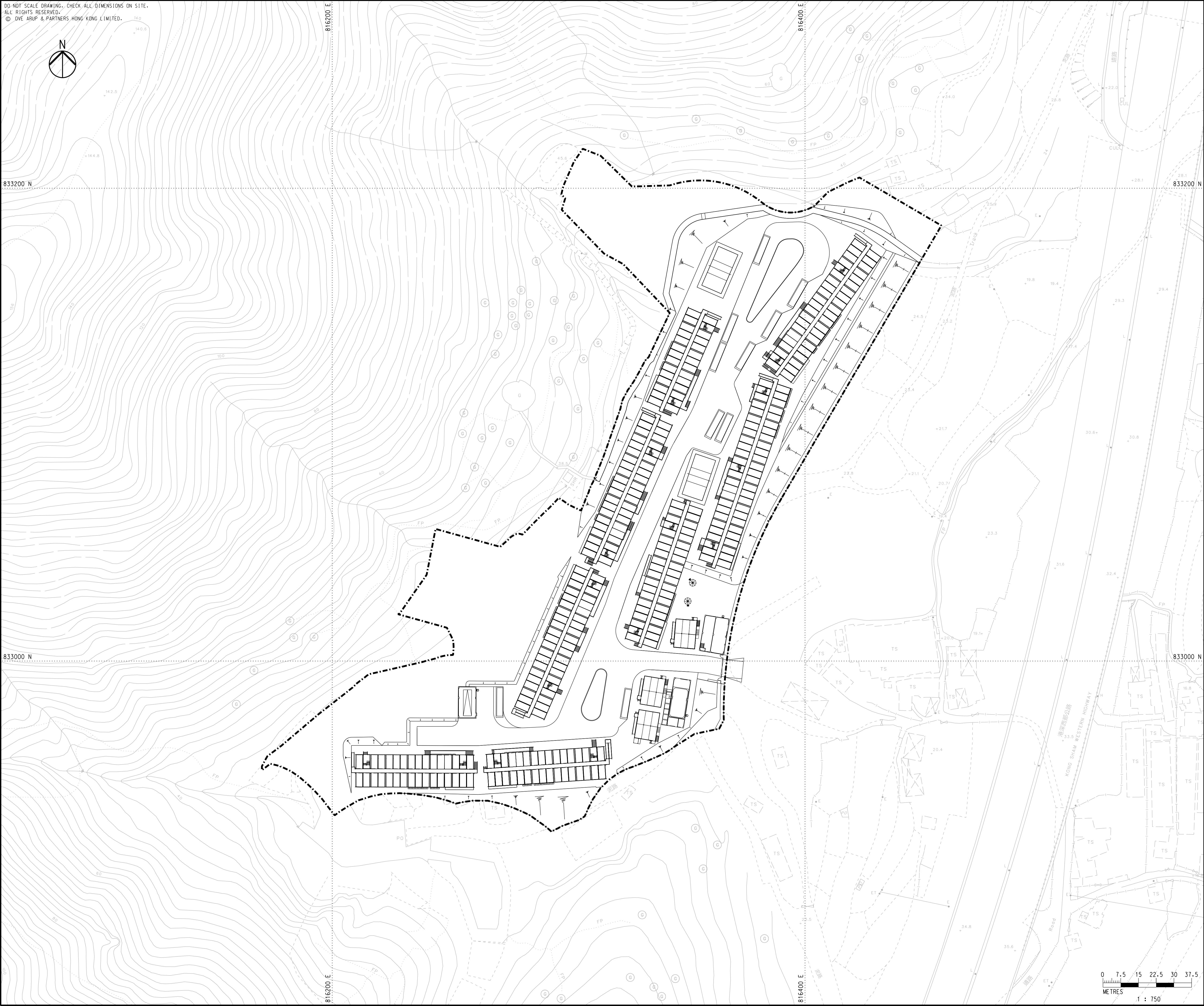
Geotechnical Engineering Office, (2016). GEO Report No. 138 (Second Edition), Hong Kong Geological Survey;

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Figures

Printed by : reman.yick Date : 7/23/2026
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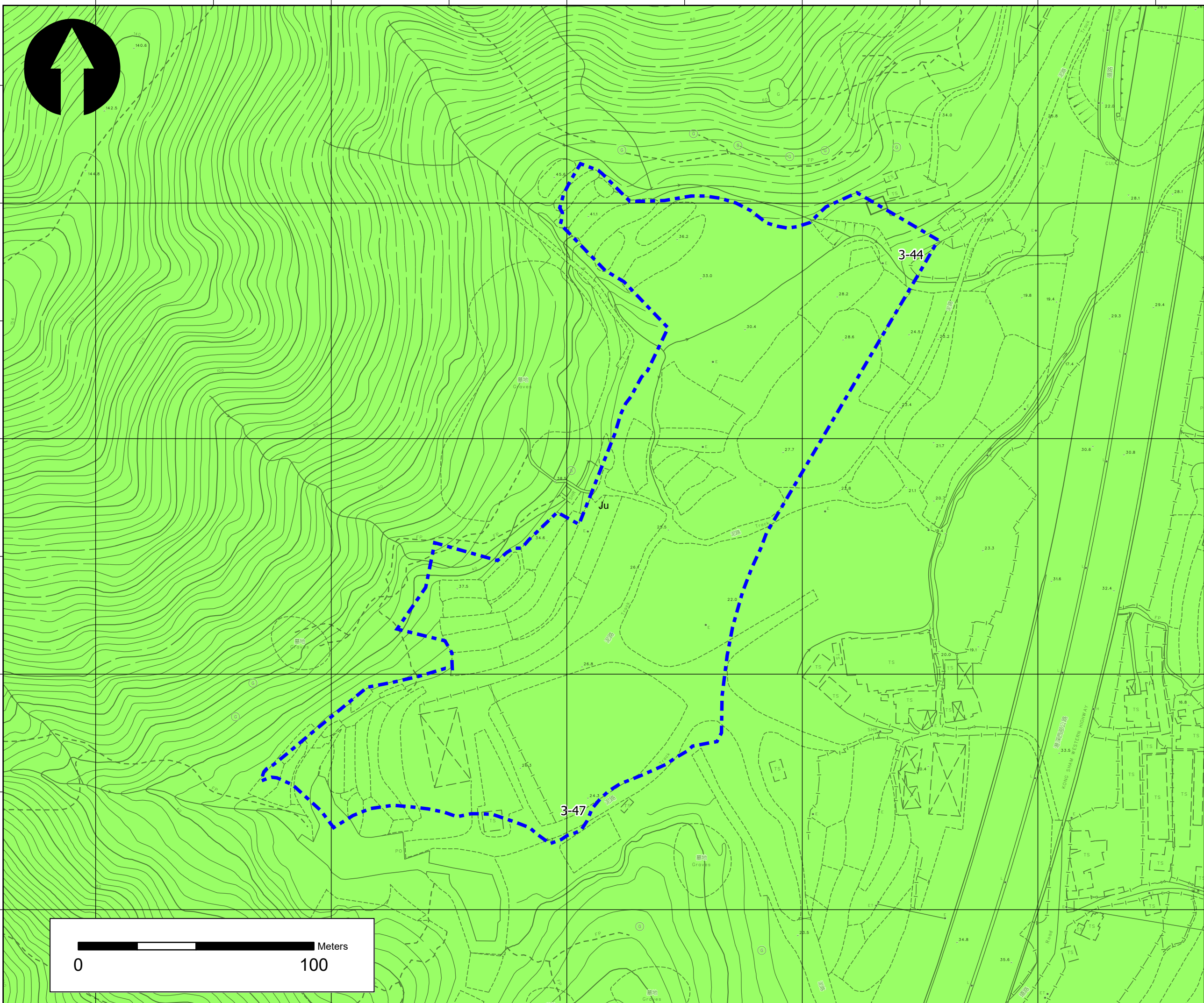


KEY PLAN

LEGEND

APPLICATION SITE

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Rev	Description	By	Date		
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Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development – Design and Construction					
Drawing title					
HSK / HT NDA					
SECOND PHASE DEVELOPMENT					
IMPORTED LABOUR QUARTERS					
GENERAL LAYOUT PLAN					
Figure 1.1					Rev.
					A
Drawn	Date	Checked	Approved		
RY	06/26	EH	KKC		
Scale	1:750 @ A1		Status	PRELIMINARY	
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Legend

- Site Boundary
- Tuen Mun Fm.

Contract No. and Title

ARUP

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area
Package A Works for Second Phase
Development – Design and Construction

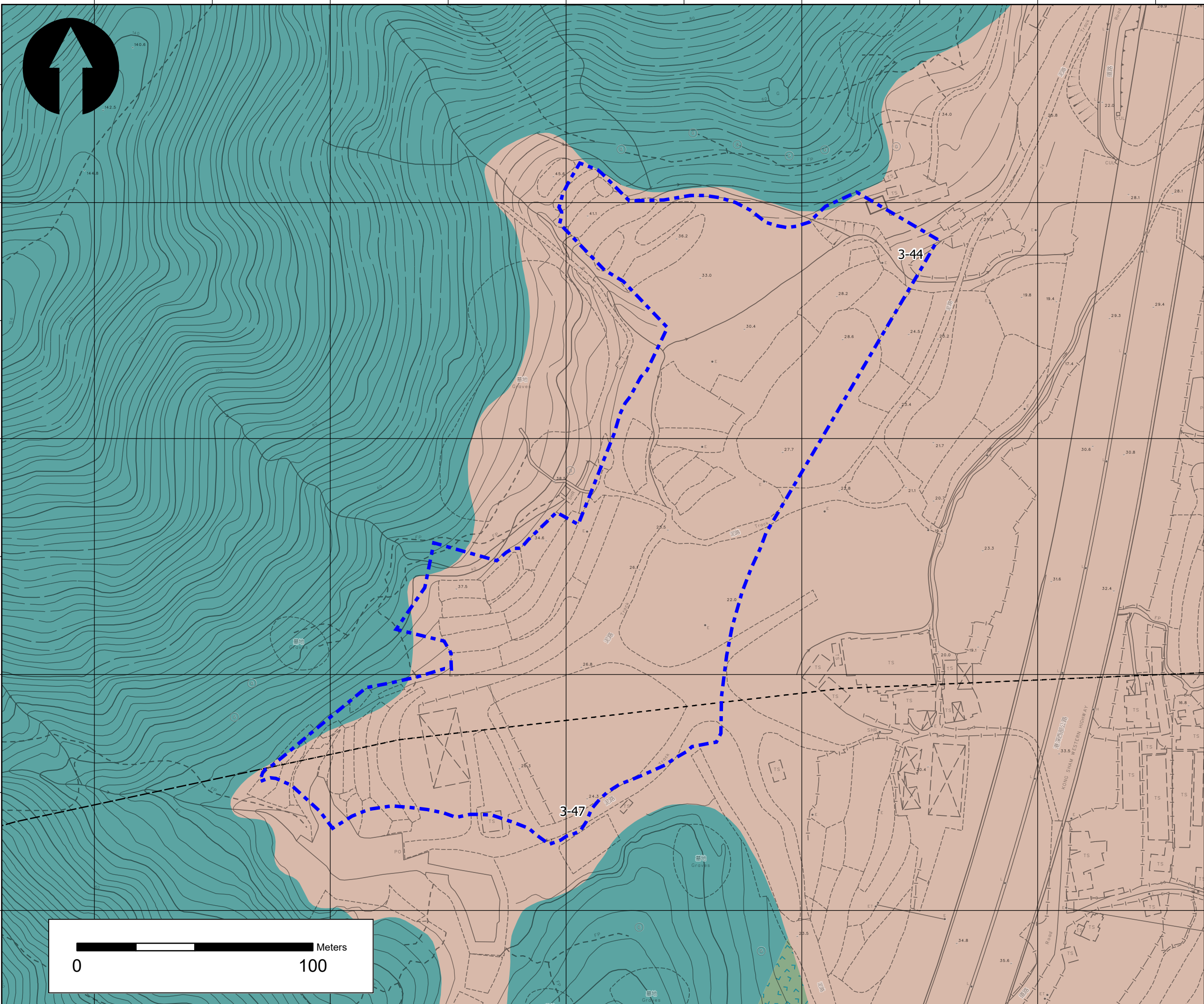
Drawing Title

1:100,000 Geological Map

Figure No.		3.1		Rev.	
Drawn	AL	Date	07.2026	Checked	KL
Scale		1:1,500		@ A3	

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土木工程拓展署
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Legend

- Site Boundary
- Faults
 - Approximate Fault
 - Inferred Fault
- Superficial Deposits
 - Qcd
- Solid Geology
 - Jua
 - Jus
- Colluvium (Chek Lap Kok Fm.)
- Andesite lava, autobreccia, lapilli lithic-bearing coarse ash crystal tuff and tuffite (Tuen Mun Fm.)
- Polymictic tuffaceous conglomerate, sandstone and siltstone with minor andesitic peperite (Tuen Mun Fm.)

Contract No. and Title

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

1:20,000 Geological Map

Figure No. 3.2

Rev. -

Drawn AL

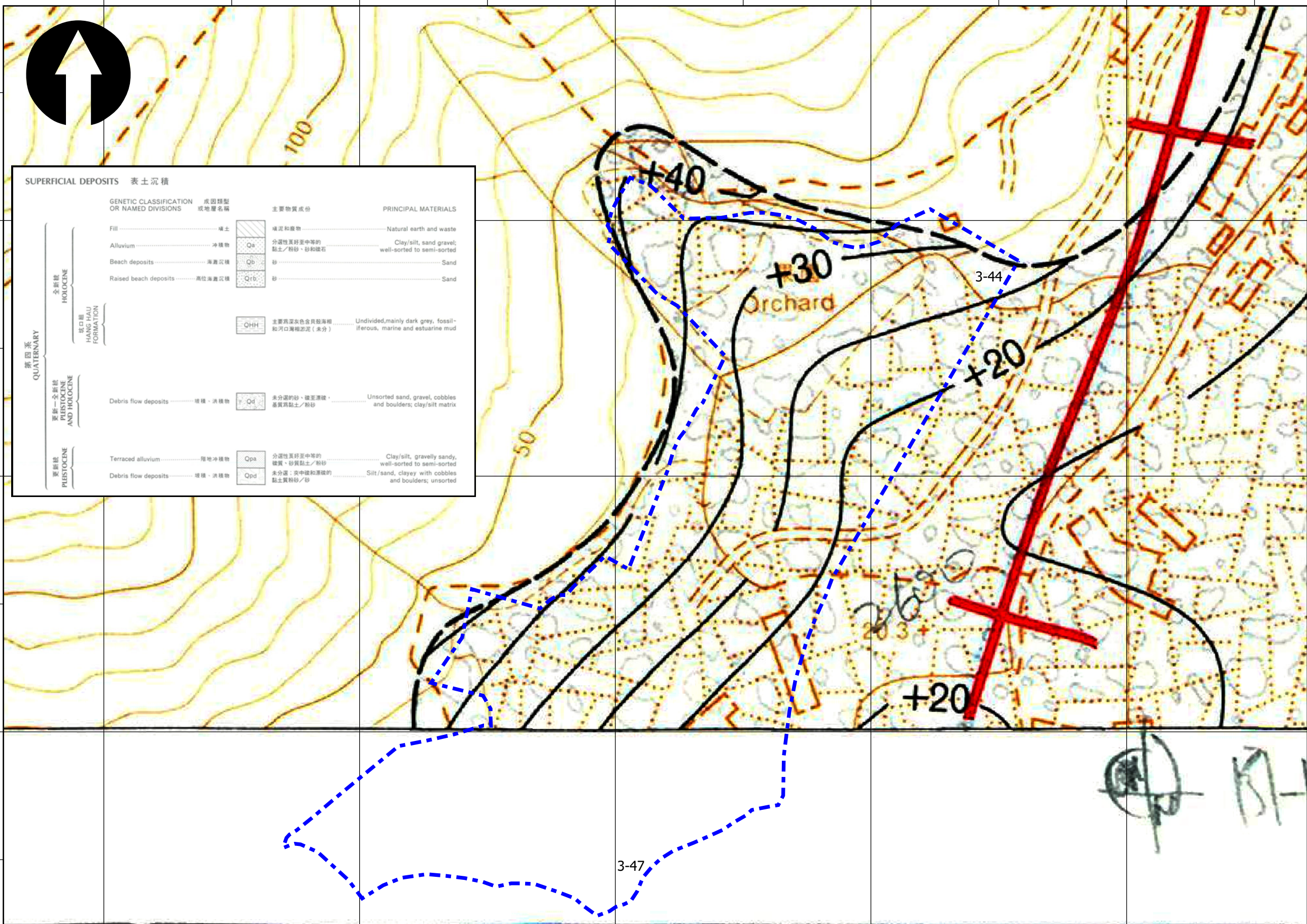
Date 07.2026

Checked KL

Approved KC

Scale 1:1,500 @ A3

 土木工程拓展署
Civil Engineering and Development Department



SUPERFICIAL DEPOSITS 表土沉積			
GENETIC CLASSIFICATION OR NAMED DIVISIONS 成因類型或地層名稱		主要物質成份	PRINCIPAL MATERIALS
全新統 HOLOCENE	Fill 填土		Natural earth and waste
	Alluvium 沖積物	Qa 分選性良好至中等的黏土/粉砂、砂和礫石	Clay/silt, sand gravel; well-sorted to semi-sorted
	Beach deposits 海灘沉積	Qb 砂	Sand
	Raised beach deposits 高位海灘沉積	Qrb 砂	Sand
第四系 QUATERNARY	洪口組 HANG HAU FORMATION		
	QHH 主要為深灰色含頁岩海相和河口海相淤泥(未分)		Undivided, mainly dark grey, fossiliferous, marine and estuarine mud
更新—全新統 PLISTOCENE AND HOLOCENE	Debris flow deposits 堆積、洪積物	Qd 未分選的砂、礫至漂礫、基質為黏土/粉砂	Unsorted sand, gravel, cobbles and boulders; clay/silt matrix
更新統 PLEISTOCENE	Terraced alluvium 階地沖積物	Qpa 分選性良好至中等的礫質、砂質黏土/粉砂	Clay/silt, gravelly sandy, well-sorted to semi-sorted
	Debris flow deposits 堆積、洪積物	Qpd 未分選：夾中礫和漂礫的黏土質粉砂/砂	Silt/sand, clayey with cobbles and boulders; unsorted

Legend

Site Boundary

Consultant

ARUP

Contract No. and Title

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

1:5,000 Geological Map (Superficial Geology)

Figure No.

3.3a

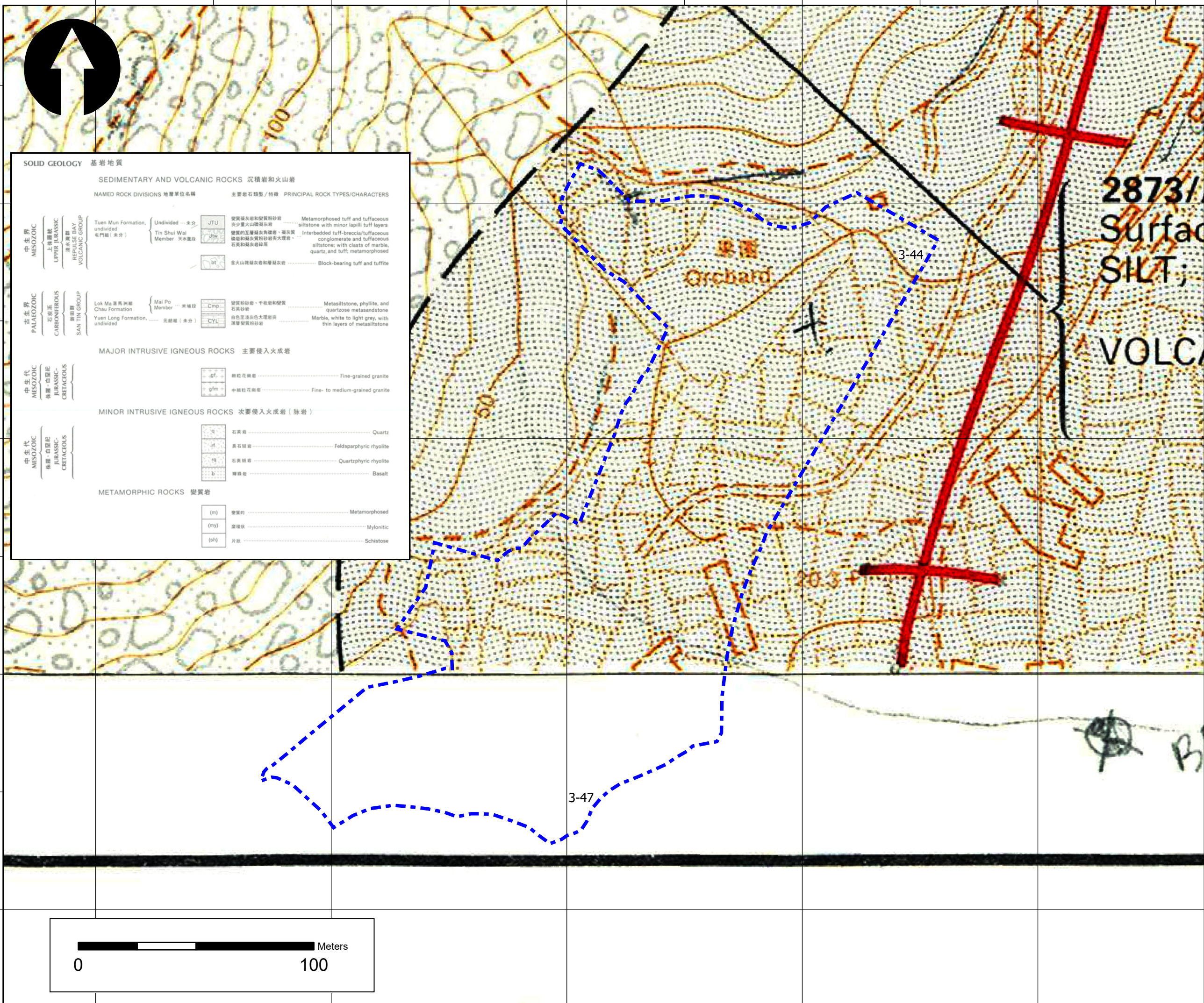
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Scale	1:1,500			@ A3			

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Civil Engineering and Development Department



SOLID GEOLOGY 基岩地質

SEDIMENTARY AND VOLCANIC ROCKS 沉積岩和火山岩

NAMED ROCK DIVISIONS 地層單位名稱

主要岩石類型 / 特徵 PRINCIPAL ROCK TYPES/CHARACTERS

中生界
MESOZOIC

上侏羅統
UPPER JURASSIC

淡水河組
TAN TAI HO GROUP

Tuen Mun Formation, undivided
屯門組 (未分)

Undivided 未分
Tin Shui Wai Member 天水圍段

JTU
JTW

變質凝灰岩和變質粉砂岩
夾少量火山碎屑灰岩
變質的互層凝灰岩和凝灰質
凝灰岩和凝灰質粉砂岩夾大理岩、
石英和凝灰岩碎屑

Metamorphosed tuff and tuffaceous
siltstone with minor lapilli tuff layers
Interbedded tuff-breccia/tuffaceous
conglomerate and tuffaceous
siltstone; with clasts of marble,
quartz, and tuff; metamorphosed

含火山碎屑灰岩和變質凝灰岩
Block-bearing tuff and tuffite

古生界
PALAEOZOIC

石炭系
CARBONIFEROUS

新田組
SAN TIN GROUP

Lok Ma Tsuen 馬洲嶺
Chau Formation

Yuen Long Formation, undivided
元朗組 (未分)

Mai Po Member 麥埔段
CYL

Cmp

變質粉砂岩、千枚岩和變質
石英砂岩
白色至淺灰色大理岩夾
淺變質凝灰粉砂岩

Metasiltstone, phyllite, and
quartzose metasandstone
Marble, white to light grey, with
thin layers of metasiltstone

中生代
MESOZOIC

侏羅-白堊紀
JURASSIC-CRETACEOUS

細粒花崗岩
Fine-grained granite

中細粒花崗岩
Fine- to medium-grained granite

中生代
MESOZOIC

侏羅-白堊紀
JURASSIC-CRETACEOUS

石英岩
Quartz

英石粗岩
Feldsparphyric rhyolite

石英粗岩
Quartzphyric rhyolite

輝綠岩
Basalt

變質岩
Metamorphosed

糜礫狀
Mylonitic

片狀
Schistose

Legend

Site Boundary

Contract No. and Title

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

1:5,000 Geological Map (Solid Geology)

Figure No.

3.3b

Rev.

-

Drawn

AL

Date

07.2026

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KL

Approved

KC

Scale

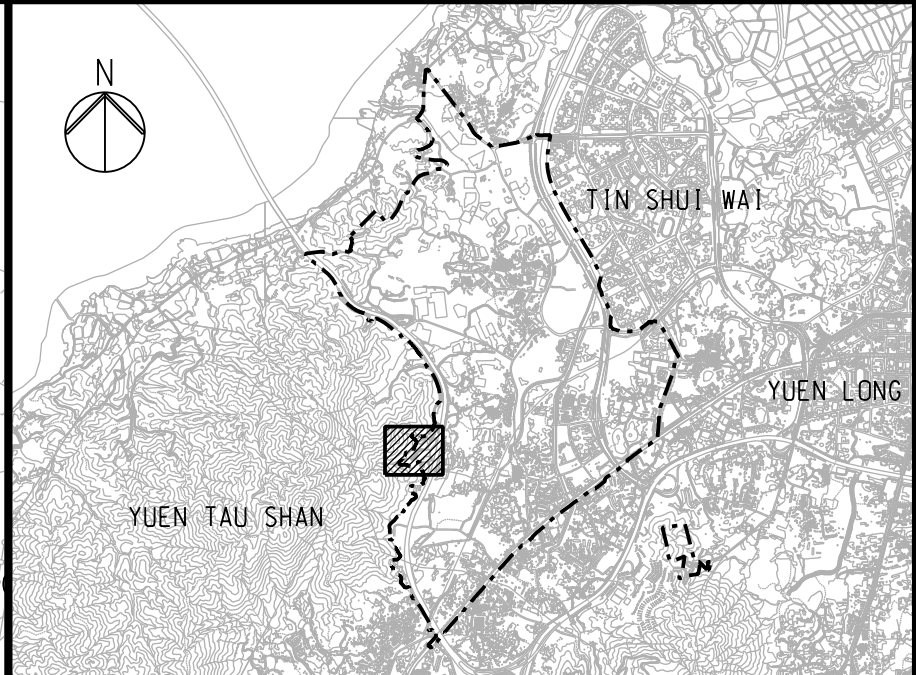
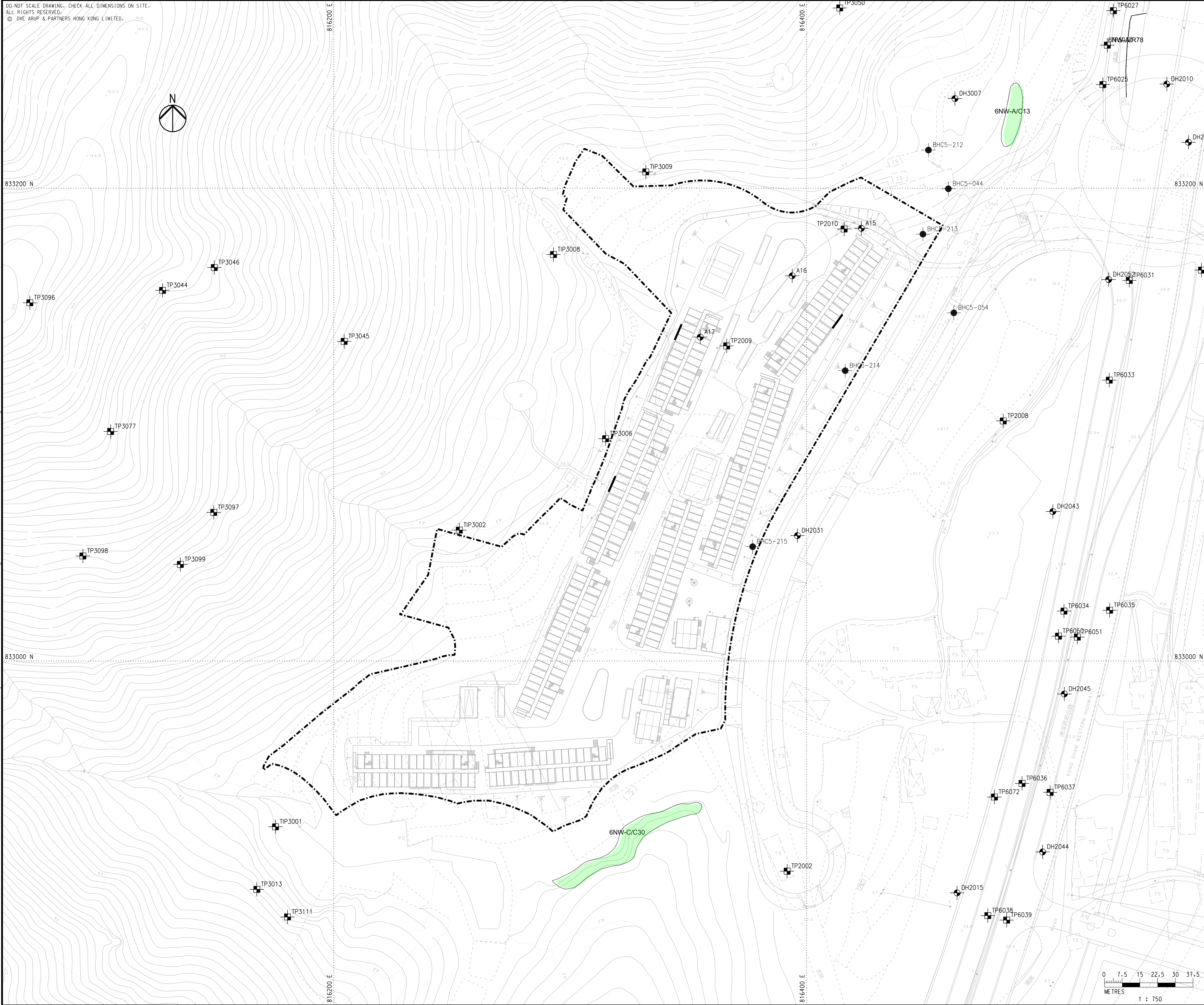
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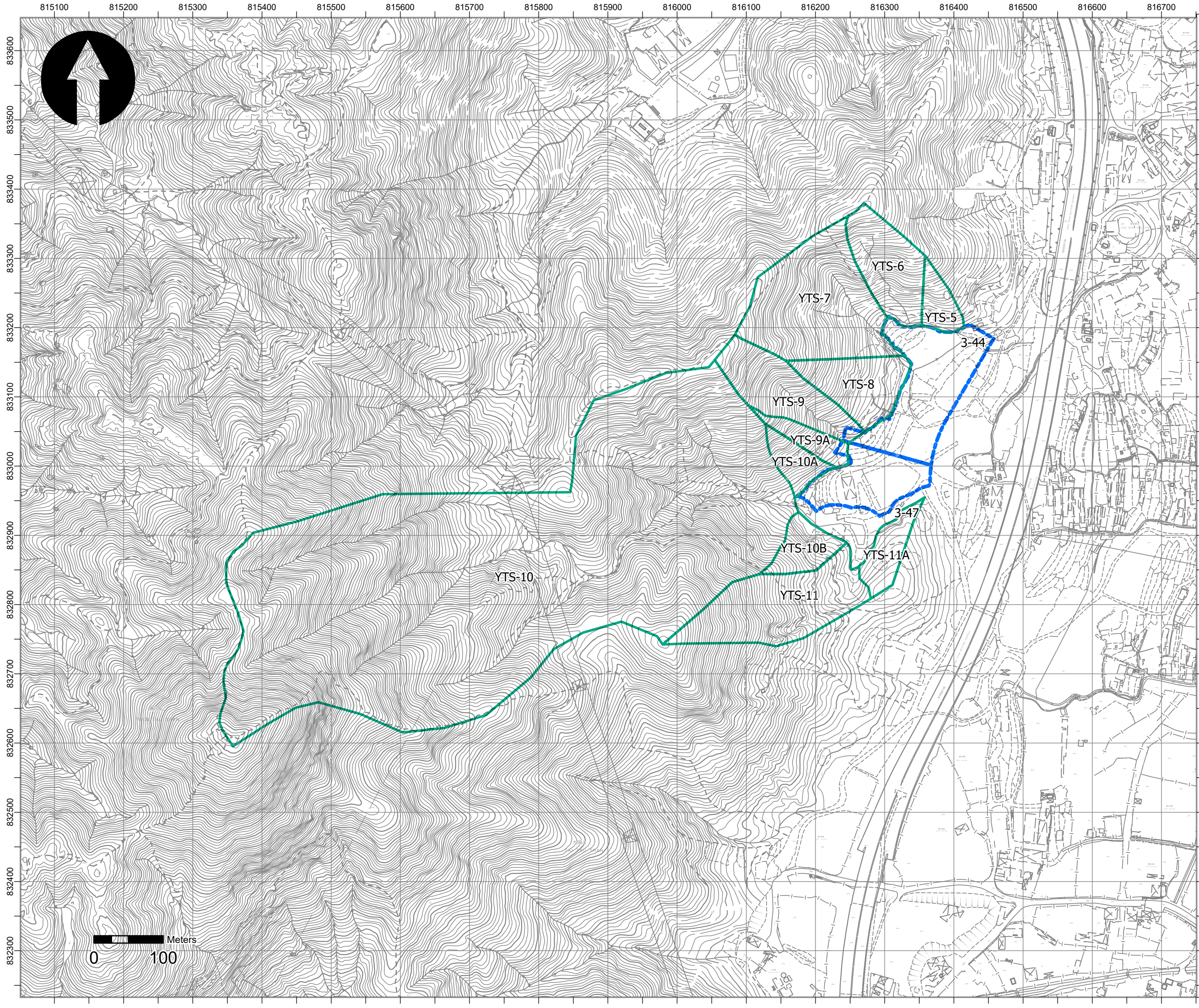


KEY PLAN

LEGEND

- APPLICATION SITE
- EXISTING DRILLHOLE (YL/2021/02)
- EXISTING TRIAL PIT (YL/2021/02)
- EXISTING DRILLHOLE (YL/2023/05)
- EXISTING REGISTERED FEATURES

A		FIRST ISSUE		KL	07/26
Rev	Description	By	Date		
Consultant					
ARUP					
Project Title					
Agreement No. CE 1/2020 (CE)					
Hung Shui Kiu / Ha Tsuen					
New Development Area Package A					
Works for Second Phase Development – Design and Construction					
Drawing title					
HSK / HT NDA SECOND PHASE DEVELOPMENT IMPORTED LABOUR QUARTERS EXISTING GROUND INVESTIGATION AND REGISTERED FEATURES LAYOUT PLAN					
Figure 3.4				Rev.	A
Drawn	Date	Checked	Approved		
AC	07/26	EH	KKC		
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- Legend**
- Site Boundary
 - Natural Terrain Catchments

Consultant

ARUP

Contract No. and Title

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

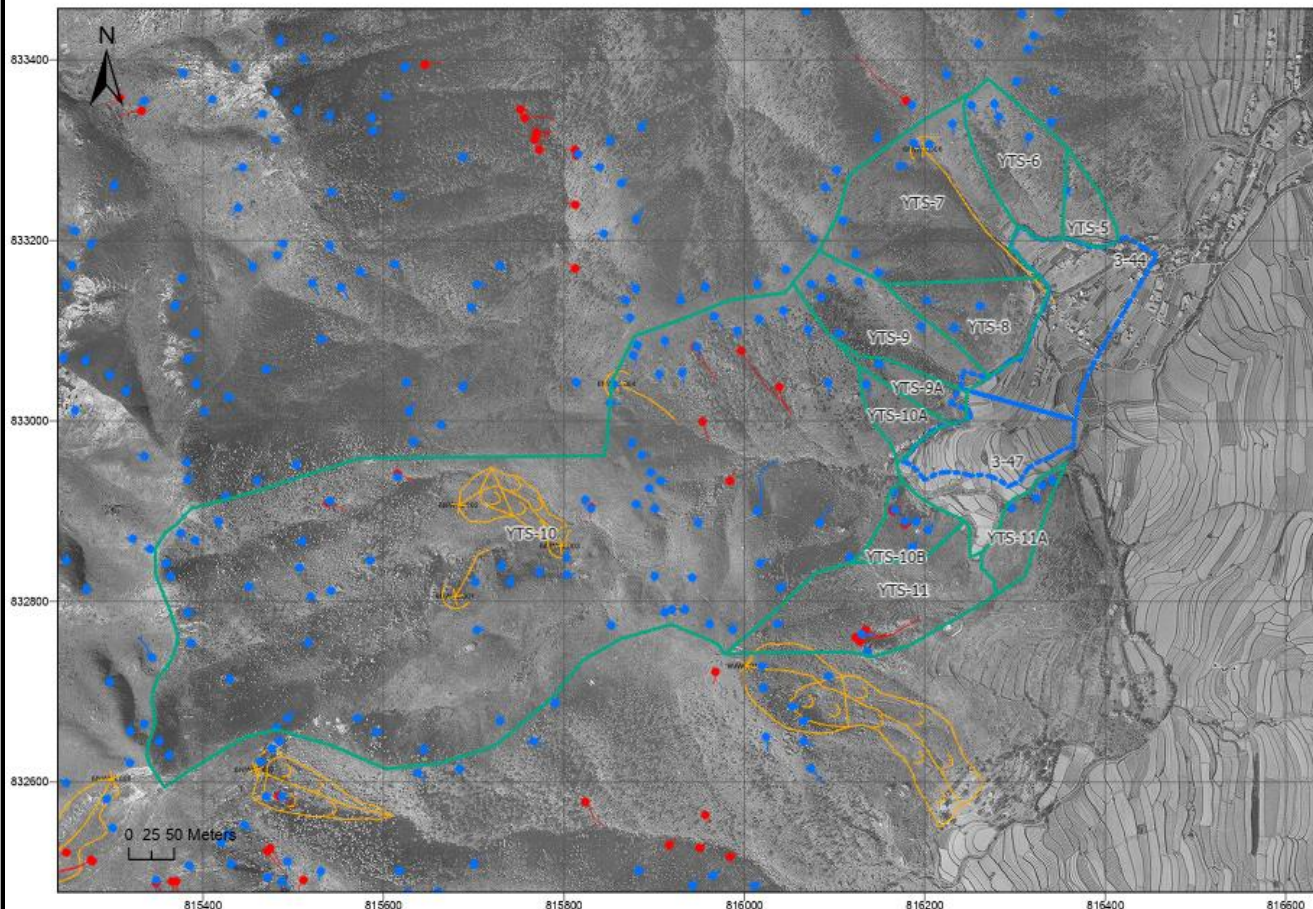
Natural Terrain Catchment Layout Plan

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Drawn	AL	Date	07.2026
Checked	KL	Approved	KC
Scale	1:5,000	@ A3	

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Appendix A

Aerial Photograph Interpretation Report



Year 1963

Sites 3-44 & 3-47

- The Sites were largely covered by farmland with multiple footpaths and village houses.
- Well-defined drainage basins that include incised drainage channels were noted within Catchment Nos. YTS-6, YTS-7, YTS-9, YTS-10. In Catchment No. YTS-10, several streams join to form a single channel in the middle and lower parts of the catchment.
- Multiple relict ENTLI records have been recorded within the natural terrain catchments overlooking the Sites. Along with four (4) large landslide in Catchment No. YTS-10 and one (1) in Catchment No. YTS-7.
- No significant signs of anthropogenic disturbance were observed in the NTHS Catchments. Minor disturbances include scattered graves at the middle to lower portion of Catchment No. YTS-10.

Legend

- Site Boundary
- Catchment Boundary
- Recent ENTLI Source
- Relict ENTLI Source
- Large Landslide Dataset

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

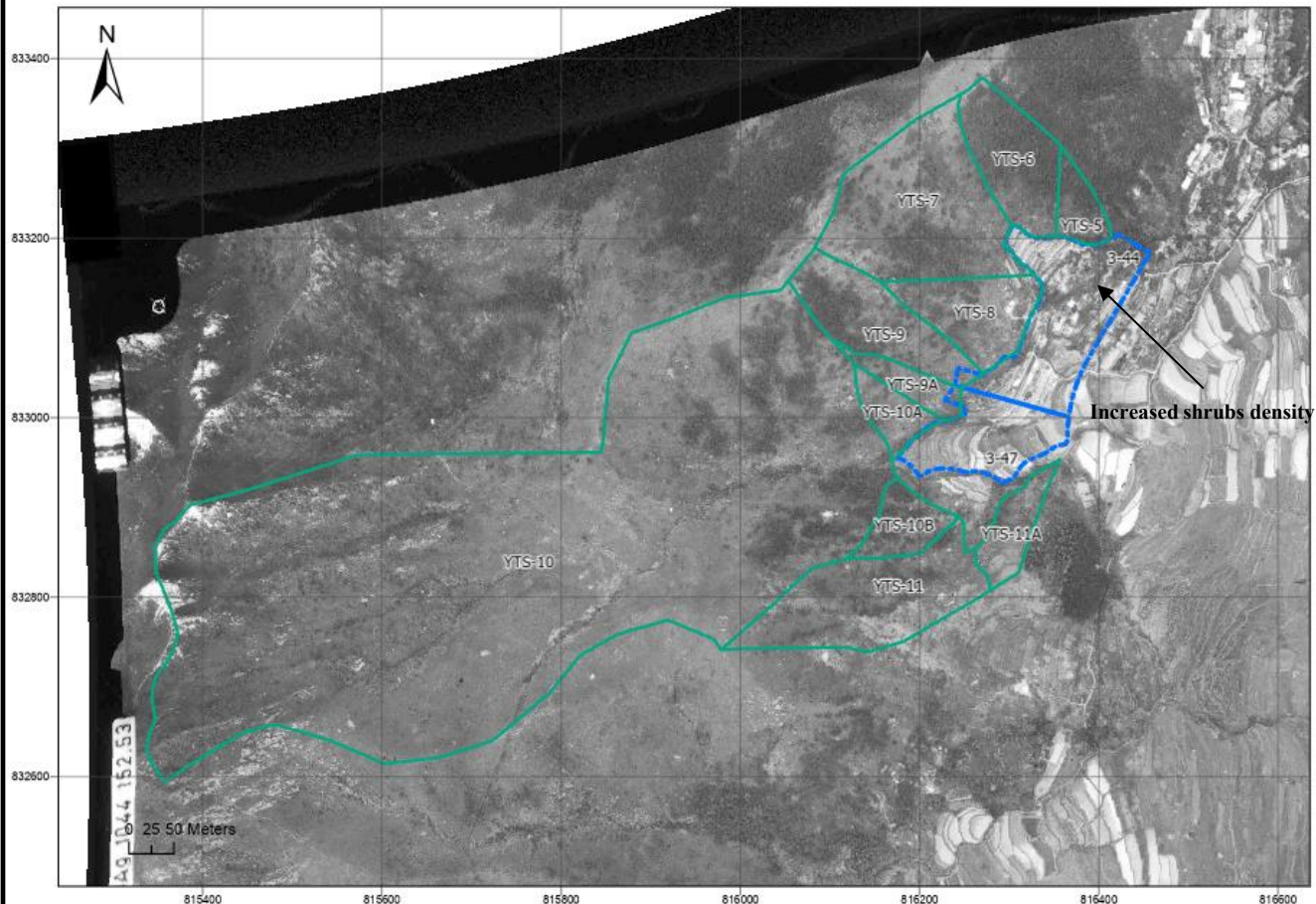
ARUP

Scale N.T.S.

Drn. AL Date Jul 2026 Chd. HC Passed JL

Job No. 278463

Figure No. A1



Year 1973

Sites 3-44 & 3-47

- Farmland at the northern portion of Site 3-44 seemingly being abandoned as reflected by increased density of shrubs
- No significant changes noted within the natural terrain catchments.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

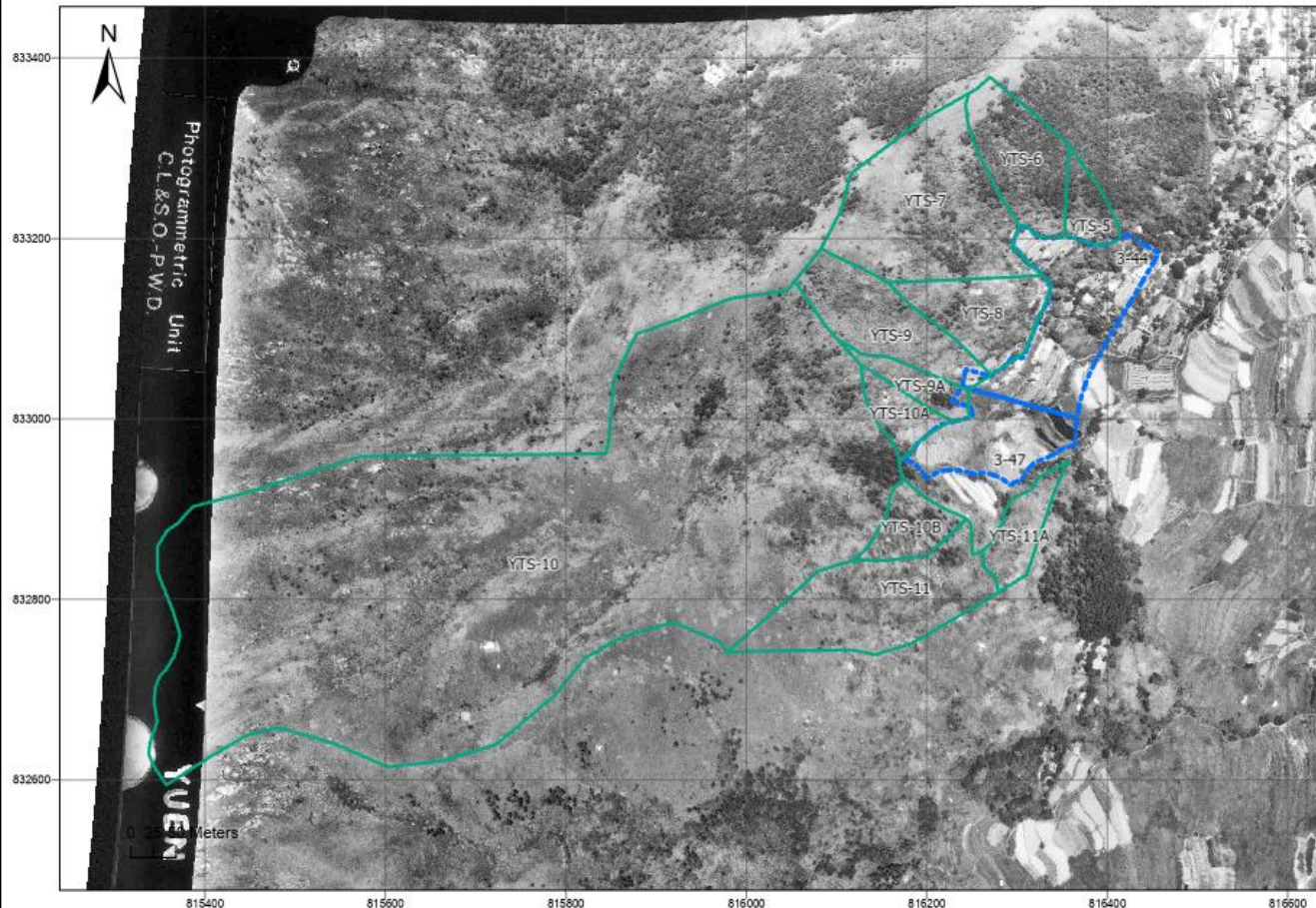
ARUP

Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A2



Year 1979

Sites 3-44 & 3-47

- No significant changes were noted within the Sites and natural terrain catchments.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

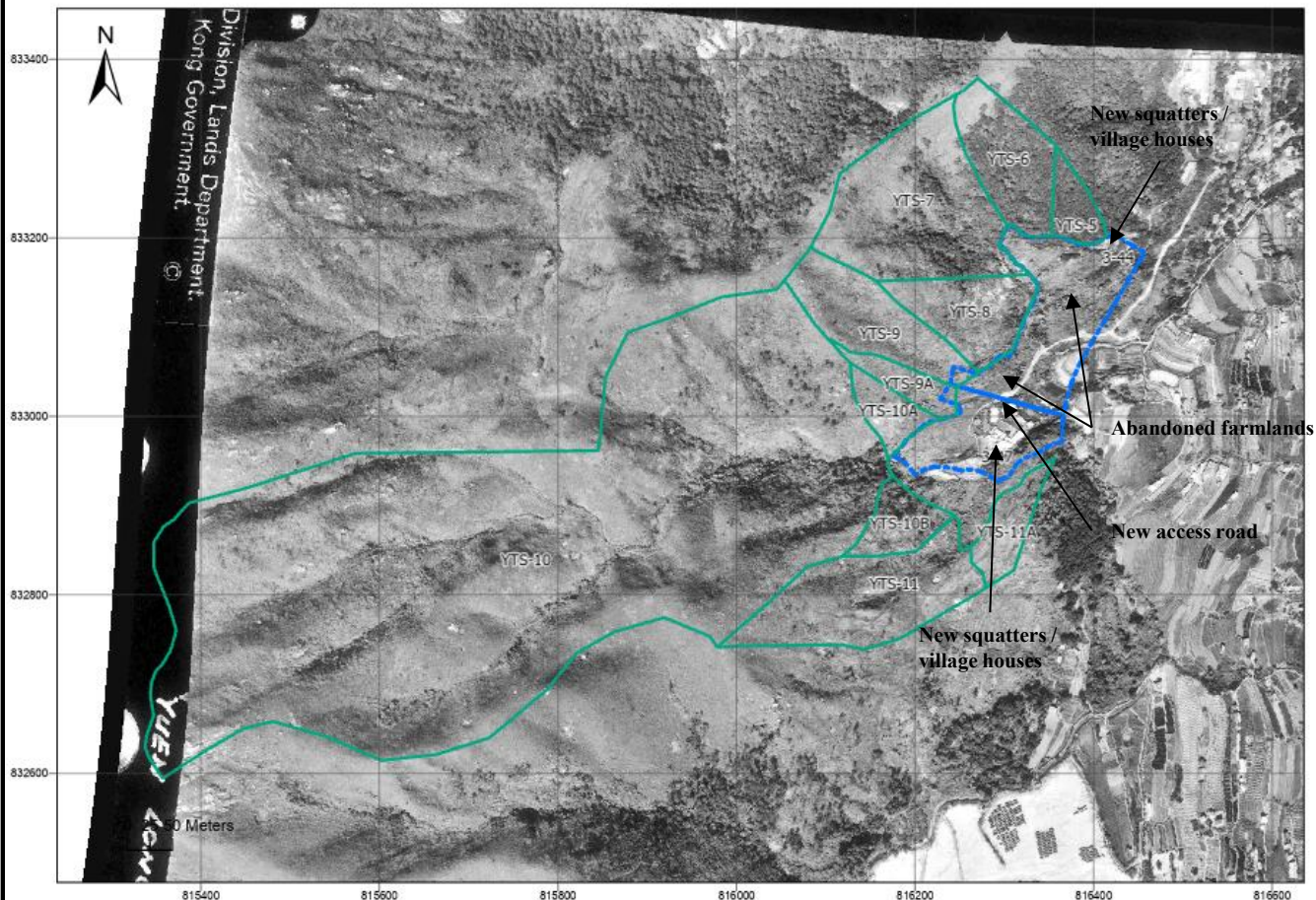
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Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A3



Year 1982

Sites 3-44 & 3-47

- Much of the farmland were covered by vegetation, suggesting most of them were abandoned.
- A new access road was formed traversing the Sites.
- Multiple squatters / village houses were formed at the northern portion of Site 3-44 and southern portion of Site 3-47.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

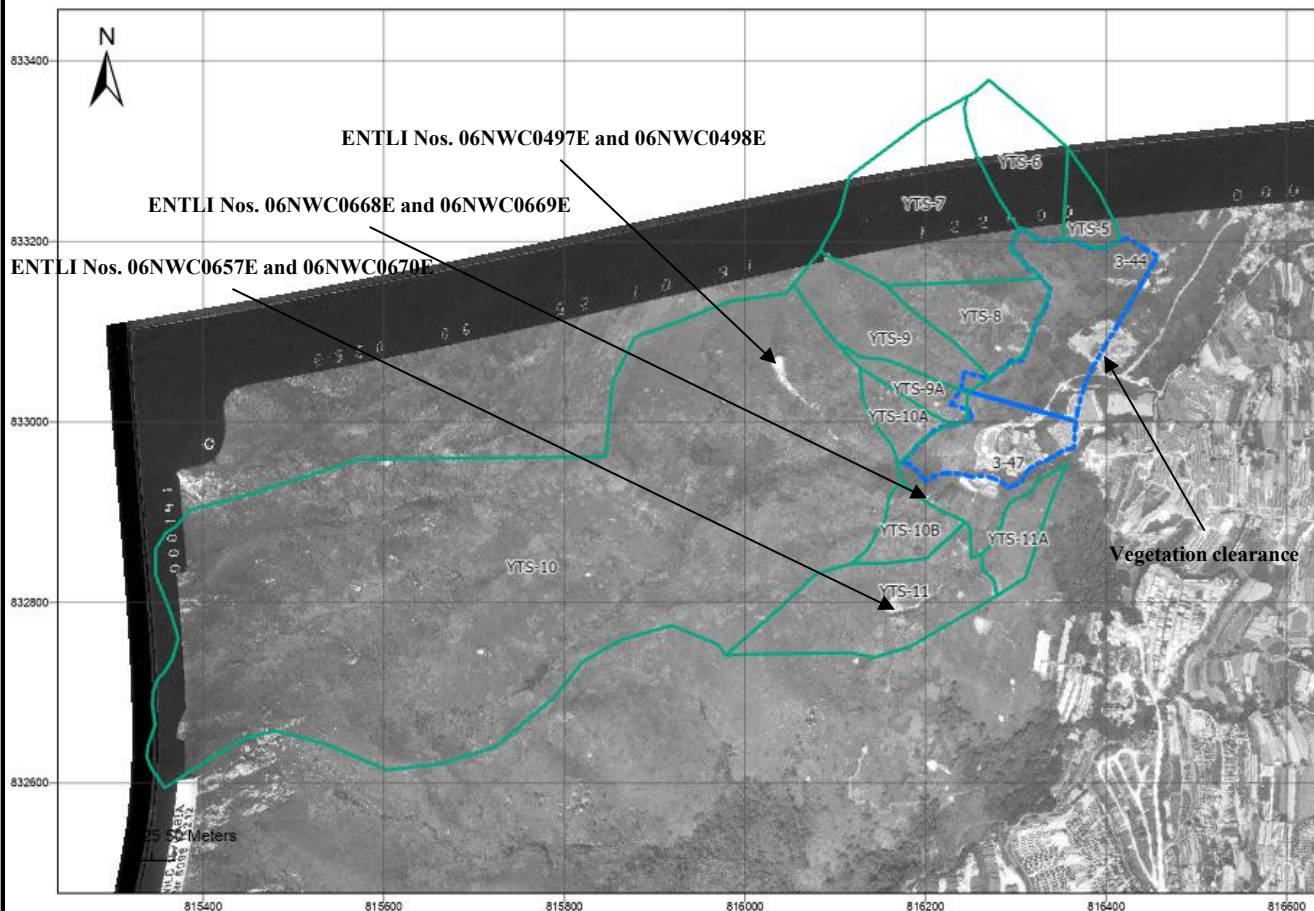
ARUP

Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A4



Year 1989

Sites 3-44 & 3-47

- Vegetation clearance noted at the eastern boundary of Site 3-44.
- ENTLI No. 06NWC0497E and 06NWC0498E occurred at the upper northern portion of Catchment No. YTS-10. ENTLI No. 06NWC0497E exhibited clear landslide scarp and debris travel path. The depression of ENTLI No. 06NWC0498E was not obvious, possibly eroded by the debris produced by ENTLI No. 06NWC0497E.
- ENTLI No. 06NWC0668E and 06NWC0669E were noted at the toe of Catchment No. YTS-10B. Slightly degraded depressions were observed for both landslides.
- ENTLI No. 06NWC0657E and 06NWC0670E occurred at the upper portion of NTHS Catchment No. YTS-11. The two landslides were of close proximity and displayed clear landslide scarp and debris travel path.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

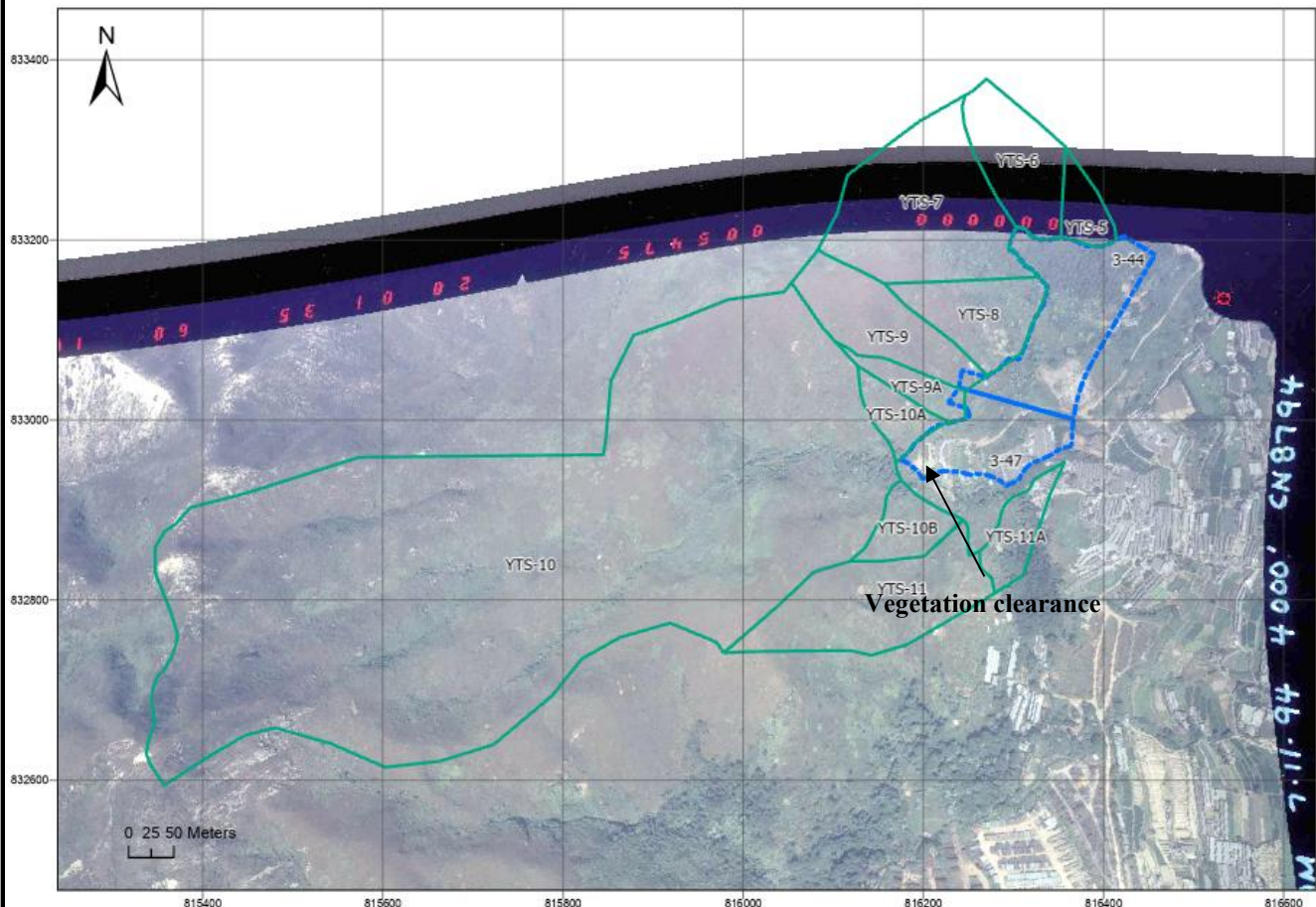
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Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A5



Year 1994

Sites 3-44 & 3-47

- Vegetation clearance noted at western portion of Site 3-47.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

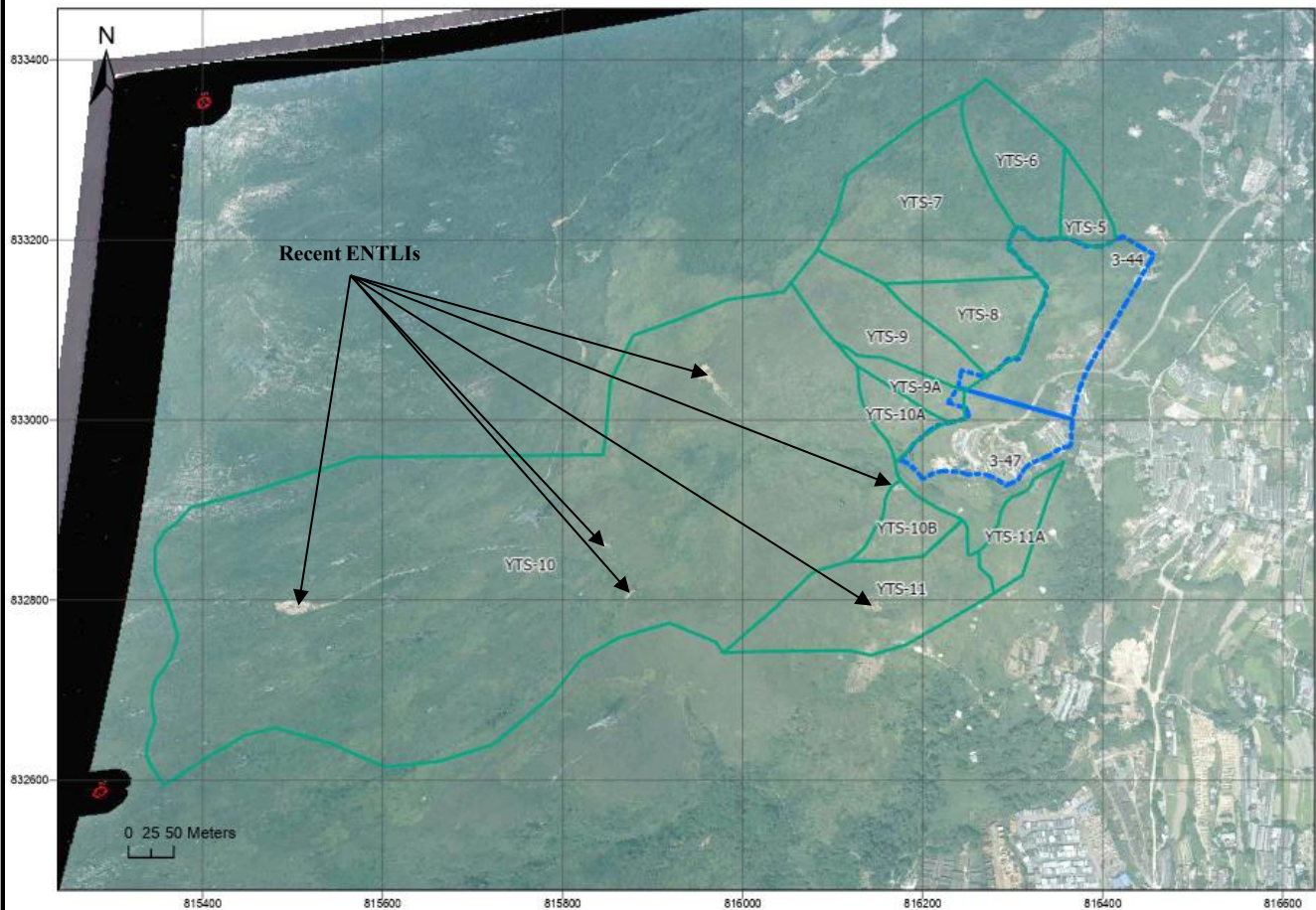
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Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A6



Year 2000

Sites 3-44 & 3-47

- No significant changes were noted within the Sites.
- ENTLI Nos. 06NWA0541E, 06NWC0752E, 06NWC0753E, 06NWC0784E, 06NWC0785E in Catchment Nos. YTS-10 and YTS-10B, 06NWC0754E in Catchment No. YTS-11.
- ENTLI Nos. 06NWC0541E and 06NWC0752E showed clear scarp and flow trails. Meanwhile, ENTLI Nos. 06NWC0753E, 06NWC0785E and 06NWC0784E showed depression features with bare vegetation cover, no obvious flow trail and displaced materials could be identified.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

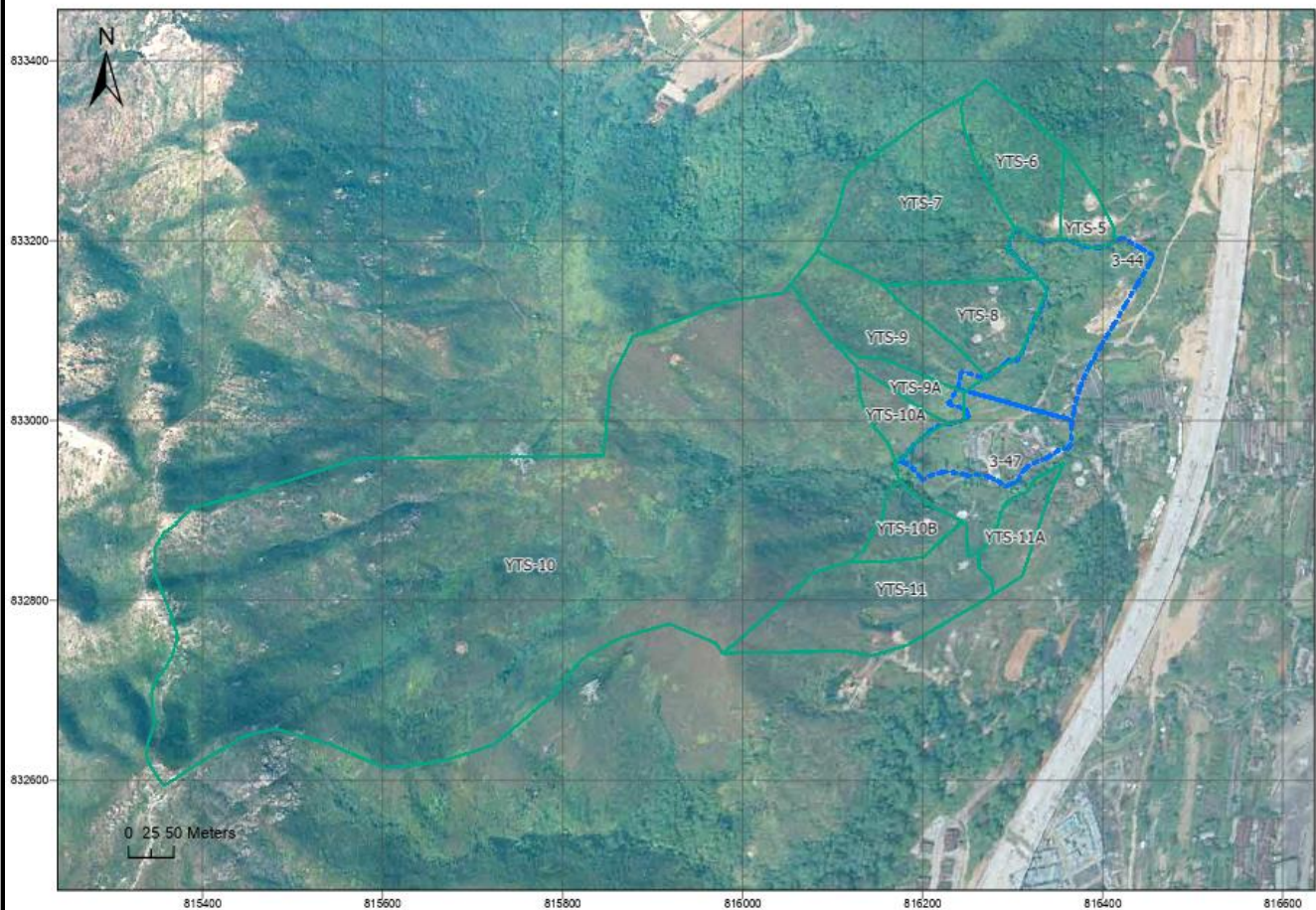
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Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A7



Year 2005

Sites 3-44 & 3-47

- No significant changes were noted within the Sites and natural terrain catchments.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

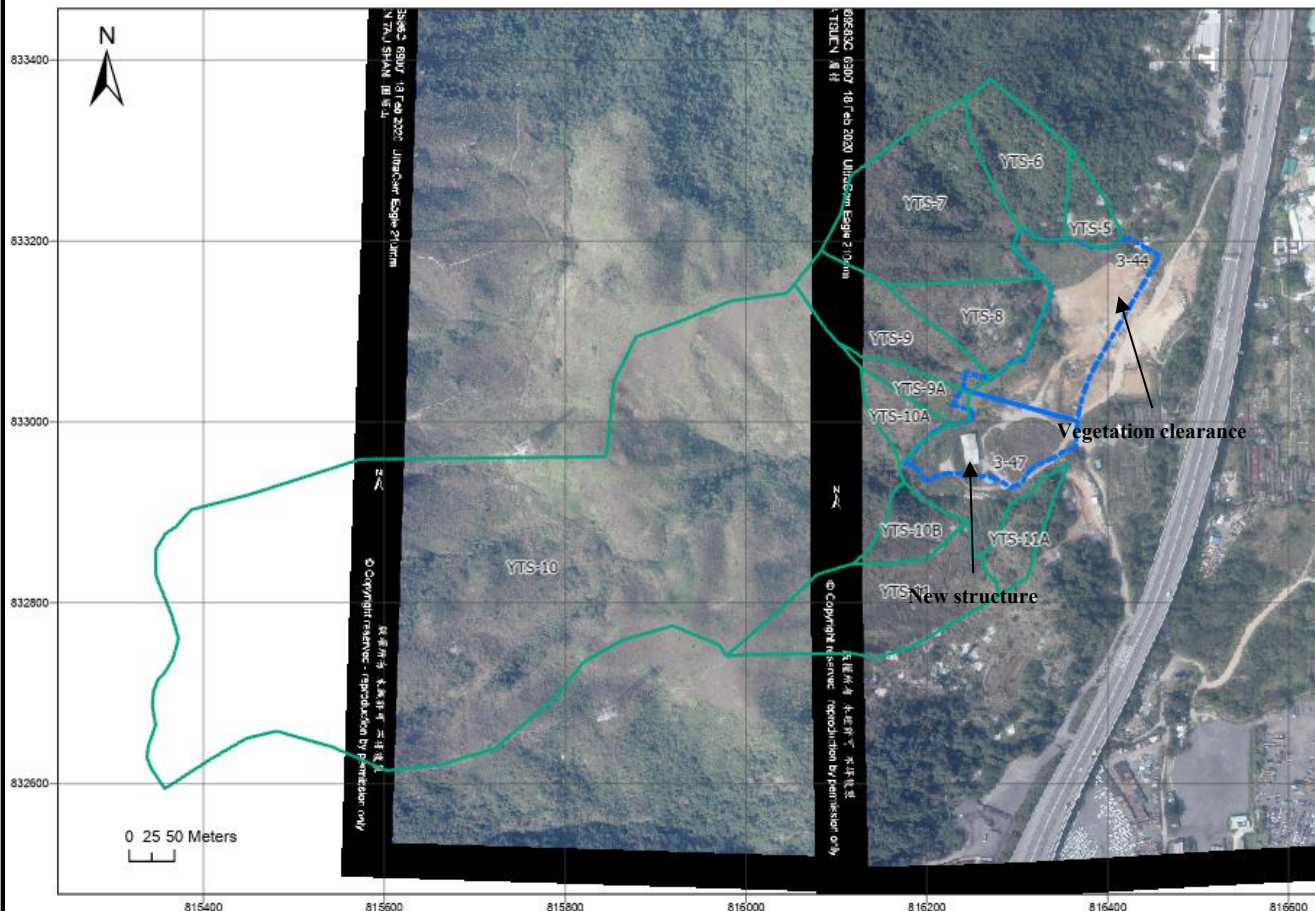
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Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A8



Year 2020

Sites 3-44 & 3-47

- Large scale vegetation clearance was noted across the Sites.
- A structure formed at the western part of Site 3-47.
- No significant changes within the natural terrain catchments are noted.

Legend

- Site Boundary
- Catchment Boundary

Job Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
- Design and Construction

Figure Title

Aerial Photograph Interpretation

ARUP

Scale N.T.S.

Drn. AS Date Apr 2024 Chd. HC Passed JL

Job No. 278463

Figure No. A9



Year 2025

Sites 3-44 & 3-47

- Extent of structure at Site 3-47 increased.
- No significant changes within the natural terrain catchments are noted.

Legend

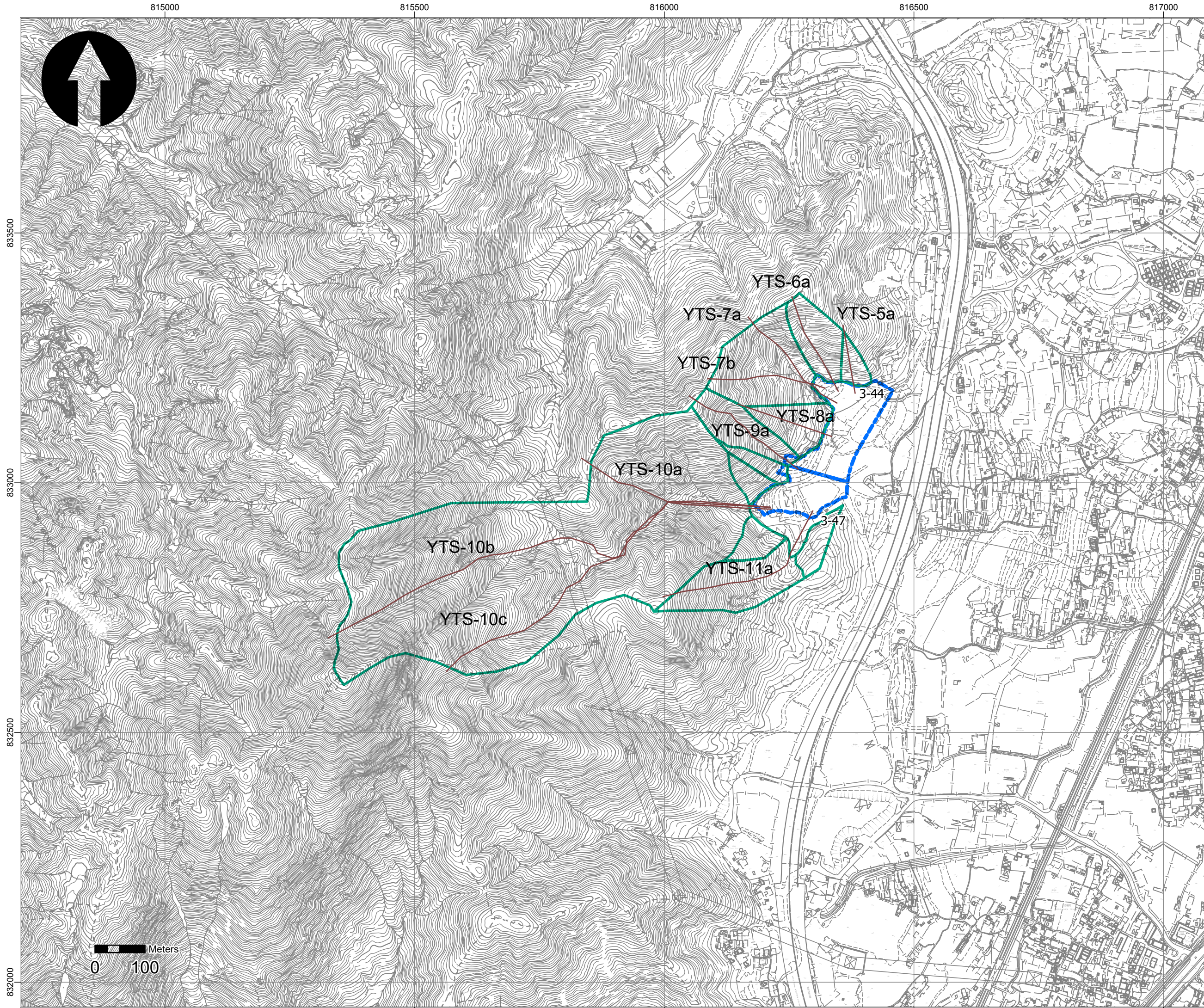
Site Boundary

Catchment Boundary

Job Title Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development - Design and Construction	Figure Title Aerial Photograph Interpretation	ARUP			
		Scale N.T.S.			
		Drn. AS	Date Apr 2024	Chd. HC	Passed JL
		Job No. 278463		Figure No. A10	

Appendix B

Extract of Previous NTHS Report for HSK/HT NDA Area



Legend

- Site Boundary
- Natural Terrain Catchments
- Screening Section

Contract No. and Title

ARUP

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

Layout Plan Showing NTHS Screening Sections

Figure No.		C1		Rev.	
Drawn	AL	Date	07.2026	Checked	KL
Scale		1:7,000		Approved	
		@ A3		KC	

Consultant

ARUP

Contract No. and Title

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

Drawing Title

Layout Plan Showing NTHS Screening Sections

Figure No.

C1

Rev.

-

Drawn

AL

Date

07.2026

Checked

KL

Approved

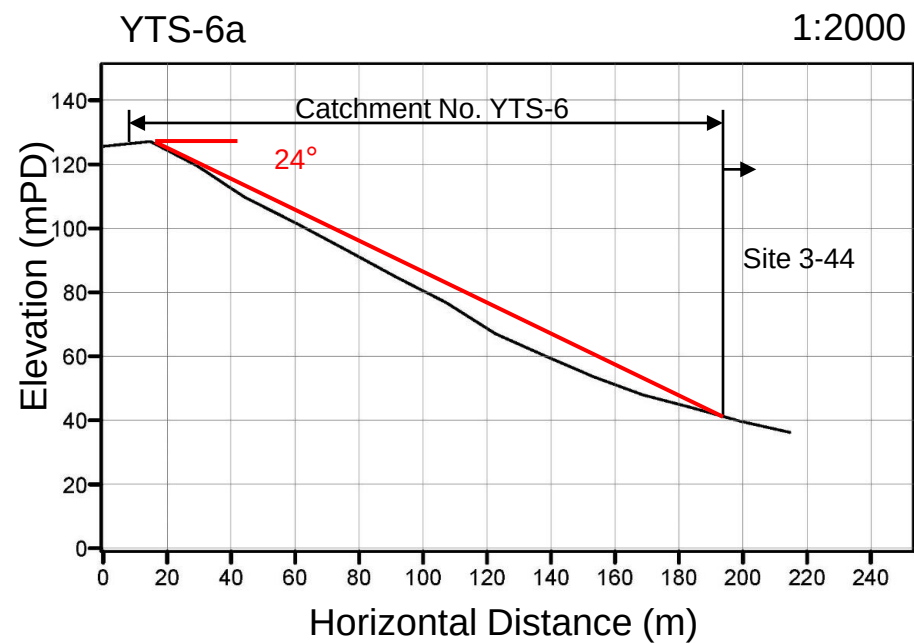
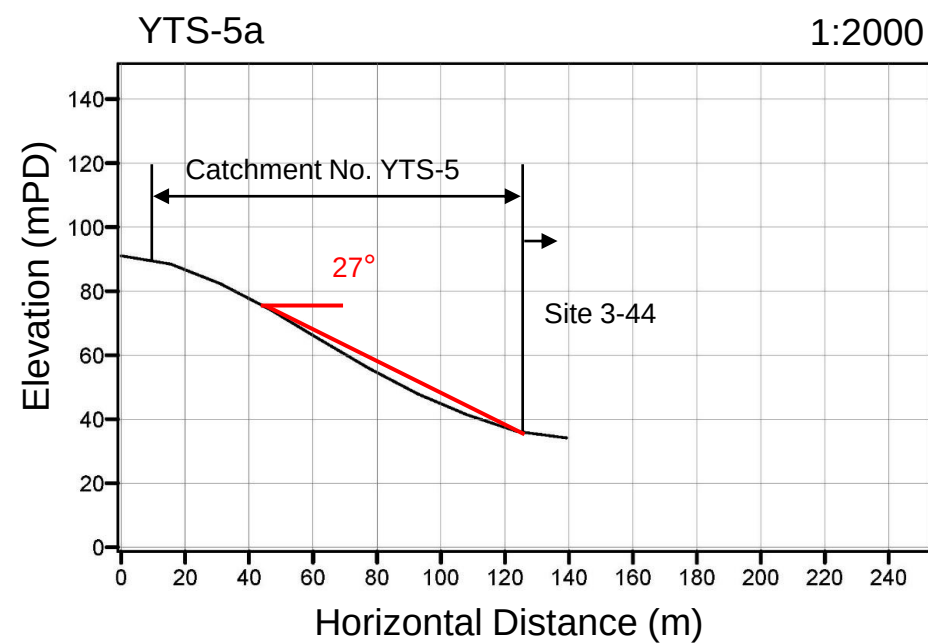
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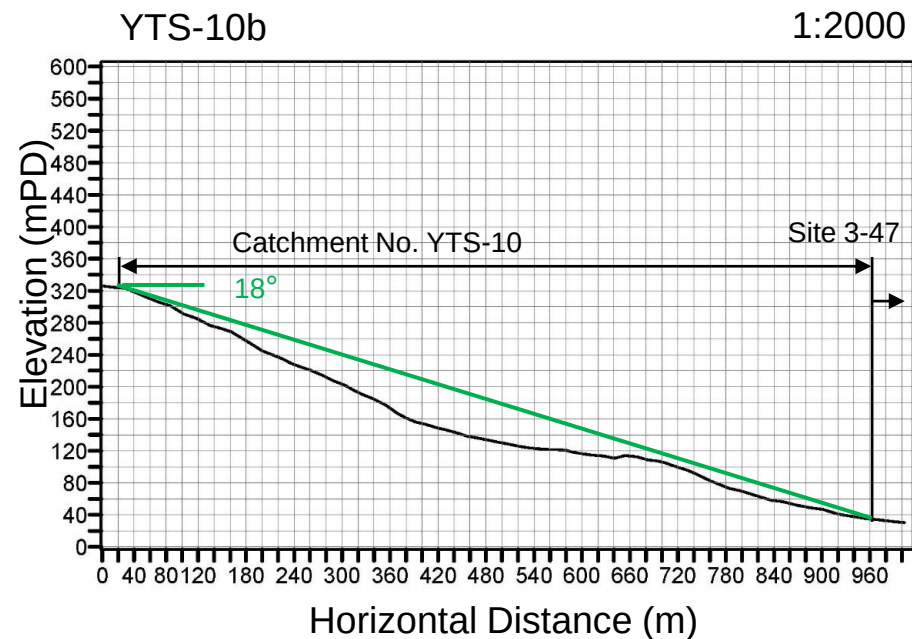
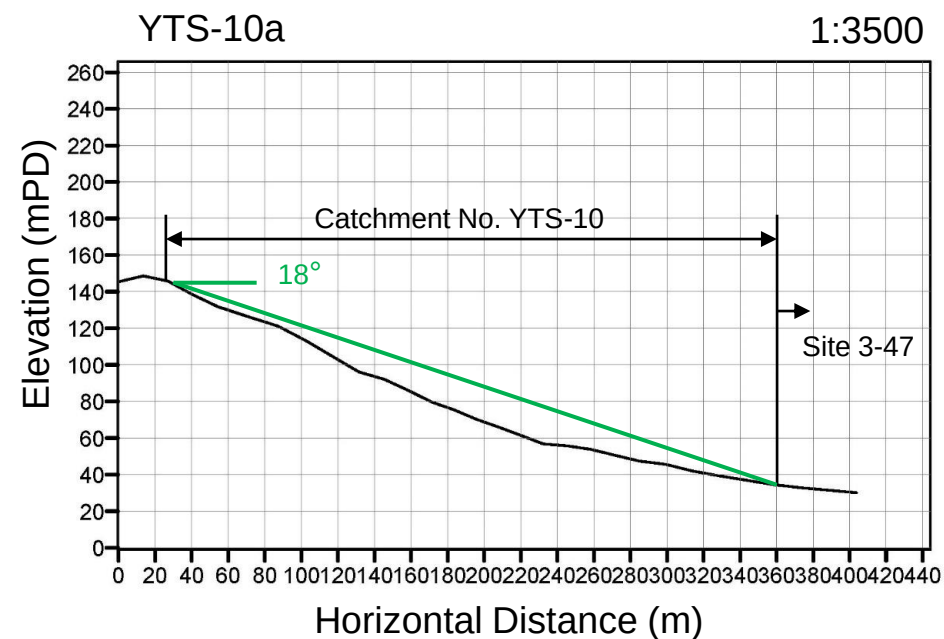
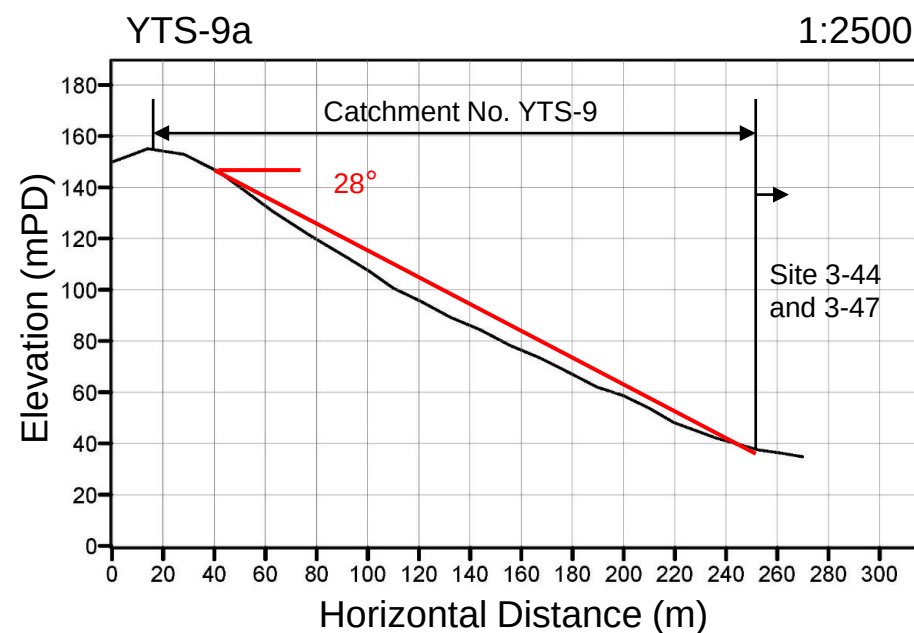
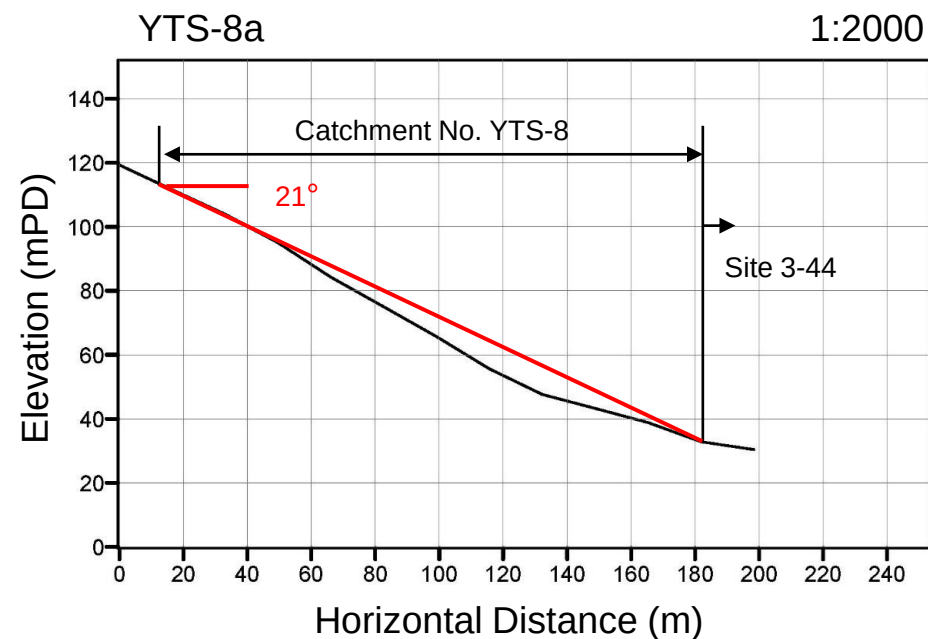
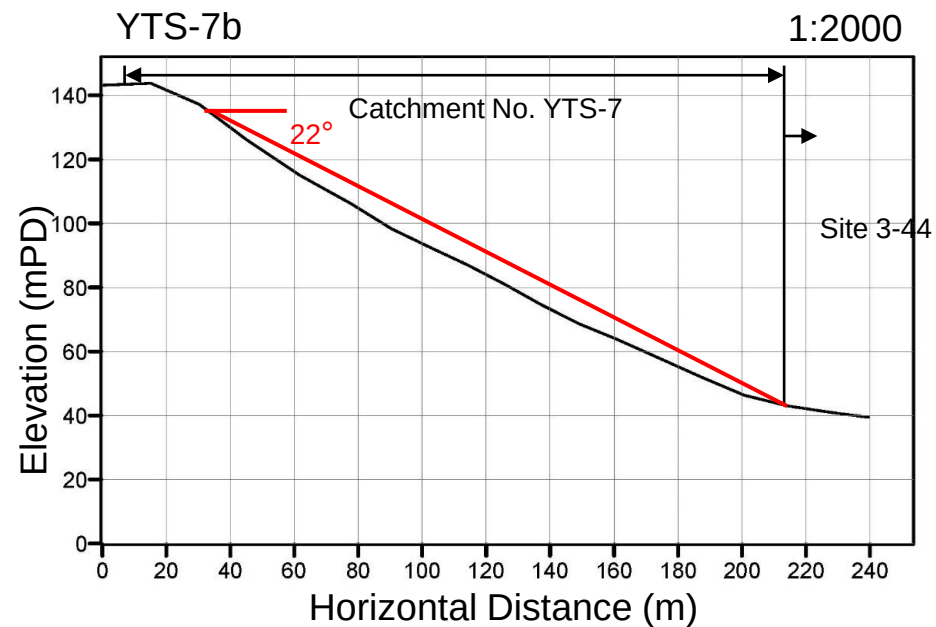
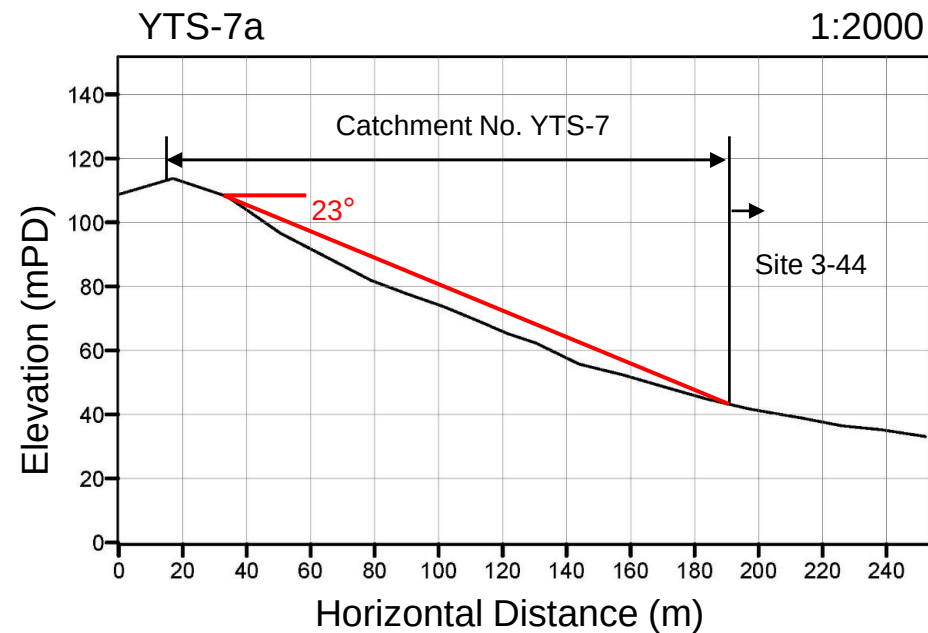
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@ A3

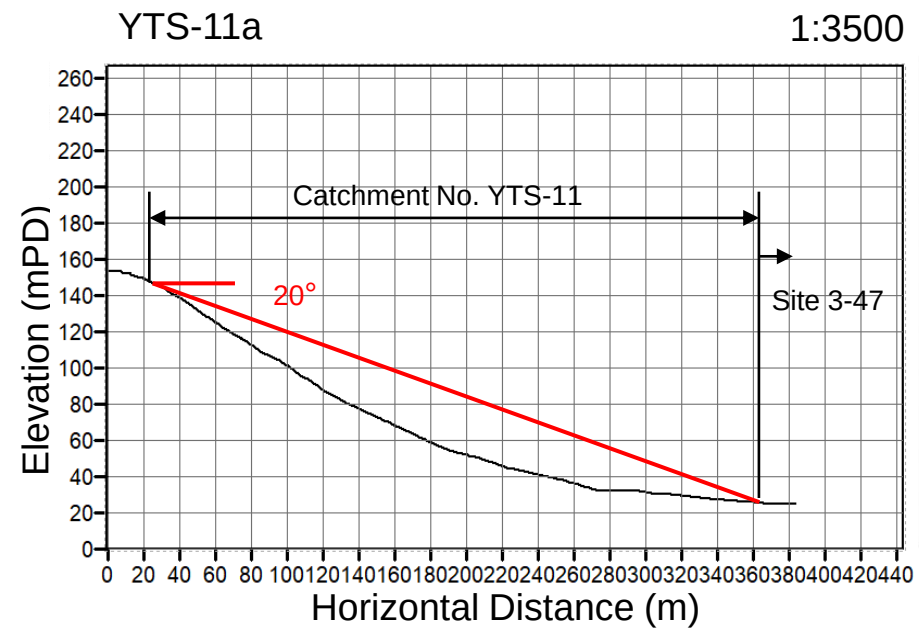
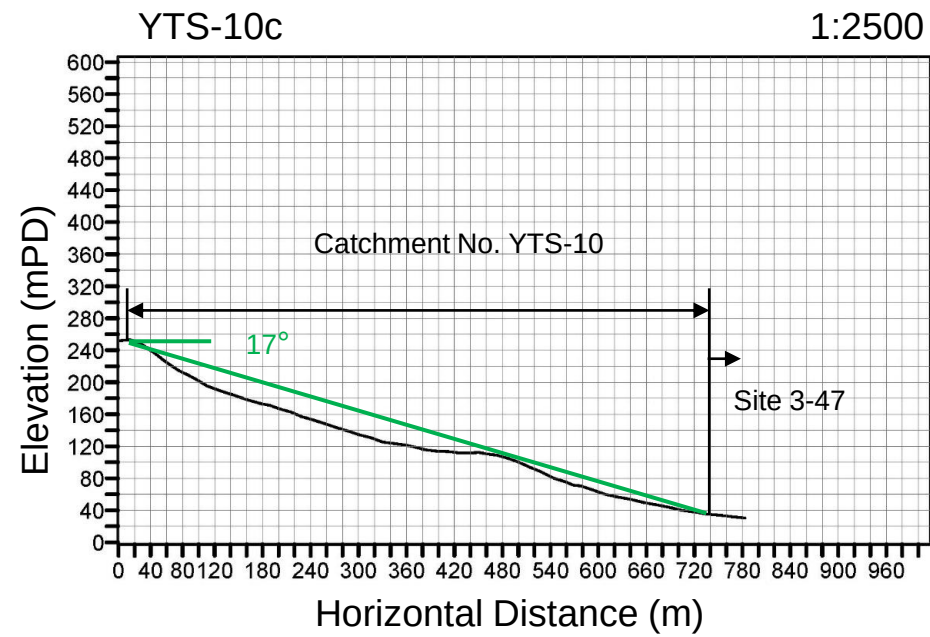
CEDD 土木工程拓展署
Civil Engineering and Development Department



Consultant						
ARUP						
Contract No. and Title						
Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction						
Drawing Title						
Southern Package Screening Sections (1 of 5)						
Figure No.				Rev.		
Figure 3.2.1				P0		
Drawn	AKL	Date	2022-12-11	Checked		
		AKL		Approved		
		AKL		AKL		
Scale						
1:0 @ A3						
 土木工程拓展署 Civil Engineering and Development Department						



Consultant			
ARUP			
Contract No. and Title Agreement No. CE 1/2020 (CE) Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction			
Drawing Title Southern Package Screening Sections (2 of 5)			
Figure No.		Rev.	
Figure 3.2.1		P0	
Drawn	AKL	Checked	AKL
Scale	1:0 @ A3		
CEDD 土木工程拓展署 Civil Engineering and Development Department			



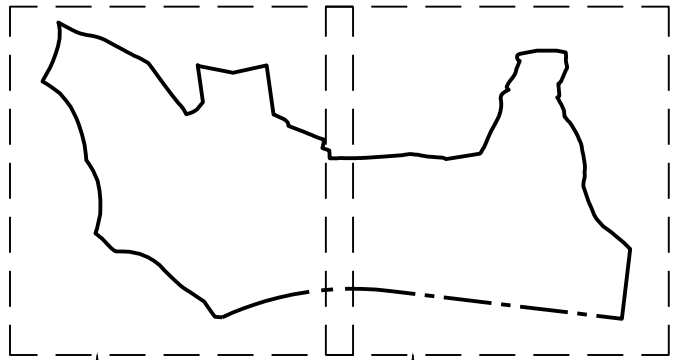
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ARUP	
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Drawing Title Southern Package Screening Sections (3 of 5)	
Figure No.	Rev.
Figure 3.2.1	P0
Drawn	Checked
AKL	AKL
Date	Approved
2022-12-11	AKL
Scale	
1:0 @ A3	
 土木工程拓展署 Civil Engineering and Development Department	

Appendix C

Proposed Site Formation Plan

SCHEMATIC LAYOUT PLAN
FOR INFORMATION ONLY

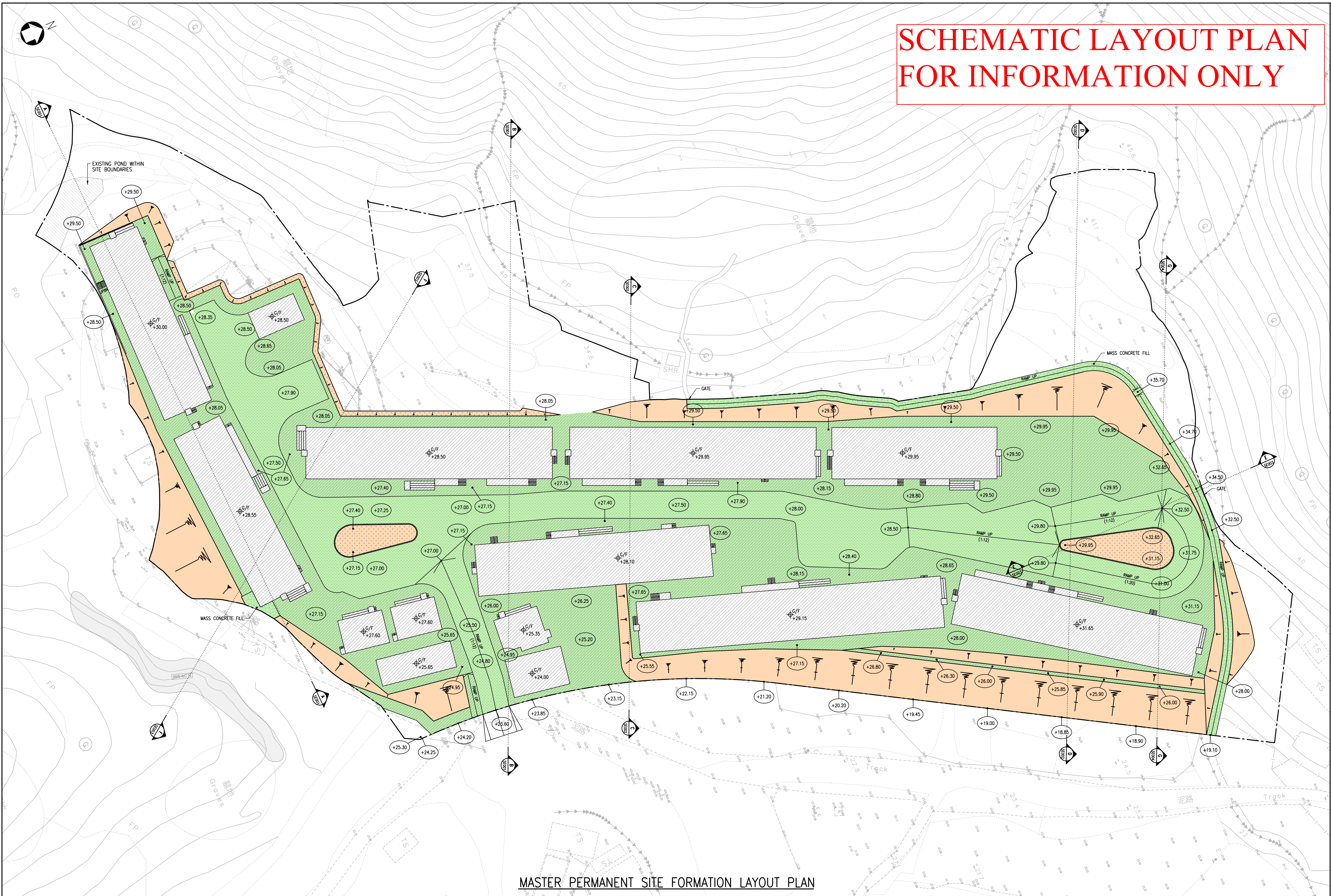
EXTRACTED FROM DRAWING:



REFER TO
DRAWING NUMBER
F/SF001/FP102

REFER TO
DRAWING NUMBER
F/SF001/FP103

KEY PLAN



MASTER PERMANENT SITE FORMATION LAYOUT PLAN

LEGEND

- — — SITE BOUNDARY LINE
- (+27.00) PROPOSED FORMATION LEVEL (mPD)
- PROPOSED CONCERTEED PAVEMENT
(FOR DRIVEWAY)
- PROPOSED FOOTPATH PAVING
(FOR PEDESTRIAN/ MAINTENANCE ACCESS)
- PROPOSED MASS CONCRETE FILL

- PROPOSED SOIL SLOPE (COVERED BY HYDROSEEDING) AS BELOW:
- PROPOSED MAXIMUM 30° SOIL CUT SLOPE
- PROPOSED TRANSITION ZONE (FROM 30° TO 33°) SOIL CUT SLOPE
- PROPOSED MAXIMUM 33° SOIL CUT SLOPE
- PROPOSED MAXIMUM 30° SOIL FILL SLOPE
- PROPOSED BUILDING STRUCTURE
UNDER SEPARATE SUBMISSION

23.73 EXISTING GROUND LEVEL (mPD)

AMENDED DRAWING

0 5 10 15 20 25 m
1 : 500 SCALE BAR

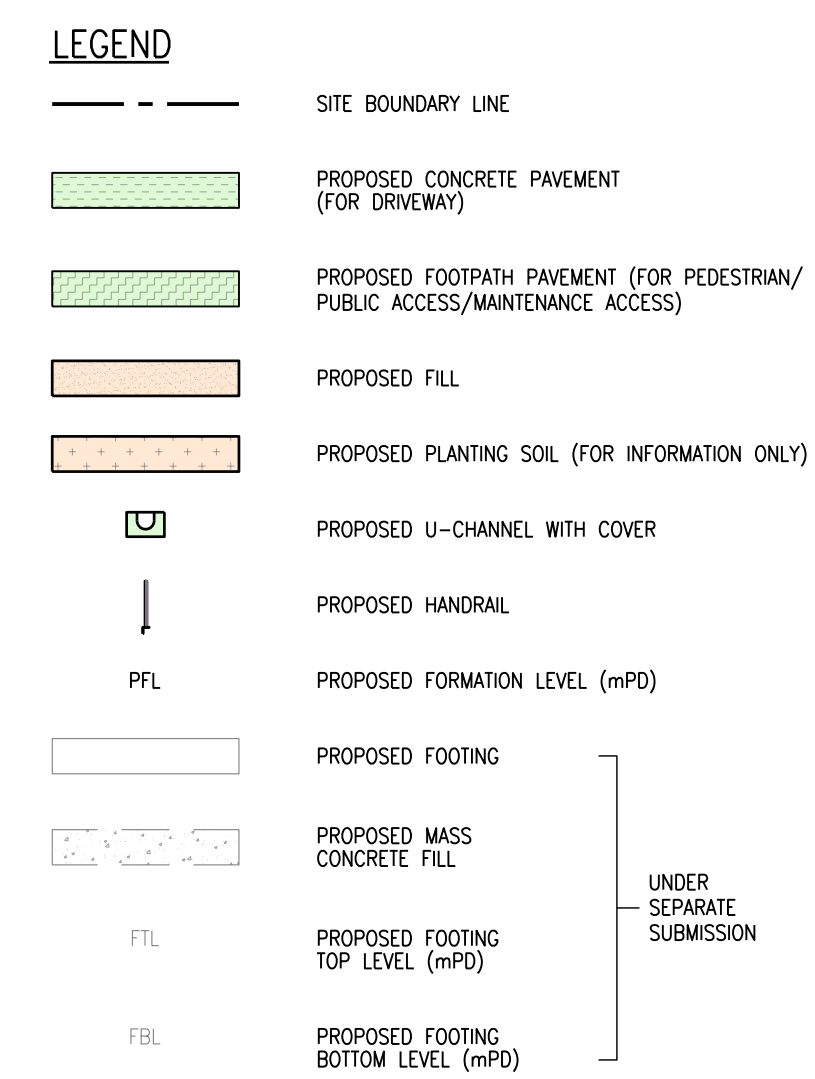
Drawing Title

SITE FORMATION WORKS –
MASTER PERMANENT SITE FORMATION
LAYOUT PLAN

Status SUBMISSION

Drawn WT	Checked KC	Approved WC
Scale 1:500 (A1)	CAD File No. –	Date JUNE 2026

First Issued	Drawing No.	Rev.
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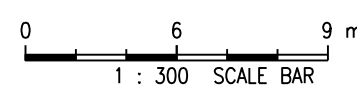
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SITE FORMATION WORKS -
SECTIONS A-A AND B-B

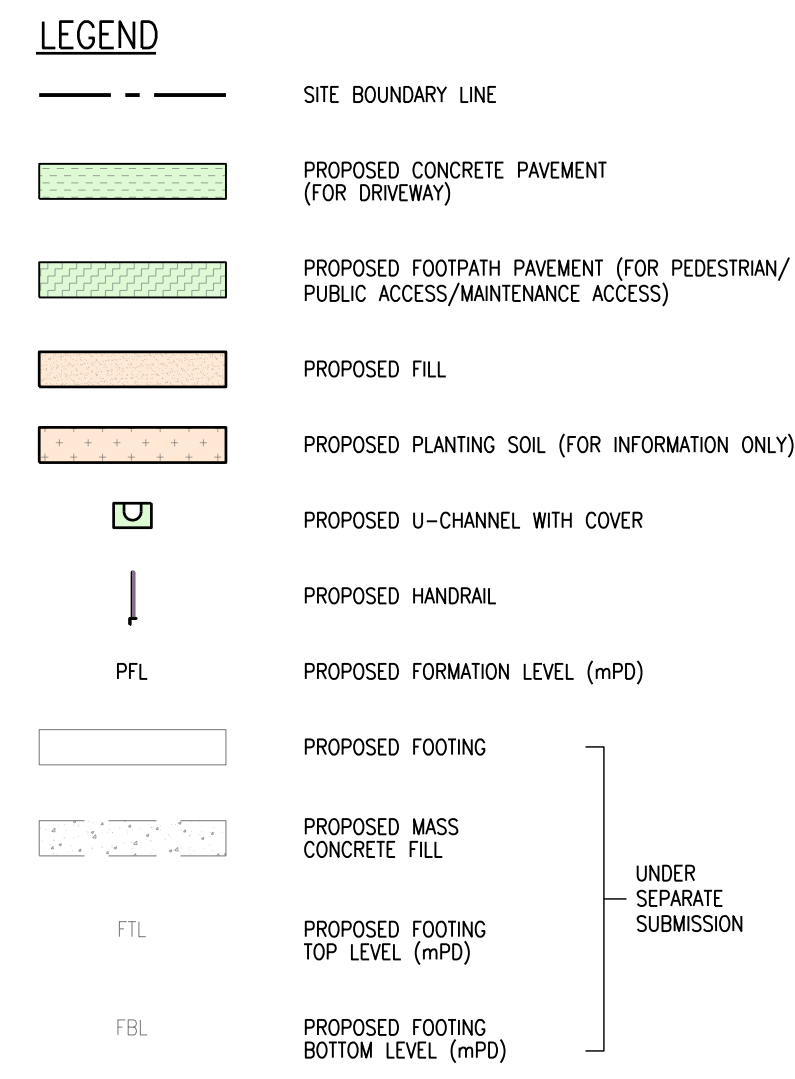
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Scale 1:300 (A1)	CAD File No. -	Date JUNE 2026

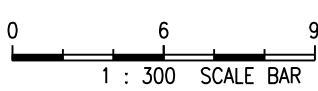
First Issued	Drawing No.	Rev.
© Copyright Reserved 版權所有 不得翻印	F/SF001/SE001	0



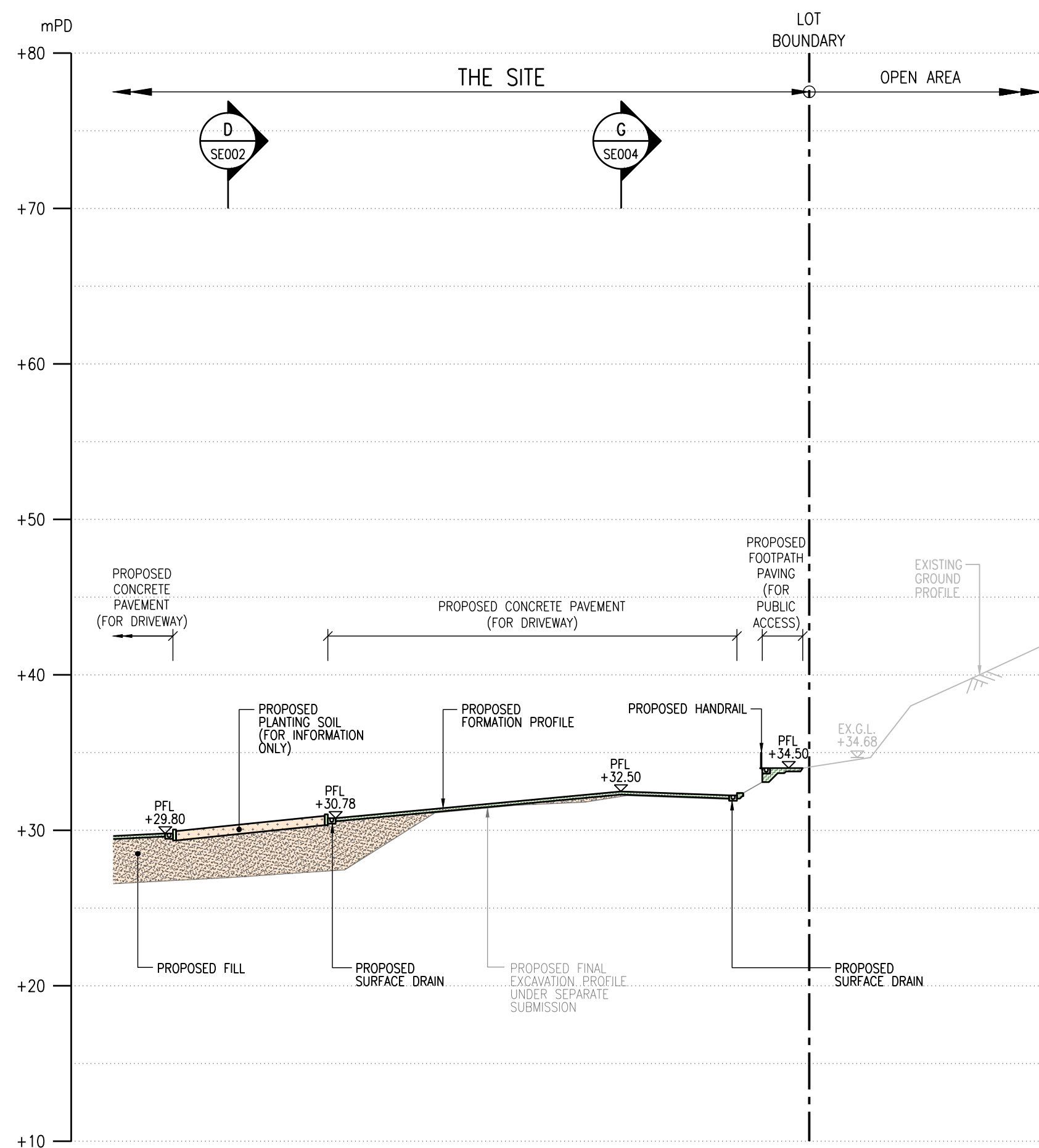
SECTION B-B



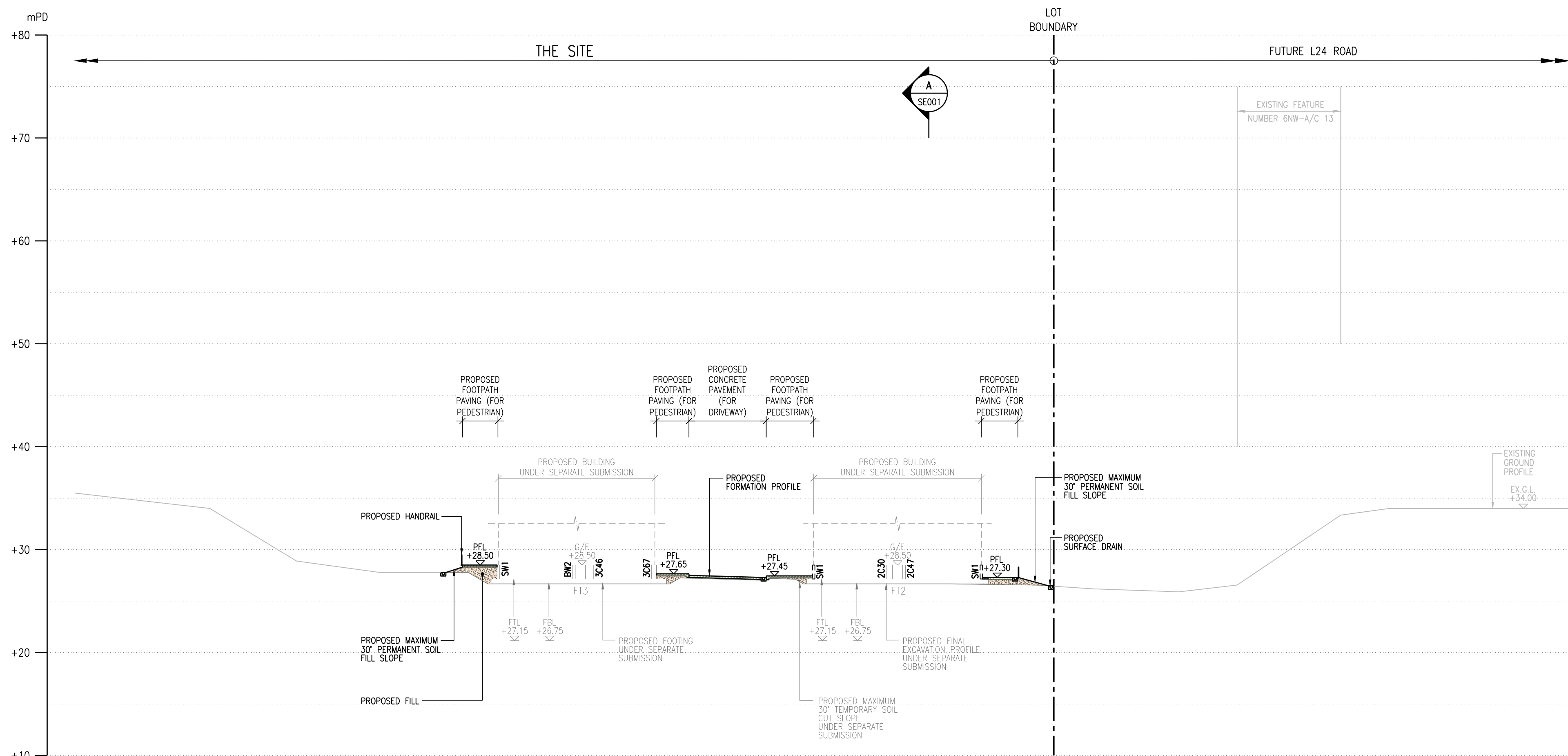
AMENDED DRAWING



Drawing Title				
SITE FORMATION WORKS – SECTIONS C-C AND D-D				
Status				
SUBMISSION				
Drawn	WT	Checked	KC	Approved
				WC
Scale	1:300 (A1)	CAD File No.	Date	
		–	JUNE, 2026	
First Issued		Drawing No.		Rev.
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SECTION E-E



SECTION F-F

LEGEND

	SITE BOUNDARY LINE
	PROPOSED CONCRETE PAVEMENT (FOR DRIVEWAY)
	PROPOSED FOOTPATH PAVEMENT (FOR PEDESTRIAN/ PUBLIC ACCESS/MAINTENANCE ACCESS)
	PROPOSED FILL
	PROPOSED PLANTING SOIL (FOR INFORMATION ONLY)
	PROPOSED U-CHANNEL WITH COVER
	PROPOSED HANDRAIL
PFL	PROPOSED FORMATION LEVEL (mPD)
	PROPOSED FOOTING
	PROPOSED MASS CONCRETE FILL
FTL	PROPOSED FOOTING TOP LEVEL (mPD)
FBL	PROPOSED FOOTING BOTTOM LEVEL (mPD)

UNDER
SEPARATE
SUBMISSION

EXTRACTED FROM DRAWING:

Drawing Title

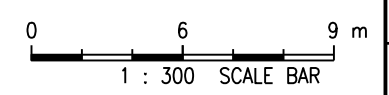
SITE FORMATION WORKS -
SECTIONS E-E AND F-F

Status	SUBMISSION
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Drawn WT	Checked KC	Approved WC
Scale 1:300 (A1)	CAD File No. -	Date JUNE 2026

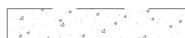
First Issued	Drawing No.	Rev.
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AMENDED DRAWING





LEGEND

	SITE BOUNDARY LINE	
	PROPOSED CONCRETE PAVEMENT (FOR DRIVEWAY)	
	PROPOSED FOOTPATH PAVEMENT (FOR PEDESTRIAN/ PUBLIC ACCESS/MAINTENANCE ACCESS)	
	PROPOSED FILL	
	PROPOSED PLANTING SOIL (FOR INFORMATION ONLY)	
	PROPOSED U-CHANNEL WITH COVER	
	PROPOSED HANDRAIL	
PFL	PROPOSED FORMATION LEVEL (mPD)	
	PROPOSED FOOTING	} UNDER SEPARATE SUBMISSION
	PROPOSED MASS CONCRETE FILL	
FTL	PROPOSED FOOTING TOP LEVEL (mPD)	
FBL	PROPOSED FOOTING BOTTOM LEVEL (mPD)	

EXTRACTED FROM DRAWING:

Drawing Title

SITE FORMATION WORKS -
SECTION G-G

Status	SUBMISSION
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Drawn		Checked		Approved	
WT		KC		WC	
Scale 1:300 (A1)		CAD File No. -		Date JUNE 2026	
First Issued		Drawing No.			Rev.
(C) Copyright Reserved 版權所有 不得翻印		F/SF001/SE004			-

NEW DRAWING

0 6 9 m

1 : 300 SCALE BAR

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F/SF001/SE004

Rev.

Appendix D

Existing Ground Investigation Logs

DRILLHOLE RECORD-NEW PROJECT-2

		DRILLHOLE RECORD		HOLE No. A16	
		CONTRACT No.: YL/2021/02		SHEET: 2 of 2	
PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development					
METHOD: Rotary Drilling			CO-ORDINATES:		WORKS ORDER No.: -
MACHINE & No.: SF-02			E 816393.92 N 833162.94		DATE from: 24/04/2023 to 06/05/2023
FLUSHING MEDIUM: Water			ORIENTATION: Vertical		GROUND LEVEL: + 27.11 mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
11	PW 11.55m		90	100				k=2.91E-7m/s 3, 2, 4, 4, 3, 5 N=16	21	Disturbed	10.00	10.00		V	Extremely weak, light grey (10R/7/1), spotted white, completely decomposed coarse ash crystal TUFF. (Clayey SILT)
12									22	Disturbed	11.00	11.10			
13									23	Disturbed	11.20	11.20			
14									24	Disturbed	11.55	11.55			End of investigation hole at 11.55m.
15															
16															
17															
18															
19															
20												20.00			

 Small Disturbed Sample  Piston sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Mazier Sample  76mm Vibrocore Sample  100mm Vibrocore Sample  Vibrocore Sub-sample SPT Liner Sample  Standard Penetration Test  In-situ Vane Shear Test  Permeability Test  Pressuremeter Test  Televiwer Survey  Packer Test  Impression Packer Test  Water Sample Standpipe Piezometer Tip	LOGGED <u>K.H. Lai</u> DATE <u>10/05/2023</u> CHECKED <u>A.B.Hollinshead</u> DATE <u>15/05/2023</u>	REMARKS
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DRILLHOLE RECORD

HOLE No. A15

CONTRACT No.: YL/2021/02

SHEET: 1 of 2

PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development

METHOD: Rotary Drilling

CO-ORDINATES:

WORKS ORDER No.: -

MACHINE & No.: SF-02

E 816423.21
N 833183.02

DATE from: 06/05/2023 to 11/05/2023

FLUSHING MEDIUM: Water

ORIENTATION: Vertical

GROUND LEVEL: +26.42 mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
09/05/2023	PW										+26.42	0.00			
1									1	↓	0.50				Firm, brown (7.5YR/5/4) to reddish brown (5YR/4/3), slightly sandy clayey SILT with occasional angular to subangular fine to medium gravel of weak siltstone and tuff. (COLLUVIUM)
									2	↓	1.00				
									3	↓	1.50				
2	PW 2.00m HW			100					4	↓	2.00	+24.42	2.00		Extremely weak, purplish brown (7.5R/3/3), locally pink (10R/8/3) and dark brown (7.5YR/3/4), completely decomposed tuffaceous METASILTSTONE. (Clayey SILT)
			90						5	↓					
3								2, 2, 1, 3, 3, 2 N=9	6	↓	3.00				
									7	↓	3.10				
									8	↓	3.20				
									9	↓	3.50				
4				100					10	↓	5.00				Extremely weak, light yellowish grey (2.5Y/7/2) to light grey (10R/7/1), locally striped brown, spotted grey, completely decomposed coarse ash crystal TUFF. (Clayey SILT)
			90					2, 2, 3, 3, 3, 4 N=13	11	↓	5.10				
5									12	↓	5.50				
									13	↓	6.00	+20.42	6.00		
6				100					14	↓	7.00				
			90					k=2.83E-7m/s	15	↓	7.10				
7								2, 3, 3, 4, 5, 5 N=17	16	↓	7.20				
									17	↓	8.00				
8				100					18	↓	9.00				
			90					2, 3, 3, 2, 4, 4 N=13	19	↓	9.10				
9									20	↓	9.50				
10											+16.42	10.00			

DRILLHOLE RECORD-NEW PROJECT-2



Small Disturbed Sample
Piston sample
U76 Undisturbed Sample
U100 Undisturbed Sample
Mazier Sample
76mm Vibrocore Sample
100mm Vibrocore Sample
Vibrocore Sub-sample
SPT Liner Sample

Standard Penetration Test
In-situ Vane Shear Test
Permeability Test
Pressuremeter Test
Televiometer Survey
Packer Test
Impression Packer Test
Water Sample
Standpipe
Piezometer Tip

LOGGED K.H. Lai

DATE 10/05/2023

CHECKED A.B.Hollinshead

DATE 15/05/2023

REMARKS

1. An inspection pit was excavated to a depth of 2.00m.
 2. Constant head permeability tests were performed from 6.05m to 7.55m and 10.05m to 11.55m below existing ground level on 09/05/2023.
 3. A standpipe was installed at 8.00m below existing ground level on 11/05/2023.
 4. A piezometer was installed at 11.00m below existing ground level on 11/05/2023.
- (to next page)

		DRILLHOLE RECORD		HOLE No. A15		
		CONTRACT No.: YL/2021/02		SHEET: 2 of 2		
PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development						
METHOD: Rotary Drilling			CO-ORDINATES:		WORKS ORDER No.: -	
MACHINE & No.: SF-02			E 816423.21 N 833183.02		DATE from: 06/05/2023 to 11/05/2023	
FLUSHING MEDIUM: Water			ORIENTATION: Vertical		GROUND LEVEL: + 26.42 mPD	

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type					
				100					21		+16.42	10.00		V	As sheet 1 of 2.
11	HW 11.55m	1.80m at 18:00						k=1.59E-7m/s 2, 3, 3, 3, 4, 5 N=15	22			11.00			
									23			11.10			
									24		+14.87	11.55			End of investigation hole at 11.55m.
12															
13															
14															
15															
16															
17															
18															
19															
20												20.00			

 Small Disturbed Sample  Piston sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Mazier Sample  76mm Vibrocore Sample  100mm Vibrocore Sample  Vibrocore Sub-sample SPT Liner Sample  Standard Penetration Test  In-situ Vane Shear Test  Permeability Test  Pressuremeter Test  Televiwer Survey  Packer Test  Impression Packer Test  Water Sample Standpipe Piezometer Tip	LOGGED <u>K.H. Lai</u> DATE <u>10/05/2023</u> CHECKED <u>A.B.Hollinshead</u> DATE <u>15/05/2023</u>	REMARKS (Continued from previous page) 5. Automatic groundwater monitoring devices (AGMD) were installed in standpipe and piezometer on 04/10/2023.
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DRILLHOLE RECORD

HOLE No.

A17

CONTRACT No.: YL/2021/02

SHEET:

1

of

2

PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development

METHOD: Rotary Drilling

CO-ORDINATES:

WORKS ORDER No.:

-

MACHINE & No.: KK-6

E 816355.03

N 833137.01

DATE from: 08/05/2023 to 11/05/2023

FLUSHING MEDIUM: Water

ORIENTATION: Vertical

GROUND LEVEL: +27.46 mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth				
08/05/2023	SW										+27.46	0.00			Firm to stiff, brown (7.5YR/5/4) to brownish grey (10YR/5/1), spotted yellowish brown and white, slightly sandy silty CLAY with some angular fine to medium gravel of weak to moderately weak siltstone. (COLLUVIUM)
1									1	↓	0.50				
									2	↓	1.00				
									3	↓	1.50				
08/05/2023		Dry at 18:00		100					4	↓	2.00				Very stiff, greyish brown (10YR/5/2), mottled reddish brown, sandy silty CLAY with occasional to some angular fine gravel of moderately weak siltstone. (COLLUVIUM)
10/05/2023		Dry at 08:00	80					2, 3, 4, 4, 5, 8 N=21	5	↓	3.00				
3	SW 3.10m PW								6	↓	3.10				
									7	↓	3.20				
									8	↓	3.50				Extremely weak, light grey (10R/7/1), completely decomposed tuffaceous METASILTSTONE. (Clayey SILT)
4				100				3, 5, 5, 7, 7, 9 N=28	9	↓	4.00	+23.46	4.00		
5									10	↓	5.00				
									11	↓	5.10				
6	PW 6.00m HW			100				3, 4, 5, 5, 5, 6 N=21	12	↓	5.50				REMARKS
									13	↓	6.00	+21.46	6.00	V	
7								k=3.36E-6m/s	14	↓	7.00				
									15	↓	7.10				
8				100				3, 4, 5, 5, 5, 6 N=20	16	↓	7.50				1. An inspection pit was excavated to a depth of 2.00m. 2. Constant head permeability tests were performed from 6.05m to 7.55m and 10.05m to 11.55m below existing ground level on 10/05/2023 and 11/05/2023 respectively.
9									17	↓	8.00				
									18	↓	9.00				
10									19	↓	9.10				
									20	↓	9.50	+17.46	10.00		



Small Disturbed Sample
Piston sample
U76 Undisturbed Sample
U100 Undisturbed Sample
Mazier Sample
76mm Vibrocore Sample
100mm Vibrocore Sample
Vibrocore Sub-sample
SPT Liner Sample

Standard Penetration Test
In-situ Vane Shear Test
Permeability Test
Pressuremeter Test
Televiometer Survey
Packer Test
Impression Packer Test
Water Sample
Standpipe
Piezometer Tip

LOGGED K.H. Lai

DATE 15/05/2023

CHECKED A.B. Hollinshead

DATE 16/05/2023

REMARKS

1. An inspection pit was excavated to a depth of 2.00m.
2. Constant head permeability tests were performed from 6.05m to 7.55m and 10.05m to 11.55m below existing ground level on 10/05/2023 and 11/05/2023 respectively.

DRILLHOLE RECORD		HOLE No.	A17		
CONTRACT No.:	YL/2021/02	SHEET:	2	of	2

PROJECT: **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development**

METHOD: Rotary Drilling

CO-ORDINATES:

WORKS ORDER No.: _____

MACHINE & No.: **KK-6**

E	816355.03
N	833137.01

DATE from: **08/05/2023** to **11/05/2023**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL: **+ 27.46** mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11	HW 11.55m	1.80m at 18:00	80	90				k=2.39E-6m/s 2, 4, 5, 6, 6, 8 N=25	No. 21 Type Depth 10.00 22 11.00 23 11.10 24 11.20 11.55	+17.46	10.00		V	As sheet 1 of 2.
12										+15.91	11.55			End of investigation hole at 11.55m.
13														
14														
15														
16														
17														
18														
19														
20											20.00			

 Small Disturbed Sample  Piston sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Mazier Sample  76mm Vibrocore Sample  100mm Vibrocore Sample  Vibrocore Sub-sample  SPT Liner Sample	 Standard Penetration Test  In-situ Vane Shear Test  Permeability Test  Pressuremeter Test  Televiwer Survey  Packer Test  Impression Packer Test  Water Sample  Standpipe  Piezometer Tip	LOGGED <u>K.H. Lai</u> DATE <u>15/05/2023</u> CHECKED <u>A.B-Hollinshead</u> DATE <u>16/05/2023</u>	REMARKS
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DRILLHOLE RECORD

HOLE No. DH2031

CONTRACT No.: YL/2021/02

SHEET: 1 of 3

PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development

METHOD: Rotary Drilling

CO-ORDINATES:

WORKS ORDER No.: -

MACHINE & No.: KK-25

E 816396.13
N 833053.04

DATE from: 01/12/2022 to 07/12/2022

FLUSHING MEDIUM: Water

ORIENTATION: Vertical

GROUND LEVEL: +23.78 mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	FI	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
01/12/2022 01/12/2022 02/12/2022	SW										+23.78	0.00				Firm to stiff, brown (7.5YR/5/4), sandy clayey SILT with some angular fine to medium gravel of moderately strong granite and occasional asphalt fragments. (FILL)
1									1	INSPECTION PIT	0.50					
									2		1.00					
									3		1.50					
02/12/2022 03/12/2022				100					4		2.00	+21.78	2.00			Stiff, brown (7.5YR/5/4), slightly sandy silty CLAY. (COLLUVIUM)
3	SW 3.10m PW		70					5, 5, 6, 4, 3, 3 N=16	5							
									6		3.00					
									7		3.10					
4									8		3.20					
									9		3.50					
									10		3.85					
5				100					11		4.00	+19.78	4.00			Firm to stiff, greyish brown (10YR/5/2), spotted brown, slightly sandy silty CLAY. (ALLUVIUM)
			70					4, 4, 4, 3, 4, 4 N=15	12		5.00					
									13		5.10					
6									14		5.20					
									15		5.50					
									16		5.85					
7				100					17		6.00	+17.78	6.00			Firm, dark grey (5Y/4/1), slightly sandy silty CLAY with occasional black decayed organic matter. (ALLUVIUM)
			70					k=6.77E-6m/s	18		7.00					
								1, 2, 2, 1, 2, 2 N=7	19		7.10					
8	1.20m at 17:00 3.40m at 09:00								20		7.20					
									21		7.55					
									22		7.85					
9				54					23		8.00	+15.78	8.00			Grey (7.5YR/6/1), slightly clayey silty fine to coarse SAND with much angular fine to coarse gravel and cobbles of quartz vein. (ALLUVIUM)
			70						24		8.55	+15.13	8.65			
									25		8.65					
10				80					26		8.90	+14.88	8.90			Grey (7.5YR/6/1), angular COBBLES with some coarse gravel of quartz. (ALLUVIUM)
			70						27		9.90	+13.78	10.00			Extremely weak, greyish brown (10YR/5/2), completely decomposed tuffaceous METASILTSTONE. (Slightly sandy SILT with some angular fine to coarse gravel)
				42					28							
			70						29							
									30							
									31							
									32							
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DRILLHOLE RECORD

HOLE No. DH2031

CONTRACT No.: YL/2021/02

SHEET: 2 of 3

PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development

METHOD: Rotary Drilling

CO-ORDINATES:

WORKS ORDER No.: -

MACHINE & No.: KK-25

E 816396.13
N 833053.04

DATE from: 01/12/2022 to 07/12/2022

FLUSHING MEDIUM: Water

ORIENTATION: Vertical

GROUND LEVEL: +23.78 mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
									No. Type Depth					
								7, 7, 14, 10, 9, 15 N=48	21 10.00 22 10.48	+13.78	10.00		V	As sheet 1 of 3.
11				85					23 10.90	+12.88	10.90		V	Extremely weak, dark yellowish brown (10YR/4/6), completely decomposed tuffaceous METASILTSTONE. (Sandy SILT with some angular fine to medium gravel)
12	PW 12.00m HW							8, 8, 12, 12, 15, 15 N=54	24 11.90 25 12.00 26 12.48					
13				82					27 12.90	+10.88	12.90		V	Extremely weak, grey (7.5YR/6/1), completely decomposed tuffaceous METASILTSTONE. (Slightly sandy SILT with some angular fine to medium gravel)
14								k=1.26E-5m/s	28 13.90 29 14.00 30 14.48					
15	0.60m at 17:00 HW 14.50m 2.33m at 09:00							9, 9, 10, 11, 12, 15 N=48		+9.28	14.50		III	Strong, grey to dark grey, striped white, slightly decomposed tuffaceous METASILTSTONE.
16				100	80	53	6.7		T21G1 15.25	+8.53	15.25		II	Joints are closely to medium spaced, locally widely spaced, rough planar and rough stepped, very narrow to extremely narrow, iron oxide stained, dipping at 0°-10°, 20°-30°, 45°-55° and 70°-80°.
17				100	100	100			T21G1 15.98					14.50 - 15.25m : Moderately strong, grey, moderately decomposed.
18				100	51	46	3.4		T21G1 16.76					
19				100	84	73			T21G1 17.75					
20				100	100	100	2.6		T21G1 18.68					
				100	100	100	1.3		T21G1					
										+3.78	20.00			

Small Disturbed Sample

Piston sample

U76 Undisturbed Sample

U100 Undisturbed Sample

Mazier Sample

76mm Vibrocore Sample

100mm Vibrocore Sample

Vibrocore Sub-sample

SPT Liner Sample

Standard Penetration Test

In-situ Vane Shear Test

Permeability Test

Pressuremeter Test

Televiometer Survey

Packer Test

Impression Packer Test

Water Sample

Standpipe

Piezometer Tip

LOGGED K.H. Lai
DATE 08/12/2022
CHECKED A.B.Hollinshead
DATE 19/12/2022

REMARKS



DRILLHOLE RECORD

HOLE No. **DH2031**

CONTRACT No.: **YL/2021/02**

SHEET: **3** of **3**

PROJECT: **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development**

METHOD: **Rotary Drilling**

CO-ORDINATES:

WORKS ORDER No.: **-**

MACHINE & No.: **KK-25**

E **816396.13**
N **833053.04**

DATE from: **01/12/2022** to **07/12/2022**

FLUSHING MEDIUM: **Water**

ORIENTATION: **Vertical**

GROUND LEVEL: **+ 23.78** mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RQD %	F I	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
									No. Type Depth	+3.78	20.00			
21		0.80m at 17:00	70	100	100	100			T2101 20.15				II	As sheet 2 of 3.
22		2.35m at 09:00	70	100	100	100	1.3		T2101 21.68					
23			70	100	100	90			T2101 22.70					
24			70	100	100	100			T2101 23.86					
			70	100	100	100			T2101 24.30	-0.52	24.30			End of investigation hole at 24.30m.
25														
26														
27														
28														
29														
30											30.00			



Small Disturbed Sample
Piston sample
U76 Undisturbed Sample
U100 Undisturbed Sample
Mazier Sample
76mm Vibrocore Sample
100mm Vibrocore Sample
Vibrocore Sub-sample
SPT Liner Sample

Standard Penetration Test
In-situ Vane Shear Test
Permeability Test
Pressuremeter Test
Televiwer Survey
Packer Test
Impression Packer Test
Water Sample
Standpipe
Piezometer Tip

LOGGED **K.H. Lai**
DATE **08/12/2022**
CHECKED **A.B.Hollinshead**
DATE **19/12/2022**

REMARKS

FUGRO		Project : Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development		Logged by : K.H. Lai Date logged : 28/11/2022 Checked by : A.B-Hollinshead Date checked : 29/11/2022		Co-ordinates : E 816366.22 m N 833133.26 m Ground Level : +27.14 mPD		Excavation Dates: 19/11/2022 to 24/11/2022 Backfill Date: 30/11/2022		Trial Pit No.: TP2009	
Contract No.: YL/2021/02											
Sample & Tests	Depth (m)	Sketch				Depth (m)	Legend	Grade	Description		
		Face A 1.50 m	Face B 1.50 m	Face C 1.50 m	Face D 1.50 m						
2 3 5 6 8 9	0.50					1.70	V	Firm, moist, brown (7.5YR/5/4) to yellowish brown (10YR/5/6), spotted black and yellowish white, slightly sandy clayey SILT with occasional to some angular fine to coarse gravel of weak to moderately weak granite and quartz. (COLLUVIUM) Extremely weak, brownish grey (10YR/5/1), mottled yellowish brown, occasionally spotted yellowish white and streaked black, completely decomposed tuffaceous METASILTSTONE. (Firm, clayey SILT) Relict joint is rough planar, extremely narrow, iron oxide stained, manganese oxide infilled (<2mm), dipping at J1. 243°/74°. End of trial pit at average depth of 2.80m.			
	1.00					1.80					
	1.50					2.00					
	2.00					2.80					
	2.50										
	2.80										
	3.00										
	3.50										
	4.00										
	4.50										
PLAN		SECTION				SYMBOL			REMARKS		
						↑ ↓ ▬ ▬ ▣ └┐ ▲ ▼ ⤵ Small Disturbed Sample Large Disturbed Sample Undisturbed Sample Vert. Undisturbed Sample Hori. Block Sample In Situ Density Test Water Sample N - Schmidt Hammer Test Water Seepage			Shoring: Yes Water Seepage: 2.60m Stability: Stable Maximum Depth: 2.80m Average Depth: 2.80m 1. Termination upon encountering groundwater. 2. All sample depths are relative to centre of trial pit. 3. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 2.80m below existing ground level. 4. Block samples were taken at 0.50m, 1.50m and 2.50m below existing ground level.		

TRIAL PIT RECORD



Project : **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen
New Development Area Package A Works for Second
Phase Development**

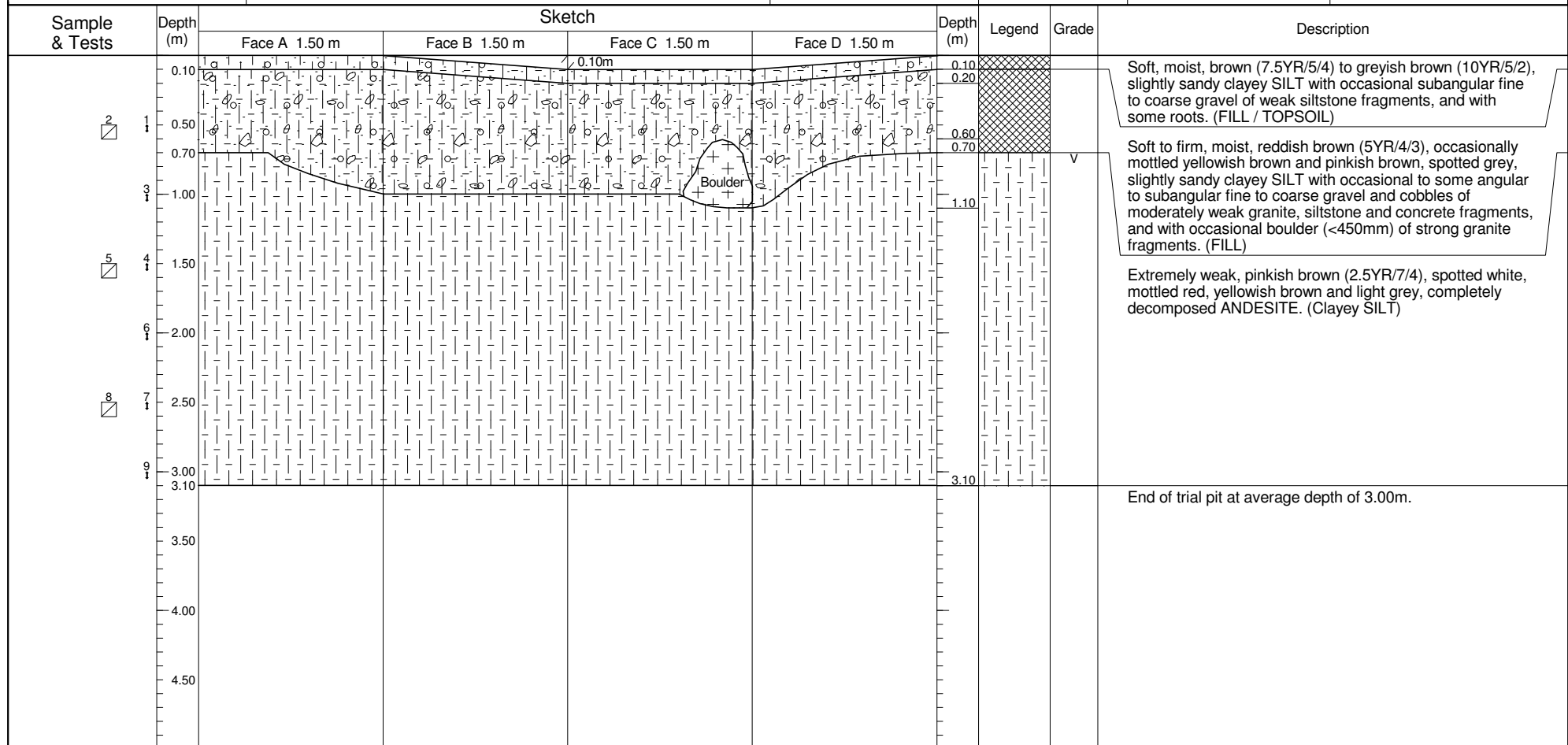
Logged by : K.H. Lai
Date logged : 22/11/2022
Checked by : A.B-Hollinshead
Date checked : 28/11/2022

Co-ordinates :
E 816415.91 m
N 833182.73 m
Ground Level :
+26.84 mPD

Excavation Dates:
19/11/2022 to 22/11/2022
Backfill Date:
29/11/2022

Trial Pit No.:
TP2010

Contract No.: YL/2021/02

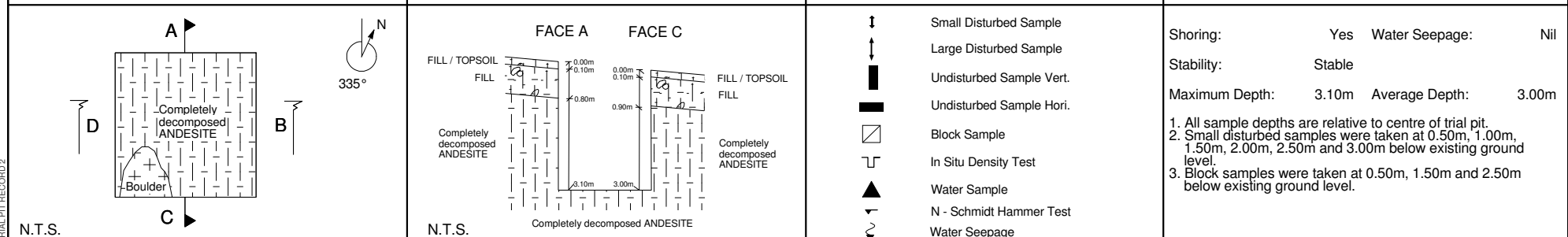


PLAN

SECTION

SYMBOL

REMARKS



TRIAL PIT RECORD



Project : **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen
New Development Area Package A Works for Second
Phase Development**

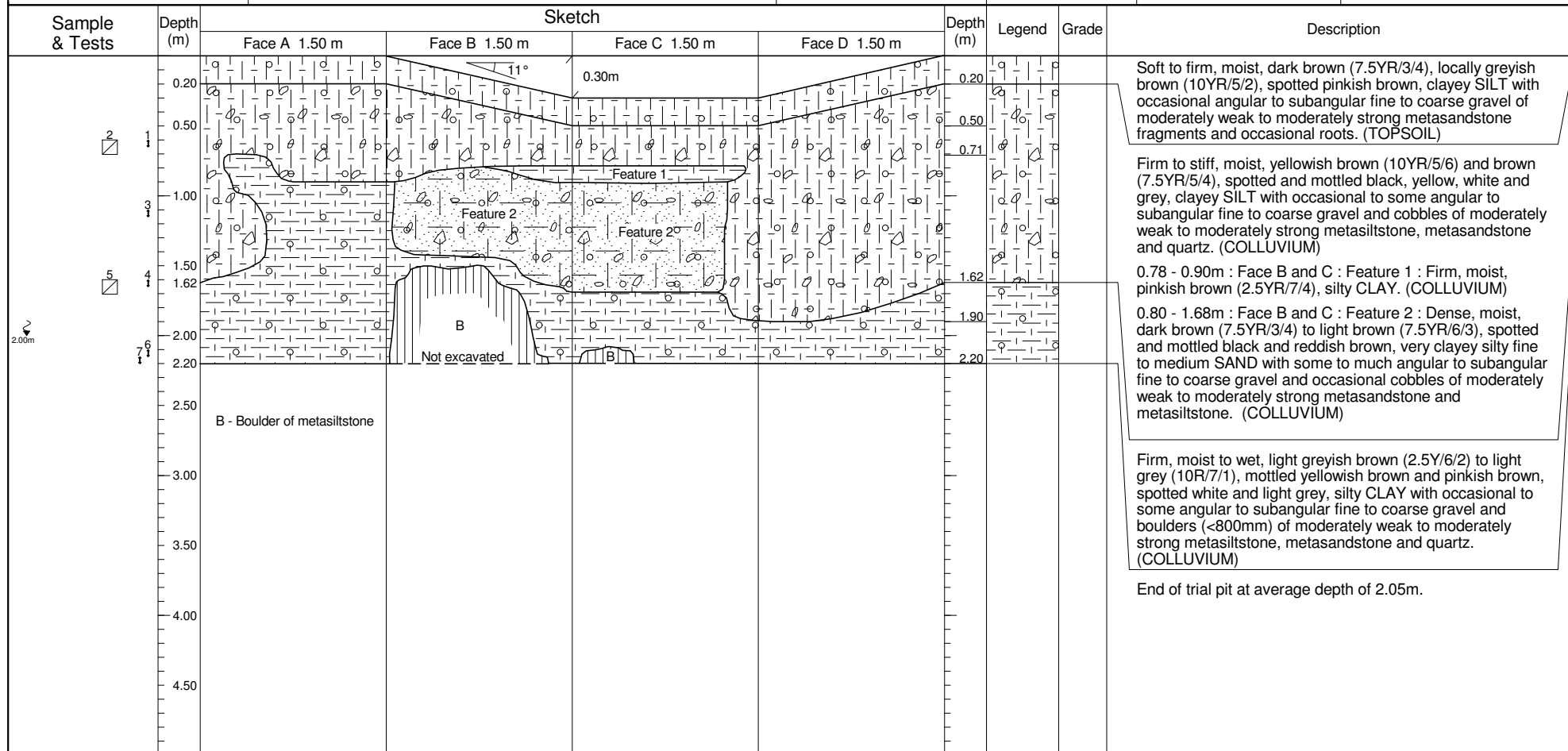
Logged by : K.H. Lai
Date logged : 21/11/2023
Checked by : A.B-Hollinshead
Date checked : 23/11/2023

Co-ordinates :
E 816175.35 m
N 832929.88 m
Ground Level :
+31.32 mPD

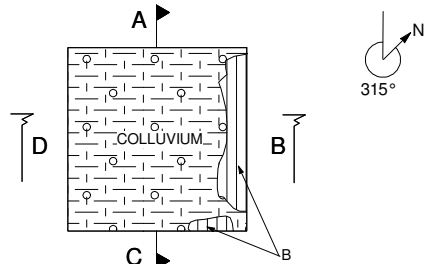
Excavation Dates:
14/11/2023 to 17/11/2023
Backfill Date:
06/12/2023

Trial Pit No.:
TIP3001

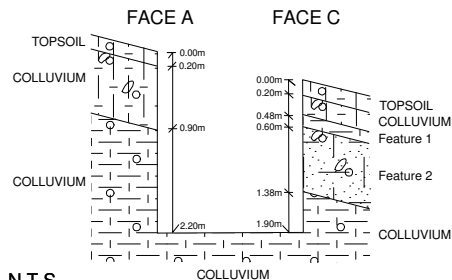
Contract No.: YL/2021/02



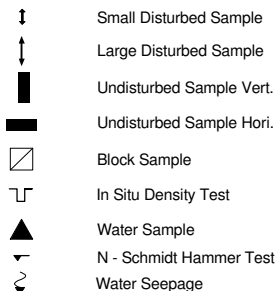
PLAN



SECTION



SYMBOL



REMARKS

Shoring: Yes Water Seepage: 2.00m
Stability: Stable
Maximum Depth: 2.20m Average Depth: 2.05m
1. Termination upon encountering groundwater.
2. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m and 2.05m below existing ground level.
3. Block samples were taken at 0.50m and 1.50m below existing ground level.

TRIAL PIT RECORD

		Project : Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development		Logged by : K.H. Lai Date logged : 28/11/2023 Checked by : A.B-Hollinshead Date checked : 06/12/2023		Co-ordinates : E 816252.42 m N 833054.62 m Ground Level : +42.28 mPD		Excavation Dates: 18/11/2023 to 24/11/2023 Backfill Date: 09/12/2023		Trial Pit No.: TIP3002	
Contract No.: YL/2021/02											
Sample & Tests	Depth (m)	Sketch				Depth (m)	Legend	Grade	Description		
		Face A 1.50 m	Face B 1.50 m	Face C 1.50 m	Face D 1.50 m						
2 5 8	0.20					0.20			Loose, dry, dark brown (7.5YR/3/4), spotted reddish brown, pinkish brown, dark grey, black and pale yellowish brown, silty fine to coarse SAND with much angular to subangular fine to coarse gravel of moderately weak to moderately strong metasandstone, metasiltstone, tuff and quartz fragments with occasional roots. (TOPSOIL)		
	0.50										
	1.00								Firm, moist, reddish brown (5YR/4/3), spotted and mottled black, white, pinkish brown, reddish brown, yellow, pink, purple and dark grey, slightly sandy clayey SILT with some to much angular to subangular fine to coarse gravel and occasional cobbles of weak to moderately strong metasiltstone, metasandstone, tuff and quartz, and with occasional roots. (COLLUVIUM)		
	1.50										
	2.00										
	2.50										
	3.00					3.07			End of trial pit at average depth of 3.00m.		
	3.50										
	4.00										
	4.50										
PLAN		SECTION		SYMBOL			REMARKS				
				↑ ↓ ▬ ▬ ▣ └ ▲ ▼ ~ Small Disturbed Sample Large Disturbed Sample Undisturbed Sample Vert. Undisturbed Sample Hori. Block Sample In Situ Density Test Water Sample N - Schmidt Hammer Test Water Seepage			Shoring: Yes Water Seepage: Nil Stability: Stable Maximum Depth: 3.07m Average Depth: 3.00m 1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level. 2. Block samples were taken at 0.50m, 1.50m and 2.50m below existing ground level. 3. An inspection pit TIP3002(IP) was excavated at bottom of trial pit.				

TRIAL PIT RECORD

N.T.S.

N.T.S.



Project : **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen
New Development Area Package A Works for Second
Phase Development**

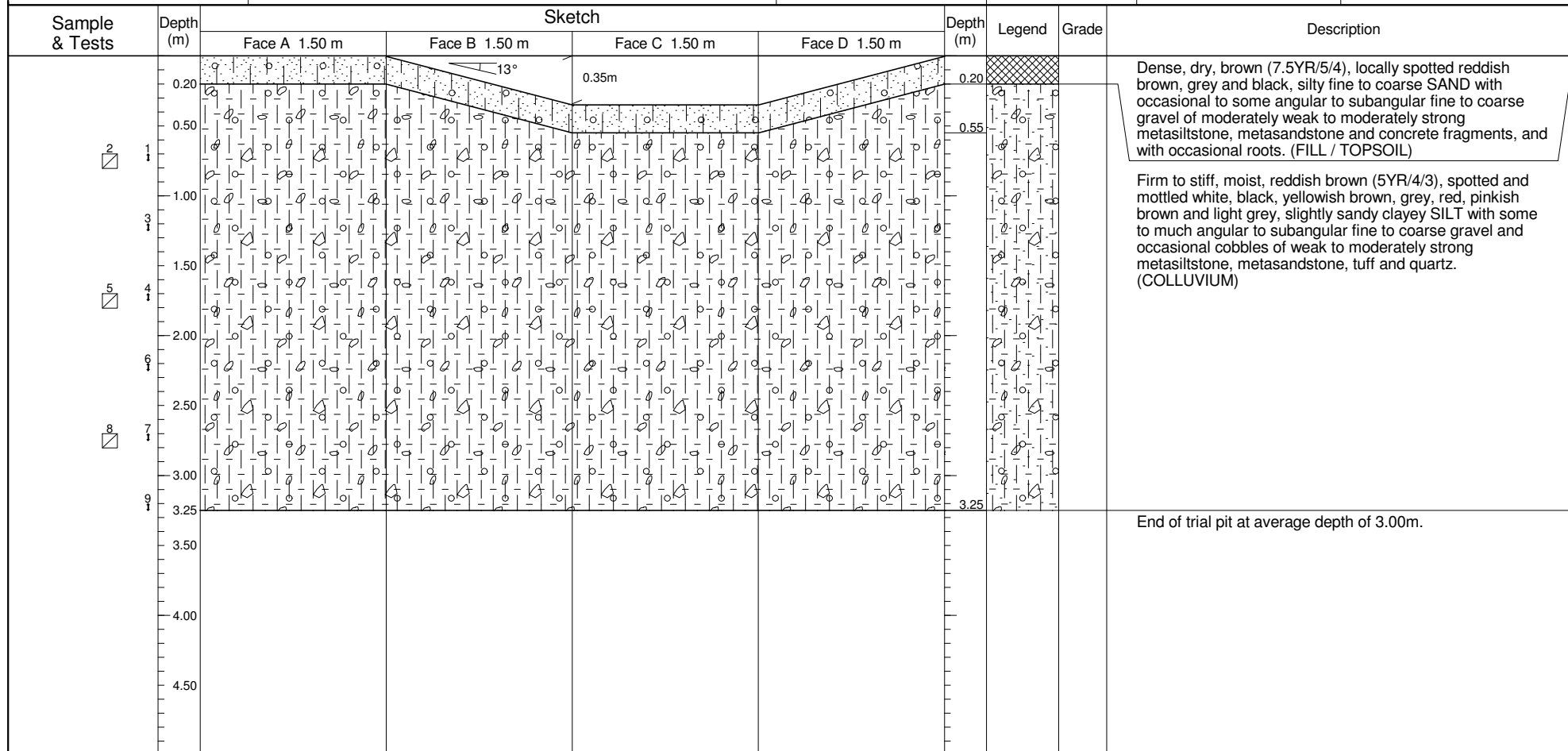
Logged by : K.H. Lai
Date logged : 04/12/2023
Checked by : A.B.Hollinshead
Date checked : 07/12/2023

Co-ordinates :
E 816314.92 m
N 833093.08 m
Ground Level :
+31.87 mPD

Excavation Dates:
21/11/2023 to 04/12/2023
Backfill Date:
11/12/2023

Trial Pit No.:
TIP3006

Contract No.: YL/2021/02



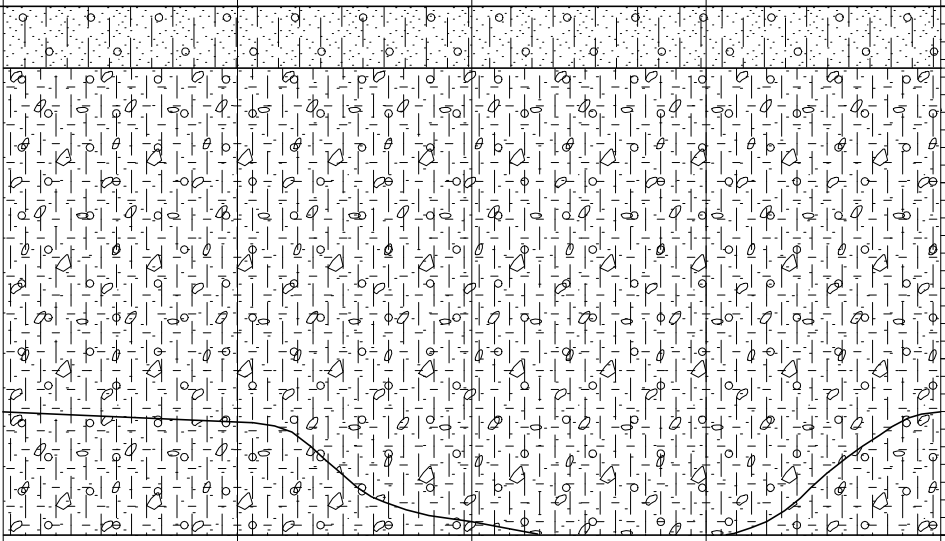
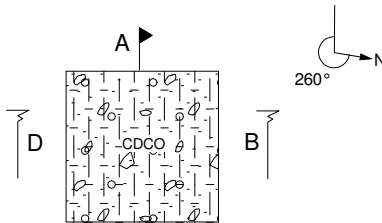
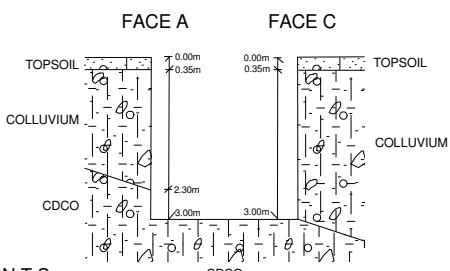
TRIAL PIT RECORD

PLAN	SECTION	SYMBOL	REMARKS
		↑ ↓ █ █ ▣ └┐ ▲ ▼ ~ Small Disturbed Sample Large Disturbed Sample Undisturbed Sample Vert. Undisturbed Sample Hori. Block Sample In Situ Density Test Water Sample N - Schmidt Hammer Test Water Seepage	Shoring: Yes Water Seepage: Nil Stability: Stable Maximum Depth: 3.25m Average Depth: 3.00m 1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level. 2. Block samples were taken at 0.50m, 1.50m and 2.50m below existing ground level. 3. An inspection pit TIP3006(IP) was excavated at bottom of trial pit.

TRIAL PIT RECORD 2

N.T.S.

N.T.S.

		Project : Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development			Logged by : K.H. Lai Date logged : 28/11/2023 Checked by : A.B-Hollinshead Date checked : 08/12/2023		Co-ordinates : E 816292.95 m N 833171.02 m Ground Level : +42.95 mPD		Excavation Dates: 18/11/2023 to 27/11/2023 Backfill Date: 09/12/2023		Trial Pit No.: TIP3008	
Contract No.: YL/2021/02												
Sample & Tests	Depth (m)	Sketch				Depth (m)	Legend	Grade	Description			
		Face A 1.50 m	Face B 1.50 m	Face C 1.50 m	Face D 1.50 m							
	1					0.35			Dense, dry, dark brown (7.5YR/3/4) to brown (7.5YR/5/4), spotted reddish brown, pinkish brown and light grey, silty fine to coarse SAND with some to much angular to subangular fine to coarse gravel of moderately weak to moderately strong metasandstone, metasiltstone and tuff fragments, and with occasional roots. (TOPSOIL / SLOPE WASHED)			
	3											
	4								Firm to stiff, moist, reddish brown (5YR/4/3), spotted and mottled pink, black, white, pinkish brown, purple, yellowish brown, grey and brown, slightly sandy clayey SILT with some angular to subangular fine to coarse gravel and occasional cobbles of weak to moderately weak metasiltstone, conglomerate, tuff and quartz. (COLLUVIUM)			
	6											
	7							V	Extremely weak to very weak, locally weak, light greyish brown (2.5Y/6/2), mottled white, yellowish brown and light grey, completely decomposed tuffaceous METACONGLOMERATE. (Slightly sandy clayey SILT with some to much angular to subrounded coarse gravel and cobbles)			
	9											
	3.00	CDCO - Completely decomposed tuffaceous METACONGLOMERATE				3.00			End of trial pit at average depth of 3.00m.			
	3.50											
	4.00											
	4.50											
PLAN		SECTION				SYMBOL			REMARKS			
 N.T.S.		 N.T.S.				 Small Disturbed Sample  Large Disturbed Sample  Undisturbed Sample Vert.  Undisturbed Sample Hori.  Block Sample  In Situ Density Test  Water Sample  N - Schmidt Hammer Test  Water Seepage			Shoring: Yes Water Seepage: Nil Stability: Stable Maximum Depth: 3.00m Average Depth: 3.00m 1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level. 2. Block samples were taken at 0.50m, 1.50m and 2.50m below existing ground level. 3. An inspection pit TIP3008(IP) was excavated at bottom of trial pit.			

TRIAL PIT RECORD 2



Project : **Ground Investigation Works for Hung Shui Kiu / Ha Tsuen
New Development Area Package A Works for Second
Phase Development**

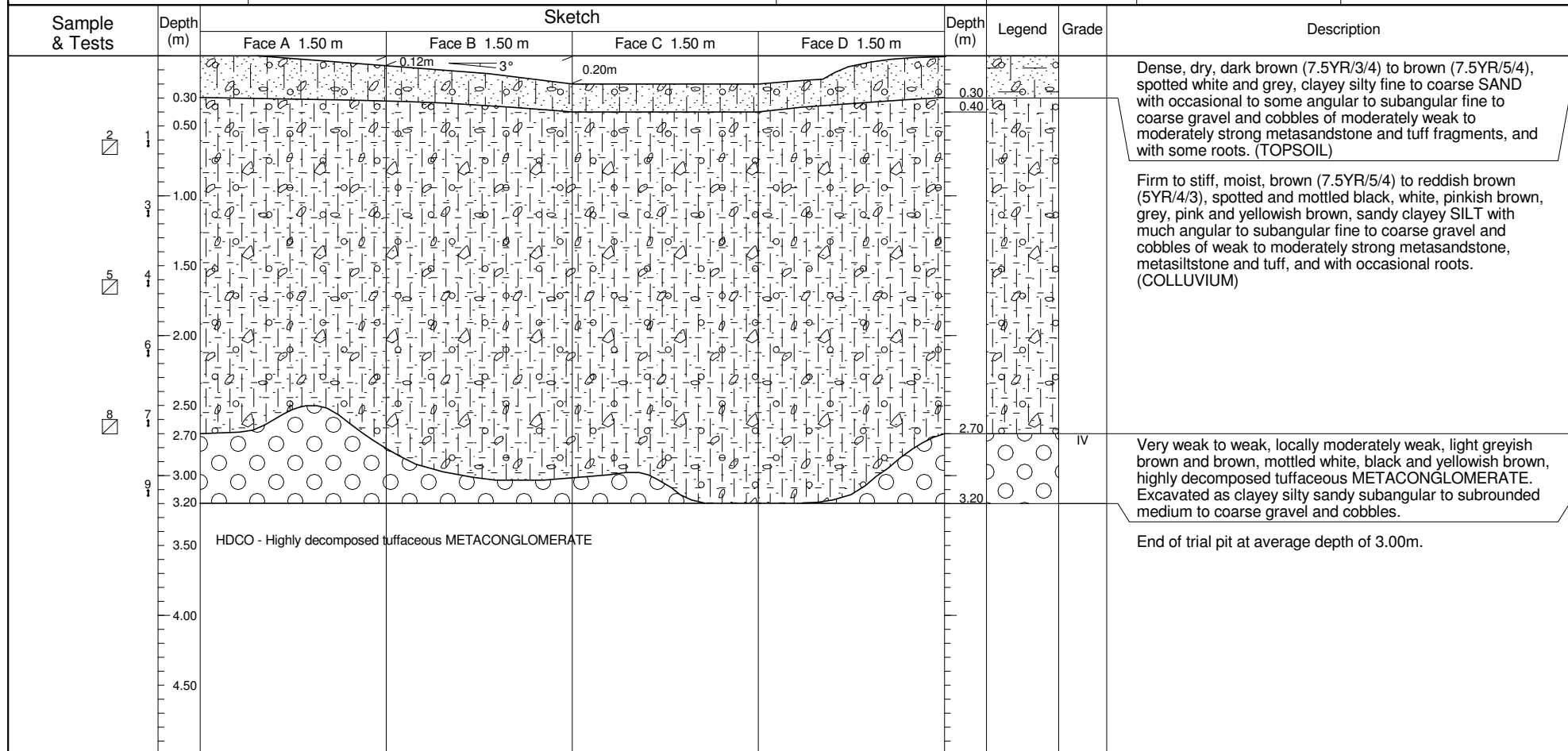
Logged by : K.H. Lai
Date logged : 05/12/2023
Checked by : A.B.Hollinshead
Date checked : 08/12/2023

Co-ordinates :
E 816332.46 m
N 833207.36 m
Ground Level :
+41.12 mPD

Excavation Dates:
21/11/2023 to 04/12/2023
Backfill Date:
11/12/2023

Trial Pit No.:
TIP3009

Contract No.: YL/2021/02



TRIAL PIT RECORD

PLAN	SECTION	SYMBOL	REMARKS
		↑ ↑↓ ■ ■ ▣ └┐ ▲ ▼ ~ Small Disturbed Sample Large Disturbed Sample Undisturbed Sample Vert. Undisturbed Sample Hori. Block Sample In Situ Density Test Water Sample N - Schmidt Hammer Test Water Seepage	Shoring: Yes Water Seepage: Nil Stability: Stable Maximum Depth: 3.20m Average Depth: 3.00m 1. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level. 2. Block samples were taken at 0.50m, 1.50m and 2.50m below existing ground level. 3. An inspection pit TIP3098(IP) was excavated at bottom of trial pit.

TRIAL PIT RECORD 2

		INSPECTION PIT RECORD		INSPECTION PIT No. TIP3002(IP)	
		CONTRACT No.: YL/2021/02		SHEET: 1 of 1	

PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development					
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WORKS ORDER No. -			CO-ORDINATES:		GROUND LEVEL + 39.35 mPD
DATE from: 01/12/2023 to 02/12/2023			E 816252.68 N 833055.28		

Progress	Water Level (m) Shift start/end	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
		No.	Type	Depth					
1		1	↓	0.50				VI	Firm to stiff, moist, red (10R/5/8) to reddish brown (5YR/4/3), occasionally mottled black, white and pale yellowish brown, clayey SILT with occasional angular coarse gravel and cobbles of weak to moderately weak metasandstone and tuff. (RESIDUAL SOIL)
		2	↓	1.00					
		3	↓	1.50					
2		4	↓	2.00	+37.35	2.00		V	Extremely weak to very weak, light greyish brown (10YR/5/2) to brown (7.5YR/5/4), spotted and mottled grey and white, completely decomposed tuffaceous METASILTSTONE. (Clayey SILT with some angular medium to coarse gravel of vein quartz)
		5	↓	2.50					
3		6	↓	3.00	+36.35	3.00			End of inspection pit at 3.00m.

↓ Small Disturbed Sample ↓ Large Disturbed Sample U76 Undisturbed Sample U100 Undisturbed Sample Water Sample	LOGGED <u>K.H. Lai</u> DATE <u>07/12/2023</u> CHECKED <u>A.B-Hollinshead</u> DATE <u>28/12/2023</u>	REMARKS 1. TIP3002(IP) was excavated at the bottom of Trial Pit TIP3002. 2. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level.
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		INSPECTION PIT RECORD		INSPECTION PIT No. TIP3006(IP)					
		CONTRACT No.: YL/2021/02		SHEET: 1 of 1					
PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development									
WORKS ORDER No. -			CO-ORDINATES:		GROUND LEVEL + 28.82 mPD				
DATE from: 06/12/2023 to 08/12/2023			E 816314.65 N 833093.82						
Progress	Water Level (m) Shift start/end	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
		No.	Type	Depth					
06/12/2023					+28.82	0.00			Firm to stiff, moist, yellowish brown (10YR/5/6) to brown (7.5YR/5/4), spotted and mottled black, light grey and reddish brown, clayey SILT with some angular to subangular fine to coarse gravel of weak to moderately strong metasandstone and metasiltstone. (COLLUVIUM)
1		1	↓	0.50					
06/12/2023 07/12/2023									Soft to firm, moist, red (10R/5/8) to reddish brown (5YR/4/3), occasionally spotted and mottled yellowish brown, black and light grey, clayey SILT. (RESIDUAL SOIL)
2		2	↓	1.00	+27.82	1.00		VI	
									End of inspection pit at 3.00m.
3		3	↓	1.50					
									End of inspection pit at 3.00m.
2		4	↓	2.00					
									End of inspection pit at 3.00m.
07/12/2023 08/12/2023		5	↓	2.50					
									End of inspection pit at 3.00m.
08/12/2023		6	↓	3.00	+25.82	3.00			
↓ Small Disturbed Sample ↓ Large Disturbed Sample U76 Undisturbed Sample U100 Undisturbed Sample Water Sample		LOGGED <u>K.H. Lai</u> DATE <u>08/12/2023</u> CHECKED <u>A.B-Hollinshead</u> DATE <u>28/12/2023</u>		REMARKS 1. TIP3006(IP) was excavated at the bottom of Trial Pit TIP3006. 2. Small disturbed samples were taken at 0.50m, 1.00m, 1.50m, 2.00m, 2.50m and 3.00m below existing ground level.					

		INSPECTION PIT RECORD				INSPECTION PIT No. TIP3008(IP)		
		CONTRACT No.: YL/2021/02		SHEET: 1 of 1				
PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development								
WORKS ORDER No. -				CO-ORDINATES:		GROUND LEVEL + 40.08 mPD		
DATE from: 01/12/2023 to 02/12/2023				E 816292.99 N 833172.38				
Progress	Water Level (m) Shift start/end	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
		No.	Type Depth					
01/12/2023 01/12/2023 02/12/2023 02/12/2023		1	↓ 0.17	+40.08 +39.91	0.00 0.17		IV	Weak to moderately weak, yellowish brown and reddish brown, mottled and spotted black, white and light grey, highly decomposed tuffaceous METACONGLOMERATE. Excavated as clayey silty angular fine to coarse gravel and cobbles.
End of inspection pit at 0.17m.								
1 2 3								
↓ Small Disturbed Sample ↑ Large Disturbed Sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Water Sample				LOGGED K.H. Lai DATE 04/12/2023 CHECKED A.B-Hollinshead DATE 28/12/2023		REMARKS 1. TIP3008(IP) was excavated at the bottom of Trial Pit TIP3008. 2. Small disturbed sample was taken at 0.17m below existing ground level.		

		INSPECTION PIT RECORD		INSPECTION PIT No. TIP3009(IP)				
		CONTRACT No.: YL/2021/02		SHEET: 1 of 1				
PROJECT: Ground Investigation Works for Hung Shui Kiu / Ha Tsuen New Development Area Package A Works for Second Phase Development								
WORKS ORDER No. -				CO-ORDINATES:		GROUND LEVEL + 38.28 mPD		
DATE from: 05/12/2023 to 06/12/2023				E 816331.90 N 833206.91				
Progress	Water Level (m) Shift start/end	Samples		Reduced Level	Depth (m)	Legend	Grade	Description
		No.	Type Depth					
05/12/2023				+38.28	0.00		IV	Very weak to weak, locally moderately weak, light greyish brown and brown, mottled white, black and yellowish brown, highly decomposed tuffaceous METACONGLOMERATE. Excavated as clayey silty sandy subangular to subrounded medium to coarse gravel and cobbles.
05/12/2023 06/12/2023		1	↓ 0.50					
06/12/2023		2	↓ 0.70	+37.58	0.70			
1								End of inspection pit at 0.70m.
2								
3					3.00			
INSPECTION PIT RECORD - NEW PROJECT ↓ Small Disturbed Sample ↑ Large Disturbed Sample  U76 Undisturbed Sample  U100 Undisturbed Sample  Water Sample				LOGGED K.H. Lai DATE 08/12/2023 CHECKED A.B-Hollinshead DATE 28/12/2023		REMARKS 1. TIP3009(IP) was excavated at the bottom of Trial Pit TIP3009. 2. Small disturbed samples were taken at 0.50m and 0.70m below existing ground level.		