

ARUP

By Hand
18 September 2026

The Secretary
Town Planning Board
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Your ref 278463/06/WLL/TYAL/MKKW/05864

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 (Planning Application No. A/HSK/628)

Submission of Further Information

We refer to the comments received from various Government departments and the public between 4 September and 16 September 2026 regarding the captioned s.16 Planning Application.

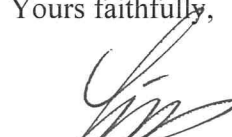
We are pleased to submit a Responses-to-Comments Table (**Appendix A**), a revised Drainage Impact Assessment (**Appendix B**), a revised Water Supply Impact Assessment (**Appendix C**), a revised Preliminary Environmental Assessment (**Appendix D**), and a revised Sewerage Impact Assessment (**Appendix E**) to address departmental and public comments for your consideration.

The softcopy of the Further Information will be uploaded to the hyperlink provided by the Town Planning Board.

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

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

Yours faithfully,


Wai Lam LEE
Director of Planning

d
e

Enc - Appendices A-E
cc - Tuen Mun and Yuen Long West District Planning Office – Ms. Carman CHEUNG (STP/HSK) (ccycheung@pland.gov.hk)
- Tuen Mun and Yuen Long West District Planning Office – Ms. Vanessa CHUNG (TP/YLW3) (vvychung@pland.gov.hk)

By Hand
21 September 2026

The Secretary
Town Planning Board
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Your ref 278463/06/WLL/TYAL/MKKW/05881

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 (Planning Application No. A/HSK/628)

Submission of Replacement Pages for Further Information

We refer to our submission of Further Information dated 18 September 2026 (our ref: 278463/06/WLL/TYAL/MKKW/05864) regarding the captioned s.16 Planning Application.

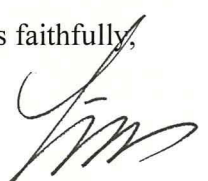
We would like to submit a replacement for Appendix A to address departmental and public comments for your consideration.

The softcopy of the Further Information will be uploaded to the hyperlink provided by the Town Planning Board.

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

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

Yours faithfully,


Wai Lam LEE
Director of Planning

d [REDACTED]
e [REDACTED]

Enc - Appendix A
cc - Tuen Mun and Yuen Long West District Planning Office – Ms. Carman CHEUNG (STP/HSK) (ccycheung@pland.gov.hk)
- Tuen Mun and Yuen Long West District Planning Office – Ms. Vanessa CHUNG (TP/YLW3) (vwychung@pland.gov.hk)

Appendix A

Responses-to-Comments Table

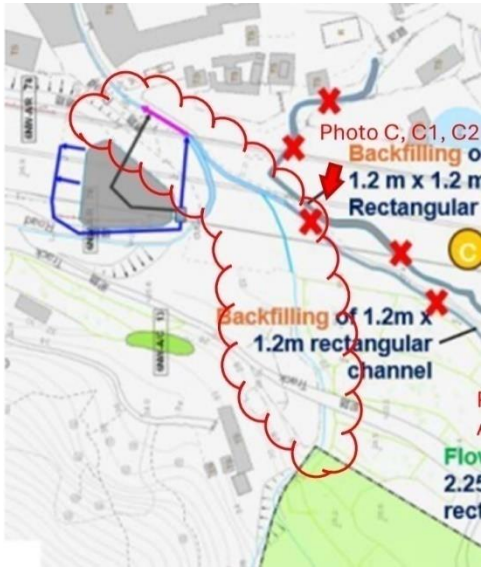
Comments from Related Departments and the Public

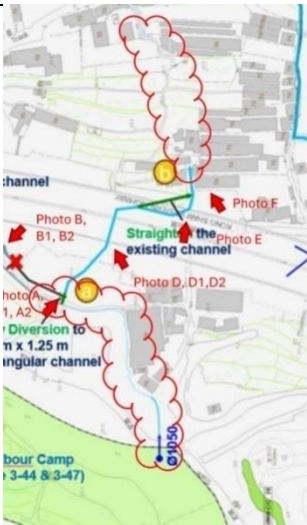
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3. Fire Services Department, Corporate Strategy Command, Planning and Development Division, dated 04 September 2026	4
4. Highways Department, New Territories Region, New Territories West District and Maintenance Division, New Territories District Section (General) 1, dated 04 September 2026	5
5. Lands Department, Lands Administration Office, District Lands Office, Yuen Long, dated 04 September 2026	5
6. Water Supplies Department, New Works Branch, Construction Division, System Planning Section, dated 04 September 2026	6
7. Transport Department, Traffic Engineering (NTW) Division, Yuen Long 1 Section, dated 08 September 2026	7
8. Environmental Protection Department, Environmental Assessment Division, Territory North Group, Yuen Long, dated 16 September 2026	7

COMMENTS FROM RELATED DEPARTMENTS AND THE PUBLIC

No.	Comments	Responses
1.	Public Comments dated 10 September 2026 The public has expressed concerns in relation to the following aspects: - Long-term planning intention and development potential of the Site - Open Space Provision - Transportation Arrangements	With the gradual recovery of the economy and real estate market, together with the anticipated growth in public works projects, including the Northern Metropolis development, the demand for construction manpower remains strong in the coming years. In support of the Government’s Labour Importation Scheme, the proposed development will be essential to support the manpower requirements of ongoing and forthcoming construction projects. The Construction Industry Council will operate and manage the proposed centralised labour quarters, providing timely and suitable accommodation to meet the sector’s operational needs (expected commissioning in Q3 2027). Given its temporary nature, the modular units can be easily dismantled and removed after use. In this regard, no impacts on the long-term planning intention of “I” zone and the development potential of the Site are expected. Adequate open space provision (not less than 18,000m²) will be provided in the Site. Recognising the importance of residents’ physical and mental wellbeing in a liveable neighbourhood, a variety of outdoor communal spaces, including shaded sitting areas and common areas, have been provided. In addition, 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. Large-capacity shuttle bus services will be provided to serve the future residents. To support passenger pick-up/drop-off activities, 10 loading and unloading (L/UL) bays are proposed within the site. Taking into account the assessment results and the operational experience of the existing

No.	Comments	Responses
		centralised quarters for imported labour in construction sector at Tam Mi, the proposed provision of 10 L/UL bays for 60-seater coaches is considered adequate to accommodate the anticipated shuttle bus operations during peak commuting periods. In addition, subject to prior coordination, the contractor may arrange shuttle bus services for residents to travel to various locations, including nearby public transport facilities, such as MTR stations, during weekends.
2.	Drainage Services Department, Operations & Maintenance Branch, Mainland North Division, Yuen Long Section, dated 04 September 2026 <u>Comments on DIA</u> (a) Referring to RtC Item 4(h), please provide site photos to demonstrate the presence and existing condition of said discharge path, as clouded in red in the following extracted figures.  <i>extracted figure 1 – discharge path at north of the site</i>	The site photos showing the presence and existing condition of the concerned discharge path has been supplemented. Please also refer to Appendix B of this Further Information for the revised Drainage Impact Assessment (DIA).

No.	Comments	Responses
	 <i>extracted figure 2 – discharge path at South of the site</i> (b) The proposed drainage scheme, calculation and other relevant information, including Annex 1 to Annex 4 in RtC should be included in the DIA. <u>Other Comments</u> Should the Town Planning Board consider that the application is acceptable from the planning point of view, I would suggest that a condition should be stipulated in the approval letter requiring the applicant to submit a drainage proposal (including revised drainage impact assessment to demonstrate that the proposed use of the site would not have adverse drainage impacts on the drainage issue to the area), to implement and maintain the proposed drainage facilities to the satisfaction of this Division.	Annex 1 to Annex 4 have been supplemented in the revised DIA. Noted.
3.	Fire Services Department, Corporate Strategy Command, Planning and Development Division, dated 04 September 2026 i. In consideration of the design/nature of the proposal, fire service installations (FSIs) are anticipated to be required. Therefore, the applicant is advised to submit relevant layout plans incorporated with the proposed FSIs to this Department for approval. In addition, the applicant should also be advised on the following points:	Noted.

No.	Comments	Responses
	- the layout plans should be drawn to scale and depicted with dimensions and nature of occupancy; and - the location of proposed FSIs to be installed should be clearly marked on the layout plans. ii. However, the applicant is reminded that if the proposed structures are required to comply with the Buildings Ordinance (Cap. 123), detailed fire services requirements will be formulated upon receipt of formal submission of general building plans.	Noted. Noted. Noted.
4.	Highways Department, New Territories Region, New Territories West District and Maintenance Division, New Territories District Section (General) 1, dated 04 September 2026 i. The access from Kong Sham Western Highway to the Site are not currently maintained by HyD and HyD is not going to take up the maintenance responsibility of the accesses; and ii. Adequate drainage measures shall be provided to prevent surface water running from the application site to the nearby public roads and drains.	Noted. The project proponent / future operator shall coordinate and maintain close liaison with CEDD regarding the vehicular access arrangement for the subject site throughout the construction period of the HSK/HT NDA. Please be advised that peripheral surface channels are provided to prevent surface water running from the application site to the nearby public roads and drains.
5.	Lands Department, Lands Administration Office, District Lands Office, Yuen Long, dated 04 September 2026 i. Should the planning approval be approved by the Town Planning Board (“TPB”), the applicant should apply to LandsD for appropriate land documentation for implementation of the proposal and relevant policy support should be obtained for the proposed application. Such application, if received, will be considered by LandsD at its absolute discretion acting in the capacity as a landlord and there is no guarantee that the land application will eventually be approved. If such application is approved, it will be subject to such terms and conditions including, among others, payment of	Noted.

No.	Comments	Responses
	premium and administrative fees, as may be imposed by LandsD. ii. The responses on proposed boundary of the application site (the Site) are noted. However, as the unleased and unallocated government land (UUGL) adjoining to Lot No. 1523 R.P. would be land-locked by the proposed development, the applicant should re-consider to include the UUGL into the Site (e.g. for landscaping, open space, etc.) to ensure full utilization of the resumed land. ii. As the access of some adjoining private lots, namely Lot Nos. 1513 R.P and 3937 R.P. both in D.D. 124, would be blocked by the Site, the applicant is required to allow access from public roads to the adjoining private lots as appropriate. iv. Further comment is reserved until the implementation arrangements (e.g. land documentation) are known. Early application for sufficient processing time is required.	Please note that the concerned site currently falls within “Green Belt” (“GB”) zone on the Draft Hung Shui Kiu and Ha Tsuen Outline Zoning Plan No. S/HSK/3, with the planning intention for defining the limits of urban and sub-urban development areas by natural features and to contain urban sprawl as well as to provide passive recreational outlets. There is a general presumption against development within “GB” zone. Please be advised that Lot Nos. 1513 R.P and 3937 R.P. are accessible through the existing accesses from public roads and these existing accesses will be maintained. Noted.
6.	Water Supplies Department, New Works Branch, Construction Division, System Planning Section, dated 04 September 2026 Comment on the Water Supply Impact Assessment: i. Please justify how the proposed reference consultancy namely “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” is related to water usage for temporary quarters.	The reference consultancy refers to the existing centralised quarters for imported labour in Tam Mi. Please be advised that both the proposed temporary centralized quarters and the existing quarters at Tam Mi accommodate an on-site residential population with similar daily water-use activities, such as drinking, washing, bathing and toilet flushing. Accordingly, the per-capita water consumption characteristics are considered comparable, and the water demand assumptions derived from the Tam Mei study are considered applicable for the Water Supply Impact Assessment.

No.	Comments	Responses
	ii. Para. 3.1.1 - Please add the following: “The existing DN300 fresh water main is placed along Kong Sham Western Highway, which is supplied by the existing Tan Kwai Tsuen South Fresh Water Service Reservoir (TKTSFWSR). The existing TKTSFWSR has a storage capacity of 77,742 m3.	Noted and supplemented accordingly. Please also refer to Appendix C of this Further Information for the revised Water Supply Impact Assessment for details.
7.	Transport Department, Traffic Engineering (NTW) Division, Yuen Long 1 Section, dated 08 September 2026 • He has no adverse comment to the planning application from traffic engineering perspective. • Since the permanent road network under the Second Phase Development of the HSK/HT NDA is not yet handed over to our department for management, the local track leading to the subject site is not under TD’s purview. The applicant shall co-ordinate with CEDD regarding the vehicular access to the subject site. • Sufficient manoeuvring spaces shall be provided within the subject site or its adjacent area. No vehicles are allowed to queue back to public roads or reverse onto/from public roads.	Noted. Noted. The project proponent / future operator shall coordinate and maintain close liaison with CEDD regarding the vehicular access arrangement for the subject site throughout the construction period of the HSK/HT NDA. Noted. Sufficient manoeuvring spaces have been provided within the subject site.
8.	Environmental Protection Department, Environmental Assessment Division, Territory North Group, Yuen Long, dated 16 September 2026 <u>Air Quality (for PEA)</u> Section 2.1.1, fifth bullet point: Please revise to “Air Pollution Control (Fuel Restriction) Regulations”. S2.6.5: The suggested mitigation measures for odour control should be incorporated into the tender document for engaging the service providers to ensure the measures would materialize and if affirmative, please state clearly in the report for proper record purposes. <u>Noise (for PEA)</u>	Noted. Section 2.1.1 has been updated accordingly. Please also refer to Appendix D of this Further Information for the revised Preliminary Environmental Assessment for details. Noted. Section 2.6.5 has been supplemented with a sentence saying that the recommended mitigation measures would be incorporated into the tender document for engaging the service providers and ensuring their implementation.

No.	Comments	Responses
	No comment <u>Waste Management and Land Contamination (for PEA)</u> No comment <u>Water Quality (for both PEA and SIA)</u> S.4.4.2: Please advise whether trip-ticket system will be adopted for the tanker collection service and if affirmative, please include this requirement in the tender document of the tankering service provider and record this properly in the PEA. Regarding the proposed sewage holding tank scheme, the Applicant and the future operator are strongly recommended to secure sewage tankering service early as it is very difficult to engage tanker service to provide at least 6 trucks full time with 30+ trips within a 9 hour reception window everyday for 3 years. The service company may need to procure additional tanker trucks and this takes time. <u>Sewerage (for both PEA and SIA)</u> S.4: Please include the information of the proposed tanker size to ensure its accessibility to the proposed reception facility.	Noted. Noted. Noted. Section 4.4.2 has been supplemented with a sentence saying that a trip-ticket system will be implemented and would be incorporated into the tender document for engaging the service providers and ensuring their implementation. Noted. Noted. Section 4.4.2 has been supplemented to mention that the required volume for the tanker is 12m³ as recommended in the SIA, and typical tanker size meeting the requirement of the proposed reception facility would be adopted by the service provider during the operational phase to ensure the accessibility of the tanker to the proposed reception facility.

(Last updated 21 September 2026)

Appendix B

Revised 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

| September 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	Indicative Scheme for the Proposed Development
Appendix B	Proposed Drainage Layout Plan
Appendix C	Results of Hydraulic Checking
Appendix D	Site Photos

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 (m^2)
 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 1200 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, including the relevant cross-sections and drainage details 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. The hydraulic calculation of the drainage network for the proposed development is presented in **Appendix C**.

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 2) 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.

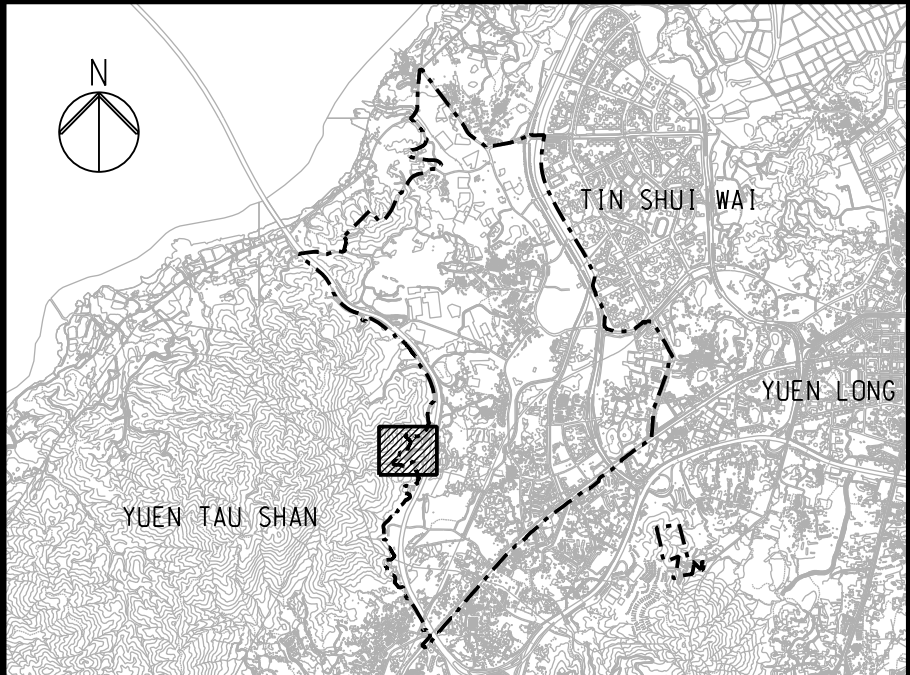
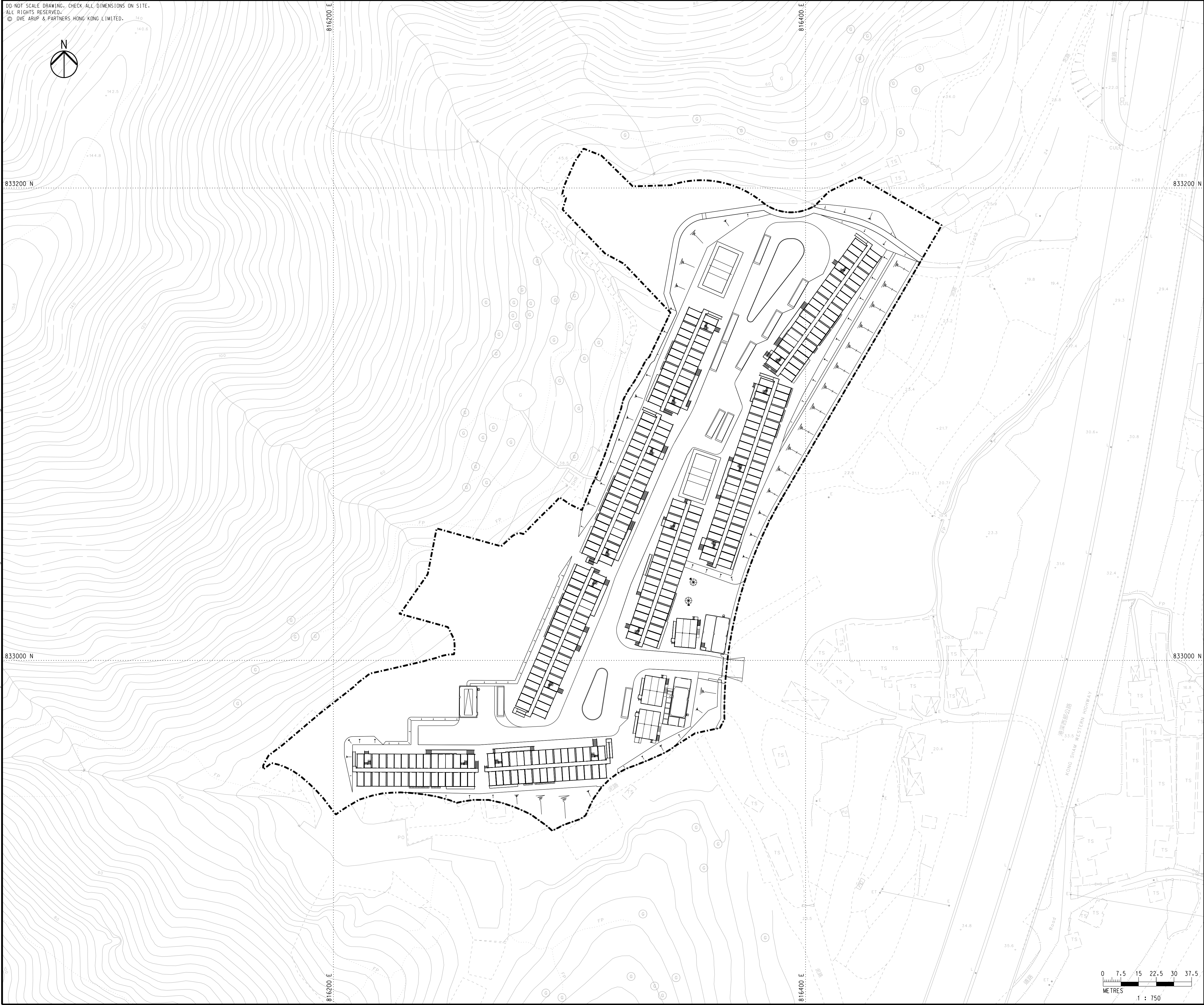
4 Summary

- 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. **Site photographs of the existing channels are presented in Appendix D.**
- 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

Printed by : reman.yick Date : 7/23/2026
Filename : J:\278000\278463 CE 1-2020 HSK-HT NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Civil\Sketch\278463_SK_C_479.dgn



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
RY	06/26	EH	KKC
Scale	1:750 @ A1		PRELIMINARY

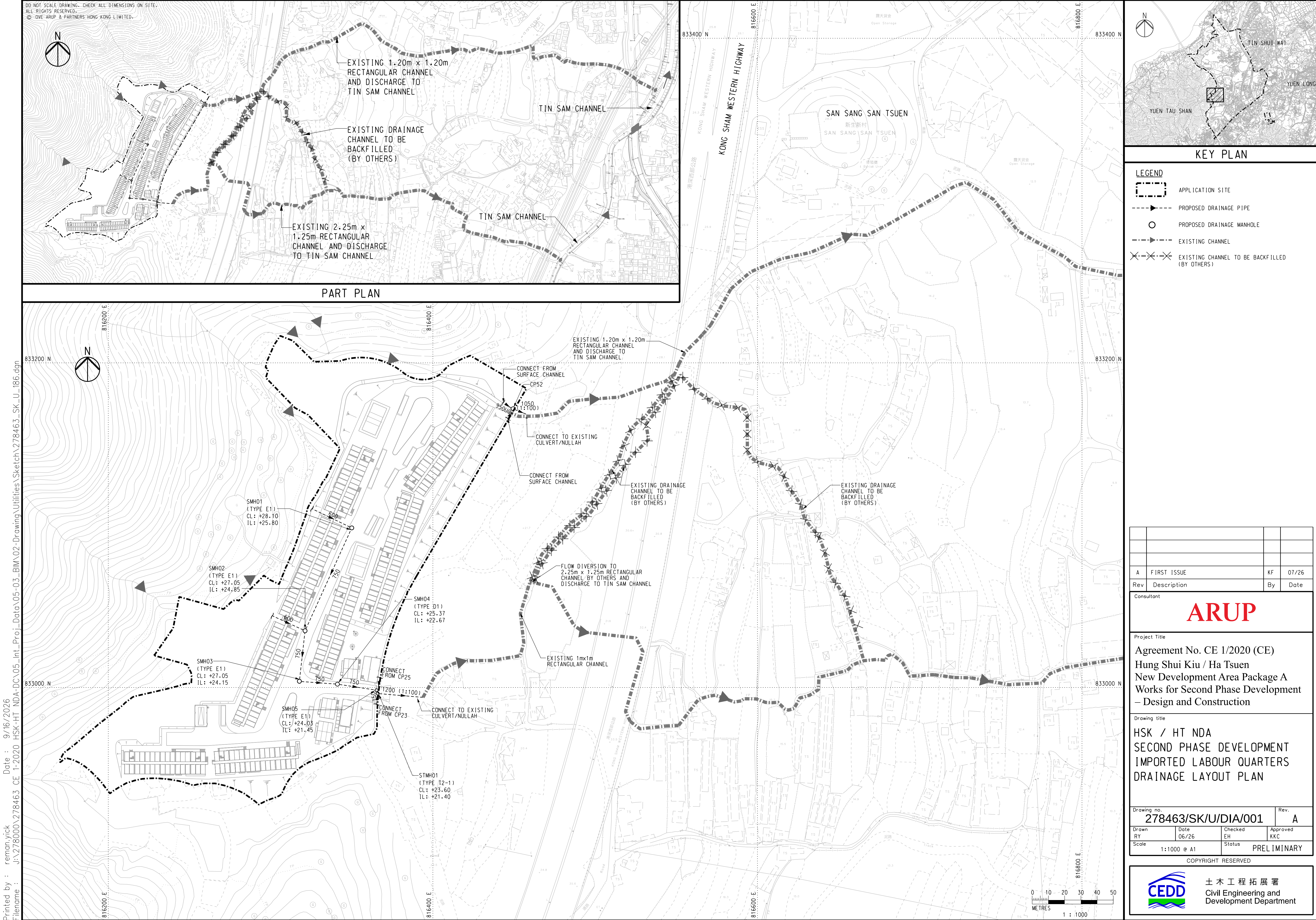
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土木工程拓展署
Civil Engineering and
Development Department

Appendix B

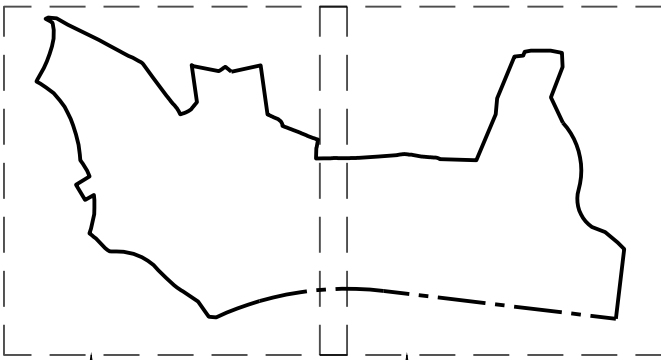
Proposed Drainage Layout Plan



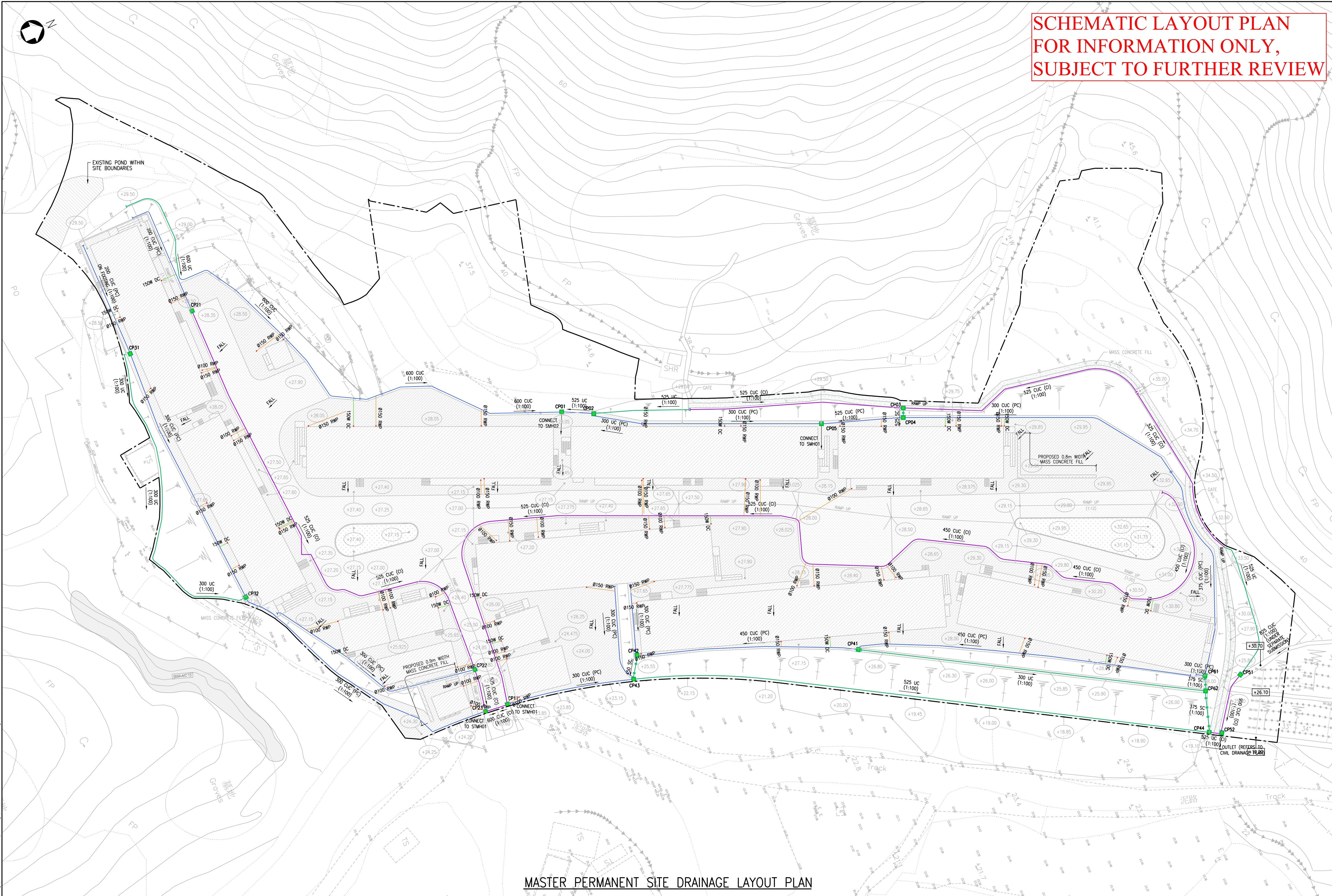
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Date : 9/16/2026

SCHEMATIC LAYOUT PLAN
FOR INFORMATION ONLY,
SUBJECT TO FURTHER REVIEW

EXTRACTED FROM DRAWING:



KEY PLAN



MASTER PERMANENT SITE DRAINAGE LAYOUT PLAN

LEGEND

- SITE BOUNDARY LINE
- PROPOSED CATCHPIT
- PROPOSED U-CHANNEL WITH CAST IRON (CI) COVER
DIAMETER (mm) OF COVER U-CHANNEL
MINIMUM DEGREE OF FLOW
(GRATING DETAIL REFERS TO DRAWING F/RW001/DD004)
- PROPOSED U-CHANNEL WITH PRECAST CONCRETE (PC) COVER
DIAMETER (mm) OF COVER U-CHANNEL
MINIMUM DEGREE OF FLOW
(GRATING DETAIL REFERS TO DRAWING F/RW001/DD004)
- PROPOSED U-CHANNEL WITHOUT 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)
- 150W DISH CHANNEL
- Ø150/Ø100 RWP
- CDP (BY BUILDING DRAINAGE)

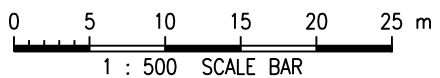
CATCHPIT SCHEDULE

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP01	+28.05	+26.85	CATCHPIT TYPE (B) - CP(B)
CP02	+28.05	+27.65	CATCHPIT TYPE (B) - CP(B)
CP03	+30.35	+29.72	CATCHPIT TYPE (B) - CP(B)
CP04	+29.4	+29	CATCHPIT TYPE (B) - CP(B)
CP05	+29.5	+28.2	CATCHPIT TYPE (B) - CP(B)
CP11	+24.05	+23.3	CATCHPIT TYPE (B) - CP(D)

NOTE: CATCHPIT DETAILS REFER TO DRAWING NO. F/RW001/DD001.

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP21	+28.5	+28	CATCHPIT TYPE (B) - CP(D)
CP22	+24.7	+23.85	CATCHPIT TYPE (B) - CP(D)
CP23	+24.1	+23.45	CATCHPIT TYPE (B) - CP(D)
CP31	+26.8	+26.25	CATCHPIT TYPE (B) - CP(B)
CP41	+27.25	+26.7	CATCHPIT TYPE (B) - CP(B)
CP42	+26.8	+25.95	CATCHPIT TYPE (B) - CP(B)
CP43	+23.05	+22.05	CATCHPIT TYPE (B) - CP(B)
CP44	+19.2	+18.3	CATCHPIT TYPE (B) - CP(B)
CP51	+25.8	+23.05	CATCHPIT TYPE (B) - CP(B)
CP52	+19.1	+18.2	CATCHPIT TYPE (B) - CP(B)
CP61	+28	+27.5	CATCHPIT TYPE (B) - CP(B)
CP62	+26	+25.5	CATCHPIT TYPE (B) - CP(B)

AMENDED DRAWING



Drawing Title

SITE FORMATION WORKS –
MASTER PERMANENT SITE DRAINAGE
LAYOUT PLAN

Status

SUBMISSION

Drawn

WT

Checked

KC

Approved

WC

Scale

1:500 (A1)

CAD File No.

–

Date

JUNE 2026

First Issued

Drawing No.

–

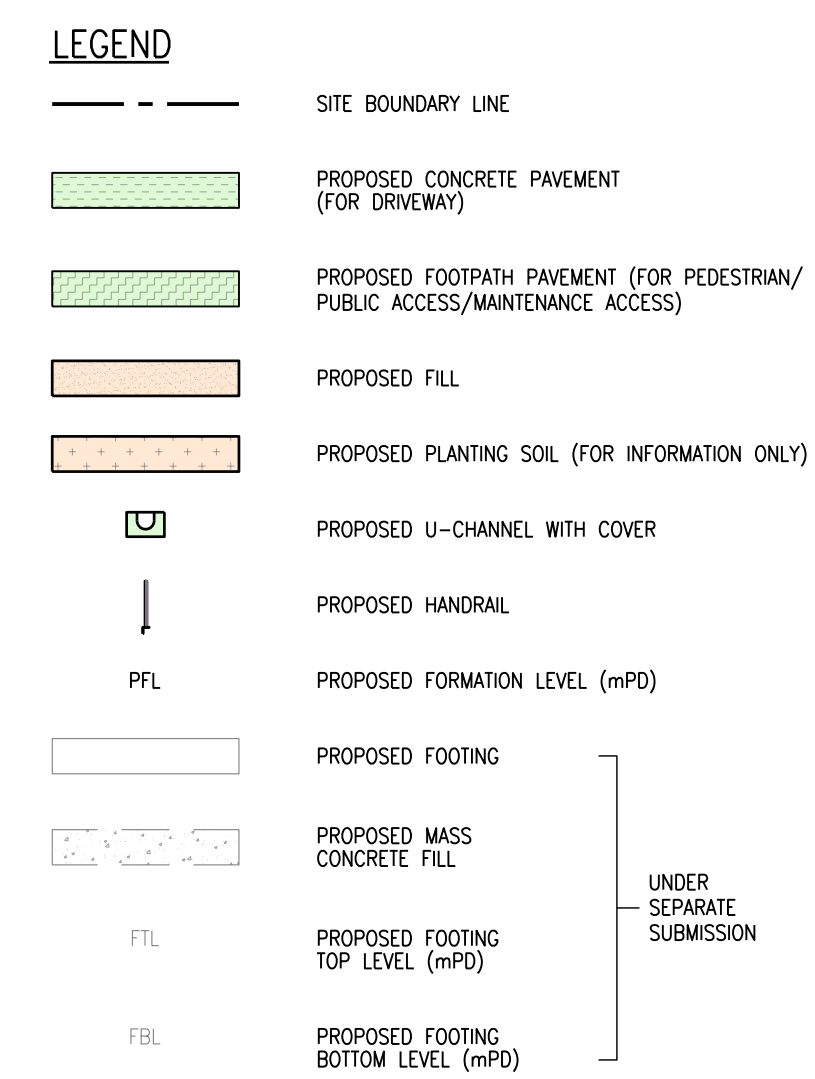
Rev.

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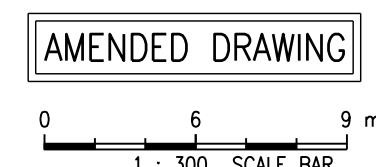
Copyright Reserved

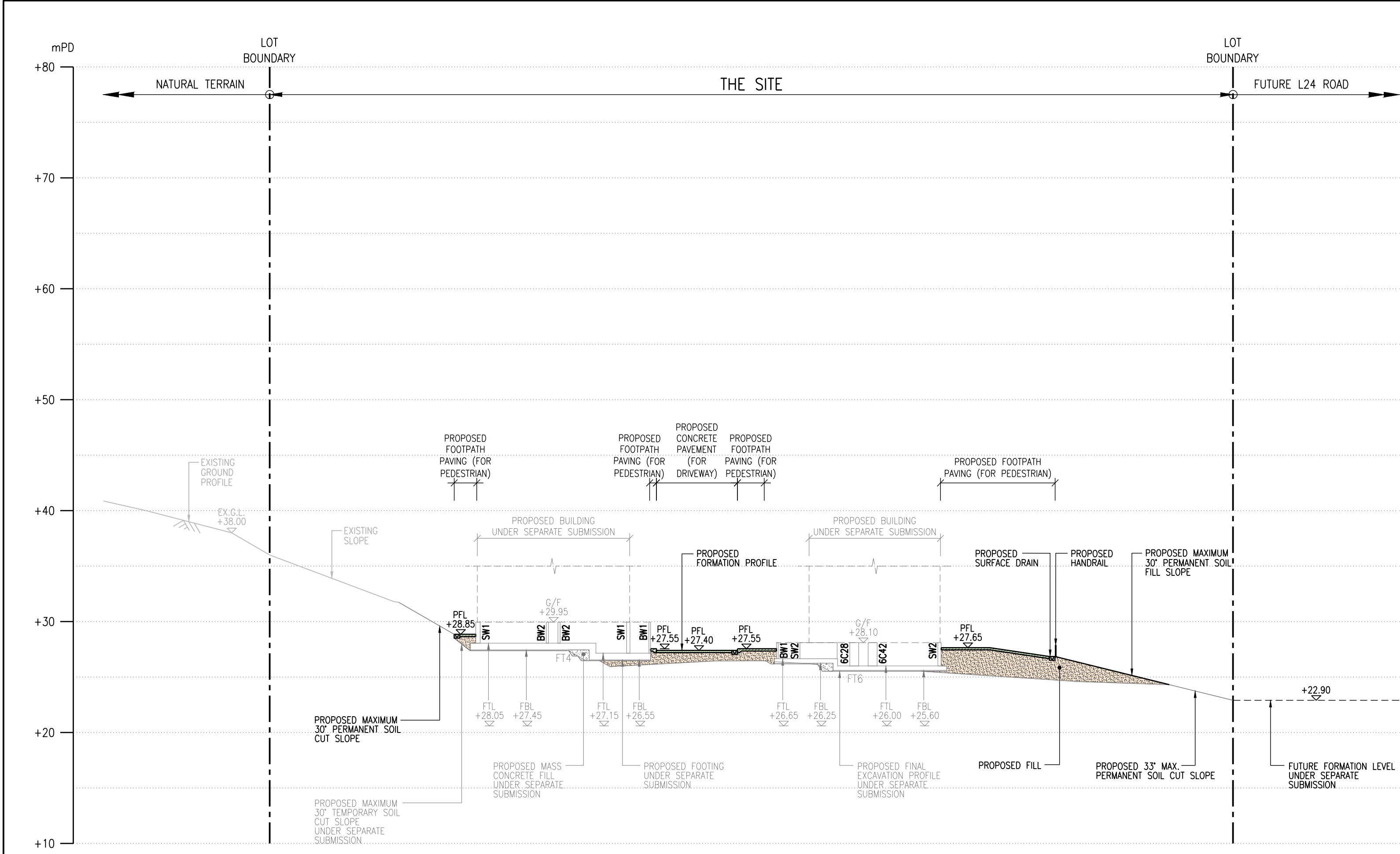
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F/SF001/FP201

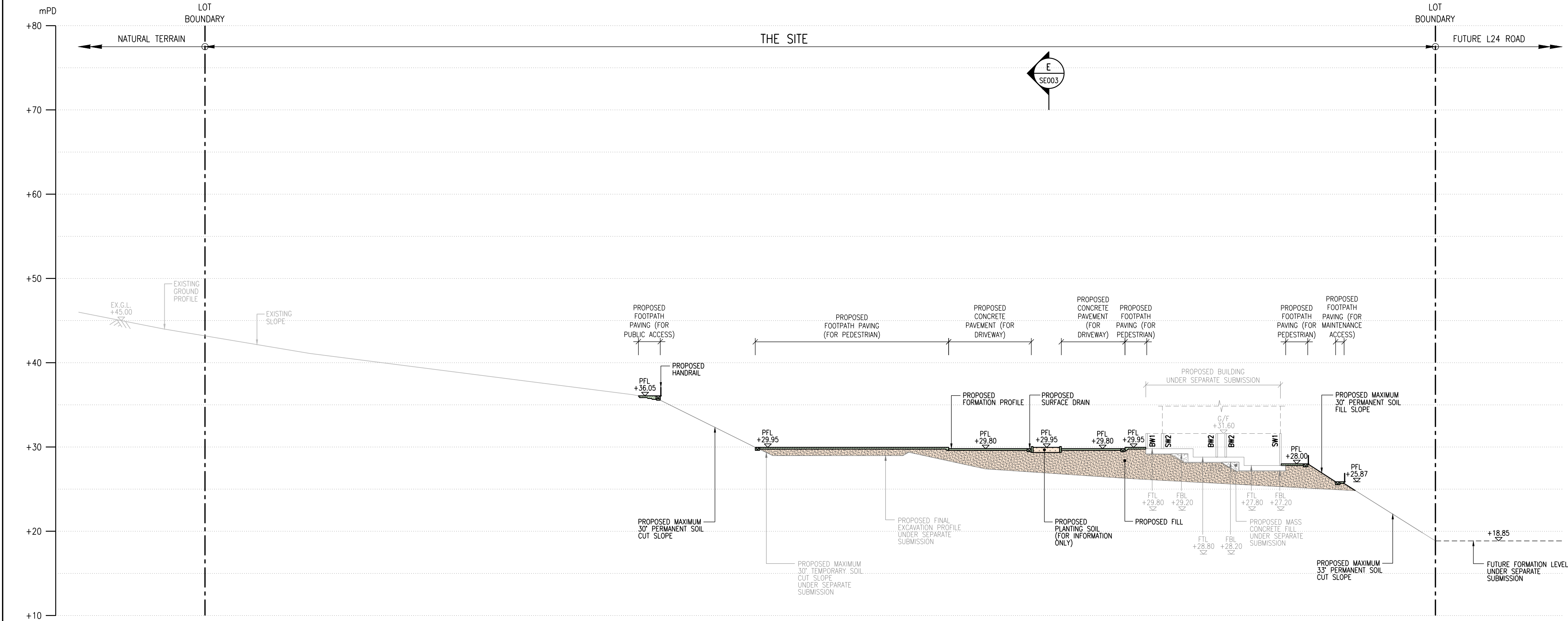


Drawing Title				
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Status				
SUBMISSION				
Drawn	WT	Checked	KC	Approved WC
Scale	1:300 (A1)	CAD File No.	–	Date JUNE, 2026
First Issued	Drawing No.			Rev.
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SECTION C-C



SECTION D-D

LEGEND

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

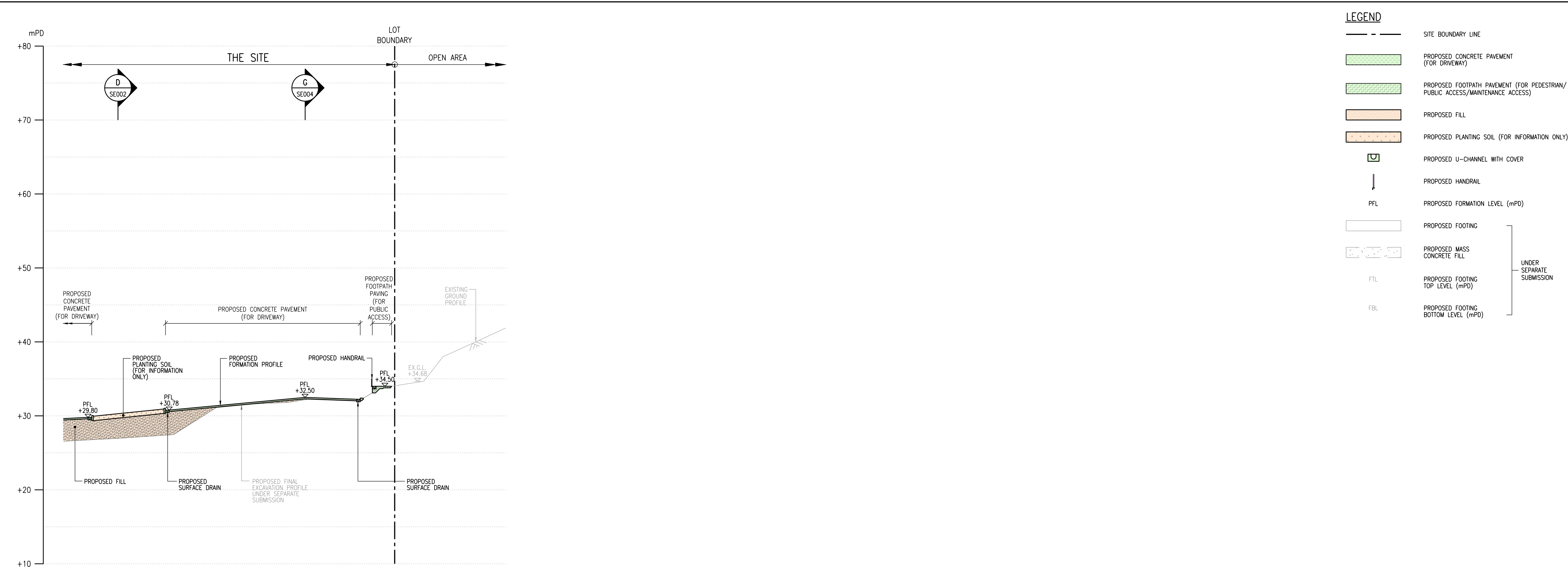
EXTRACTED FROM DRAWING:

FOR INFORMATION ONLY,
SUBJECT TO FURTHER REVIEW

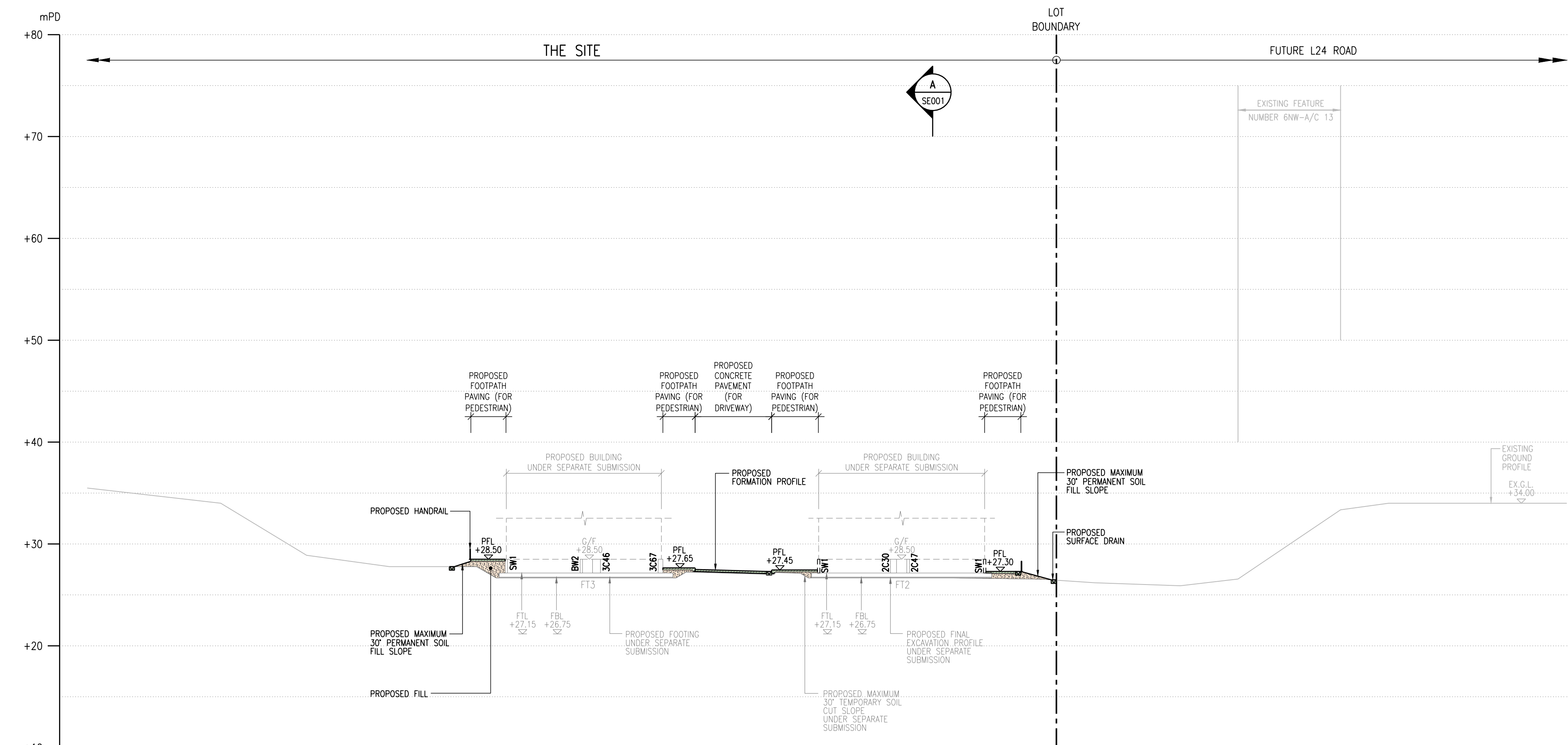
AMENDED DRAWING

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1 : 300 SCALE BAR

Drawing Title				
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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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		0		



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
- PROPOSED FORMATION LEVEL (mPD)
- PROPOSED FOOTING
- PROPOSED MASS CONCRETE FILL
- PROPOSED FOOTING TOP LEVEL (mPD)
- PROPOSED FOOTING BOTTOM LEVEL (mPD)

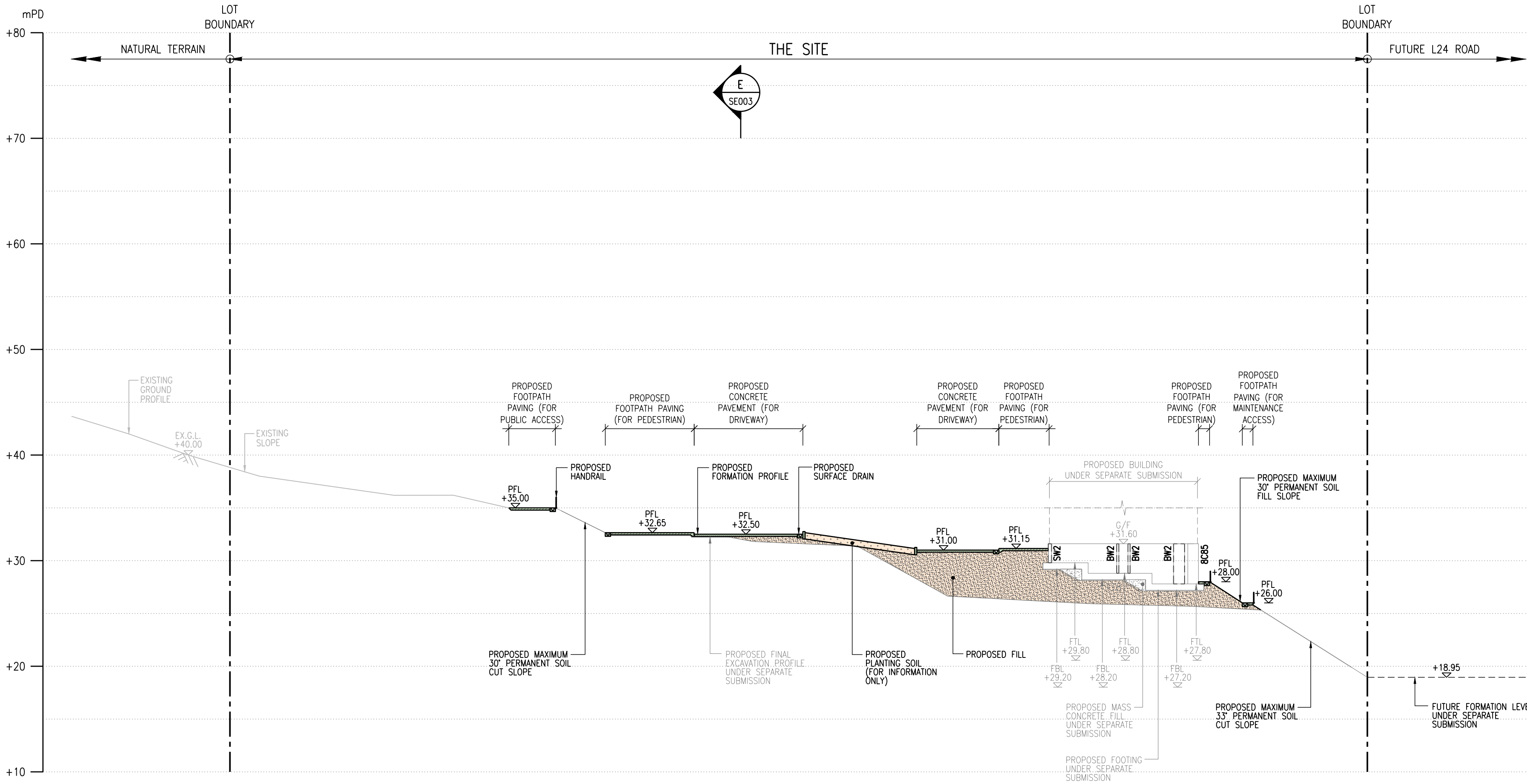
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Scale 1:300 (A1)	CAD File No. –	Date JUNE 2026	Rev.
First Issued	Drawing No. F/SF001/SE003		0
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FOR INFORMATION ONLY,
SUBJECT TO FURTHER REVIEW

AMENDED DRAWING

0 6 9 m
1 : 300 SCALE BAR



SECTION G-G

- 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
 - PROPOSED FOOTING TOP LEVEL (mPD)
 - PROPOSED FOOTING BOTTOM LEVEL (mPD)
- UNDER SEPARATE SUBMISSION

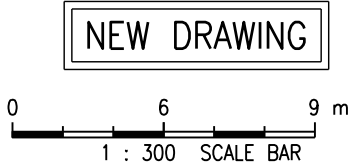
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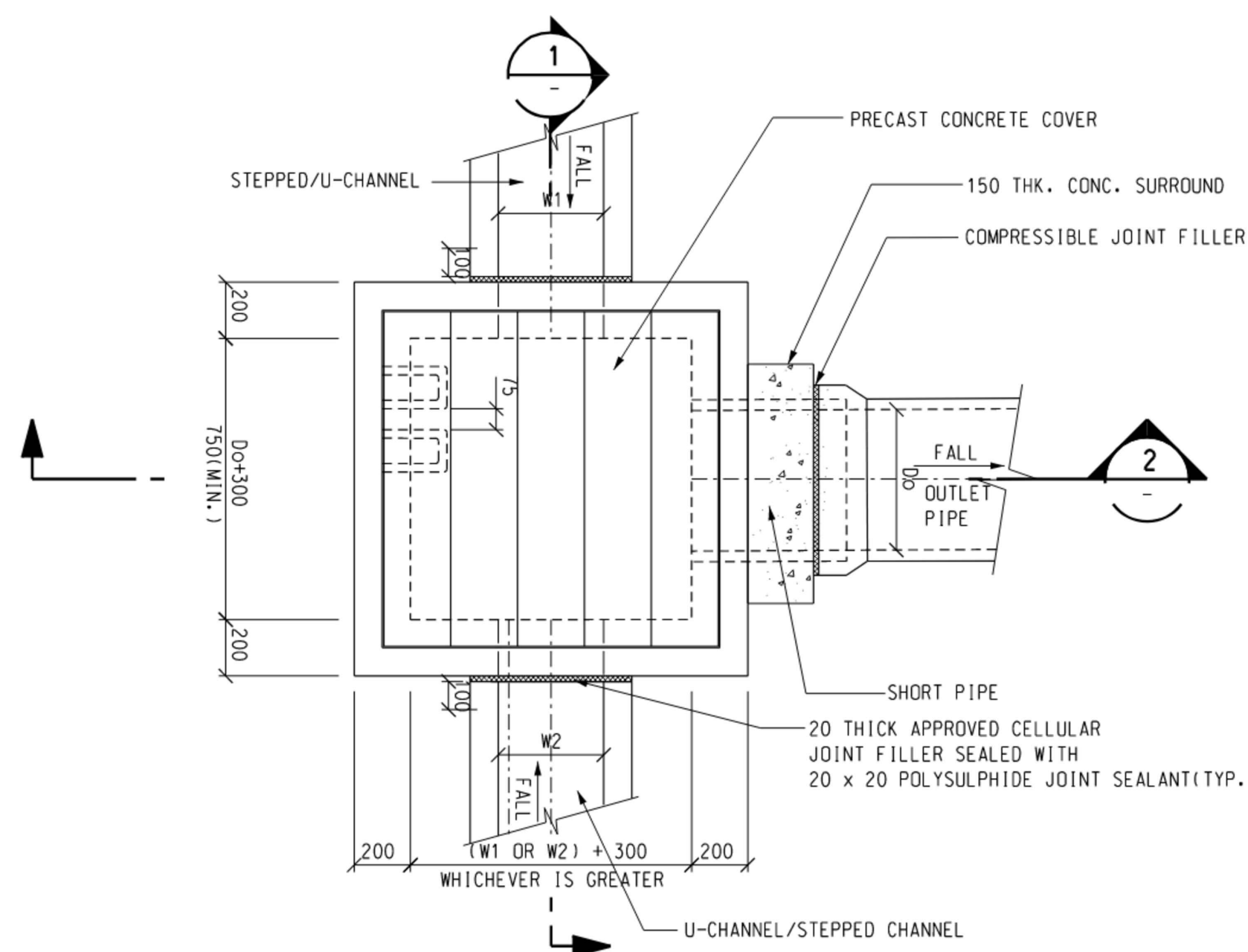
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SECTION G-G

SUBMISSION					
Drawn WT		Checked KC		Approved WC	
Scale 1:300 (A1)		CAD File No. —		Date JUNE 2026	
First Issued		Drawing No. F/SF001/SE004			Rev. —
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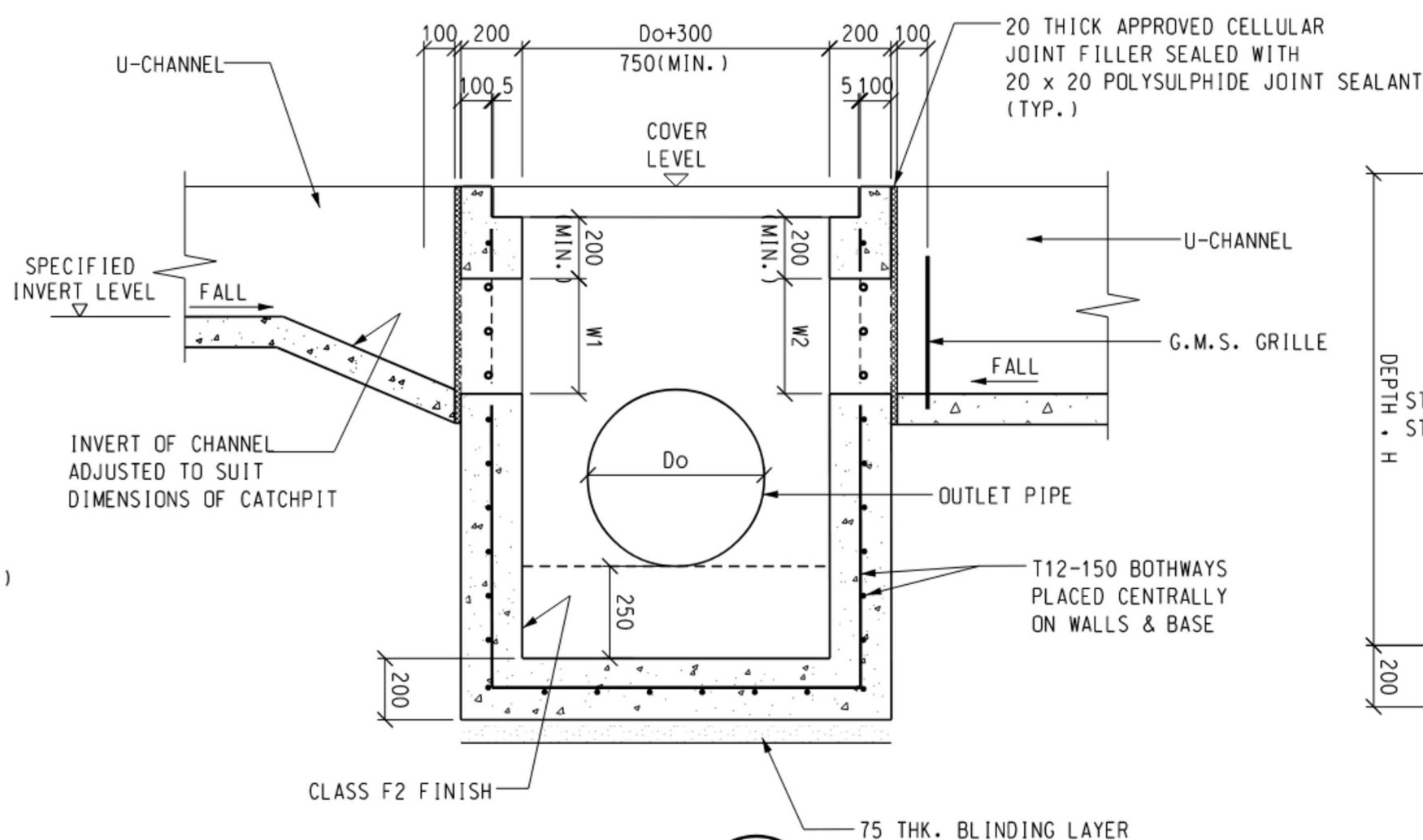


CATCHPIT TYPE (B) - CP(B)

PLAN

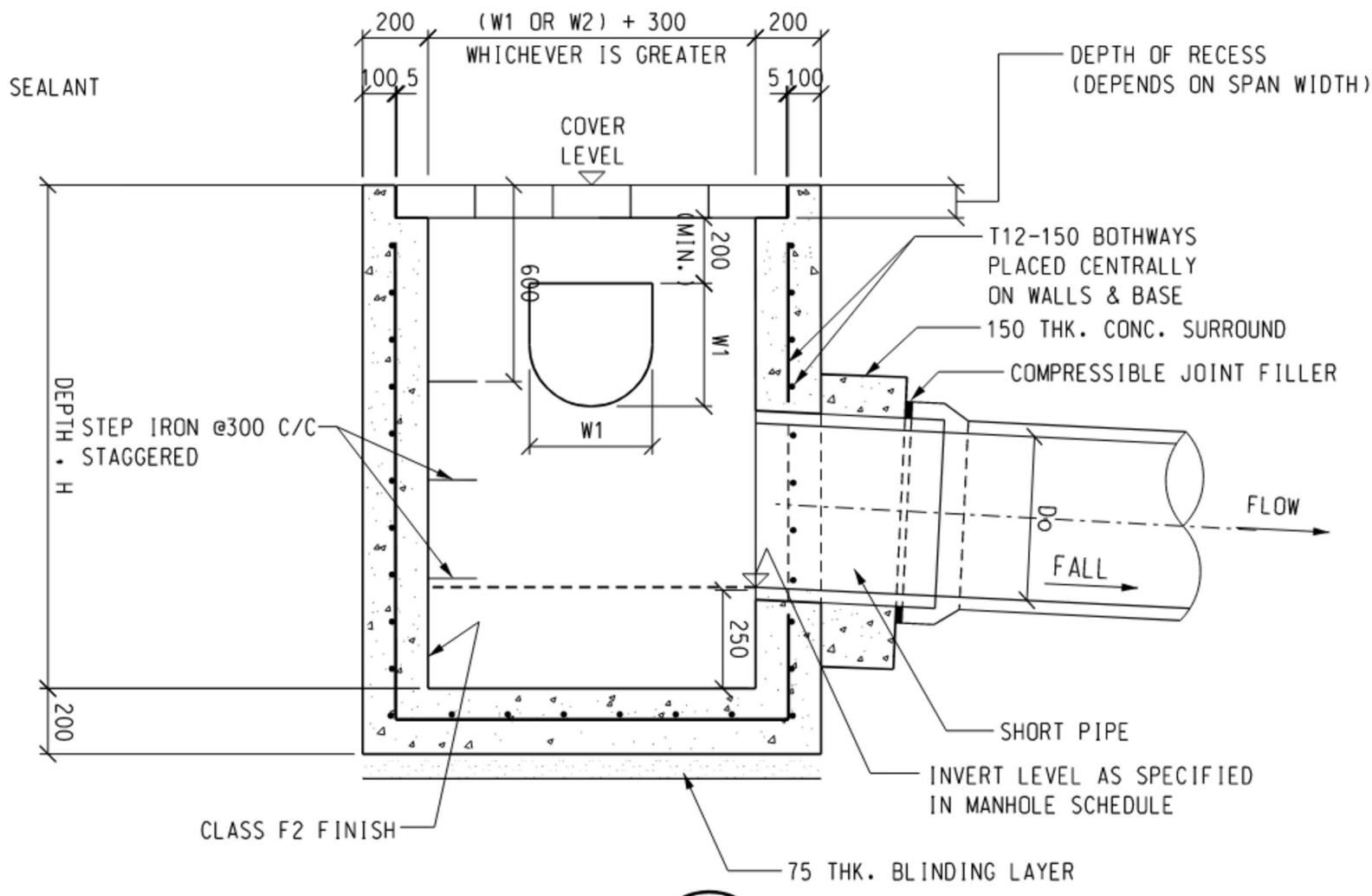
SCALE 1:20

(CATCHPIT NOT SUBJECTED TO VEHICLE LOADING)



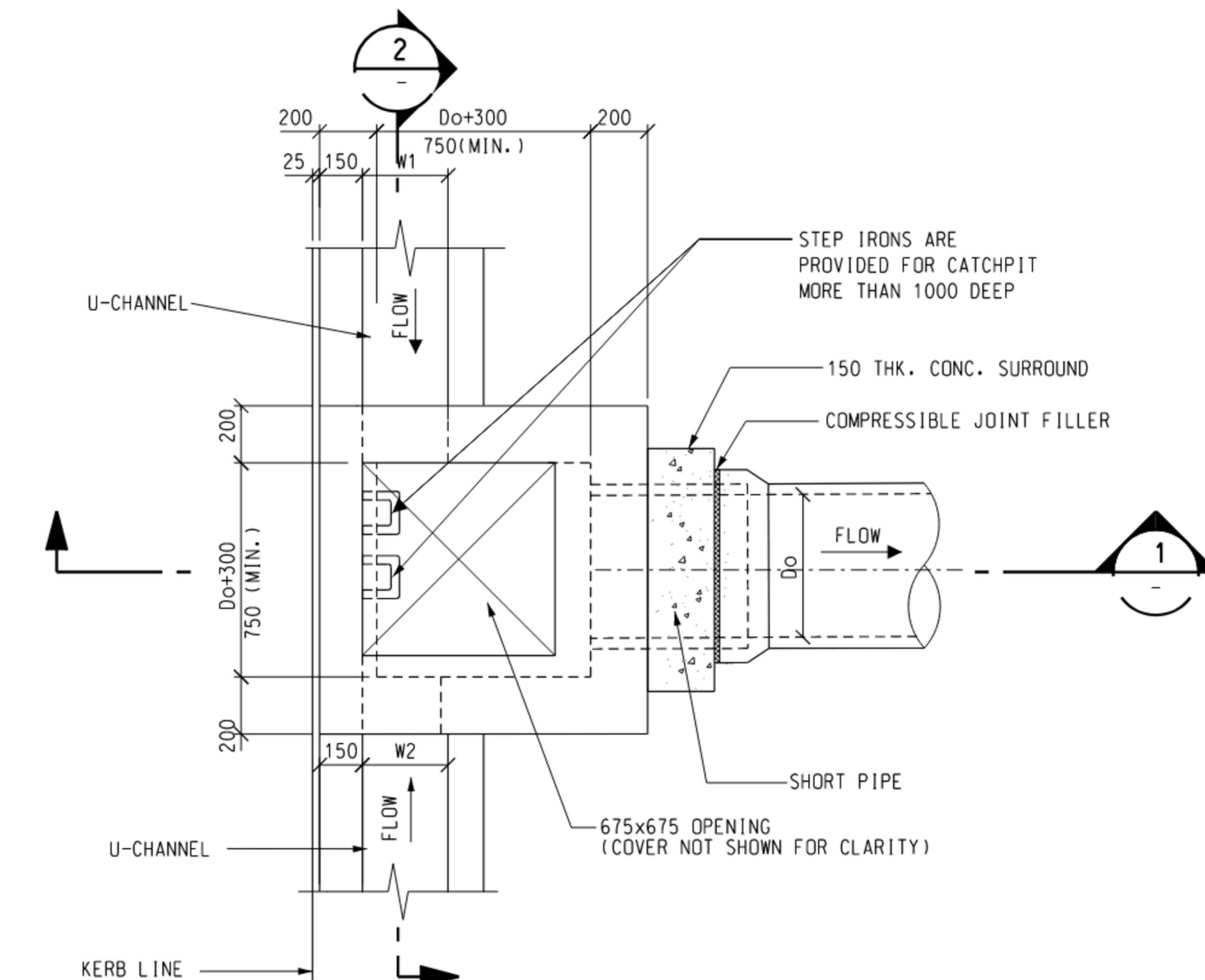
SECTION 3

SCALE 1:20



SECTION 4

SCALE 1:20

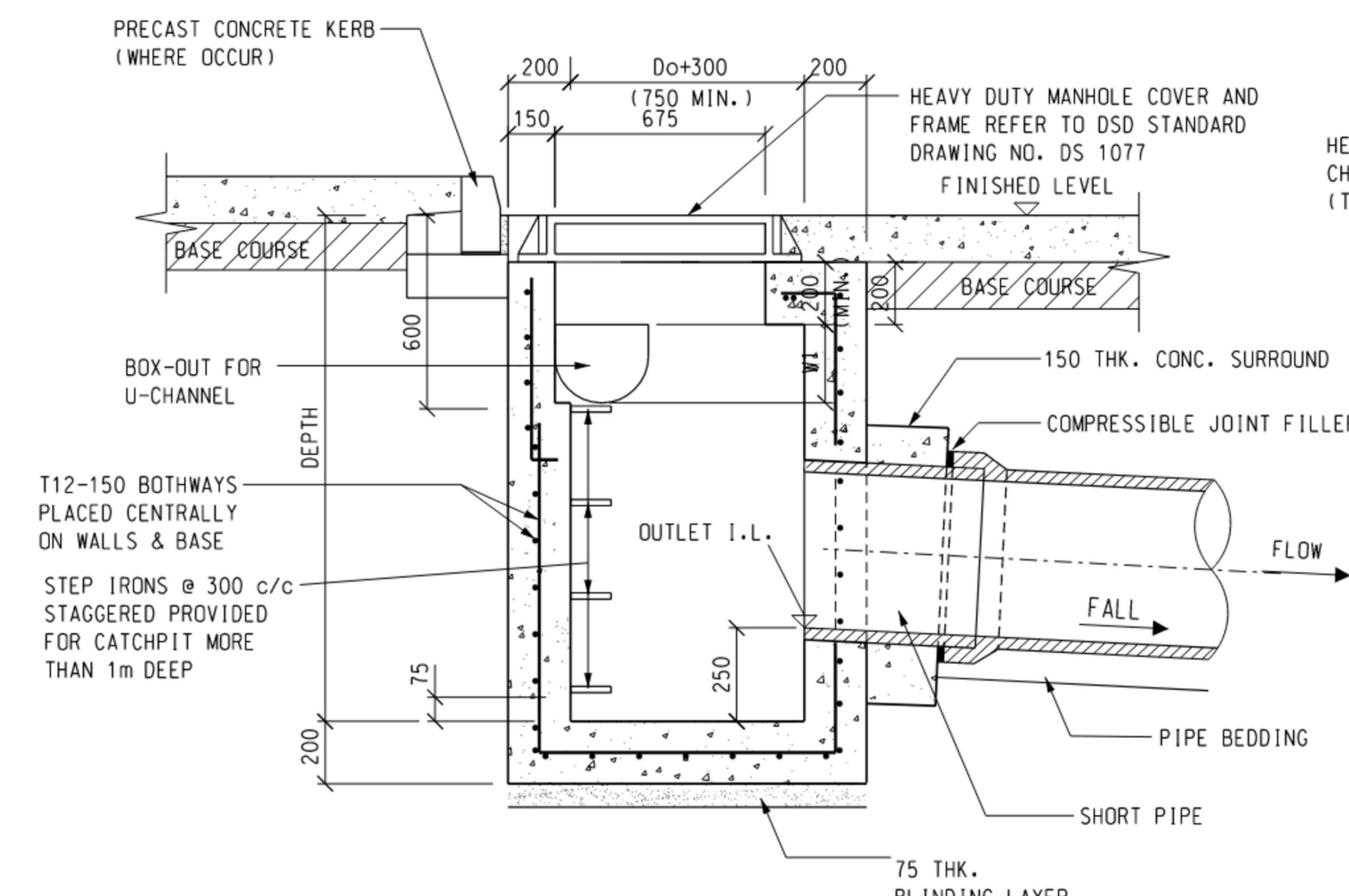


CATCHPIT TYPE (D) - CP-D

PLAN

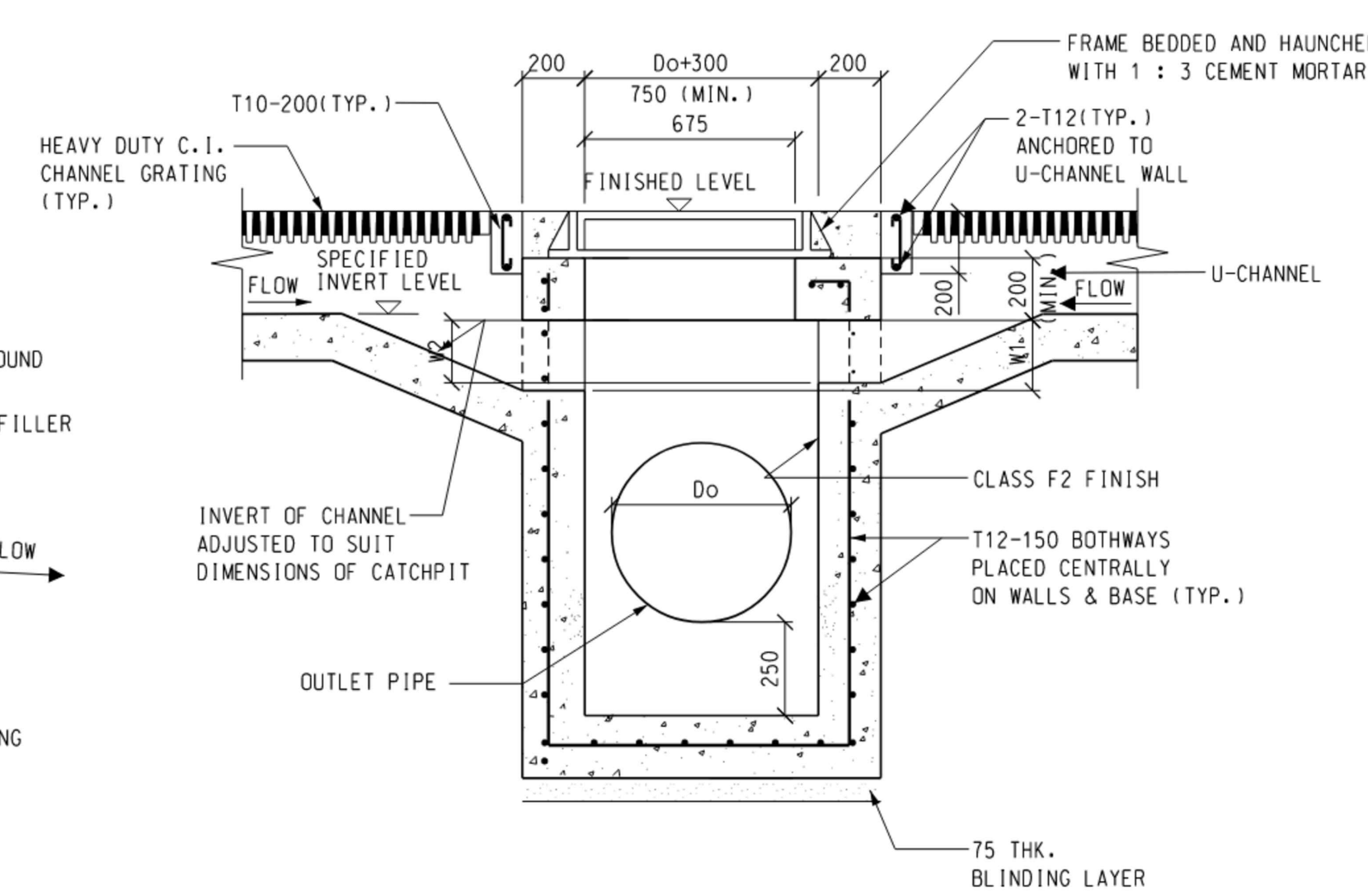
SCALE 1:20

(CATCHPIT SUBJECTED TO VEHICLE LOADING)



SECTION 1

SCALE 1:20



SECTION 2

SCALE 1:20

FOR INFORMATION ONLY,
SUBJECT TO FURTHER REVIEW

0 500 1000 mm
1 : 20 SCALE BAR

Drawing Title

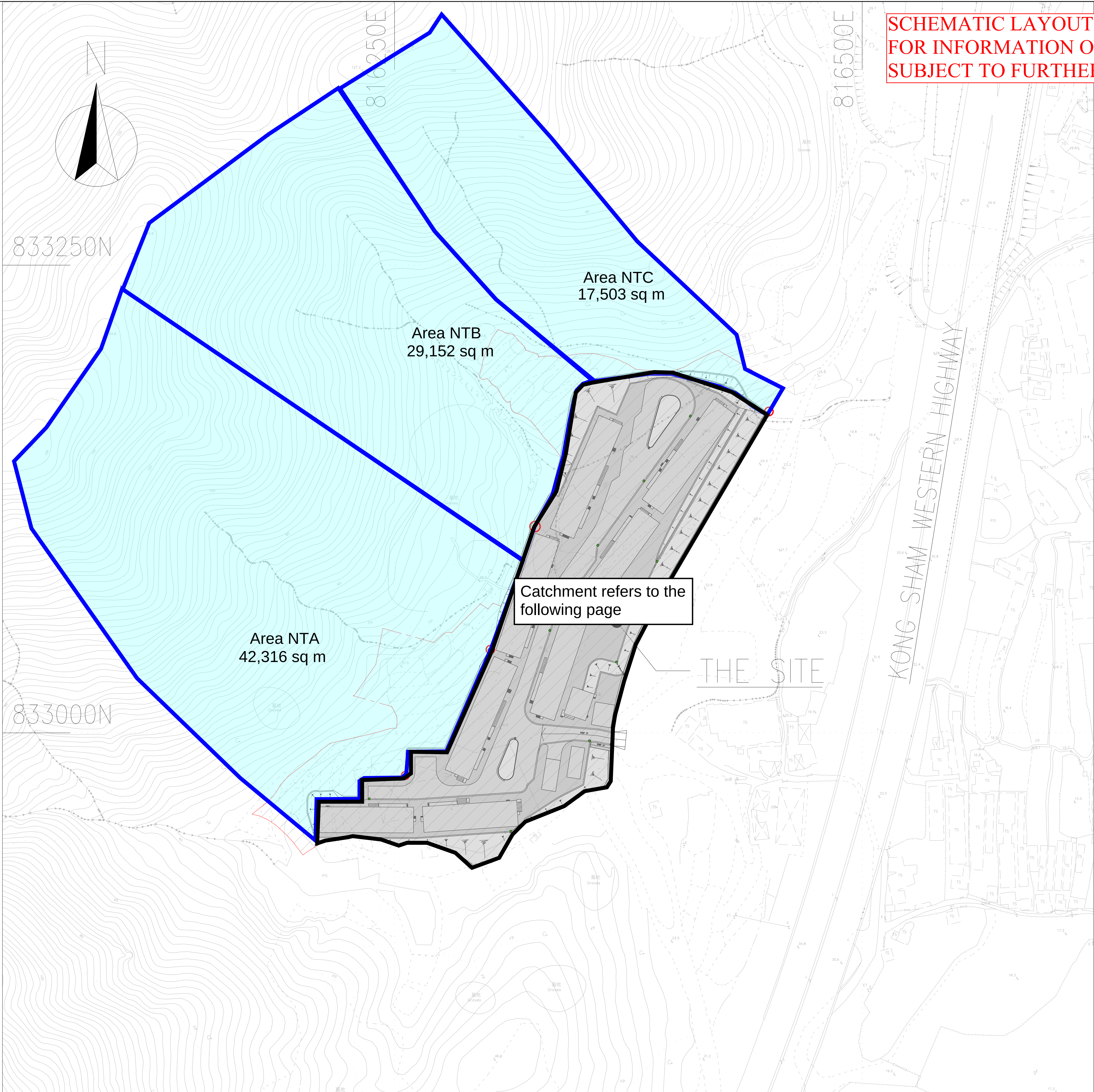
CIVIL DRAINAGE WORKS –
MISCELLANEOUS DETAILS
(SHEET 1 OF 4)

Status SUBMISSION

Drawn WT	Checked KC	Approved WC
Scale AS SHOWN (A1)	CAD File No. –	Date JUNE 2026
First Issued	Drawing No.	Rev.
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Appendix C

Results of Hydraulic Checking

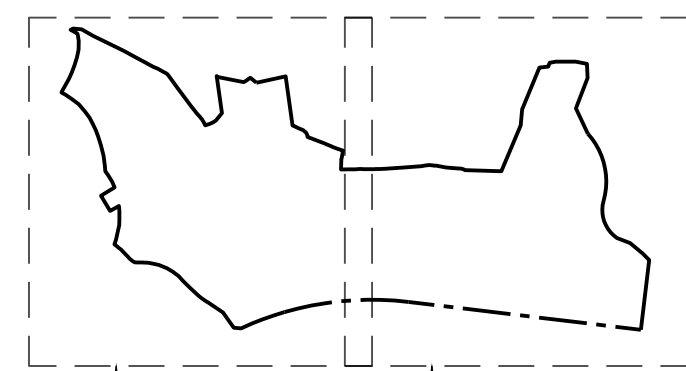


SCHEMATIC LAYOUT PLAN
FOR INFORMATION ONLY,
SUBJECT TO FURTHER REVIEW

Drawing Title			
SITE FORMATION WORKS – MASTER PERMANENT SITE DRAINAGE CATCHMENT PLAN			
Status SUBMISSION			
Drawn	Checked	Approved	
Scale	CAD File No. _	Date	JUNE 2026
First Issued	Drawing No.	Rev.	
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SCHEMATIC LAYOUT PLAN
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REFER TO
DRAWING NUMBER
F/SF001/FP202

REFER TO
DRAWING NUMBER
F/SF001/FP203

KEY PLAN

Catchment refers to the
previous page

Zone 01
593 sq m

Zone 02
1,689 sq m

Zone 03
4,768 sq m

Zone 04
442 sq m

Zone 22
1,392 sq m

Zone 13
4,678 sq m

Zone 31
1,503 sq m

Zone 21
1,985 sq m

Zone 12
4,924 sq m

Zone 11
609 sq m

Zone 32
647 sq m

Zone 41
(Future
Drainage
assumed
50,000)

Zone 33
331 sq m

Discharge

Discharge

MASTER PERMANENT SITE DRAINAGE LAYOUT PLAN

LEGEND

SITE BOUNDARY LINE

PROPOSED CATCHPIT

PROPOSED U-CHANNEL WITH CAST IRON (CI) COVER
DIAMETER (mm) OF COVER U-CHANNEL
MINIMUM DEGREE OF FLOW
(GRATING DETAIL REFERS TO DRAWING F/RW001/DD004)

PROPOSED U-CHANNEL WITH PRECAST CONCRETE (PC) COVER
DIAMETER (mm) OF COVER U-CHANNEL
MINIMUM DEGREE OF FLOW
(GRATING DETAIL REFERS TO DRAWING F/RW001/DD004)

PROPOSED U-CHANNEL WITHOUT 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)

150W DISH CHANNEL

Ø150/Ø100 RWP

CDP (BY BUILDING DRAINAGE)

CATCHPIT SCHEDULE

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP01	+28.05	+26.85	CATCHPIT TYPE (B) - CP(B)
CP02	+28.05	+27.65	CATCHPIT TYPE (B) - CP(B)
CP03	+30.35	+29.72	CATCHPIT TYPE (B) - CP(B)
CP04	+29.4	+29	CATCHPIT TYPE (B) - CP(B)
CP05	+29.5	+28.2	CATCHPIT TYPE (B) - CP(B)
CP11	+24.05	+23.3	CATCHPIT TYPE (B) - CP(D)

NOTE: CATCHPIT DETAILS REFER TO DRAWING NO. F/RW001/DD001.

Catchpit	Covered Level (mPD)	Inverted Level (mPD)	Catchpit Type
CP21	+28.5	+28	CATCHPIT TYPE (B) - CP(D)
CP22	+24.7	+23.85	CATCHPIT TYPE (B) - CP(D)
CP23	+24.1	+23.45	CATCHPIT TYPE (B) - CP(D)
CP31	+26.8	+26.25	CATCHPIT TYPE (B) - CP(B)
CP41	+27.25	+26.7	CATCHPIT TYPE (B) - CP(B)
CP42	+26.8	+25.95	CATCHPIT TYPE (B) - CP(B)
CP43	+23.05	+22.05	CATCHPIT TYPE (B) - CP(B)
CP44	+19.2	+18.3	CATCHPIT TYPE (B) - CP(B)
CP51	+25.8	+23.05	CATCHPIT TYPE (B) - CP(B)
CP52	+19.1	+18.2	CATCHPIT TYPE (B) - CP(B)
CP61	+28	+27.5	CATCHPIT TYPE (B) - CP(B)
CP62	+26	+25.5	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

WT

Checked

KC

Approved

WC

Scale

1:500 (A1)

CAD File No.

–

Date

JUNE 2026

First Issued

Drawing No.

Rev.

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F/SF001/FP201

0

Project: Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area

Title: Drainage Pipe Design (By Colebrook-White Equation)

Date: 15/9/2026 By: EH(WAL) Check: DK(WAL)

Zone	Area
NTA	43276
NTB	27325
NTC	17503
01	593
02	1689
03	4768
04	442
11	609
12	4924
13	4678
21	1985
22	1392
31	1503
32	647
33	331
41	50000

Channel	Assumed surface characteristics	Channel Size	Qp (L/min)	Remark	Ctm 1	Ctm 2	Ctm 3	Ctm 4	Ctm 5	Ctm 6	Ctm 7	Ctm 8
CP01 (In) L	Steep heavy soil grassland	600 U-Channel	36655	-	NTA	-	-	-	-	-	-	-
CP01 (In) R	Steep heavy soil grassland	525 U-Channel	25966	-	NTA	-	-	-	-	-	-	-
CP01 (Out)	Steep heavy soil grassland	-	52580	To SMH02	NTA	-	-	-	-	-	-	-
CP02 (In)	Steep heavy soil grassland	525 U-Channel	25966	-	NTA	-	-	-	-	-	-	-
CP03 (In) L	Steep heavy soil grassland	525 U-Channel	22857	-	NTB	-	-	-	-	-	-	-
CP03 (In) R	Steep heavy soil grassland	525 U-Channel	22857	-	NTB	-	-	-	-	-	-	-
CP04 (In) L	Steep heavy soil grassland	525 U-Channel	32927	-	NTB	-	-	-	-	-	-	-
CP04 (In) R	Steep heavy soil grassland	300 U-Channel	728	-	11	-	-	-	-	-	-	-
CP05 (In)	Steep heavy soil grassland	525 U-Channel	33660	To SMH01	NTB	11	-	-	-	-	-	-
CP51 (In)	Steep heavy soil grassland	525 U-Channel	15414	-	NTC	32	0	-	-	-	-	-
CP52 (In) R	Steep heavy soil grassland	900 U-Channel	63539	-	NTC	33	41	-	-	-	-	-
CP41 (In)	Concrete	450 U-Channel	6760	-	21	-	-	-	-	-	-	-
CP42 (In) L	Concrete	300 U-Channel	2634	-	22	-	-	-	-	-	-	-
CP42 (In) R	Concrete	450 U-Channel	7512	-	21	-	-	-	-	-	-	-
CP43 (In) L	Concrete	300 U-Channel	5268	-	22	-	-	-	-	-	-	-
CP43 (In) M	Concrete	300 U-Channel	5268	-	22	-	-	-	-	-	-	-
CP43 (In) R	Concrete	450 U-Channel	8038	-	22	21	-	-	-	-	-	-
CP44 (In) L	Steep heavy soil grassland	525 U-Channel	5832	-	22	21	31	-	-	-	-	-
CP61 (In)	Concrete	300 U-Channel	7512	-	21	-	-	-	-	-	-	-
CP62 (In)	Concrete	375 U-Channel	7512	-	21	-	-	-	-	-	-	-
CP44 (In) R	Concrete	375 U-Channel	7512	-	21	-	-	-	-	-	-	-
CP52 (In) L	Steep heavy soil grassland	525 U-Channel	5832	-	21	22	31	-	-	-	-	-
CP52 (Out)	Steep heavy soil grassland	-	74858	To Existing Nullah	NTC	21	22	31	32	33	41	-
CP11 (In)	Concrete	450 U-Channel	9317	-	12	-	-	-	-	-	-	-
CP12 (In)	Concrete	450 U-Channel	18633	-	12	-	-	-	-	-	-	-
CP13 (In)	Concrete	450 U-Channel	18633	-	12	-	-	-	-	-	-	-
CP14 (In)	Concrete	525 U-Channel	36336	-	12	13	-	-	-	-	-	-
CP15 (In)	Concrete	525 U-Channel	27019	-	12	13	-	-	-	-	-	-
CP15 (Out)	Concrete	-	36336	To STMH01	12	13	-	-	-	-	-	-
CP31 (In)	Steep heavy soil grassland	300 U-Channel	354	-	01	-	-	-	-	-	-	-
CP32 (In) L	Steep heavy soil grassland	300 U-Channel	709	-	01	-	-	-	-	-	-	-
CP32 (In) R	Concrete	300 U-Channel	3196	-	02	-	-	-	-	-	-	-
CP23 (In) L	Concrete	300 U-Channel	7112	-	01	02	04	-	-	-	-	-
CP22 (In) L	Concrete	300 U-Channel	6391	-	02	-	-	-	-	-	-	-
CP21 (In) L	Concrete	300 U-Channel	5413	-	03	-	-	-	-	-	-	-
CP22 (In) R	Concrete	525 U-Channel	18043	-	03	-	-	-	-	-	-	-
CP23 (In) R	Concrete	525 U-Channel	24434	-	02	03	-	-	-	-	-	-
CP23 (Out)	Concrete	-	28351	To STMH01	01	02	03	04	-	-	-	-

Note:

Outlet A (temporary stage) is discharged from CP23, CP15, SHM01, SHM02 to STMH01 Q = 150927 L/min
Outlet A1 (permanent stage) is discharged from SHM01, SHM02 to SMH06 Q = 86241 L/min
Outlet A2 (permanent stage) is discharged from CP23, CP15 to STMH01 Q = 64687 L/min
Outlet B is discharged from CP52 Q = 74858 L/min

Channel	Total Area	Ctm 1	Ctm 2	Ctm 3	Ctm 4	Ctm 5	Ctm 6	Ctm 7	Ctm 8
CP01 (In) L	30293	30293	0	0	0	0	0	0	0
CP01 (In) R	21638	21638	0	0	0	0	0	0	0
CP01 (Out)	43276	43276	0	0	0	0	0	0	0
CP02 (In)	21638	21638	0	0	0	0	0	0	0
CP03 (In) L	19128	19128	0	0	0	0	0	0	0
CP03 (In) R	19128	19128	0	0	0	0	0	0	0
CP04 (In) L	27325	27325	0	0	0	0	0	0	0
CP04 (In) R	609	609	0	0	0	0	0	0	0
CP05 (In)	27934	27325	609	0	0	0	0	0	0
CP51 (In)	12899	12252	647	0	0	0	0	0	0
CP52 (In) R	52081	1750	331	50000	0	0	0	0	0
CP41 (In)	1787	1787	0	0	0	0	0	0	0
CP42 (In) L	696	696	0	0	0	0	0	0	0
CP42 (In) R	1985	1985	0	0	0	0	0	0	0
CP43 (In) L	1392	1392	0	0	0	0	0	0	0
CP43 (In) M	1392	1392	0	0	0	0	0	0	0
CP43 (In) R	2124	139	1985	0	0	0	0	0	0
CP44 (In) L	4880	1392	1985	1503	0	0	0	0	0
CP61 (In)	1985	1985	0	0	0	0	0	0	0
CP62 (In)	1985	1985	0	0	0	0	0	0	0
CP44 (In) R	1985	1985	0	0	0	0	0	0	0
CP52 (In) L	4880	1985	1392	1503	0	0	0	0	0
CP52 (Out)	61109	5251	1985	1392	1503	647	331	50000	0
CP11 (In)	2462	2462	0	0	0	0	0	0	0
CP12 (In)	4924	4924	0	0	0	0	0	0	0
CP13 (In)	4924	4924	0	0	0	0	0	0	0
CP14 (In)	9602	4924	4678	0	0	0	0	0	0
CP15 (In)	7140	2462	4678	0	0	0	0	0	0
CP15 (Out)	9602	4924	4678	0	0	0	0	0	0
CP31 (In)	297	297	0	0	0	0	0	0	0
CP32 (In) L	593	593	0	0	0	0	0	0	0
CP32 (In) R	845	845	0	0	0	0	0	0	0
CP23 (In) L	1880	593	845	442	0	0	0	0	0
CP22 (In) L	1689	1689	0	0	0	0	0	0	0
CP21 (In) L	1430	1430	0	0	0	0	0	0	0
CP22 (In) R	4768	4768	0	0	0	0	0	0	0
CP23 (In) R	6457	1689	4768	0	0	0	0	0	0
CP23 (Out)	7492	593	1689	4768	442	0	0	0	0

All values are in square meters

page 1				
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area			
Title:	Rainfall intensity design	Date:	15/9/2026	By: EH(WAL) Check: DK(WAL)

A surface drainage system is designed to collect surface run-off from the catchment areas nearby

Adopted design paramters or methodologies are shown as follow: -

- 1) Design rainfall intensity is based on return period of 1 in 50 years
- 2) computation of stormwater run-off is refer to Stormwater Drainage Manual (DSD), Fifth Edition with Corrigendum No. 1/2022, 1/2024 & 2/2024; and DSD Technical Circular 1/2017.

a) The maximum run-off is calculated by "Intensity-Duration-Frequency (IDF) Relationship"

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

b) The design parameter complies with GEO Technical Guidance Note No. 30 (TGN 30)

c) The time of concentration is defined as the maximum time taken by surface water to travel from the catchment boundary to the point in the desainage system under design. By using Bransby-Williams Equation:

$$t = 0.14465L/H^{0.2} A^{0.1}$$

where,

t = time of concentration

A = catchment area

H = Average fall (m per 100m) from the summit of catchment to the point of design

L = Distance in meters measured on the line of natural flow between the design section and that point of the catchment from which water would taken the longest time to reach the design section

page 2				
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area			
Title:	Drainage Pipe Design (By Colebrook-White Equation)	Date:	15/9/2026	By: EH(WAL) Check: DK(WAL)

rainfall intensity calculation

Type	Area, A (m ²)	Design return period (year)	Average Fall, H (m per 100m)	Fall Distance, L (m)	time of concentration, t (min) (max 5 mins)	mean rainfall intensity (mm/hr)
CP01 (In) L	30293.2	50	50	200	4.71	242
CP01 (In) R	21638	50	50	200	4.88	240
CP01 (Out)	43276	50	50	200	4.55	243
CP02 (In)	21638	50	50	200	4.88	240
CP03 (In) L	19127.5	50	50	200	4.94	239
CP03 (In) R	19127.5	50	50	200	4.94	239
CP04 (In) L	27325	50	50	200	4.76	241
CP04 (In) R	609	50	50	200	5.00	239
CP05 (In)	27934	50	50	200	4.75	241
CP51 (In)	12899.1	50	50	200	5.00	239
CP52 (In) R	52081.3	50	50	200	4.47	244
CP41 (In)	1786.5	50	50	200	5.00	239
CP42 (In) L	696	50	50	200	5.00	239
CP42 (In) R	1985	50	50	200	5.00	239
CP43 (In) L	1392	50	50	200	5.00	239
CP43 (In) M	1392	50	50	200	5.00	239
CP43 (In) R	2124.2	50	50	200	5.00	239
CP44 (In) L	4880	50	50	200	5.00	239
CP61 (In)	1985	50	50	200	5.00	239
CP62 (In)	1985	50	50	200	5.00	239
CP44 (In) R	1985	50	50	200	5.00	239
CP52 (In) L	4880	50	50	200	5.00	239
CP52 (Out)	61108.9	50	50	200	4.39	245
CP11 (In)	2462	50	50	200	5.00	239
CP12 (In)	4924	50	50	200	5.00	239
CP13 (In)	4924	50	50	200	5.00	239
CP14 (In)	9602	50	50	200	5.00	239
CP15 (In)	7140	50	50	200	5.00	239
CP15 (Out)	9602	50	50	200	5.00	239
CP31 (In)	296.5	50	50	200	5.00	239
CP32 (In) L	593	50	50	200	5.00	239
CP32 (In) R	844.5	50	50	200	5.00	239
CP23 (In) L	1879.5	50	50	200	5.00	239
CP22 (In) L	1689	50	50	200	5.00	239
CP21 (In)	1430.4	50	50	200	5.00	239
CP22 (In) R	4768	50	50	200	5.00	239
CP23 (In) R	6457	50	50	200	5.00	239
CP23 (Out)	7492	50	50	200	5.00	239

Stormwater Coefficient (HKO Headquater)	
	50 years
a	505.5
b	3.29
c	0.355

page 1				
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area			
Title:	Drainage Pipe Design (By Colebrook-White Equation)	Date:	15/9/2026	By: EH(WAL) Check: DK(WAL)

Calculation of Flow Capacity by Colebrook-White Equation

Cross Section	D (mm)	Flow Area, A (m ²)	Wetted perimeter P (m)	Hydraulic radius, R = A/P (m)	Gradient, 1/Sf	Surface roughness, ks (mm)	V (m/s), from Colebrook-White Eqn.	Q (m ³ /s) = V*A	Q (L/min)
U-Channel	300	0.0803	0.771	0.104	100	0.6	1.94	0.156	9337
U-Channel	375	0.1255	0.964	0.130	100	0.6	2.23	0.280	16789
U-Channel	450	0.1808	1.157	0.156	100	0.6	2.50	0.452	27098
U-Channel	525	0.2461	1.350	0.182	100	0.6	2.75	0.677	40602
U-Channel	600	0.3214	1.542	0.208	100	0.6	2.99	0.960	57614
U-Channel	675	0.4067	1.735	0.234	100	0.6	3.21	1.307	78431
U-Channel	750	0.5021	1.928	0.260	100	0.6	3.43	1.722	103334
U-Channel	825	0.6076	2.121	0.286	100	0.6	3.64	2.210	132591
U-Channel	900	0.7231	2.314	0.313	100	0.6	3.84	2.774	166459

Runoff Calculation

Type	Area, A (m ²)	Design return period (year)	i (mm/hr)	Surface Characteristics	Runoff coeff. C	Qp (m ³ /s)	Qp (L/min) = A x 1 x C / 60	Critical Case
CP01 (In) L	30293.2	50	242	Steep heavy soil grassland	0.3	0.611	36655	-
CP01 (In) R	21638	50	240	Steep heavy soil grassland	0.3	0.433	25966	-
CP01 (Out)	43276	50	243	Steep heavy soil grassland	0.3	0.876	52580	-
CP02 (In)	21638	50	240	Steep heavy soil grassland	0.3	0.433	25966	-
CP03 (In) L	19127.5	50	239	Steep heavy soil grassland	0.3	0.381	22857	-
CP03 (In) R	19127.5	50	239	Steep heavy soil grassland	0.3	0.381	22857	-
CP04 (In) L	27325	50	241	Steep heavy soil grassland	0.3	0.549	32927	-
CP04 (In) R	609	50	239	Steep heavy soil grassland	0.3	0.012	728	-
CP05 (In)	27934	50	241	Steep heavy soil grassland	0.3	0.561	33660	-
CP51 (In)	12899.1	50	239	Steep heavy soil grassland	0.3	0.257	15414	-
CP52 (In) R	52081.3	50	244	Steep heavy soil grassland	0.3	1.059	63539	-
CP41 (In)	1786.5	50	239	Concrete	0.95	0.113	6760	-
CP42 (In) L	696	50	239	Concrete	0.95	0.044	2634	-
CP42 (In) R	1985	50	239	Concrete	0.95	0.125	7512	-
CP43 (In) L	1392	50	239	Concrete	0.95	0.088	5268	-
CP43 (In) M	1392	50	239	Concrete	0.95	0.088	5268	-
CP43 (In) R	2124.2	50	239	Concrete	0.95	0.134	8038	-
CP44 (In) L	4880	50	239	Steep heavy soil grassland	0.3	0.097	5832	-
CP61 (In)	1985	50	239	Concrete	0.95	0.125	7512	-
CP62 (In)	1985	50	239	Concrete	0.95	0.125	7512	-
CP44 (In) R	1985	50	239	Concrete	0.95	0.125	7512	-
CP52 (In) L	4880	50	239	Steep heavy soil grassland	0.3	0.097	5832	-
CP52 (Out)	61108.9	50	245	Steep heavy soil grassland	0.3	1.248	74858	-
CP11 (In)	2462	50	239	Concrete	0.95	0.155	9317	-
CP12 (In)	4924	50	239	Concrete	0.95	0.311	18633	-
CP13 (In)	4924	50	239	Concrete	0.95	0.311	18633	-
CP14 (In)	9602	50	239	Concrete	0.95	0.606	36336	-
CP15 (In)	7140	50	239	Concrete	0.95	0.450	27019	-
CP15 (Out)	9602	50	239	Concrete	0.95	0.606	36336	-
CP31 (In)	296.5	50	239	Steep heavy soil grassland	0.3	0.006	354	-
CP32 (In) L	593	50	239	Steep heavy soil grassland	0.3	0.012	709	-
CP32 (In) R	844.5	50	239	Concrete	0.95	0.053	3196	-
CP23 (In) L	1879.5	50	239	Concrete	0.95	0.119	7112	-
CP22 (In) L	1689	50	239	Concrete	0.95	0.107	6391	-
CP21 (In)	1430.4	50	239	Concrete	0.95	0.090	5413	-
CP22 (In) R	4768	50	239	Concrete	0.95	0.301	18043	-
CP23 (In) R	6457	50	239	Concrete	0.95	0.407	24434	-
CP23 (Out)	7492	50	239	Concrete	0.95	0.473	28351	-

page 2				
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area			
Title:	Drainage Pipe Design (By Colebrook-White Equation)	Date:	15/9/2026	By: EH(WAL) Check: DK(WAL)

Drainage Check

Type	Qp	Designated Section	Diameter (mm)	Q (L/min)	Check	Utilization (%)
CP01 (In) L	36655	U-Channel	600	57614	> 36655(OK)	64
CP01 (In) R	25966	U-Channel	525	40602	> 25966(OK)	64
CP01 (Out)	52580	U-Channel	-	-	-	-
CP02 (In)	25966	U-Channel	525	40602	> 25966(OK)	64
CP03 (In) L	22857	U-Channel	525	40602	> 22857(OK)	56
CP03 (In) R	22857	U-Channel	525	40602	> 22857(OK)	56
CP04 (In) L	32927	U-Channel	525	40602	> 32927(OK)	81
CP04 (In) R	728	U-Channel	300	9337	> 728(OK)	8
CP05 (In)	33660	U-Channel	525	40602	> 33660(OK)	83
CP51 (In)	15414	U-Channel	525	40602	> 15414(OK)	38
CP52 (In) R	63539	U-Channel	900	166459	> 63539(OK)	38
CP41 (In)	6760	U-Channel	450	27098	> 6760(OK)	25
CP42 (In) L	2634	U-Channel	300	9337	> 2634(OK)	28
CP42 (In) R	7512	U-Channel	450	27098	> 7512(OK)	28
CP43 (In) L	5268	U-Channel	300	9337	> 5268(OK)	56
CP43 (In) M	5268	U-Channel	300	9337	> 5268(OK)	56
CP43 (In) R	8038	U-Channel	450	27098	> 8038(OK)	30
CP44 (In) L	5832	U-Channel	525	40602	> 5832(OK)	14
CP61 (In)	7512	U-Channel	300	9337	> 7512(OK)	80
CP62 (In)	7512	U-Channel	375	16789	> 7512(OK)	45
CP44 (In) R	7512	U-Channel	375	16789	> 7512(OK)	45
CP52 (In) L	5832	U-Channel	525	40602	> 5832(OK)	14
CP52 (Out)	74858	U-Channel	-	-	-	-
CP11 (In)	9317	U-Channel	450	27098	> 9317(OK)	34
CP12 (In)	18633	U-Channel	450	27098	> 18633(OK)	69
CP13 (In)	18633	U-Channel	450	27098	> 18633(OK)	69
CP14 (In)	36336	U-Channel	525	40602	> 36336(OK)	89
CP15 (In)	27019	U-Channel	525	40602	> 27019(OK)	67
CP15 (Out)	36336	U-Channel	-	-	-	-
CP31 (In)	354	U-Channel	300	9337	> 354(OK)	4
CP32 (In) L	709	U-Channel	300	9337	> 709(OK)	8
CP32 (In) R	3196	U-Channel	300	9337	> 3196(OK)	34
CP23 (In) L	7112	U-Channel	300	9337	> 7112(OK)	76
CP22 (In) L	6391	U-Channel	300	9337	> 6391(OK)	68
CP21 (In)	5413	U-Channel	300	9337	> 5413(OK)	58
CP22 (In) R	18043	U-Channel	525	40602	> 18043(OK)	44
CP23 (In) R	24434	U-Channel	525	40602	> 24434(OK)	60
CP23 (Out)	28351	U-Channel	-	-	-	-

page 1				
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area			
Title:	Drainage Pipe Design (By Colebrook-White Equation)	Date:	15/9/2026	By: EH(WAL) Check: DK(WAL)

Summary of stormwater inlet to the Manhole

Outlet from	to Manhole	Discharge Flow (L/min)	Discharge Flow (m ³ /s)
CP01	To SMH02	52580	0.876
CP23	To STMH01	28351	0.473
CP05	To SMH01	33660	0.561
CP15	To STMH01	36336	0.606
CP52	To Existing Nullah	74858	1.248

Design Pipe Capacity (Temporary Stage)

Reference

2.) The partial velocity is obtained from the book:- *Tables for the hydraulic design of pipes and sewers, Hydraulics Research*, Wallingford.
note 1: 10% reduction of flow area is allowed for effect of deposition of sediment

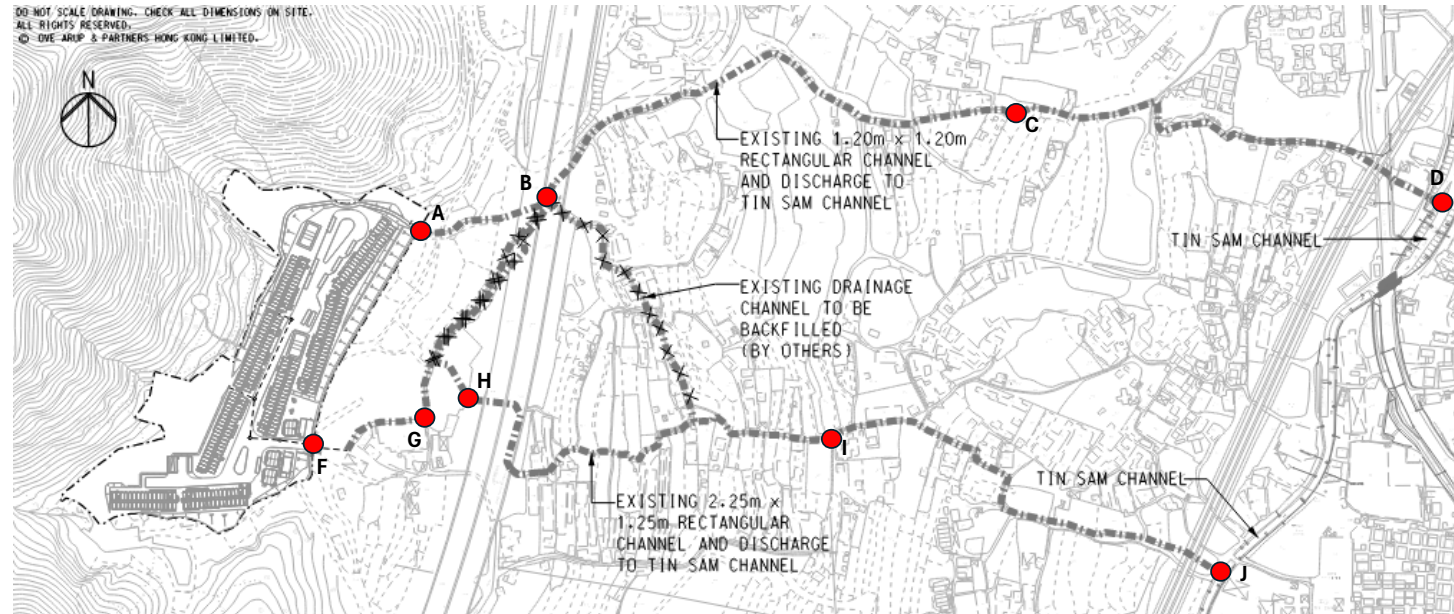
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page 1					
Project:	Proposed Imported Labour Quarters at Hung Shui Kiu/ Ha Tsuen New Development Area				
Title:	Drainage Pipe Design (By Colebrook-White Equation)	Date:	#####	By:	EH(WAL) Check: DK(WAL)

Summary of stormwater inlet to the Manhole (Temporary Stage)

Connection	Upstream Invert Level (mPD)	Downstream Invert Level (mPD)	Pipe Size (mm)	Discharge Flow (m ³ /s)	Capacity (m ³ /s)	Utilization (%)
CP04 to SMH01	29.5	25.8	600	0.561	4.030	14
CP01 to SMH02	27.05	24.85	600	0.876	3.415	26
SMH01 to SMH02	25.8	24.85	750	1.437	1.817	79
SMH02 to SMH03	24.85	24.15	750	1.437	2.352	61
SMH03 to SMH04	24.15	22.67	750	1.437	3.899	37
SMH04 to SMH05	22.67	21.45	750	1.437	4.088	35
SMH05 to STMH01	21.45	21.4	750	1.437	2.031	71
STMH01 to Nullah	21.4	-	1200	2.516	2.919	86

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



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	CP 52	1050mm dia. discharge pipe from development site to proposed CP 52	19.00	-	-	-	-	-	-	17.25	17.35	17.25	1.75	1.65	1.75
	B	OF 5A.2	Along the existing channel	16.60	16.13	16.34	16.127	0.47	0.26	0.47	15.53	15.61	15.53	1.07	1.00	1.07
	C	816901833263	Along the existing channel	9.33	8.20	8.33	8.199	1.13	0.99	1.13	8.03	8.11	8.03	1.30	1.21	1.30
	D	817246833173	Tin Sam Channel	6.65	4.85	5.19	5.05	1.81	1.46	1.60	4.85	5.19	5.05	1.80	1.46	1.60
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	STMH04L24	1200mm dia. discharge pipe from development site to proposed SMH04L24	23.60	-	-	-	-	-	-	22.20	22.36	22.20	1.40	1.24	1.40
	G	816454833025	Along the existing channel	20.60	19.73	19.79	19.725	0.88	0.81	0.88	20.37	20.38	20.37	0.23	0.22	0.23
	H	816462833046	Along the existing channel	18.70	17.42	17.44	17.415	1.29	1.26	1.29	18.00	18.12	18.00	0.70	0.59	0.70
	I	816701833008	Along the existing channel	11.33	10.70	10.86	10.702	0.63	0.48	0.63	10.82	11.01	10.82	0.51	0.32	0.51
	J	817079832893	Tin Sam Channel	7.68	6.09	6.46	6.1	1.59	1.23	1.58	6.19	6.56	6.19	1.49	1.12	1.49

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 $\geq$ 300mm
0 $\leq$ Freeboard $\leq$ 299mm
Freeboard < 0 (i.e., overtopping)

Appendix D

Site Photos

Part Print 1

Part Print 2

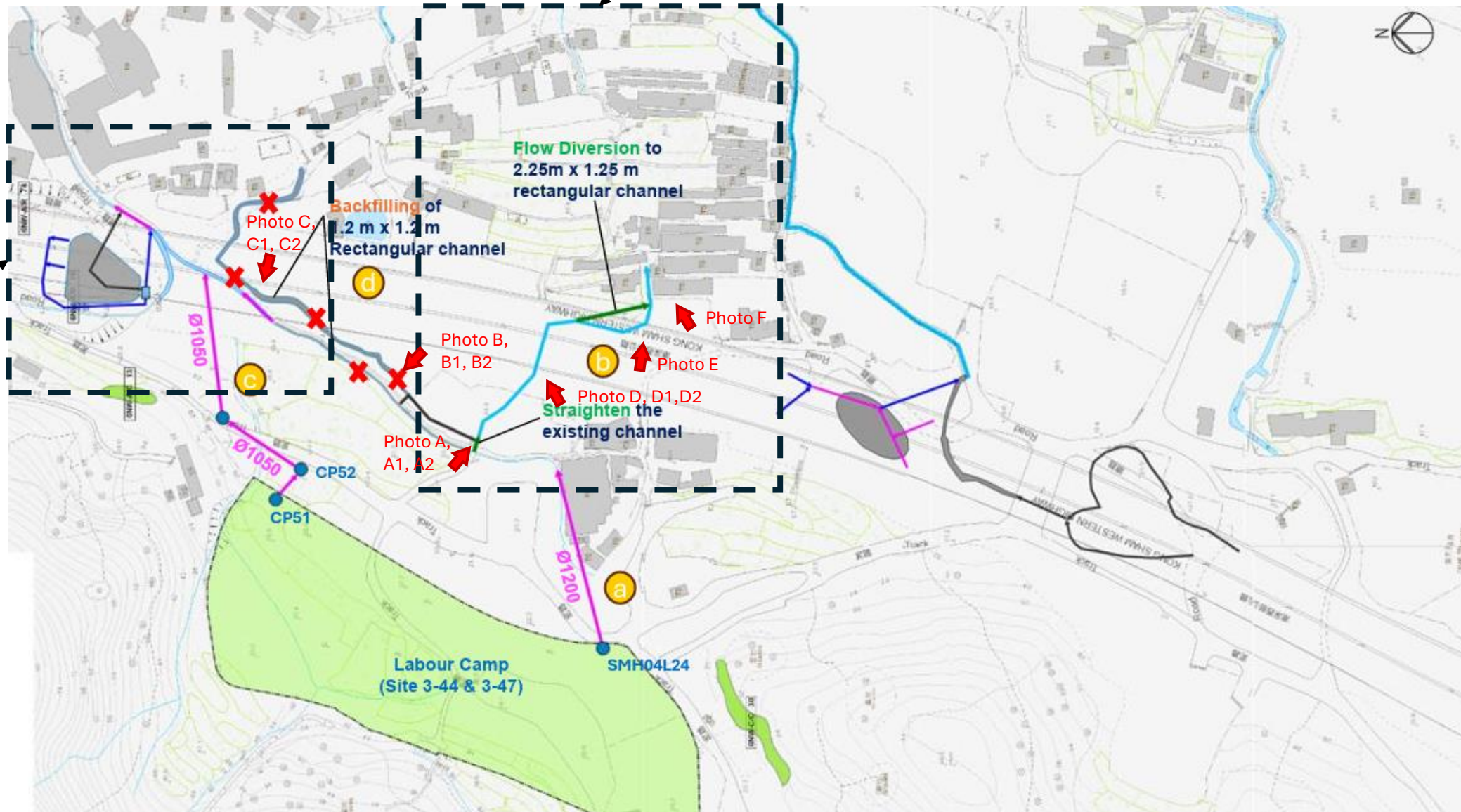




Photo A



Photo A-1

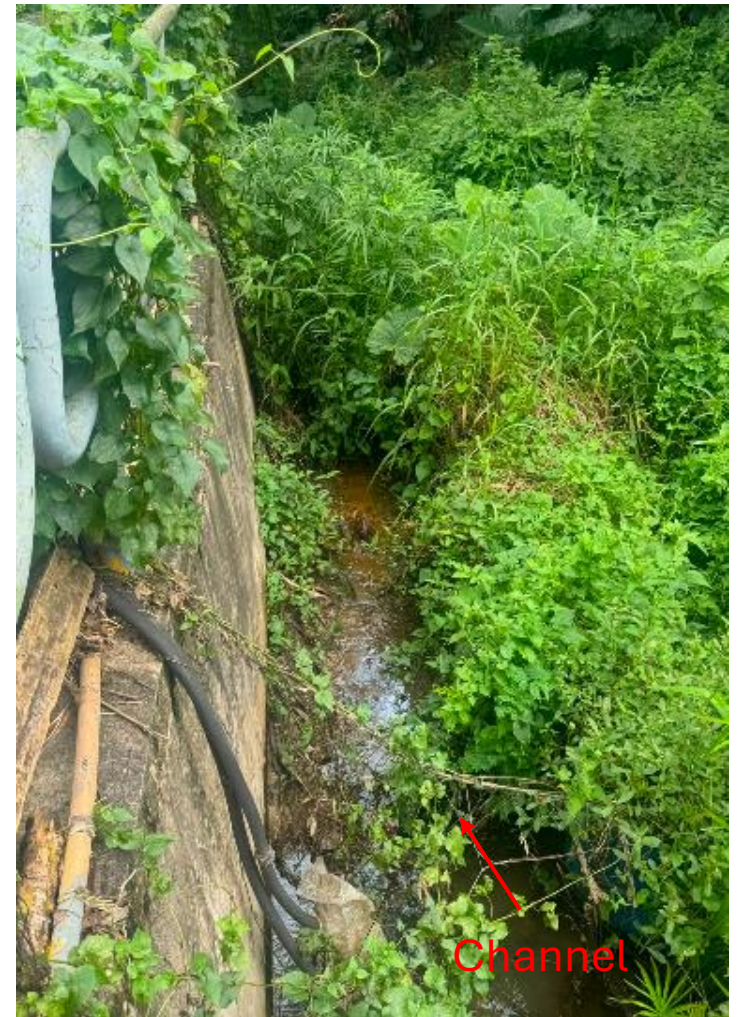


Photo A-2



Photo B



Photo B-1



Photo B-2

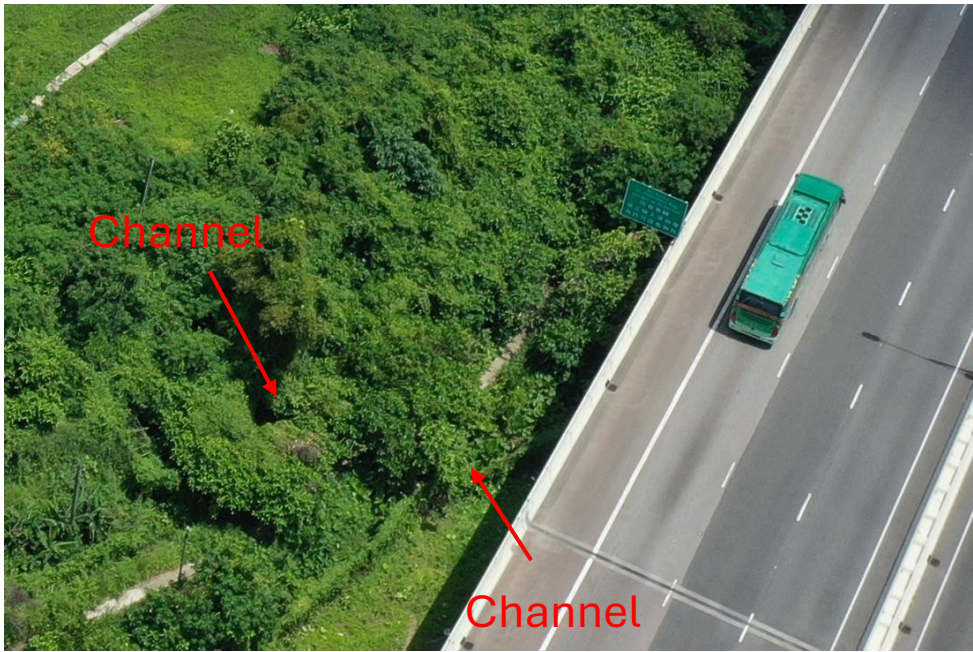


Photo C



Photo C-1



Photo C-2



Photo C-3



Photo D



Photo D-1



Photo D-2



Photo E



Photo F

Part Print 1
- Key Plan





Photo 1-1



Photo 1-2



Photo 1-3



Photo 1-4



Photo 1-5



Photo 1-6

Part Print 2 - Key Plan



Aerial Photo 1



Photo 2-1

Aerial Photo 2

Photo 2-4A, 2-4B

Photo 2-3

Photo 2-2





Photo 2-1



Photo 2-2



Photo 2-3



Photo 2-4a



Photo 2-4b

Appendix C

Revised 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

| September 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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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. Both the Tam Mei development (centralised quarters for imported labour) and the proposed temporary labour quarters accommodate an on-site residential population with similar daily water-use activities, such as drinking, washing, and toilet flushing.			

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. The existing DN300 fresh water main is placed along Kong Sham Western Highway, which is supplied by the existing Tan Kwai Tsuen South Fresh Water Service Reservoir (TKTSFWSR). The existing TKTSFWSR has a storage capacity of 77,742 m³.

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**.

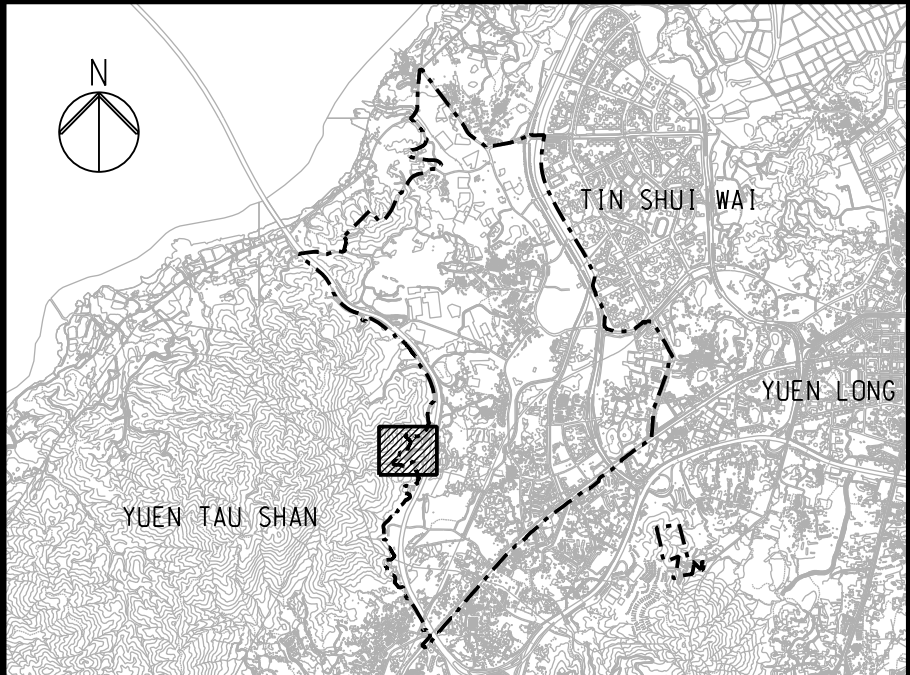
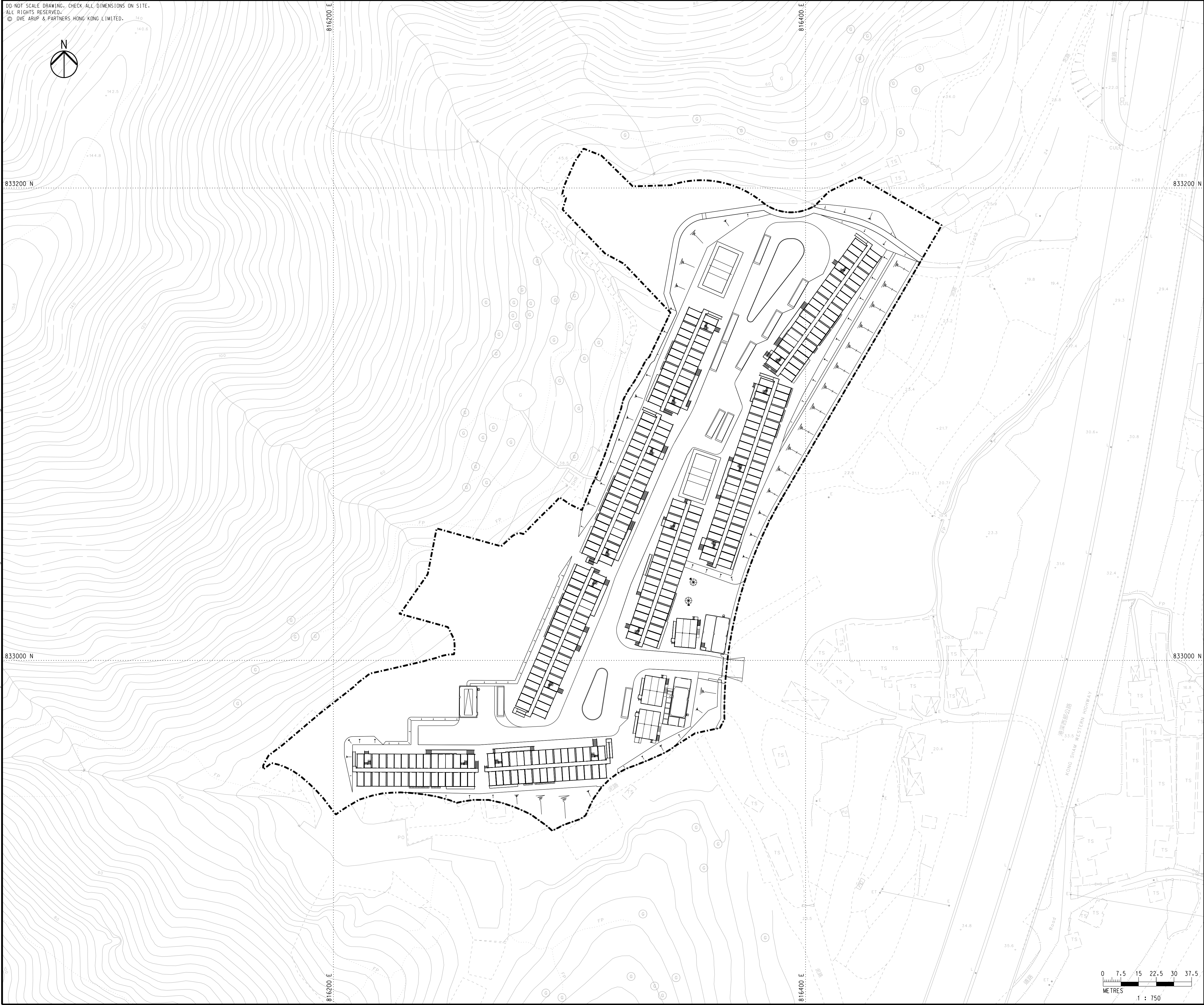
5. Summary

- 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

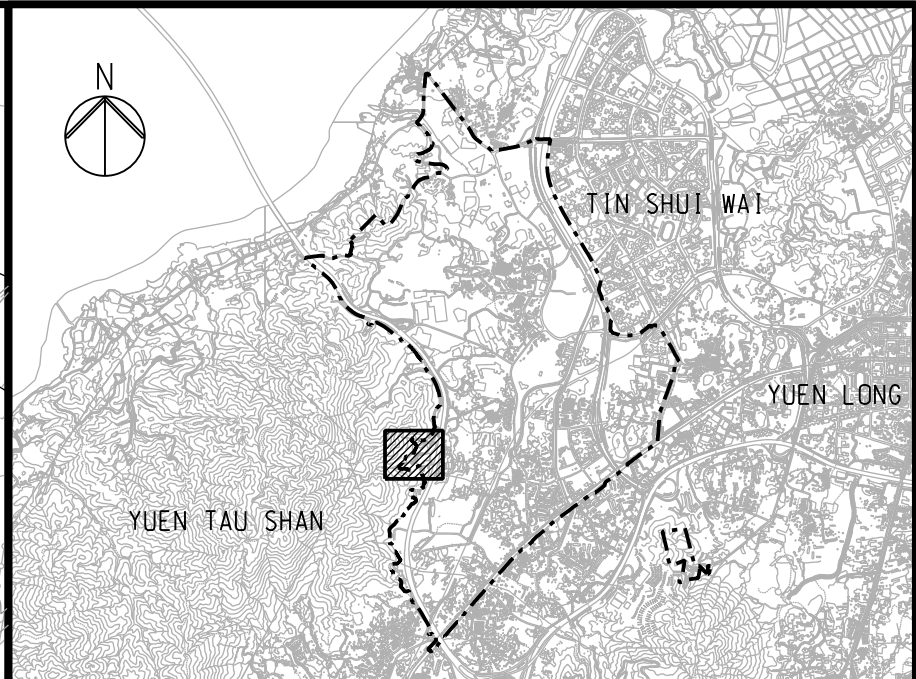
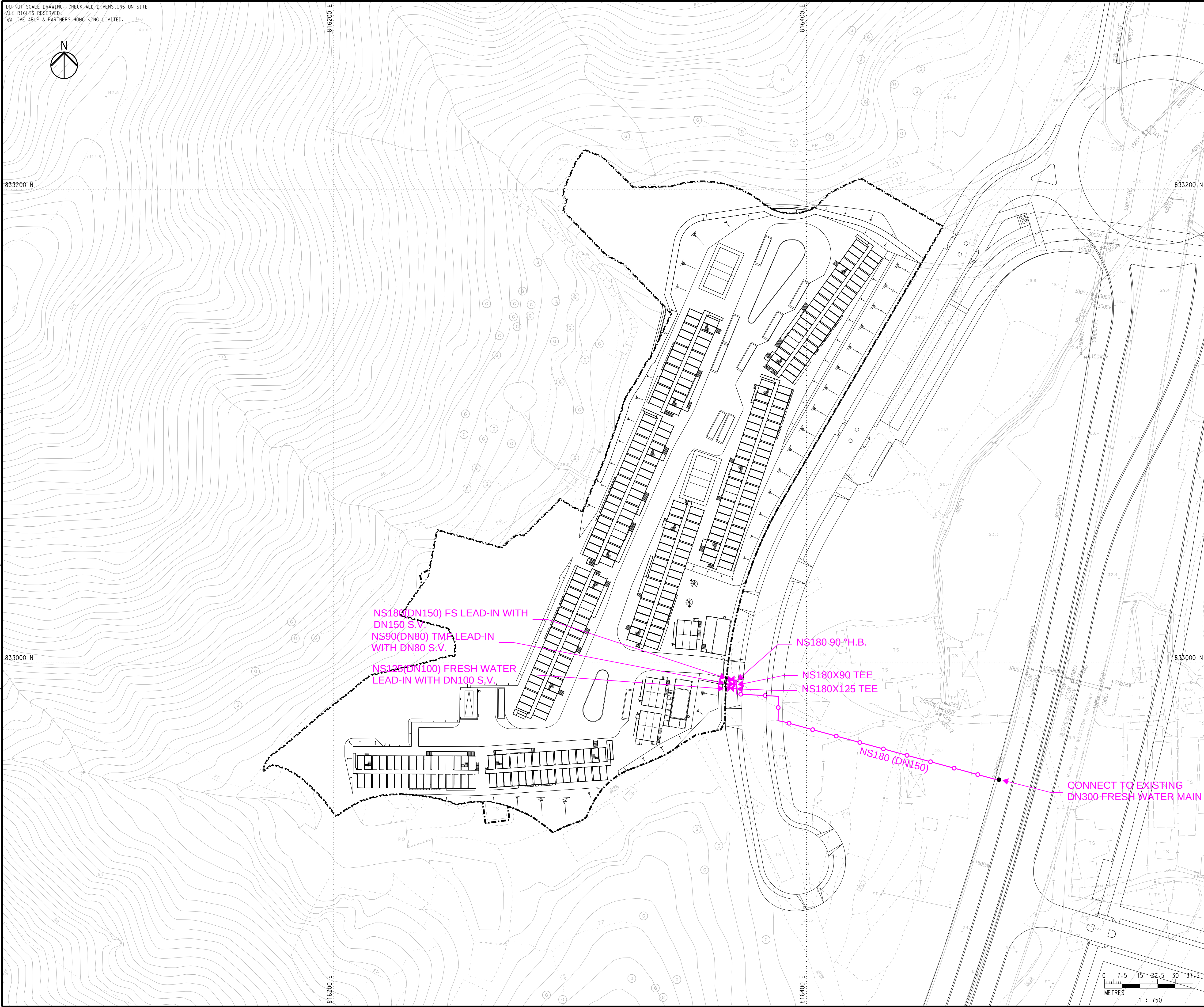
LEGEND
[Dashed Box] APPLICATION SITE

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			
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278463/SK/C/479		A	
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1:750 @ A1			
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Appendix B

Proposed Water Supply Layout Plan

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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					
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HSK / HT NDA					
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IMPORTED LABOUR QUARTERS					
PROPOSED WATER SUPPLY					
LAYOUT PLAN					
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Appendix D

Revised 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

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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) Regulations;
- 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.

2.6.5

All sewage generated from the proposed development would be discharged to sewage holding tanks, with regular removal using sealed tanker for disposal. Details to be mentioned in **Section 4.4**. Odour control measures will be implemented, including the use of quick-connect airtight couplings between the holding tank and suction tankers to ensure an enclosed system; vacuum desludging trucks with displaced air treatment systems such as activated carbon filters, etc. to neutralise the odour before the release of air; chemical dosing or pre-treatment in the holding tank to suppress odour generation; tight sealing of all discharge outlets and valves during transit; regular maintenance and pressure testing of tanker barrels, gaskets and seals; and frequent cleaning of the tanks to remove accumulated sludge to minimise odour generation. With the recommended mitigation measures to be incorporated into the tender document for engaging the service providers and ensuring their implementation, no adverse odour impact arising from the proposed development 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/m^2 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 using sealed tanker to the nearby sewage pumping station or sewage treatment works for disposal. A fully enclosed pump-out system will be adopted to collect the sewage from the sewage holding tanks by competent contractor for further handling and disposal. Details to be referred to the SIA. A trip-ticket system will be implemented for the disposal of collected sewage, which would be incorporated into the tender document for engaging the service providers and ensuring their implementation and proper document. The required volume for the tanker is 12m³ as recommended in the SIA. Typical tanker size meeting the requirement of the proposed reception facility would be adopted by the service provider during the operational phase, to ensure the accessibility of the tanker to the proposed reception facility.

4.4.3 Odour control measures will be implemented as mentioned in Section 2.6.5. Adverse water quality impact on surrounding WSRs, and associated odour impact due to the sewage from the proposed development during operational phase is not anticipated.

4.4.4 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.

4.4.5 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, adverse 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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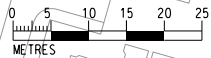
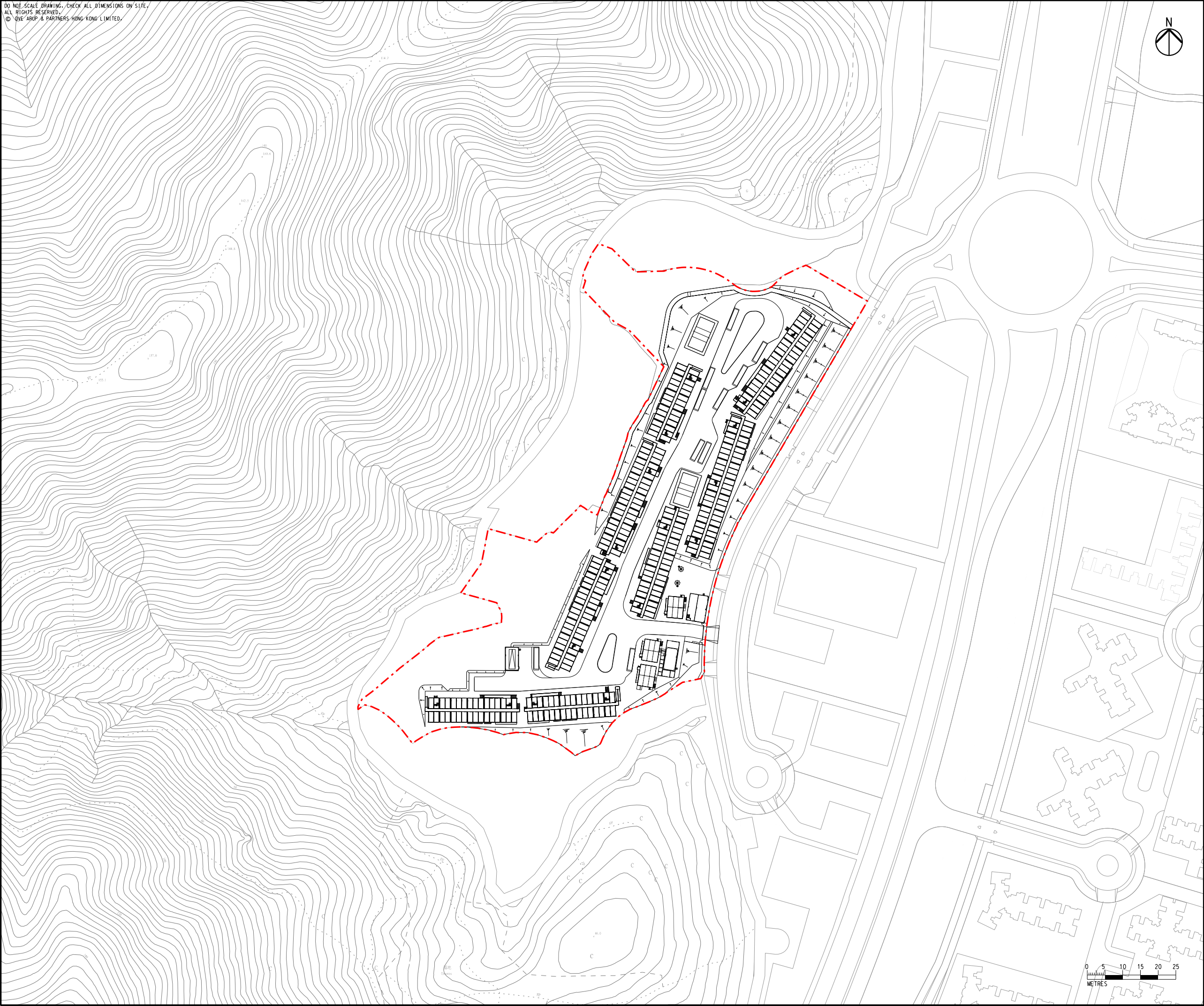


LEGEND



APPLICATION SITE

Printed by : 4/8/2026
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
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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			
LOCATION OF APPLICATION SITE			
Drawing no.			Rev.
FIGURE 1.1			A
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LEGEND

- APPLICATION SITE
- 200m BUFFER DISTANCE
- RELOCATED CHIMNEY

RELOCATED CHIMNEYS

SAN-SANG SAN TSUEN

KONG SHAM WESTERN HIGHWAY

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LOCATION OF			
INDUSTRIAL EMISSION			
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FIGURE 2.1			
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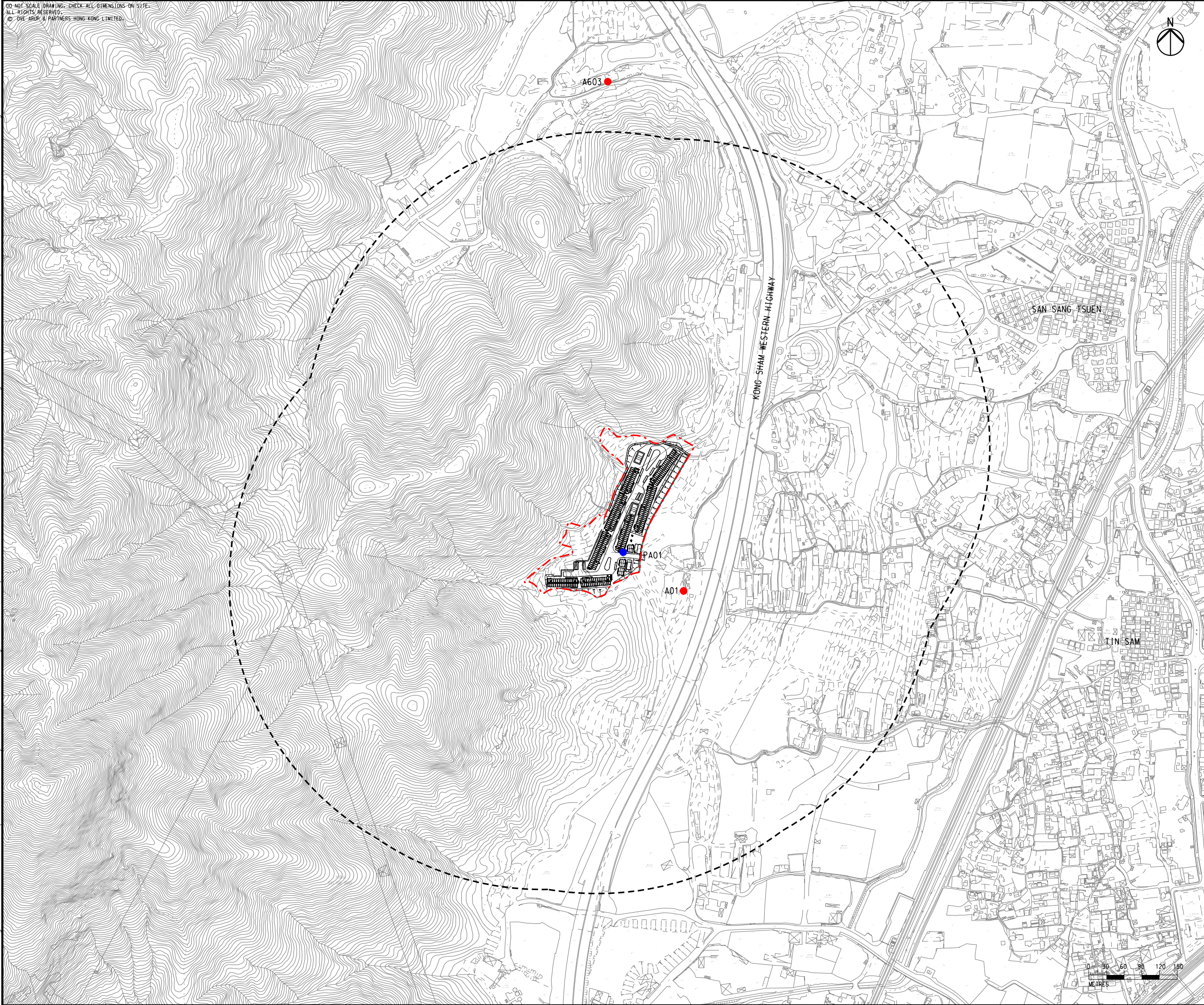


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Printed by : 3/8/2026
Filename : \\global\\EastAsia\\HKG\\Group\\C\\ENV\\env\\Project\\278463\\13 Drawing Deliverables\\report\\21 S16 for Construction Staff Quarter\\Figure 2.2 - Locations of Representative Air Sensitive Receivers.dgn

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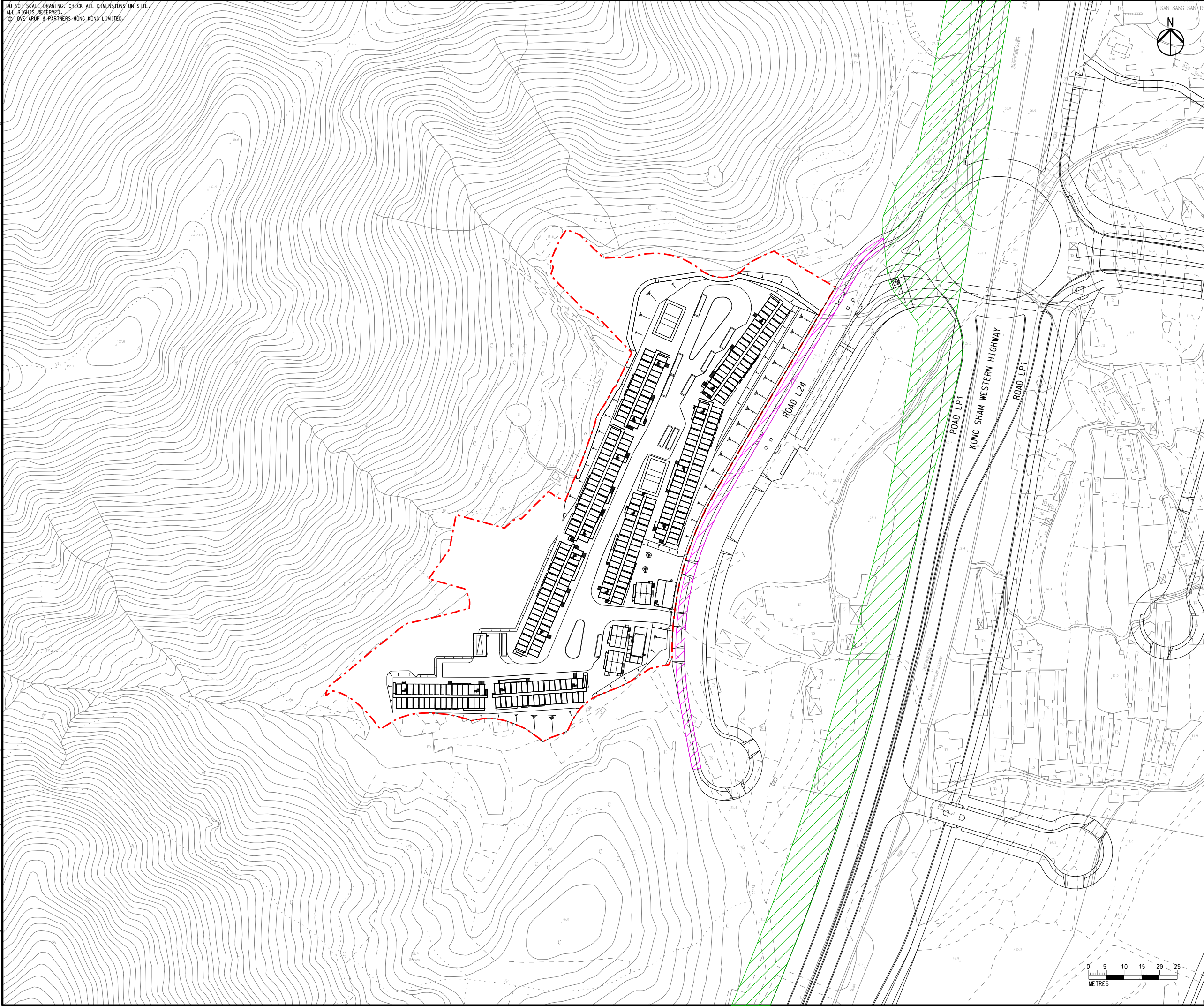


- LEGEND
- APPLICATION SITE
 - 500m ASSESSMENT AREA
 - EXISTING AIR SENSITIVE RECEIVERS
 - PLANNED AIR SENSITIVE RECEIVERS

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LOCATIONS OF REPRESENTATIVE AIR SENSITIVE RECEIVERS					
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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

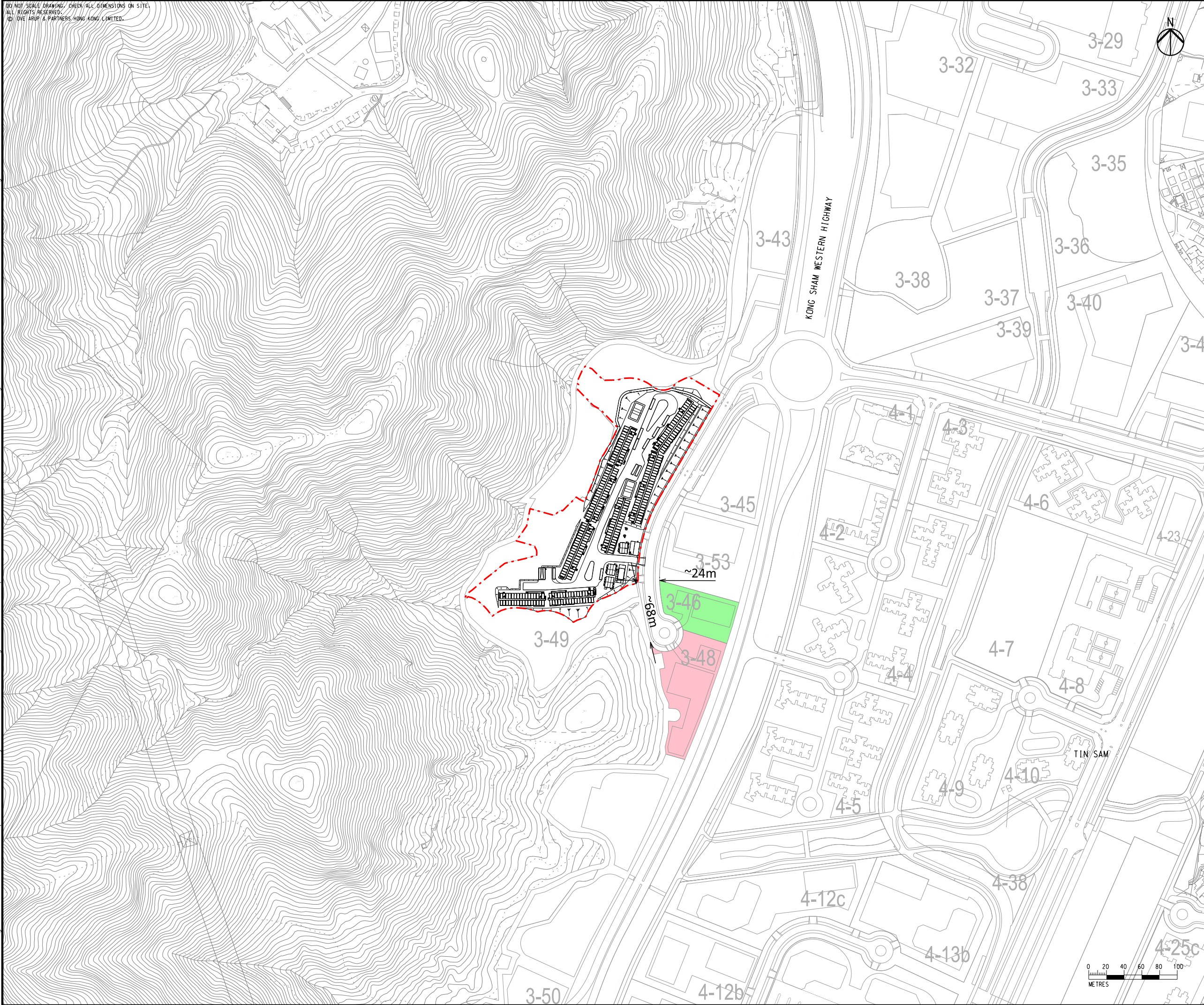
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SEPARATION DISTANCE			
FROM NEARBY ROAD NETWORKS			
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Filename : \\global-eastasia\HKG Group\CEN\env\Project\278463\13 Drawing Deliverables\Report\21 S16 for Construction Staff Quarter\Figure 2.4 - Locations of Planned Odour Sources.dgn



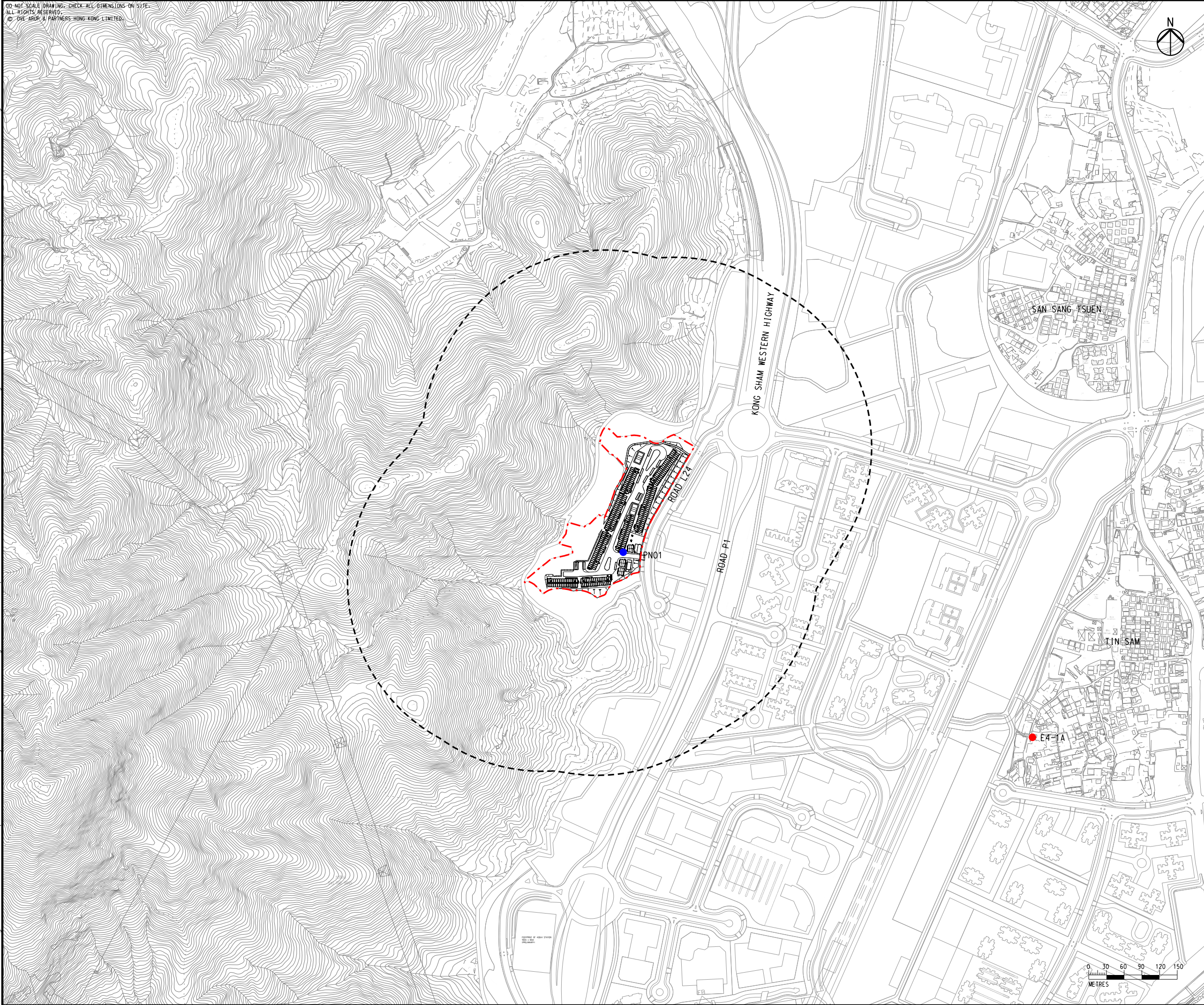
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- APPLICATION SITE
- PLANNED REFUSE COLLECTION POINT (RCP)
- PLANNED SEWAGE PUMPING STATION (SPS)

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LOCATIONS OF PLANNED ODOUR SOURCES					
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Printed by : 4/8/2026
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

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New Development Area Package A
Works for Second Phase Development
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Drawing title

LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

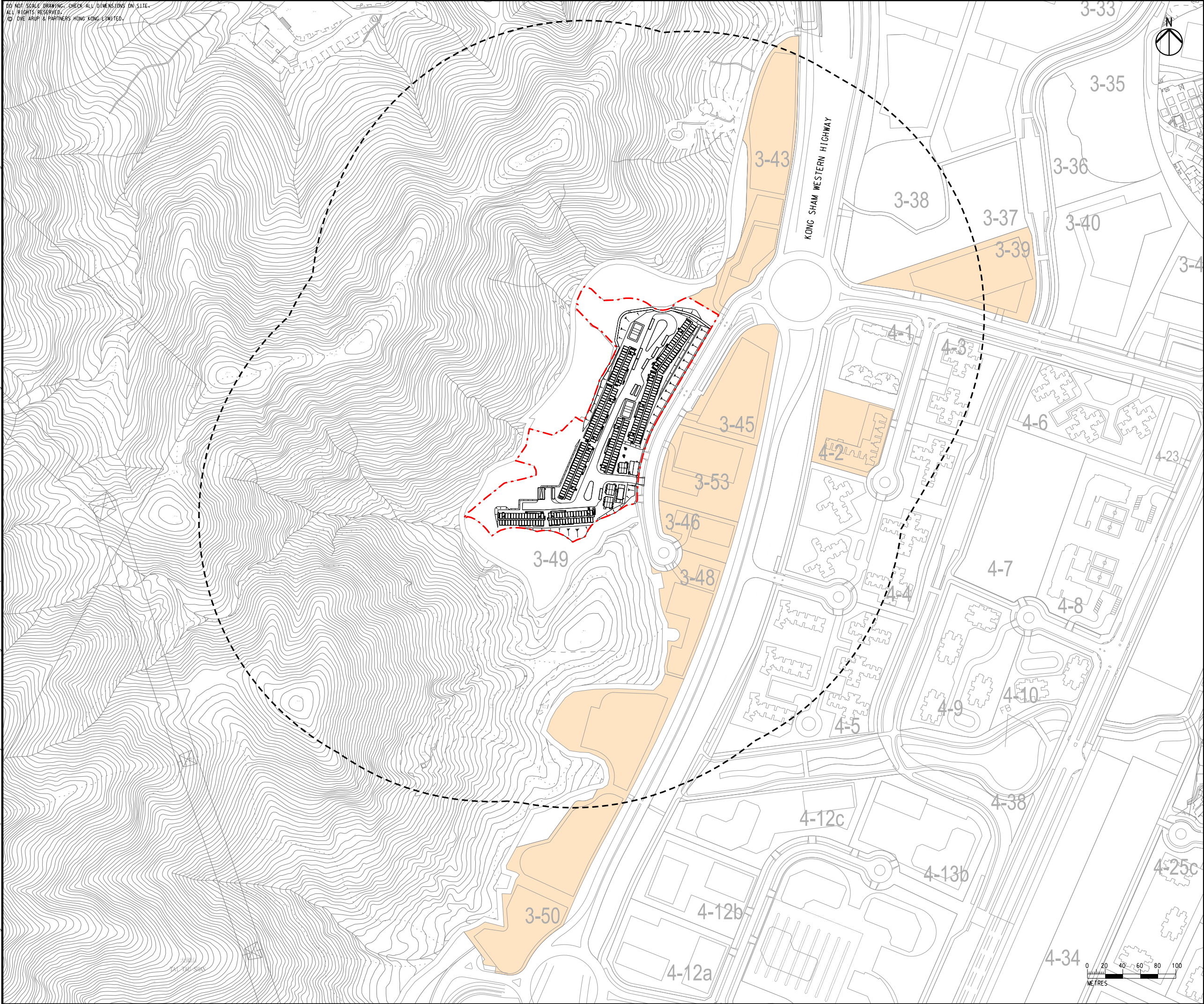
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FIGURE 3.1		A	
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Printed by : 3/8/2026
Filename : \\global\\EastAsia\\HK Group\\CIENV\\env\\Project\\278463\\13 Drawing Deliverables\\report\\21 S16 for Construction Staff Quarter\\Figure 3.2 - Locations of Fixed Plant Noise Sources.dgn



LEGEND

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

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LOCATIONS OF FIXED PLANT NOISE SOURCES					
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Appendix E

Revised 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

| September 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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Hong Kong
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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

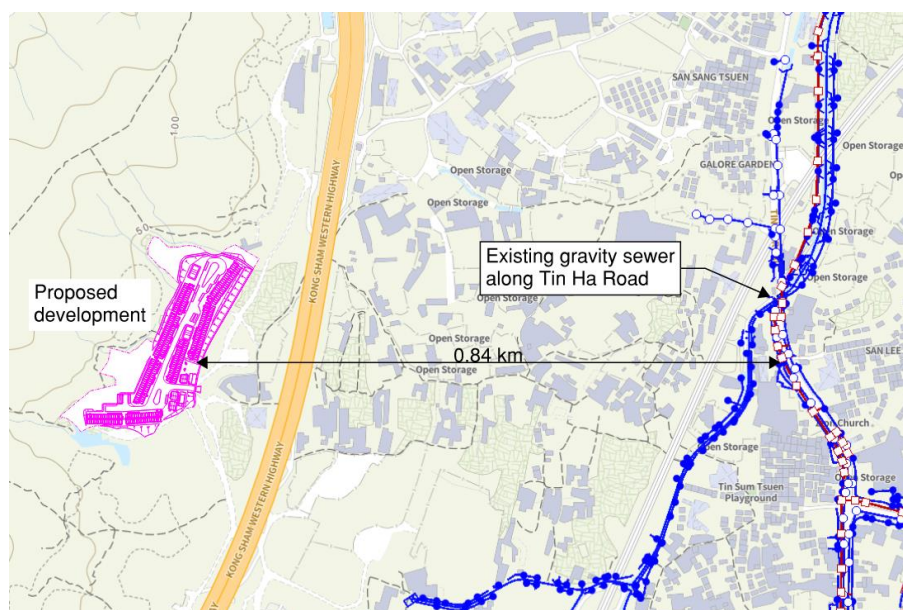
3.2.1 The ADWF generated from the proposed development is estimated in accordance with EPD's GESF. **Table 3.1** below summarises the sewage flow generation.

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 Various sewage treatment and disposal options, including the suggested on-site package treatment plant, were thoroughly explored in the early stage of the study. However, taking into account the extremely tight construction timeline, limited footprint/spatial capacity within the site, and significant cost implications, the on-site treatment plant option was found to be technically non-viable. Furthermore, given the temporary nature of the project, the proposed tanker-away arrangement remains the most optimal and practical solution for the proposed development and the sewage holding tank scheme is the interim arrangement. The construction of proposed sewerage system and sewage pumping stations which are part of essential infrastructures for HSK/HT NDA

and are planned to be completed to facilitate second phase development as soon as possible, subject to land resumption programme and extension of time. The adoption of permanent sewage system will be adopted upon the commissioning under second phase development of HSK NDA.

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.

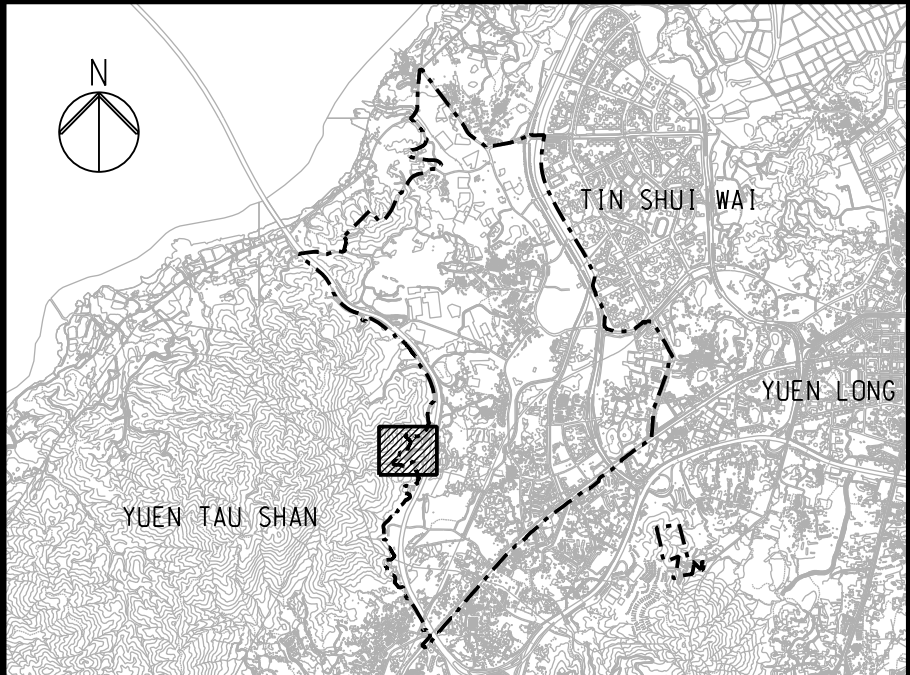
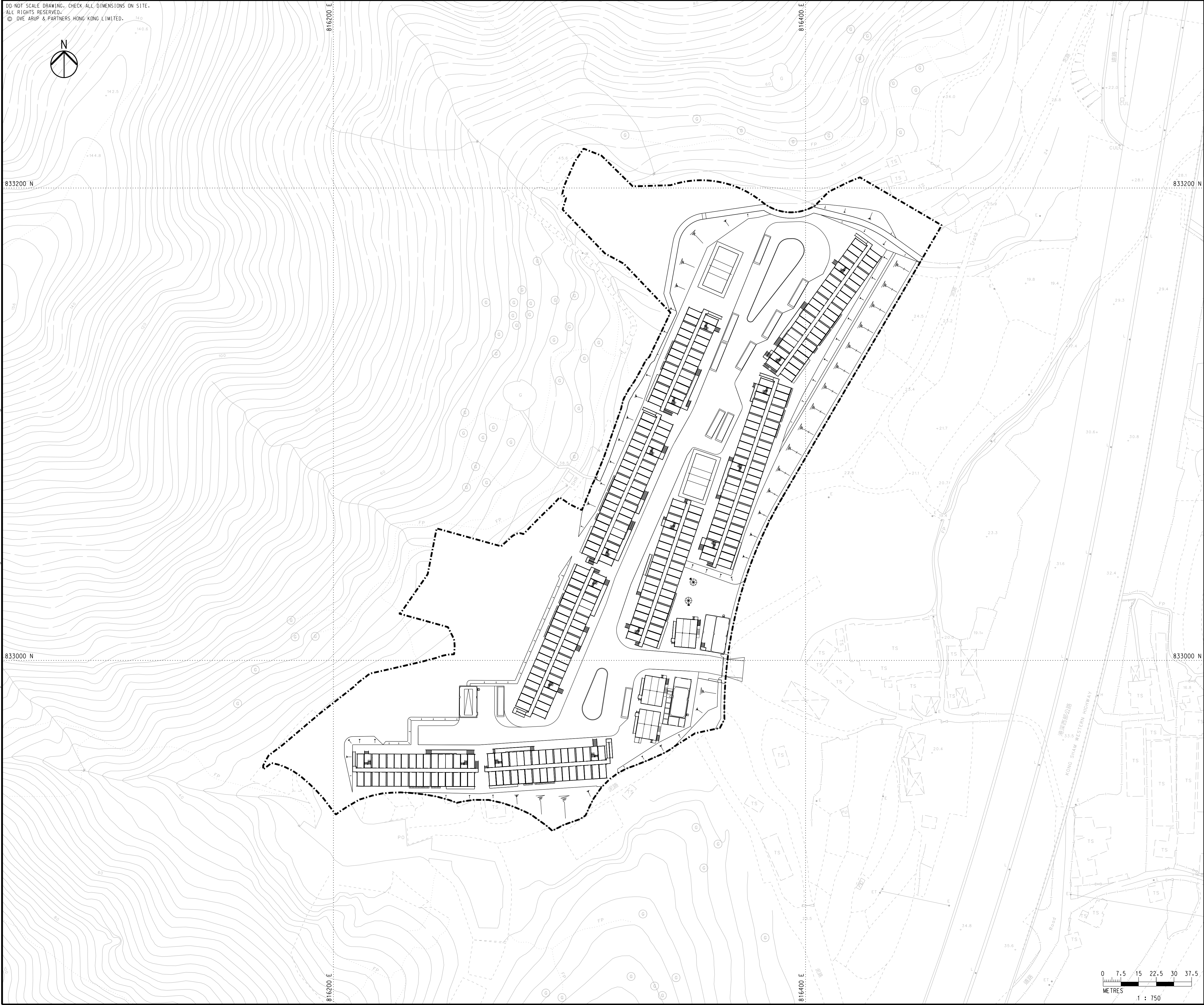
5. Summary

- 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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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
RY	06/26	EH	KKC
Scale	Status		
1:750 @ A1	PRELIMINARY		

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Appendix B

Proposed Sewerage Layout Plan

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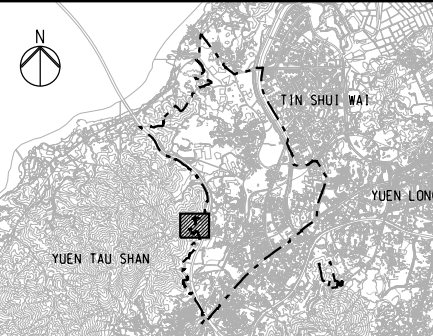
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LEGEND

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

KEY PLAN



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 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	

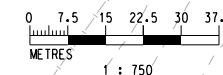
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Sewerage Catchment and Design Storage Volume of Holding Tanks

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 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