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D01 / Geotechnical Planning Review Report

Proposed Development of La Casetta DD399 Lot 453 Ting Kau

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Prepared for Barrie Ho Architecture Interiors Ltd

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Executive Summary

The Owner of La Casetta, which is located at DD399 Lot 453 in Ting Kau, is planning to submit a section 16 Planning Application for the proposed redevelopment, which involves reconstruction of the existing residential blocks and construction of a lift shaft to facilitate the vehicular access to the residential block. SMEC Asia Ltd. on behalf of Barrie Ho Architecture Interiors Ltd has undertaken a geotechnical review for the preparation of Geotechnical Planning Review (GPR) Report to support the proposed development and planning application.

From the geotechnical assessment, which is based on the available geological and geotechnical data, it is concluded that the proposed development at the subject Site is geotechnically feasible. Significant geotechnical hazards / constraints that may adversely affect the future redevelopment are not evident from the available geotechnical data.

1 Introduction

1.1 Background

- 1.1.1 The Owner of La Casetta, which is located at DD399 Lot 453 in Ting Kau, is planning to submit a section 16 Planning Application for redevelopment. The Site is currently occupied by two blocks of 2-storey villas founded on an elevated platform. The proposed redevelopment involves reconstruction of the existing residential blocks into a new 3-storey single-family house, and construction of a lift shaft and a car ramp to facilitate the vehicular access to the residential house.
- 1.1.2 SMEC Asia Ltd (“SMEC”) has been commissioned to conduct this Geotechnical Planning Review Report (GPRR) to support the application for the proposed development.

1.2 Objectives of the Report

- 1.2.1 In accordance with the guidelines under GEO Advice Note for Planning Applications under Town Planning Ordinance (CAP. 131), a Geotechnical Planning Review Report (GPRR) is prepared in support of the S.16 Planning Application. The objectives of this Geotechnical Planning Review are summarized as follows:
- i. Identify any existing geotechnical features and / or natural terrain located within or in close proximity that may potentially affect or be affected by the Site / future development;
 - ii. Carry out preliminary review on the stability of the features based on the available background / published information;
 - iii. Assess the geotechnical feasibility of the proposed development; and
 - iv. Recommend the need for further study based on the results of the preliminary assessments.

2 Site Description

2.1.1 The Site, La Casetta, is located on the hillslopes between Castle Peak Road – New Ting Kau on the downhill and Tuen Mun Road on the uphill, in Ting Kau. The Site is also situated to the southeast of another residential block, The Wonderland. The Site is accessed by Ting Yat Road, which aligns alongside Castle Peak Road – Ting Kau. The general location of the Site is shown in **Figure 1**.

2.1.2 The Site, with an area of approximately 773m², is surrounded by eight (8) geotechnical features. These features will potentially affect or be affected by the proposed development. The maintenance responsibility of these features as indicated in the Systematic Identification of Maintenance Responsibility (SIMAR) of Slopes are summarized in Table 2.1 below. In accordance with Tables 5.1 – 5.4 of the Geotechnical Manual for Slopes and Table 1 of Geotechnical Engineering Office (GEO) Technical Guidance Note 15 (TGN 15), the facility groups at crest and toe of these features, which are based on the current site situations, and the associated Consequence-to-life (CTL) categories are determined and summarized in Table 2.1 below. A plan showing the location of the eight registered features is presented in **Figure 2**.

Table 2.1: Existing Geotechnical Features

Feature no.	Current Facility Group at Crest	Current Facility Group at Toe	Consequence-to-Life Category (CTL)	Maintenance agent
6SE-D/CR47	Undeveloped green belt	Residential building	1	• DD399 Lot439
6SE-D/R137	Residential building	Road / Footpath with very low traffic density	1	• DD399 Lot453
6SE-D/FR154	Cottage, licensed and squatter area	Road/footpath with moderate traffic density	1	• DD399 Lot453 (SD1) • Lands Department (SD2)
6SE-D/F178	Cottage, licensed and squatter area	Road / Footpath with low traffic density	1	• DD399 Lot453 (SD1) • Lands Department (SD2)
6SE-D/C423	Residential building	Road/footpath with moderate traffic density	1	• Lands Department
6SE-D/CR424	Undeveloped green belt	Residential building	1	• DD399 Lot453
6SE-D/C425	Undeveloped green belt	Road/footpath with moderate traffic density	2	• Lands Department
6SE-D/C600	Residential building	Road/footpath with moderate traffic density	1	• Highways Department

2.1.3 There is a southwest facing natural hillside situated on the upslope of the Site. The natural hillside rises from approximately 50mPD from behind the Site to 72mPD below Tuen Mun Road, inclining at about 22°.

2.1.4 Topographical survey and lot boundary survey works were carried out by Henry Chan Surveyors Ltd. and were completed in March 2024. The topographical survey plan is included in **Appendix C**.

3 Desk Study

3.1 General

3.1.1 A review of the available geological and geotechnical data for the Site area and its general vicinity has been carried out. Most of the relevant information was collated from GEO's web-based Geotechnical Information Infrastructure (GInfo). The available information includes published geological data, archived ground investigation (GI) data, Landslide Incident Record, and previous studies / assessments relating to the existing features. Some of the key findings are summarized below.

3.2 Published Geology

3.2.1 According to the Hong Kong Geological Survey (HKGS) Map Sheet 6 (scale 1:20,000) – Solid and Superficial Geology of Yuen Long (2nd Edition, 2019), the Site and its general vicinity are generally underlain by superficial deposits consisting of Fill overlying colluvium and completely decomposed Tuff; whereas the solid geology is predominated by coarse ash crystal Tuff of the Yim Tin Tsai Formation. An extract of the published geological map showing the Site and its vicinity is produced in **Figure 2**.

3.3 Adjacent Features and Associated Studies

3.3.1 The Site is situated on a sloping terrain and it is encircled by eight (8) man-made registered features. The basic information of these features is summarized below:

Table 3.1: Summary of the Basic Information of Features

Feature	Type	Geometry			Current CTL	Maintenance agent
		Length (m)	Height (m)	Angle (degree)		
6SE-D/CR47	Cut Slope with Retaining Wall	47 (S) 43 (W)	9 (S) 5.9 (W)	55 (S) 85 (W)	1	• DD399 Lot439
6SE-D/R137	Retaining Wall	38	3.3	90	1	• DD399 Lot453
6SE-D/FR154	Fill Slope with Retaining Wall	15 (S) 17 (W)	6 (S) 3.4 (W)	40 (S) 90 (W)	1	• DD399 Lot453 (SD1) • Lands Department (SD2)
6SE-D/F178	Fill Slope	26 (SD1) 26 (SD2)	3 (SD1) 1.5 (SD2)	35 (SD1) 70 (SD2)	1	• DD399 Lot453 (SD1) • Lands Department (SD2)
6SE-D/C423	Cut Slope	20	14	50	1	• Lands Department
6SE-D/CR424	Cut Slope with Retaining Wall	27 (S) 25 (W)	8.4 (S) 2.8 (W)	60 (S) 90 (W)	1	• DD399 Lot453
6SE-D/C425	Cut Slope	12	9	45	2	• Lands Department

6SE-D/C600	Cut Slope	6	14	40	1	• Highways Department
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3.3.2 Background information search was carried out to identify any previous studies and / or records of upgrading / maintenance works on these features and the results are summarised in the table below.

Table 3.2: Summary of Previous Studies / Upgrading Works

Feature	Slope Assessment / Upgrading Works / Maintenance Records
6SE-D/CR47	<p>A Stage 2 Study was previously carried out by Maunsell Geotechnical Services Ltd. in 1999. The report presents that the minimum FOS of slope portion of the feature using lower bound shear strength parameters is around 1.1 which is lower than the standard value of 1.2 for existing feature.</p> <p>Nevertheless, since the stability analysis was carried out using the worst soil parameters, and no sign of distress was observed on the slope feature during the engineer inspection in 1999, the feature was considered safe and no upgrading works were required. The report was accepted by GEO in 2001.</p>
6SE-D/R137	Records on previous slope assessment / upgrading works / maintenance records are not available.
6SE-D/FR154	Records on previous slope assessment / upgrading works / maintenance records are not available.
6SE-D/F178	Records on previous slope assessment / upgrading works / maintenance records are not available.
6SE-D/C423	<p>A Stage 2 Study was previously carried out by Maunsell Geotechnical Services Ltd. in 1999. The report presents that the minimum FOS of eastern slope portion of the feature using lower bound shear strength parameters is 0.947 which is lower than the standard value of 1.2 for existing feature. The report was accepted by GEO.</p> <p>DH Order Nos. DH117/NT/01/C was issued by BD on in 2001. The feature was modified/upgraded to current standard and accepted by BD in 2005 and GEO in 2008. The related document is recorded in Private Project No. GCMW 3/5/DH50/01/NT, which shall be kept by the owner of DD399 Lot453 (La Casetta).</p>
6SE-D/CR424	<p>A Stage 2 Study was previously carried out by Maunsell Geotechnical Services Ltd. in 1999 and the report was accepted by GEO. GEO checking certificate was issued in 2001. The report presents that the minimum FOS of slope portion of the feature using lower bound shear strength parameters is 0.883 which is lower than the standard value of 1.2 for existing feature. The report was accepted by GEO.</p> <p>DH Order Nos. DH116/NT/01/C was issued by BD in 2001. The feature was modified/upgraded to current standard and accepted by BD in 2005 and GEO in 2008. The related document is recorded in Private Project No. GCMW 3/5/DH50/01/NT, which shall be kept by the owner of DD399 Lot453 (La Casetta).</p>
6SE-D/C425	<p>A Stage 2 Study was previously carried out by Maunsell Geotechnical Services Ltd. in 1999 and the report was accepted by GEO. GEO checking certificate was issued in 2001. The report presents that the minimum FOS of the feature using lower bound shear strength parameters is around 1.1 which is lower than the standard value of 1.2 for existing feature.</p> <p>Nevertheless, since the stability analysis was carried out using the worst soil parameters, and no sign of distress was observed on the slope feature during the engineer inspection in 1999, the feature was considered safe and no upgrading works were required. The report was accepted by GEO in 2001.</p>
6SE-D/C600	As-constructed verification report was previously conducted in 2008. The FOS of the feature is larger than 1.4 which is under the current standard. The work was accepted by GEO in 2011. The related document is recorded in Public Project No. GCMW2/B2/200.

3.4 Existing Ground Investigation (GI)

3.4.1 There are three (3) archived GI carried out within or in close vicinity of the Site. The relevant GI data is summarized in the table below:

Table 3.3: Summary of Previous GIs

Project	GI Contractor	Year	Relevant GI Stations
Factual Report on Ground Investigation – Conforming Design Volume 18, Section 1: Retaining Wall 42 – Fieldwork (GIU 36832)	Gold Ram Engineering & Development Ltd.	2003	35 boreholes (RWB42.43-RWB42.77)
Factual Report on Ground Investigation – Conforming Design Volume 23 – Footbridge 14 (GIU 36838)	Gold Ram Engineering & Development Ltd.	2003	10 boreholes (FB14/06-P1-FB14/09-P2)
Contract No. GE/2008/04 – Ground Investigation – New Territories West (Term Contract) (GIU 49913)	Fugro Geotechnical Services Ltd.	2009	4 slope strippings (SS1 (crest) to SS2 (toe))

3.4.2 From the available GI records, the sub-surface profiles of the Site typically consisted of a layer of fill, varying from approximately 1 m to 4.7 m thick, overlying the saprolite of completely and highly decomposed tuff, which ranged from 6 m to about 9 m thick. A layer of colluvium of 0.5 m to about 3 m thick was locally encountered in few drillholes underlying the fill layer. The bedrock, consisting of moderately and slightly decomposed tuff, was encountered at approximately 10 m to 13 m below ground, generally at around +25mPD to +34mPD. Although there is no available record on standpipe/piezometer, reference is made to the groundwater level recorded during drilling of the adjacent boreholes. It is revealed that the groundwater level generally lies at approximately 30.8 mPD, which is well below the ground level.

3.4.3 The typical descriptions of the different materials are summarized as follows:

- Fill - Loose to medium dense, fine to coarse gravel sized moderately strong TUFF fragments
- Colluvium - Firm to stiff sandy CLAY with subangular to subrounded fine to coarse gravel
- Saprolite - Firm to stiff sandy SILT, extremely weak completely to highly decomposed coarse ash TUFF
- Bedrock - Moderately strong to strong, moderately to slightly decomposed medium-grained coarse ash TUFF

3.4.4 The location of existing GI stations is shown in **Figure 3**. A summary of the GI findings is enclosed in **Appendix B**.

3.5 Past Landslide Records

3.5.1 According to GEO's Landslide Incident Record, there is no past landslide recorded at the registered features.

3.5.2 According to Enhanced Natural Terrain Landslide Inventory (ENTLI), there is no past landslide recorded within the natural terrain study area.

3.6 Existing WSD Tunnel

- 3.6.1 According to the WSD record plan, there is an existing WSD tunnel located underneath the proposed development. The tunnel, which was constructed in 1950s, has an outer diameter of 2.0m, aligning in an east-west direction within the lot boundary of the development. The top level of the tunnel lies at approximately +19.8mPD, which is approximately 7.7m below the future formation level.
- 3.6.2 The as-built drawings of the tunnel are enclosed in **Appendix E**.

4 Site Reconnaissance

- 4.1.1 Site reconnaissance was carried out in November 2023 to inspect the conditions of the Site and its general vicinity (refer to **Plates 1 to 20**).
- 4.1.2 The Site is located in Ting Kau, at approximately 175m to the north of Ting Kau Beach. It is occupied by a villa, which consists of two blocks of 2-storey high building structures, lying at approximately +44mPD. The Site can be accessed via Ting Yat Road from the west. There is an open carpark area located at the eastern end of Ting Yat Road, where the site can be accessed via pedestrian stairway.
- 4.1.3 There are eight (8) features located within or adjacent to the Site. These features were inspected during the site reconnaissance and the key findings are summarized in **Table 4.1**.

Table 4.1: Summary of Site Observations for Existing Features

Feature	General Descriptions
6SE-D/CR47	The feature is a southwest facing cut slope with retaining wall. The southeast portion of the slope, which is located near the proposed development, is approximately 47 m long, 9 m high, inclining at 55°. The retaining wall part is made of concrete and is about 43m length and 5.9m height, with face angle of 85°. Above the retaining wall, the slope is generally covered with chunam and vegetation in the forms of mature trees and shrubs. Another two-storey building (i.e. The Wonderland) is located at the toe of the feature; whereas a natural terrain is located at the crest of the feature. No significant sign of seepage or distress was identified during the site inspection.
6SE-D/R 137	Feature 6SE-D/R 137 is a retaining wall, located immediately at downhill of the two-storey building of the proposed development. The retaining wall part is made of concrete and is about 38m length and 3.3m height, with face angle of 90°. 6SE-D/F178 and 6SE-D/FR154 are located at the toe of the feature; The visual condition of the wall surface was generally fair. No significant sign of distress or seepage was evident on the retaining wall during the site inspection.
6SE-D/FR154	Feature 6SE-D/FR154 is a south facing fill slope with retaining wall, located along Castle Peak Road. The slope, which will be affected by the proposed development, is approximately 15 m long, 6 m high, inclining at 40°. A Retaining wall about 3.4 m high, 17m long is located alongside the Castle Peak Road. The slope is generally covered with chunam and vegetation in the forms of grass and shrubs. There are 225 UC and 100 UC along the toe and surface of the slope and toe of wall part respectively, which were generally blocked by debris and leaves. Castle Peak Road and the adjacent pavement are located at the toe of the feature; The visual condition of the wall surface was generally fair. No significant sign of distress or seepage was evident on the slope during the site inspection.
6SE-D/F178	The feature is a south facing fill slope located alongside Castle Peak Road. Feature 6SE-D/F178 is composed with two parts. The first part is 26 m long and 3 m high, inclining at about 35°. The slope is generally overgrown with thick vegetation in the forms of mature trees and shrubs. The second part of slope is 26 m long and 1.5 m high, inclining at about 70°. The slope is generally covered with chunam. Since the slope is generally enclosed by chain link fence, close-up inspection of the feature could not be carried out. There is a 225 UC along the toe of the feature, which was generally blocked by debris and leaves. No significant sign of seepage or distress was identified during the site inspection.

6SE-D/C423	The feature is a west facing cut slope located alongside Ting Yat Road. It is about 20m long and 14m high, inclining at about 50°. On the south side and the north side of the feature, there are pedestrian stairways for access to the crest of the slope respectively. The slope is generally covered with chunam and vegetation in the forms of grass and shrubs. There is a 300 UC along the toe of the feature, which was generally clean and free from debris. Ting Yat Road and the adjacent pavement are located at the toe of the feature; whereas the platform above the slope is occupied by a two-storey building. No significant sign of seepage or distress was identified during the site inspection.
6SE-D/CR424	The feature is a south facing cut slope with retaining wall, located at 2.5m from the uphill face of the two-storey building. The feature is entirely located within the site boundary. The retaining wall part is made of concrete and is about 25m length and 2.8m height, with face angle of 90°. Above the retaining wall, the slope part of the feature is 3.5m high and inclining at max. 60°. It is generally covered with chunam and vegetation in the forms of mature trees and shrubs. There is a 275 UC along the toe of the feature, which was generally blocked by debris and planters. A two-storey building is located at the toe of the feature; whereas a natural terrain is located at the crest of the feature. No significant sign of seepage or distress was identified during the site inspection.
6SE-D/C425	The feature is a west facing cut slope located alongside Ting Yat Road. It is about 12m long and 9m high, inclining at about 45°. The slope is generally covered with shotcrete, and overgrown with vegetation in the forms of mature trees and shrubs. There is a 200 UC along the toe of the feature, which was generally blocked by debris and leaves. Ting Yat Road and the adjacent pavement are located at the toe of the feature; whereas the platform above the slope is occupied by an inaccessible area. No significant sign of seepage or distress was identified during the site inspection.
6SE-D/C600	The feature is a south facing cut slope located alongside Ting Yat Road. It is about 6m long and 14m high, inclining at about 40°. The slope is generally covered with other cover materials. There is not UC along the toe or crest of the feature. Castle Peak Road and the adjacent pavement are located at the toe of the feature; whereas the crest the slope is connected to another feature 6SE-D/FR154. No significant sign of seepage or distress was identified during the site inspection.

5 Proposed Development

5.1 General

- 5.1.1 According to the latest architectural layout plan (**Appendix A**), the proposed development involves the construction of a three-storeys high residential building with a lift tower to the west of the building. The three-storeys high building structure with one level of lower ground level for carport will be erected at the Site. The future ground level will be formed at about +44mPD, which generally matches with the toe level of Feature No. 6SE-D/CR424.

5.2 Impact on Existing Geotechnical Features

- 5.2.1 As aforementioned, there are eight (8) geotechnical features located in the proximity of the proposed redevelopment. These features may affect or be affected by the proposed works as discussed hereafter.
- 5.2.2 For features 6SE-D/R137, 6SE-D/FR154, 6SE-D/CR423 and 6SE-D/C424, since they are located within the footprint of the future development, they are likely to be removed and/or substantially modified during the site formation works.
- 5.2.3 For the remaining features, including 6SE-D/CR47, 6SE-D/F178, 6SE-D/C425 and 6SE-D/C600, they are not located within the footprint of the future development, and therefore they will generally be retained. However, in view of the close proximity of these features to the future development, such as 6SE-D/F178 and 6SE-D/C425, the stability of these features should be duly considered during the detailed design to ensure that they will not be affected by the future construction works. In particular for features 6SE-D/F178 and 6SE-D/C425, where record of previous slope assessment / upgrading works is not available. Slope upgrading works should be considered, where necessary, to enhance the overall stability of these features.

5.3 Proposed Geotechnical Works

- 5.3.1 In order to facilitate the construction of a vehicular access ramp and a car lift at the entrance of the Site, the existing ground level, which consists of a staircase, will be excavated and lowered to about 30mPD to match with road level of Ting Yat Road. In connection, the southern portion of feature 6SE-D/C423 will also be excavated. A pair of retaining structure will therefore be required to support the level difference, which is about 15 m high in maximum, for a length of about 18 m long on the northern side and 18.5 m long on southern side. In view of the limited space near the entrance, small diameter (about 400mm) soldier pile wall supported with fly beams can be considered as one of the options for the retaining wall system.
- 5.3.2 Since there is an existing WSD tunnel located beneath the development, the construction of the retaining structures for the car lift should be duly considered to minimize any adverse impact on the tunnel. For the temporary stage construction, three to four rows of tie back are proposed to support the retaining walls to minimize their embedded length and the ground level shall be excavated to the bottom level of the car lift footing (+27.5mPD). In the permanent stage, the stability of the retaining wall will be maintained by combining the permanent car lift structure with a footing of ~2.5m thick, and the car lift structure will also be tied with the raft footing of the building (~2m thick, with shear keys to be provided). In addition, raking drains shall be installed on the retaining wall to avoid building up of the groundwater table in the long term. As such, this combined structural system can effectively minimize any additional pressure imposed on the WSD tunnel.
- 5.3.3 On the northern side of the Site, where feature 6SE-D/CR424 is situated, the eastern portion of the feature will likely be locally cut back to provide space for the future development. The existing retaining wall will therefore be required to be modified to support the additional level difference, which is about 2 m high in maximum, for a length of 13 m long.

- 5.3.4 On the eastern side of the Site, where feature 6SE-D/FR154 is situated, the formation level of the proposed building will be lowered to around +44mPD, which will be lower than the crest level of the northern portion of feature 6SE-D/FR154 at +47.5mPD. Hence, a retaining wall will be required to support the level difference, which is about 3.5 m high and 16 m long.
- 5.3.5 Layout plan and few sections illustrating the above proposed geotechnical works are shown in **Appendix C**.
- 5.3.6 There is a natural hillside, about 22 m high, with a lateral extent of about 44 m, situated directly upslope of the Site. Since the angular elevation of the natural terrain from the Site is more than 20°, a natural terrain hazard assessment should be carried out during the detailed design stage as according to GEO Report 138 to assess any potential natural terrain hazards such as boulder fall and open hillslope failure, which will affect the future development. Mitigation measures should be designed to protect the Site from potential hazards emanating from upslope.

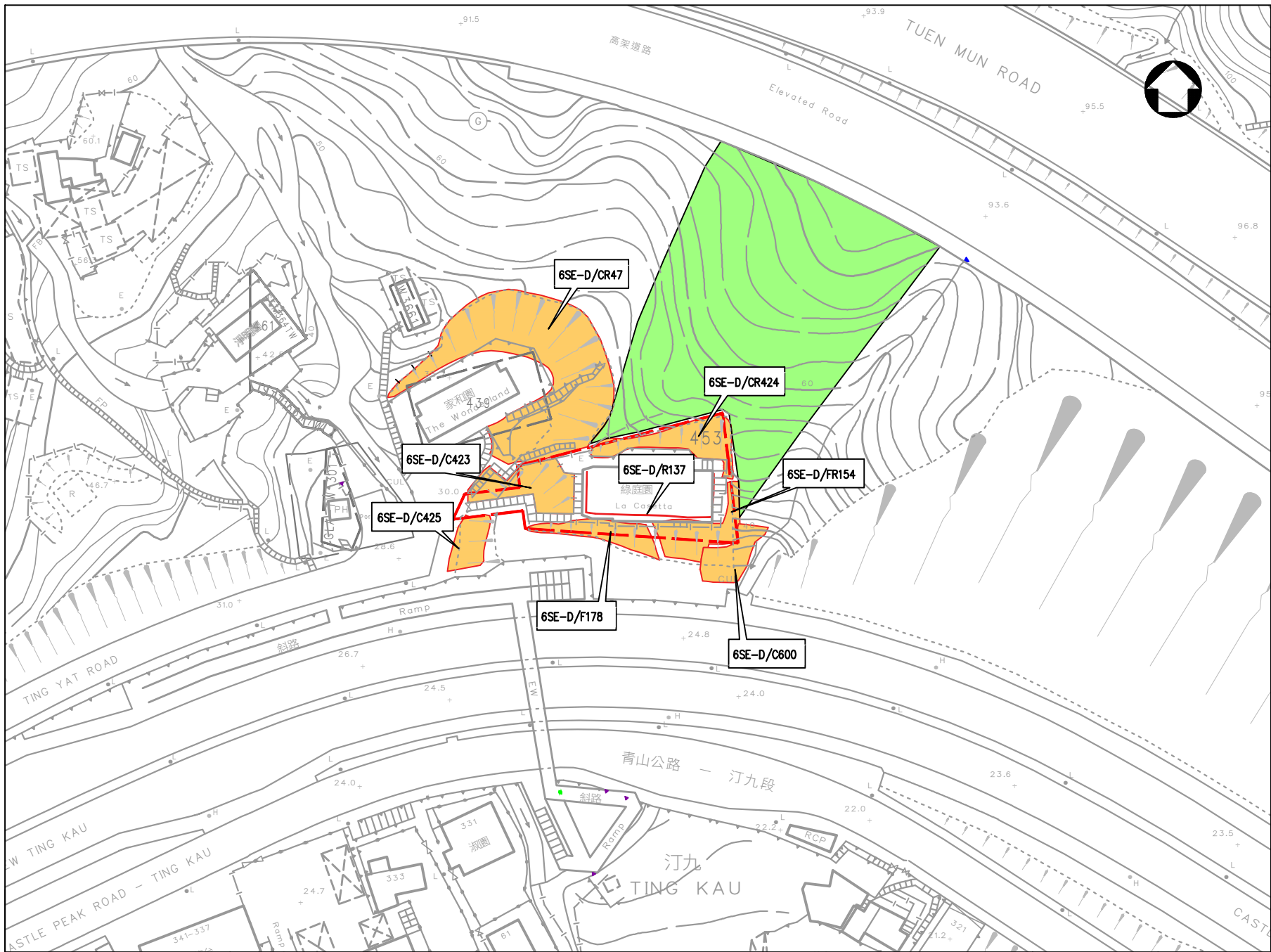
5.4 Impact on Existing WSD Tunnel

- 5.4.1 The proposed works are considered to impose minimal impact to the WSD tunnel as discussed below:
- The proposed development, which includes the construction of a car lift by excavating the existing ground, and the re-development of the residential building with same no. of levels, will not introduce additional loadings or increase the hydrostatic pressure to the WSD Tunnel.
 - There is sufficient clearance (~7.7m) of more than two times the diameter of the tunnel, which is only 2 m in diameter, between the proposed structure (i.e., the proposed footing structure at +27.5mPD) and the tunnel crown (at +19.8 mPD).
 - Based on the available GI records as aforementioned, the rockhead level above the tunnel is relatively high, approximately +30mPD at the location of the proposed car lift. Hence, there is a significant rock cover above the tunnel, which is about 7.7 m. It is therefore considered that the proposed development will induce minimal impact to the tunnel.
 - The proposed construction method, without blasting or percussive piling method, will induce minimal vibration to the adjacent ground as well as the tunnel, which is located at about 11.2 m below ground.

6 Conclusions and Recommendations

- 6.1.1 From the above geotechnical assessment, which is based on the available geological and geotechnical data, it is concluded that the proposed development at the subject Site is geotechnically feasible. Significant geotechnical hazards / constraints that may adversely affect the future redevelopment are not evident from the available geotechnical data.
- 6.1.2 For the eight adjacent features, four of them (6SE-D/R137, 6SE-D/FR154, 6SE-D/CR423 and 6SE-D/C424) will either be removed or substantially modified. For the remaining four features (6SE-D/CR47, 6SE-D/F178, 6SE-D/C425 and 6SE-D/C600), although they will not be directly affected by the future development, the stability of these features should be duly considered in view of their close proximity to the future development. Upgrading works should be carried out, where deemed necessary. In conjunction with the proposed development, a few new retaining structures will be required to support the level difference generated from the excavation works.
- 6.1.3 Since there is a natural terrain with an angular elevation of more than 20° from the Site, a natural terrain hazard assessment study should be carried out during the detailed design stage to assess any potential natural terrain hazards that would affect the Site and mitigation measures should then be considered to protect the Site from the hazards.
- 6.1.4 It is recommended that project-specific GI should be carried out during the detailed design stage to collate sufficient and relevant geotechnical data for building up a reliable ground model to facilitate the detailed engineering designs including site formation, slope upgrading works and foundation designs.
- 6.1.5 For the WSD tunnel, detailed impact assessment on the tunnel shall be carried out during the detailed design stage and construction stage based on more comprehensive geological information and geotechnical data.
- 6.1.6 A comprehensive instrumentation and monitoring system with mitigation / contingency measures should be formulated during the detailed design to closely monitor the construction impact on the adjacent building structures, roads, slopes and utilities as well as the WSD tunnel to ensure that all the allowable limits on ground movement / vibration are achieved.

FIGURES

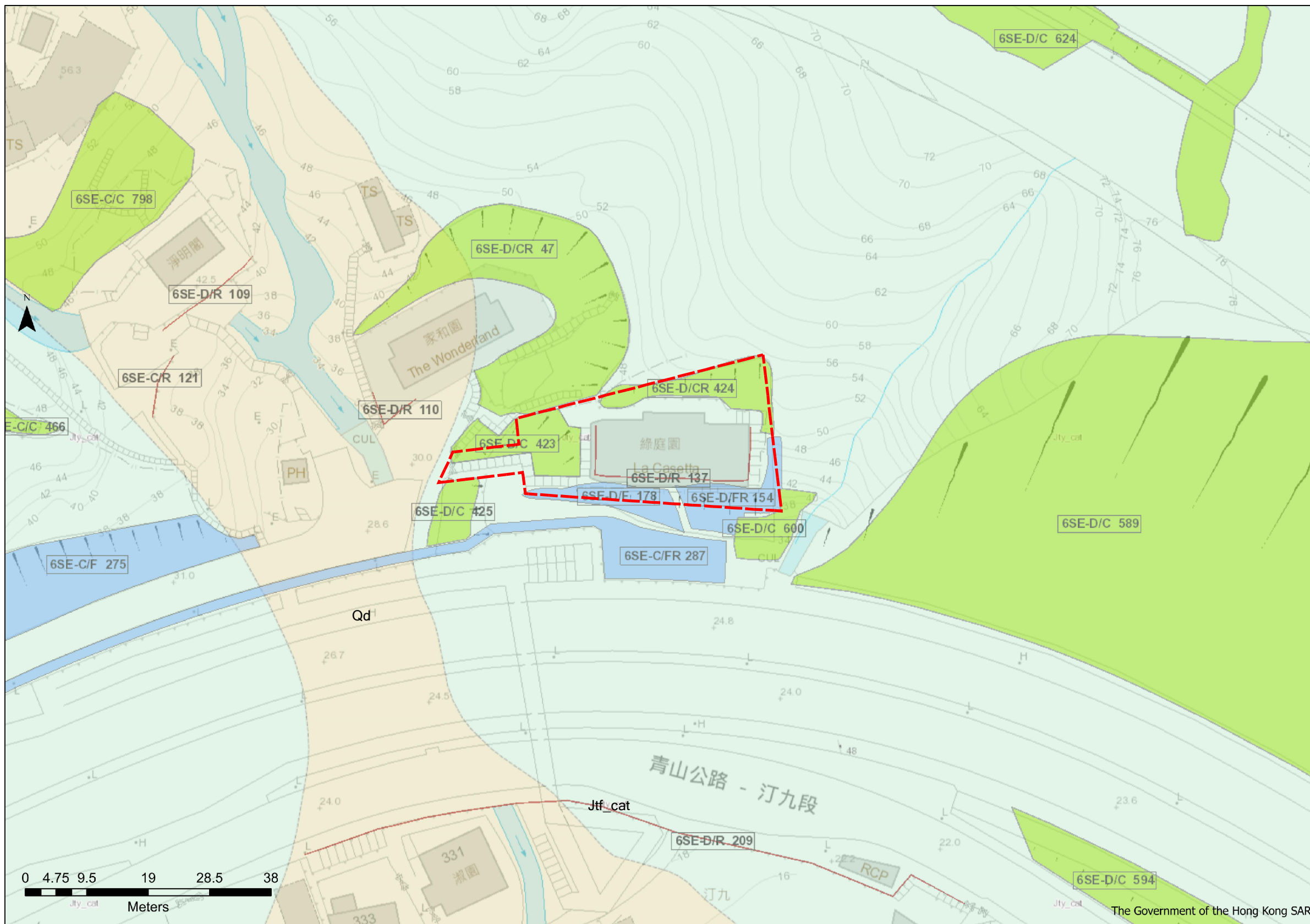


- LEGEND**
- APPLICATION SITE BOUNDARY
 - LOT BOUNDARY
 - FEATURE
 - EXTENT OF NATURAL TERRAIN



Proposed Development of La Casetta DD399 Lot 453 Ting Kau
Figure 1 - Location Plan

SCALE	1:750 (A4)	DATE	SEP 24
DRAWN BY	MH	CHECKED BY	EH
JOB NO.	7076981	REVISION	A



Legend

Site Boundary

Superficial Deposit

Qd Debris Flow Deposits

Solid Geology

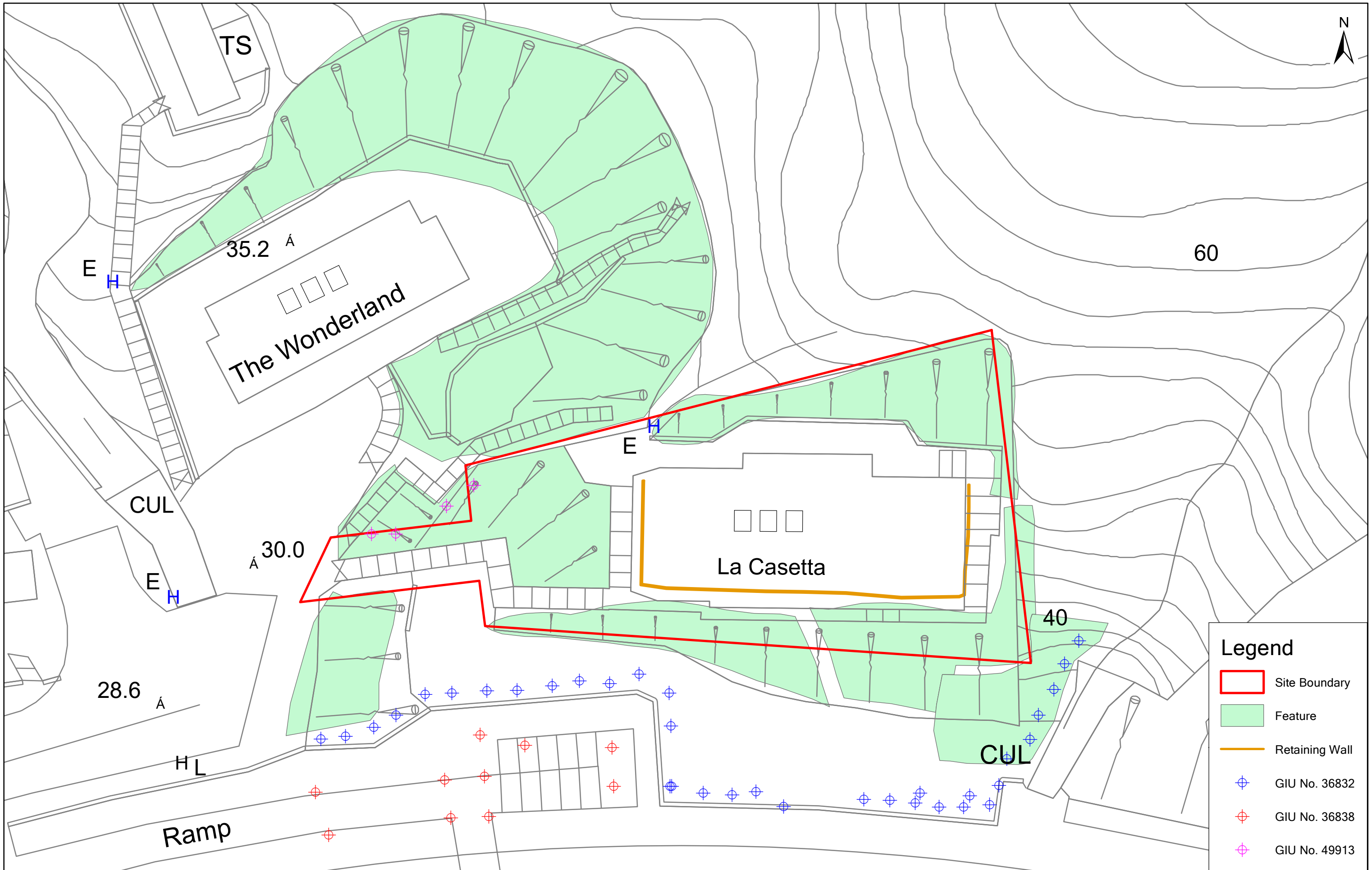
Jtf_cat Yim Tin Tsai Fm:
Coarse Ash Crystal Tuff

(Extract from Hong Kong Geological Survey Sheet 6, 2nd Edition, 2008)



Proposed Development of La Casetta DD399 Lot 453 Ting Kau
Extract of Published Geology Map

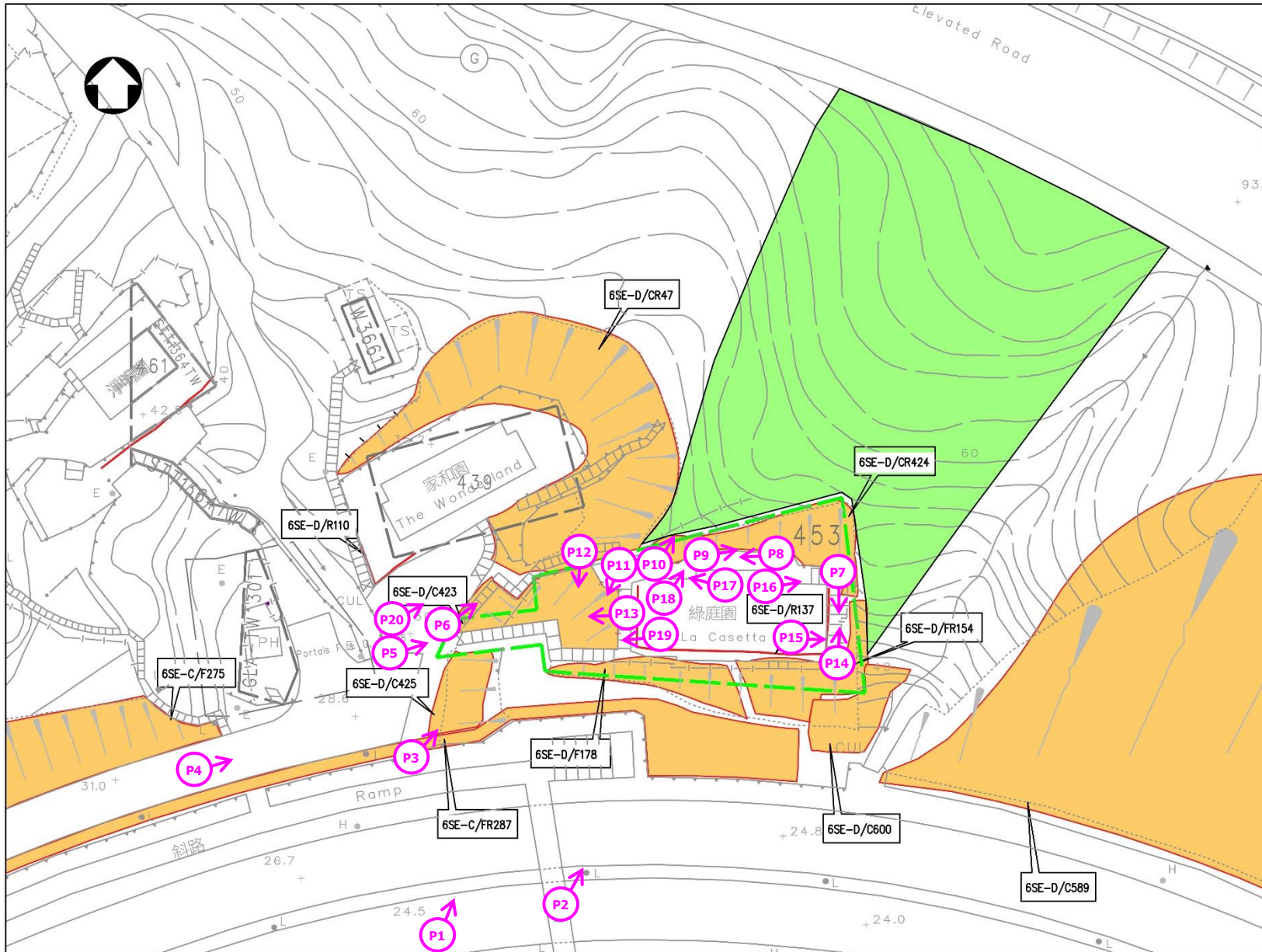
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CHECK	EH	DRAWN	MH
JOB NO.	7076981	Figure 2	REV. A



Legend	
	Site Boundary
	Feature
	Retaining Wall
	GIU No. 36832
	GIU No. 36838
	GIU No. 49913

SCALE	1:250	DATE	Apr 2024
CHECK	EH	DRAWN	MH
JOB NO.	7076981	Figure 3	REV. A

PLATES



LEGEND

- APPLICATION SITE BOUNDARY
- LOT BOUNDARY
- FEATURE BOUNDARY
- EXTENT OF NATURAL TERRAIN
- ➔ PLATE LOCATION



PROPOSED DEVELOPMENT OF LA CASETTA DD399 LOT 453 TING KAU

FIGURE P1 - PLATE LOCATION PLAN

SCALE	1:750 (A4)	DATE	MAR 24
DRAWN BY	HW	CHECKED BY	EH
JOB NO.	7076981	REVISION	-

Plate 1

General view at left portion of development site (Facing west)



Plate 2

General view at right portion of the development site (Facing west)



Plate 3

General view feature No. 6SE-D/C425



Plate 4

General view of vehicle access



Plate 5

General view of open area in front of the proposed development

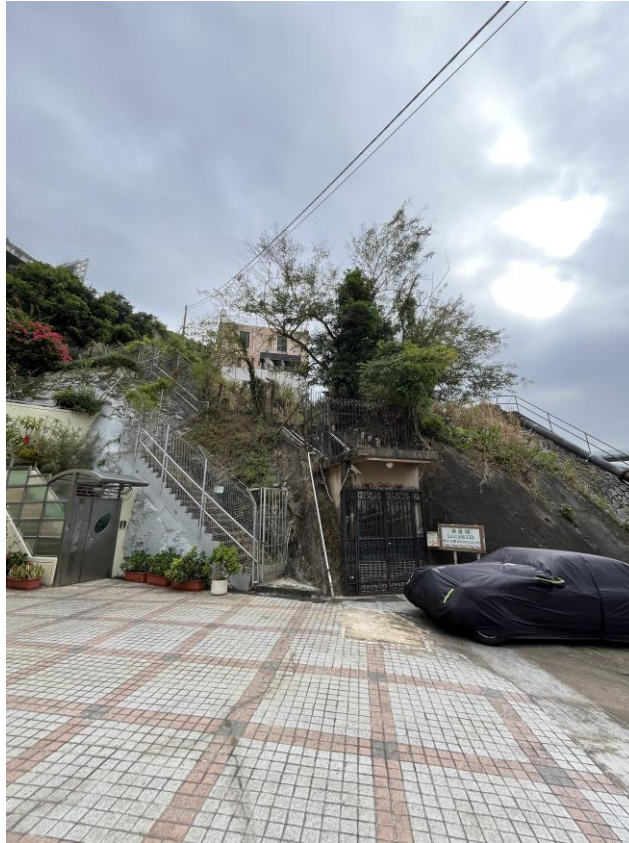


Plate 6

General view of feature No. 6SE-D/C423



Plate 7

General view of the east portion of the proposed development



Plate 8

General view of retaining wall portion of Feature No. 6SE-D/CR424 (western part)



Plate 9

General view of retaining wall portion of Feature No. 6SE-D/CR424 (eastern part)



Plate 10

General view of slope portion of Feature No. 6SE-D/CR424 (western part)



Plate 11

General view of platform within the proposed development



Plate 12

General view of Feature No. 6SE-D/C423



Plate 13

General view of Feature No. 6SE-D/C423



Plate 14

General view of Feature No. 6SE-D/FR154



Plate 15

General view of Feature No. 6SE-D/C600



Plate 16

General view of north-eastern portion of Natural Terrain



Plate 17

General view of north-western portion of Natural Terrain



Plate 18

General view of Feature No. 6SE-D/CR424

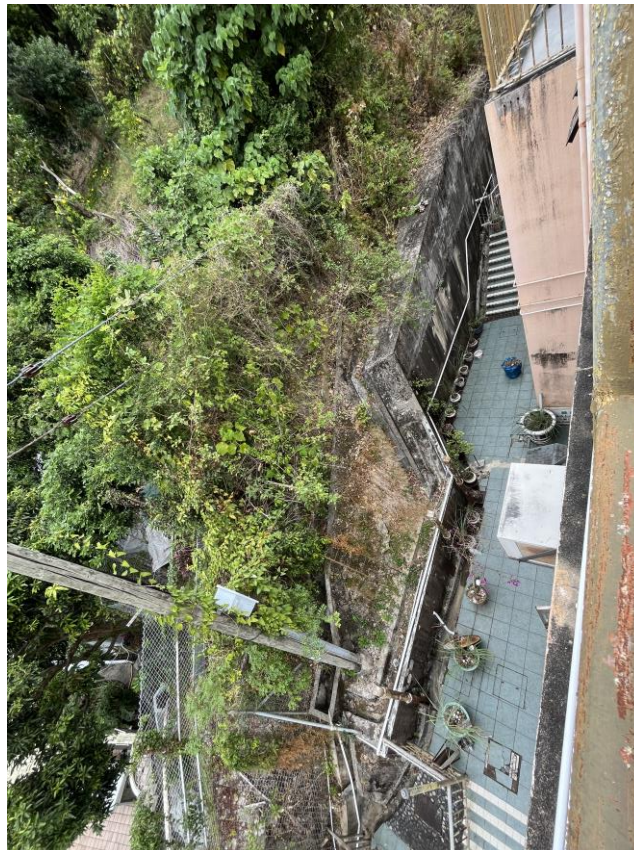


Plate 19

General view of Feature No. 6SE-D/C423

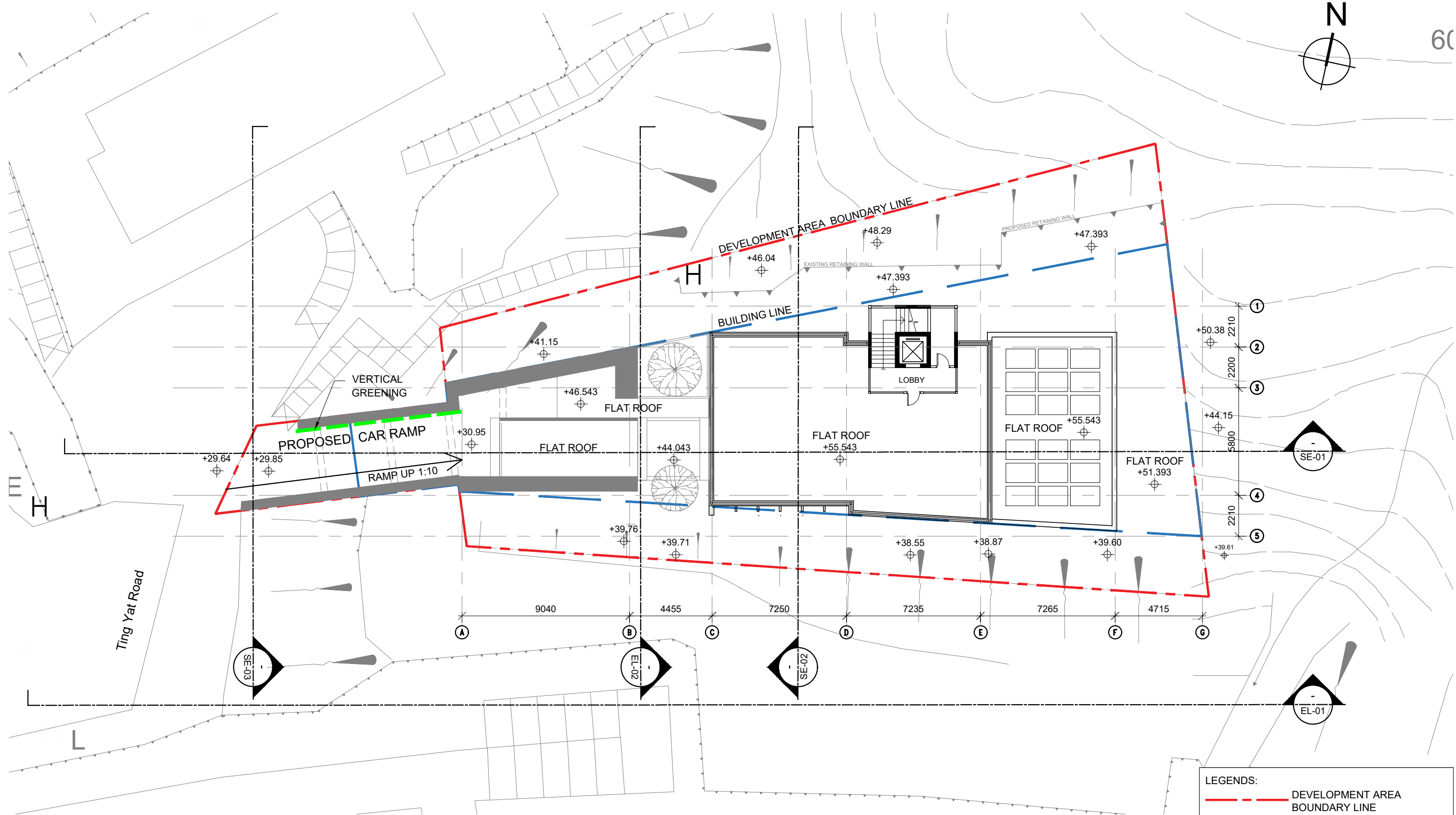


Plate 20

General view of open area in front of the proposed development



Appendix A **PROPOSED DEVELOPMENT SCHEME**



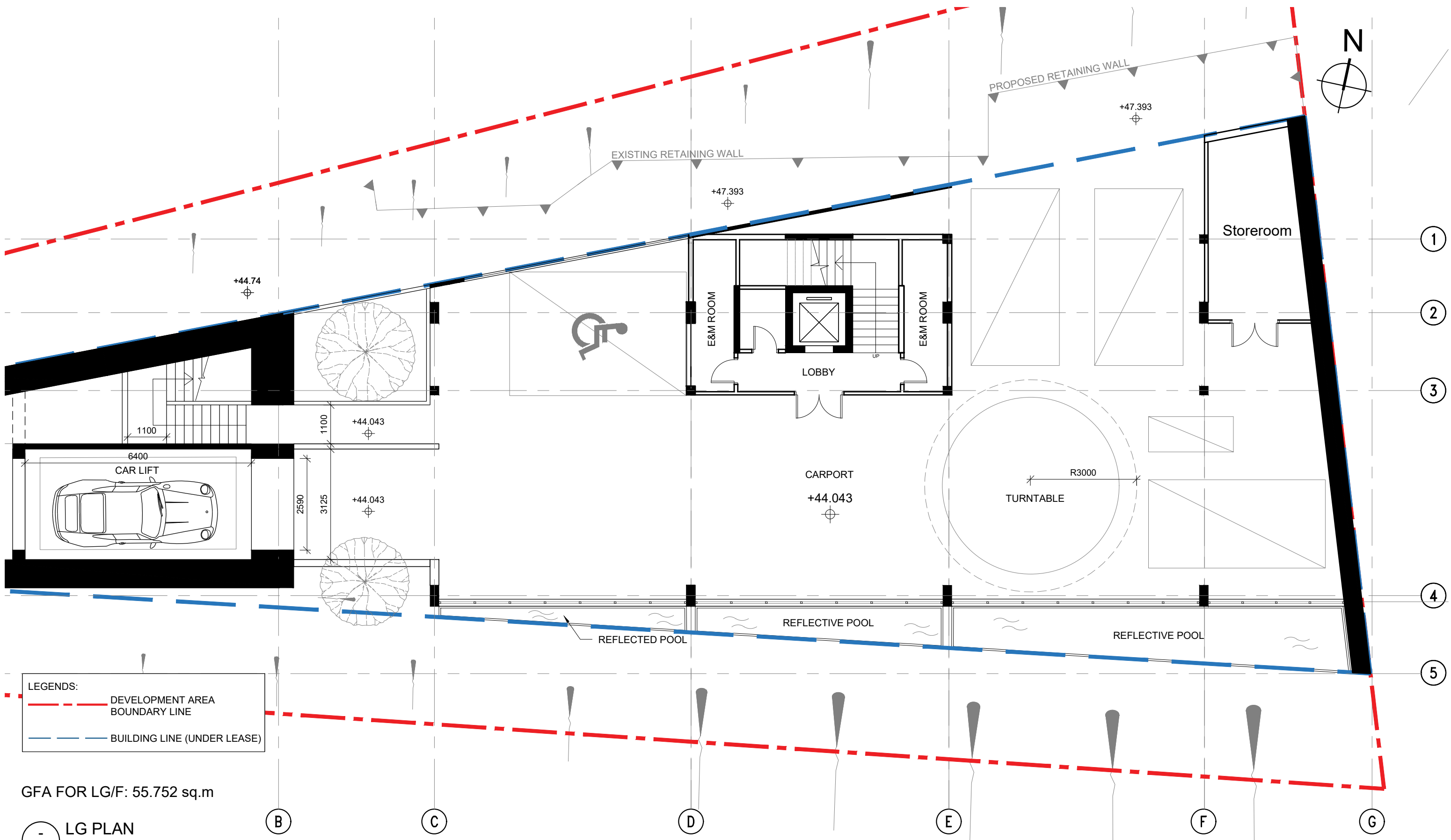
MASTER LAYOUT PLAN
 MLP-01 SCALE: 1:200 (A3)

LEGENDS:

	DEVELOPMENT AREA BOUNDARY LINE
	BUILDING LINE (UNDER LEASE)
	VERTICAL GREENING

何 周 禮 建 築 設 計 事 務 所 有 限 公 司

REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED: -	BARRIE HO LTD ARCHITECTURE · INTERIORS			REVISION A	DATE MAY 2024	DRAWN GL	CHECKED MM	PLANNING SUBMISSION
	DATE: -				REVISION B	DATE SEP 2024	DRAWN MC	CHECKED AP	
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	DATE: -			JOB NO.: 202327					
	DRAWN: BC			SCALE: 1:200 (A3)					
DATE: DEC 2023									



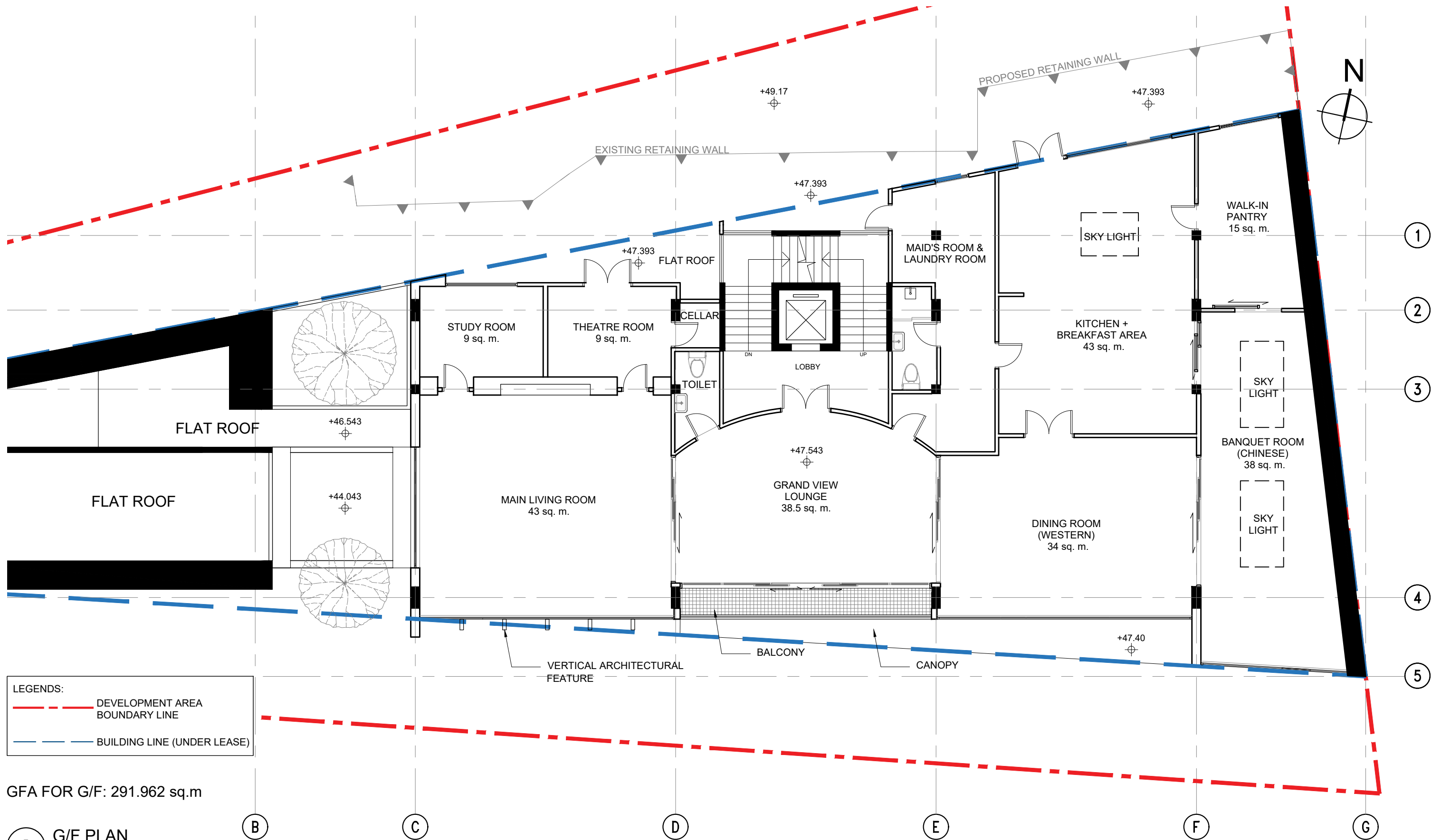
LEGENDS:
 - - - - - DEVELOPMENT AREA BOUNDARY LINE
 - - - - - BUILDING LINE (UNDER LEASE)

GFA FOR LG/F: 55.752 sq.m

LG PLAN
 LP-01 SCALE: 1:100 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED:	BARRIE HO LTD ARCHITECTURE · INTERIORS		REVISION	DATE	DRAWN	CHECKED	PLANNING SUBMISSION
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	DATE:							
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	DATE:	LA CASSETTA, TING KAU	LG PLAN	LP-01				
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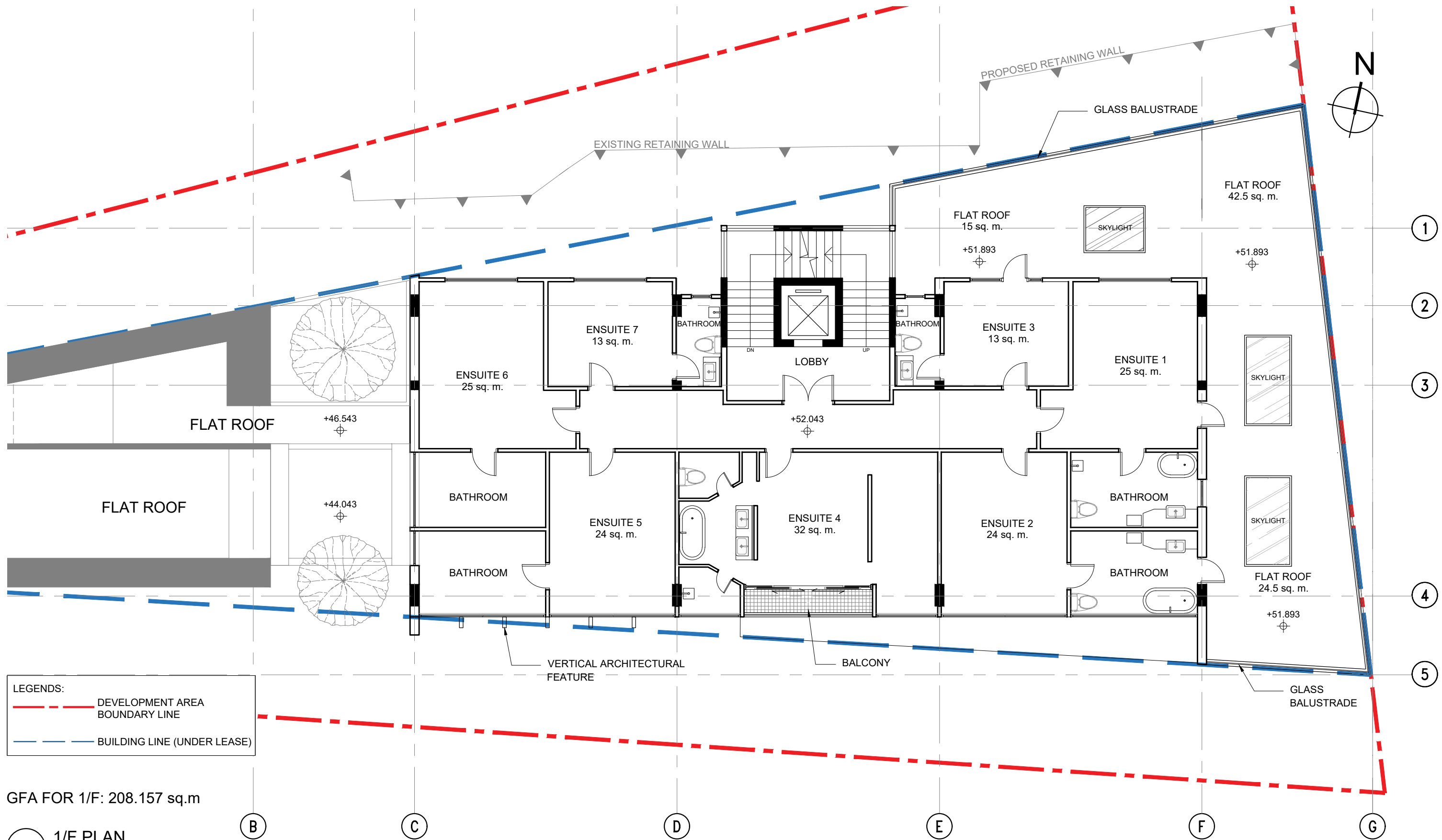


GFA FOR G/F: 291.962 sq.m

G/F PLAN
 LP-02 SCALE: 1:100 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED:	BARRIE HO LTD ARCHITECTURE · INTERIORS		REVISION	DATE	DRAWN	CHECKED	PLANNING SUBMISSION
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	CHECKED: MM			B	SEP 2024	MC	AP	
	DATE:							
DRAWN: BC	PROJECT:	TITLE:	DWG NO.:					
DATE: DEC 2023	LA CASSETTA, TING KAU	G/F PLAN	LP-02					
			JOB NO.:					
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LEGENDS:

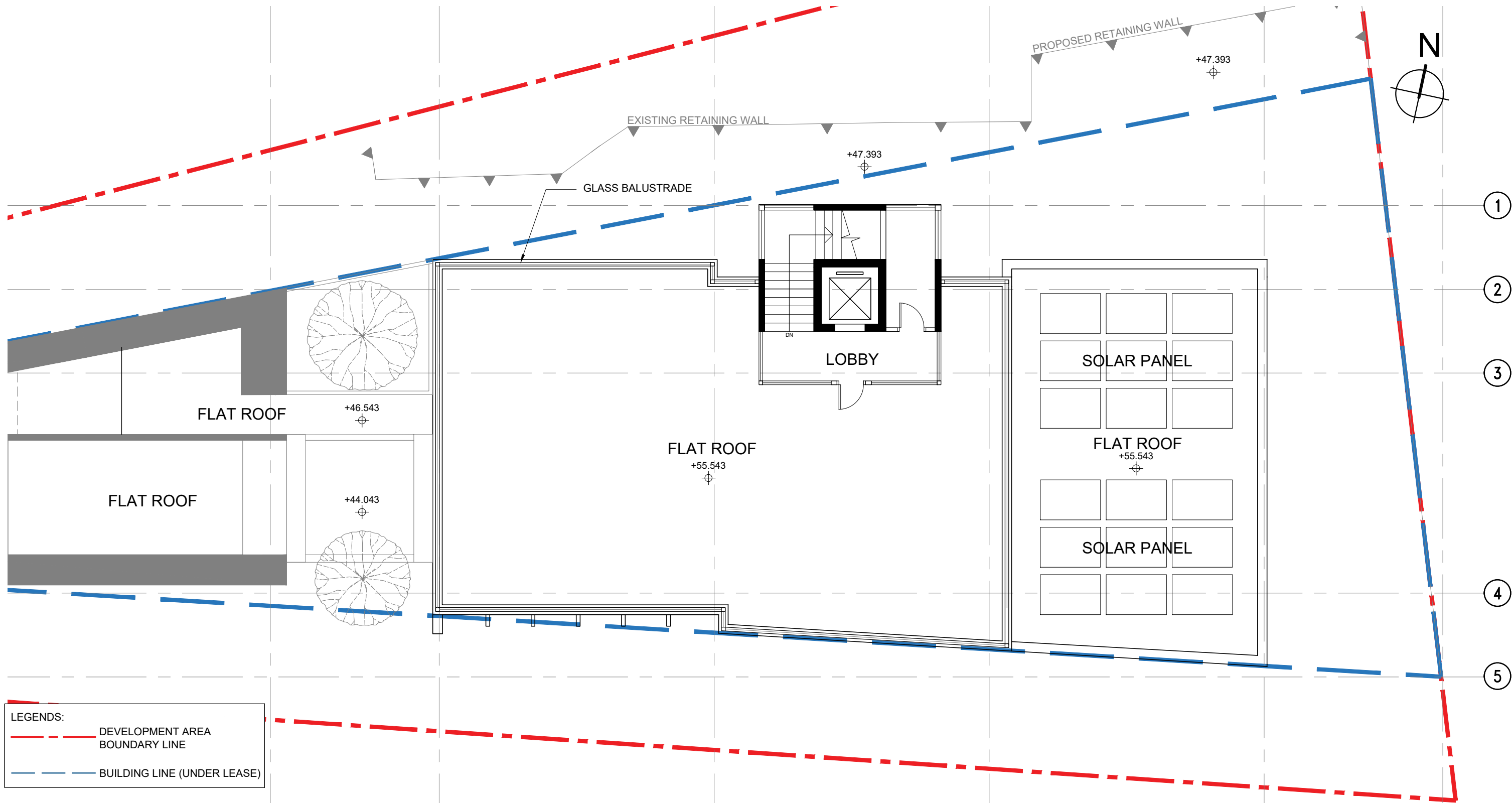
	DEVELOPMENT AREA BOUNDARY LINE
	BUILDING LINE (UNDER LEASE)

GFA FOR 1/F: 208.157 sq.m

1/F PLAN
 SCALE: 1:100 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED: -	BARRIE HO LTD ARCHITECTURE · INTERIORS			REVISION A	DATE MAY 2024	DRAWN GL	CHECKED MM	PLANNING SUBMISSION
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	CHECKED: MM	PROJECT: LA CASSETTA, TING KAU	TITLE: 1/F PLAN		DWG NO.: LP-03				
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DRAWN: BC									
DATE: DEC 2023									

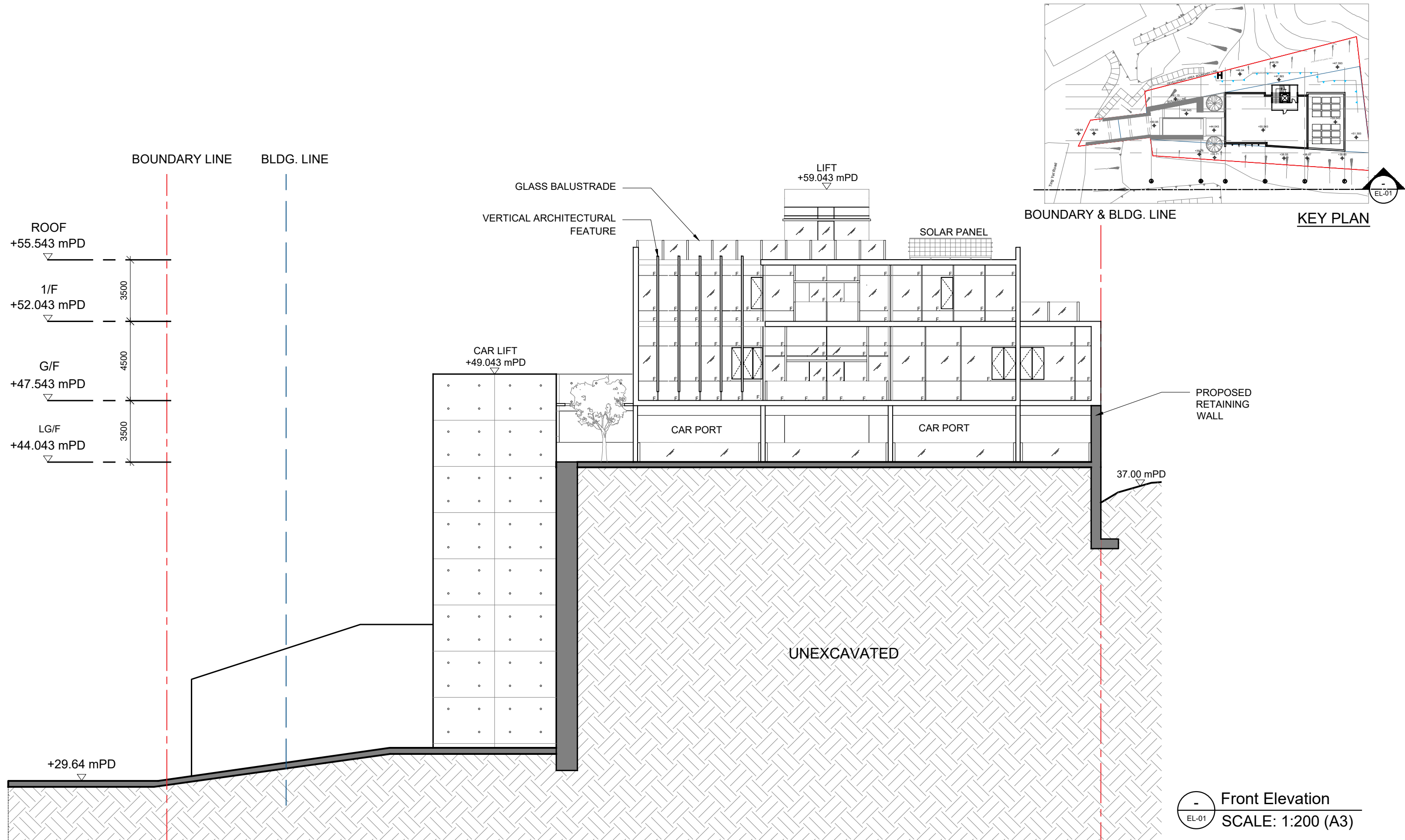


GFA FOR ROOF: 22.789 sq.m

ROOF PLAN
SCALE: 1:100 (A3)

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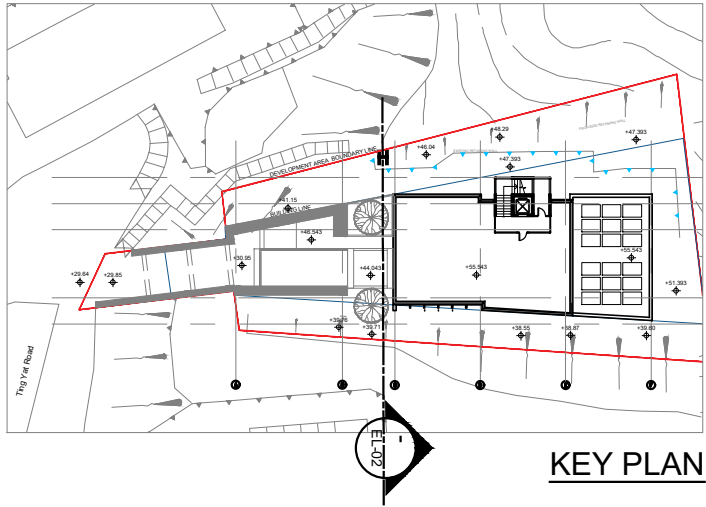
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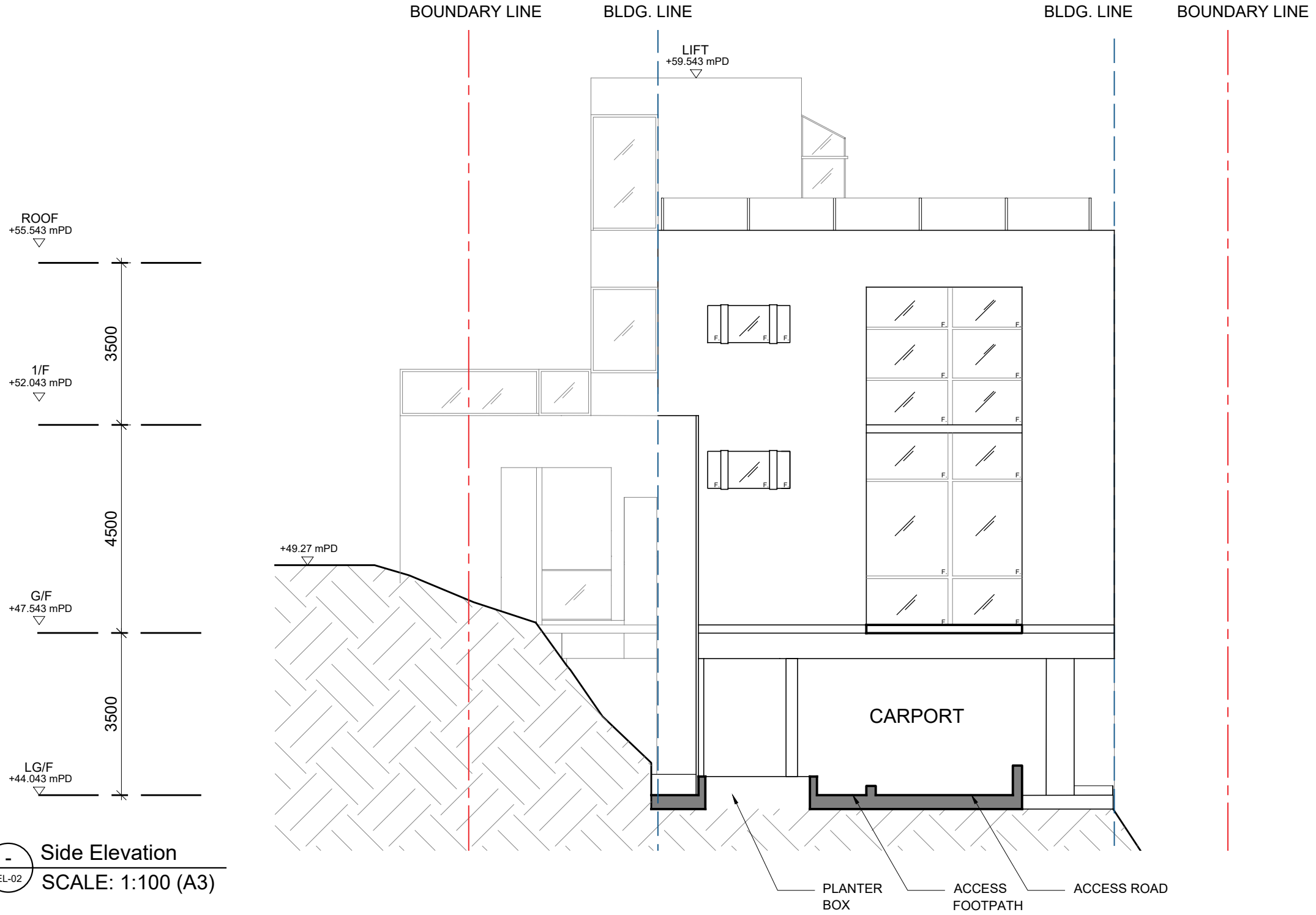
Front Elevation
SCALE: 1:200 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED:	BARRIE HO LTD ARCHITECTURE · INTERIORS			REVISION	DATE	DRAWN	CHECKED	PLANNING SUBMISSION
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	DRAWN: SY	JOB NO.: 202327		SCALE: 1:200 (A3)					
DATE: JAN 2023									



KEY PLAN



ROOF
+55.543 mPD

3500

1/F
+52.043 mPD

4500

G/F
+47.543 mPD

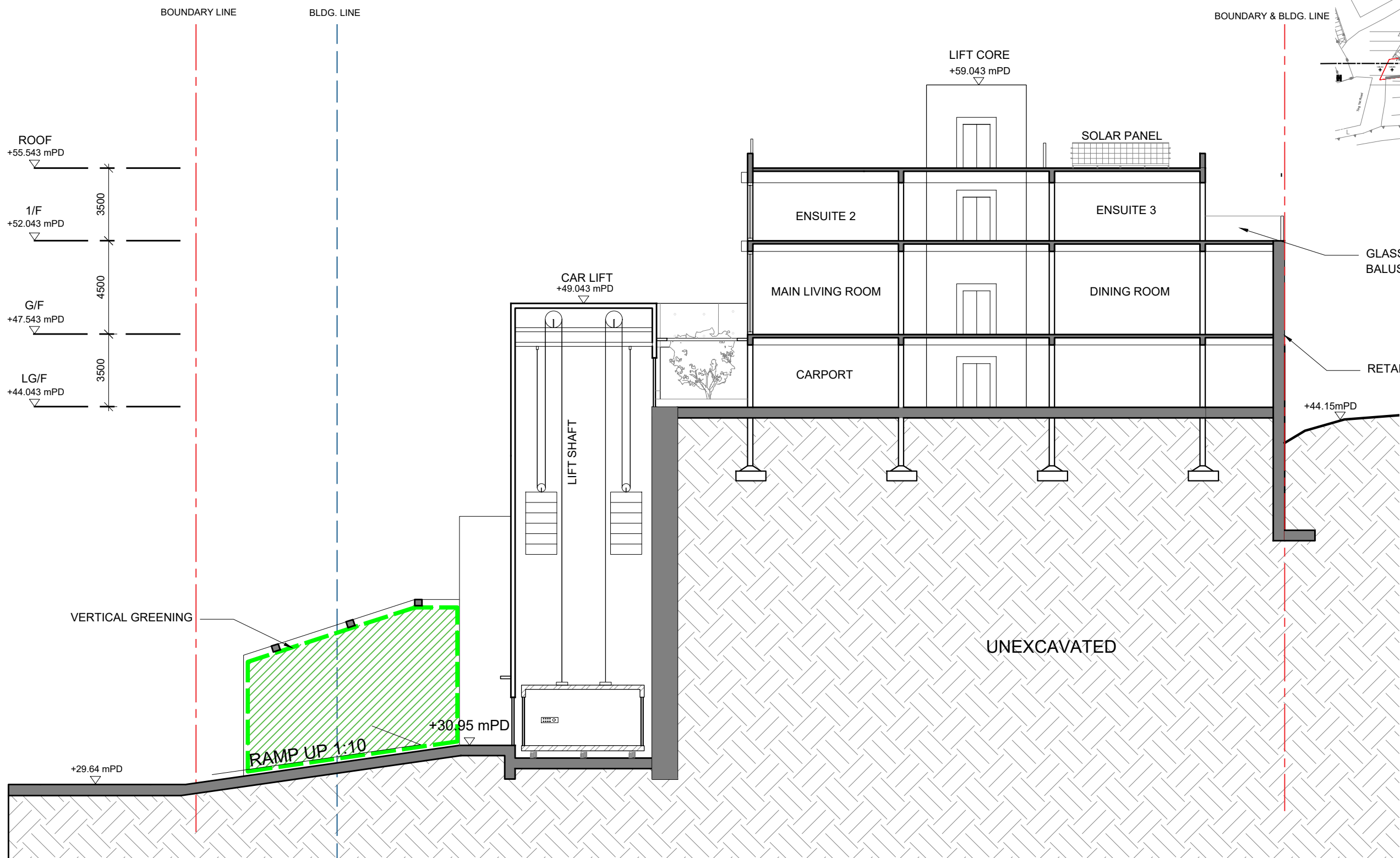
3500

LG/F
+44.043 mPD

Side Elevation
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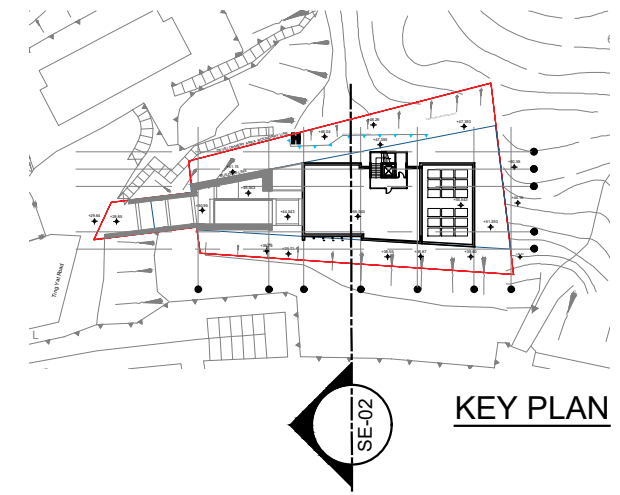
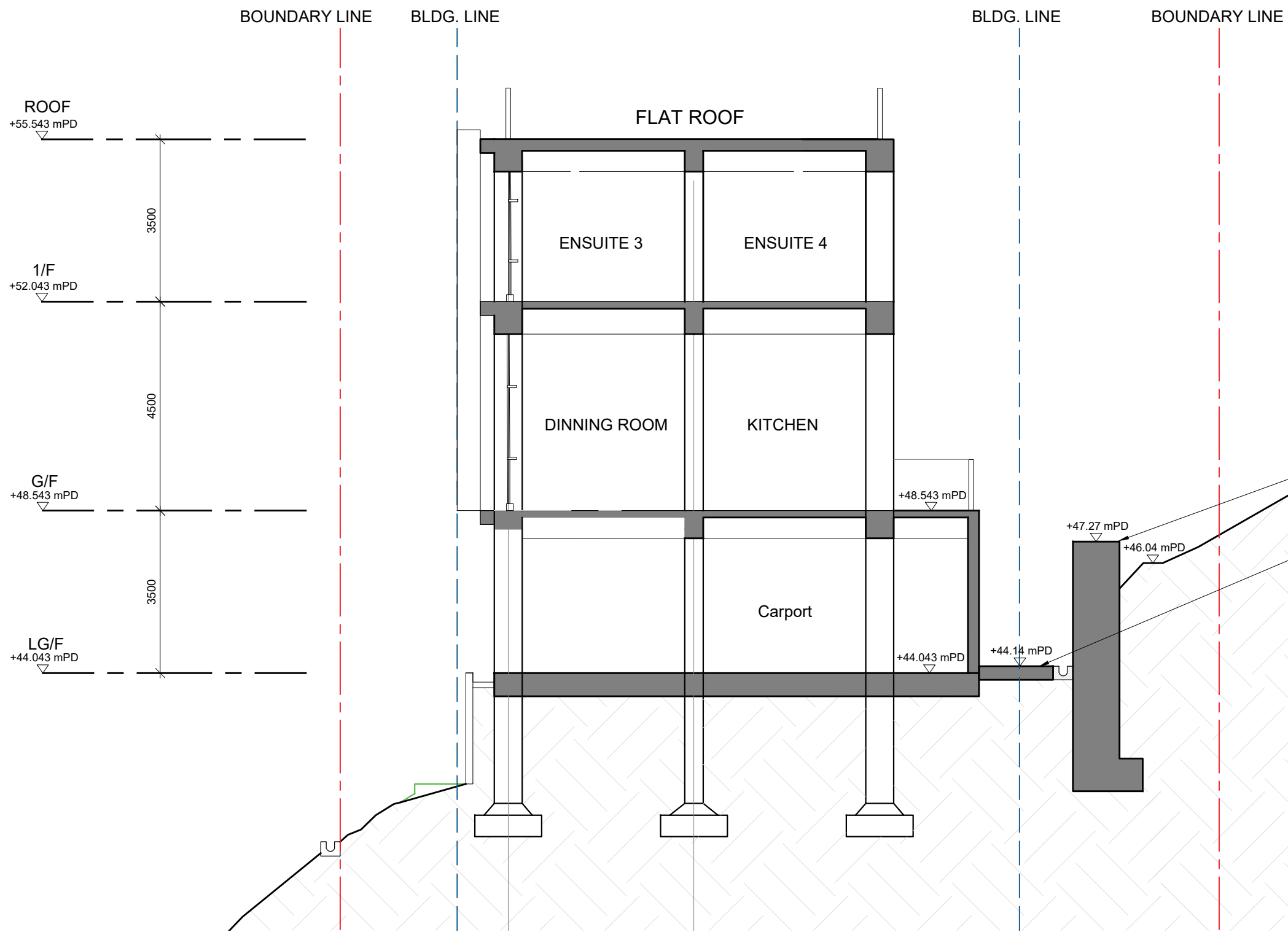
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	DATE:								
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	DATE:	LA CASSETTA, TING KAU	SIDE ELEVATION	EL-02					
	DRAWN: SY			JOB NO.:					
	DATE: JAN 2023			SCALE: 1:100 (A3)					



- Schematic Section 01
 SE-01 SCALE: 1:200 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED: -	BARRIE HO ARCHITECTURE · INTERIORS			REVISION	DATE	DRAWN	CHECKED	PLANNING SUBMISSION
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	DATE: -								
	DRAWN: KL	PROJECT: LA CASSETTA, TING KAU	TITLE: SCHEMATIC SECTION	DWG NO.: SE-01					
	DATE: 06 Dec 2023			JOB NO.: 202327					
				SCALE: 1:200 (A3)					



SE-02 Schematic Section 02
SCALE: 1:100 (A3)

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REMARKS: DO NOT SCALE THIS DRAWING. ALL MEASUREMENTS MUST BE CHECKED ON SITE.	APPROVED: -	BARRIE HO ARCHITECTURE · INTERIORS		REVISION	DATE	DRAWN	CHECKED	PLANNING SUBMISSION
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DRAWN: KL			JOB NO.:					
DATE: DEC 2023			SCALE:					

ROOF
+55.543 mPD

1/F
+52.043 mPD

G/F
+47.543 mPD

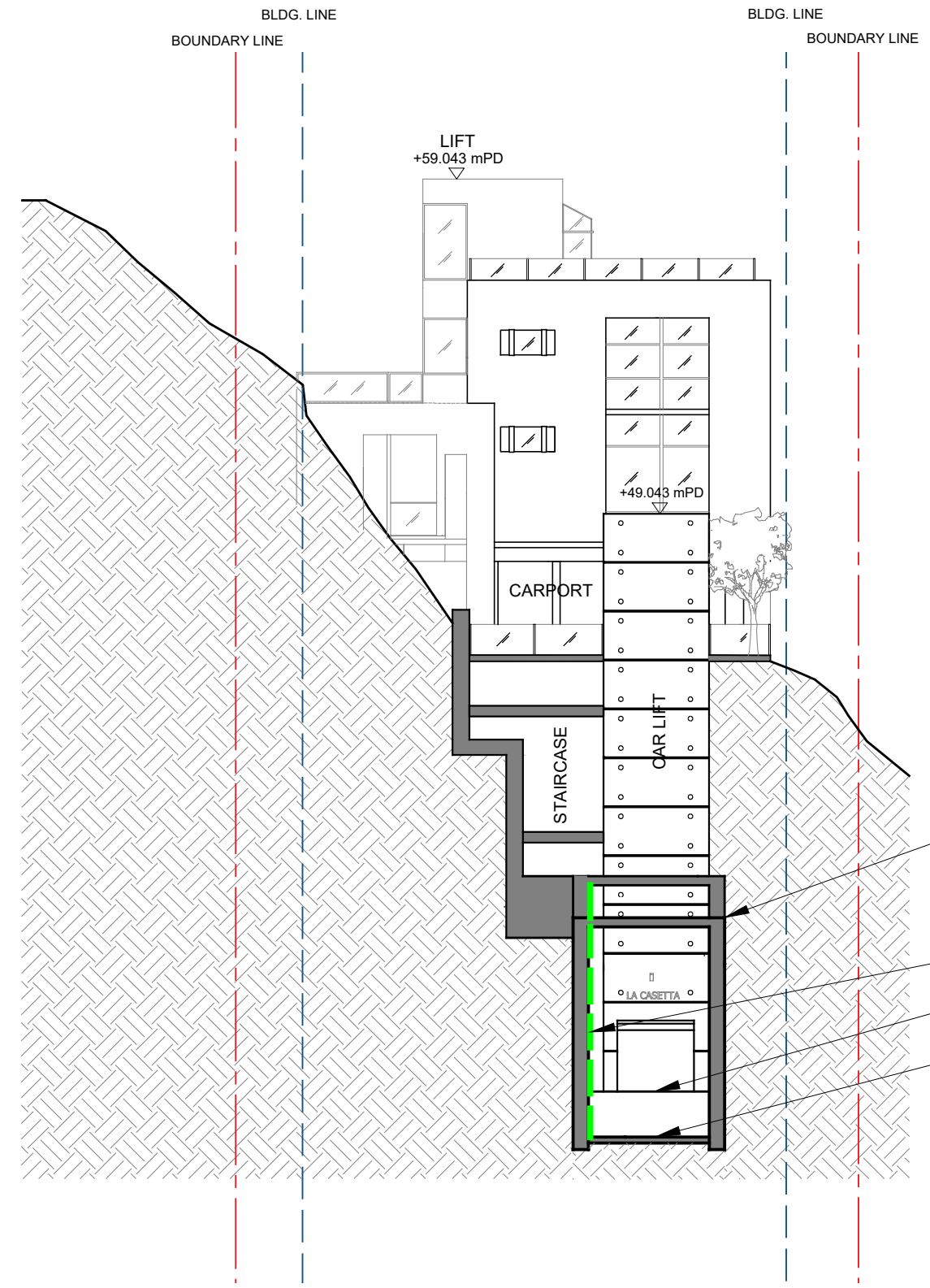
LG/F
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3500

4500

3500

TING YAT ROAD
+29.64 mPD

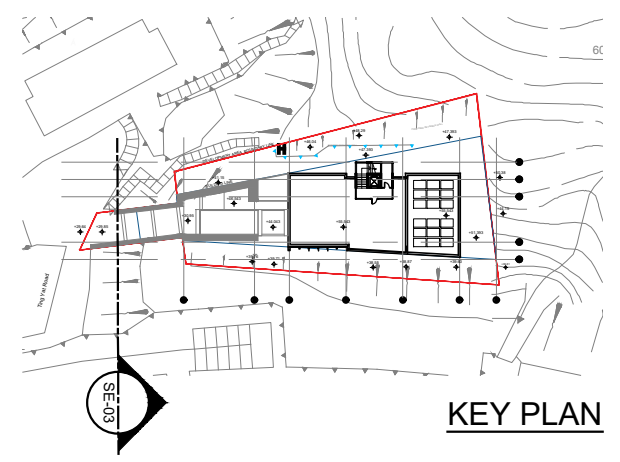


EX. RETAINING WALL

VERTICAL GREENING

CAR LIFT ENTRANCE

TING YAT ROAD



Schematic Section 03
SCALE: 1:200 (A3)

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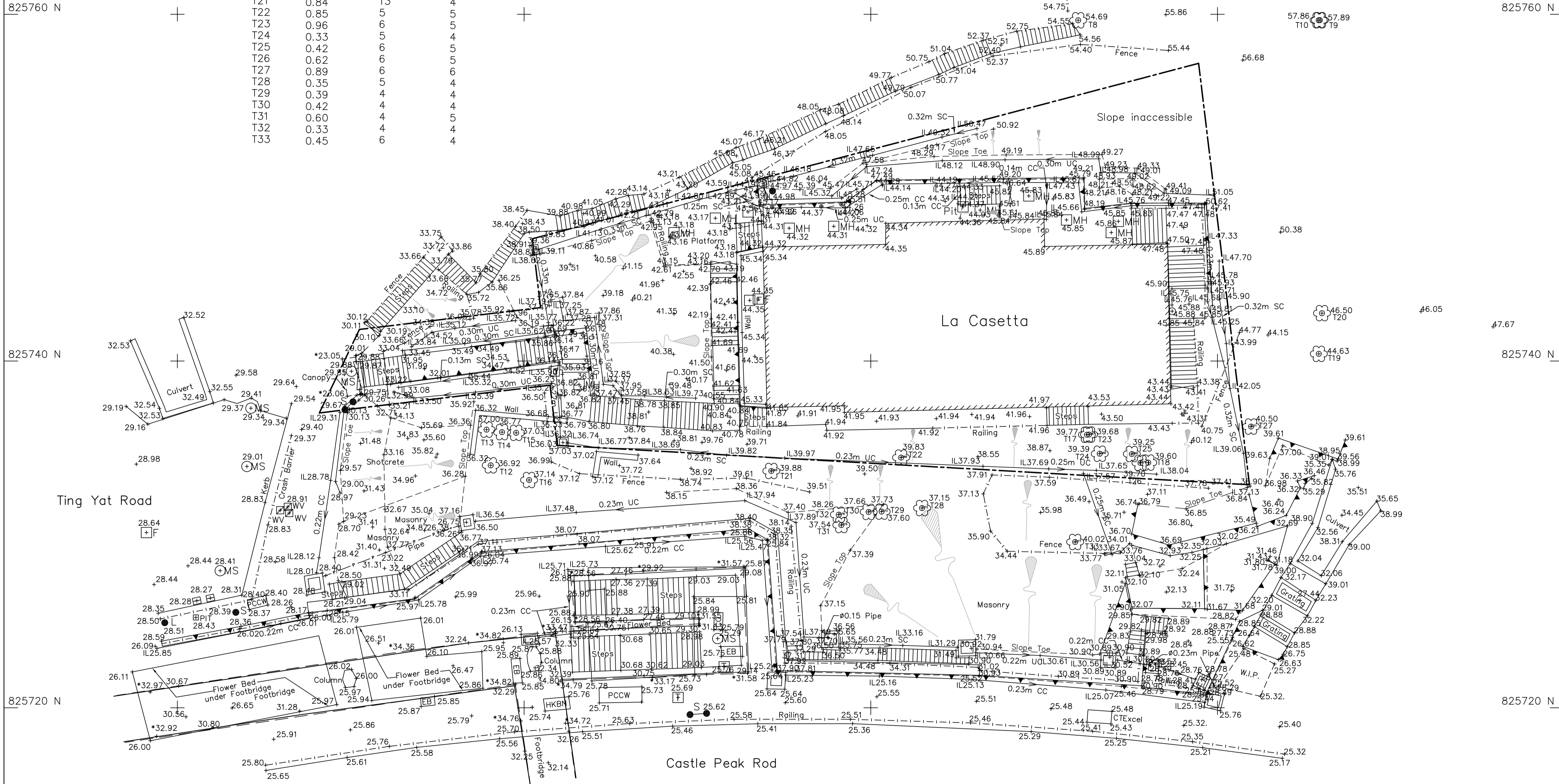
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	LA CASSETTA, TING KAU	SCHEMATIC SECTION 03	SE-03						
			JOB NO.:						
			SCALE: 1:200 (A3)						

Appendix B **SUMMARY OF PREVIOUS GI RECORDS**

Appendix C **TOPOGRAPHICAL SURVEY PLAN**

Tree Table

Tree No.	Girth (m)	Height (m)	Spread (m)
T2	0.42	5	3
T3	0.53	4	2
T4	0.38	4	2
T5	0.45	5	4
T6	0.72	2	2
T7	0.46	2	2
T8	0.54	4	2
T9	0.79	7	4
T10	0.62	6	4
T11	0.79	4	3
T12	0.42	6	3
T13	0.64	6	3
T14	0.37	5	2
T15	0.98	7	6
T16	0.86	8	5
T17	0.84	7	5
T18	0.62	8	4
T19	0.92	7	12
T20	0.43	5	3
T21	0.84	13	4
T22	0.85	5	5
T23	0.96	6	5
T24	0.33	5	4
T25	0.42	6	5
T26	0.62	6	5
T27	0.89	6	6
T28	0.35	5	4
T29	0.39	4	4
T30	0.42	4	4
T31	0.60	4	5
T32	0.33	4	4
T33	0.45	6	4



- Notes:**
- All levels are in metres above HK Principal Datum
 - Grid lines are in H.K. Metric Grid 1980.
 - Elevations of kerb are referred to the bottom of kerb.
 - Lot boundary shown hereon is scaled from the Lot Index Plan.

- Legend:**
- Foul Water Manhole
 - MS Storm Water Manhole
 - MH Manhole
 - 0.30m CC Covered Channel and Invert Level
 - 0.30m UC U-Channel and Invert Level
 - 0.30m SC Stepped Channel and Invert Level
 - Gully
 - Catch Pit
 - Valve Water
 - EB Electric Box
 - T Telecom Manhole
 - Pit
 - T1 Tree & Tree Number
 - S Sign Pole
 - L Lamp Post
 - E Electricity Pole
 - Gate
 - Fence/Railing
 - P Pipeline
 - 0.10mØ Pipe
 - Retaining Wall
 - *31.57 Above ground level
 - Approximate Lot Boundary (Subject to Survey)

Rev. A: Trees T21-T33 are updated on 17-09-2024

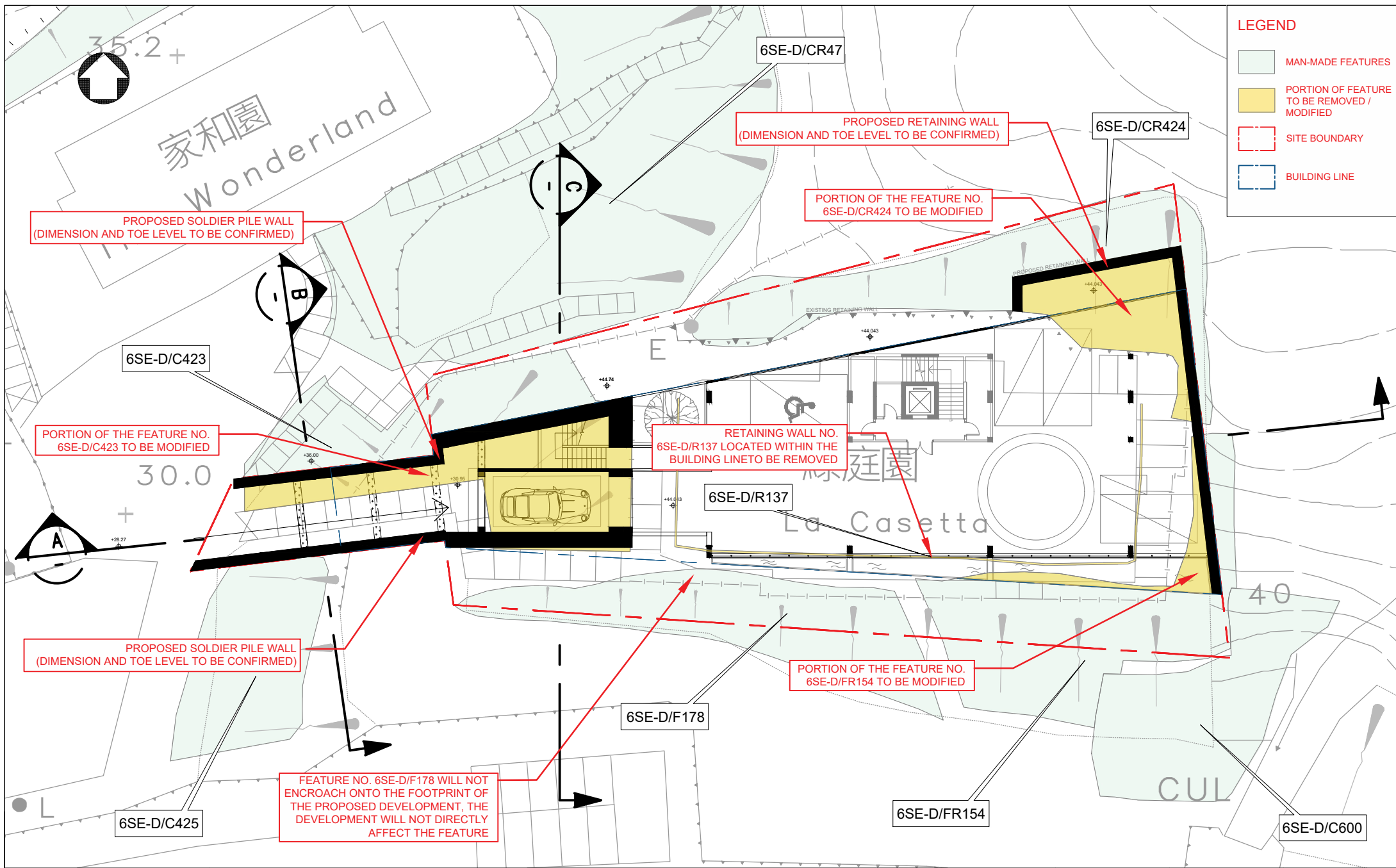
Drawing title
 Topographical Survey Plan of
 Lot 453 in D.D. 399, La Casetta,
 Ting Yat Road, Ting Kau.

Drawing no. : HC-16004/01A	Date 18/03/2024	Scale 1 : 200 (A2)
	Checked by H. So	Drawn by H.Y. Poon

Surveyor
HENRY CHAN SURVEYORS LTD.
 Authorized Land & Hydrographic Surveyors
 Shop 7, Mei Hing Mansion, Tel : 2638-1313 Fax : 2638-1328
 1-17 Yan Hing Street, Tai Po, N.T. e-mail : hcsurvey@netvigator.com

Henry H K Chan
 BSc FHKIS RPS(LSD)
 Authorized Land Surveyor

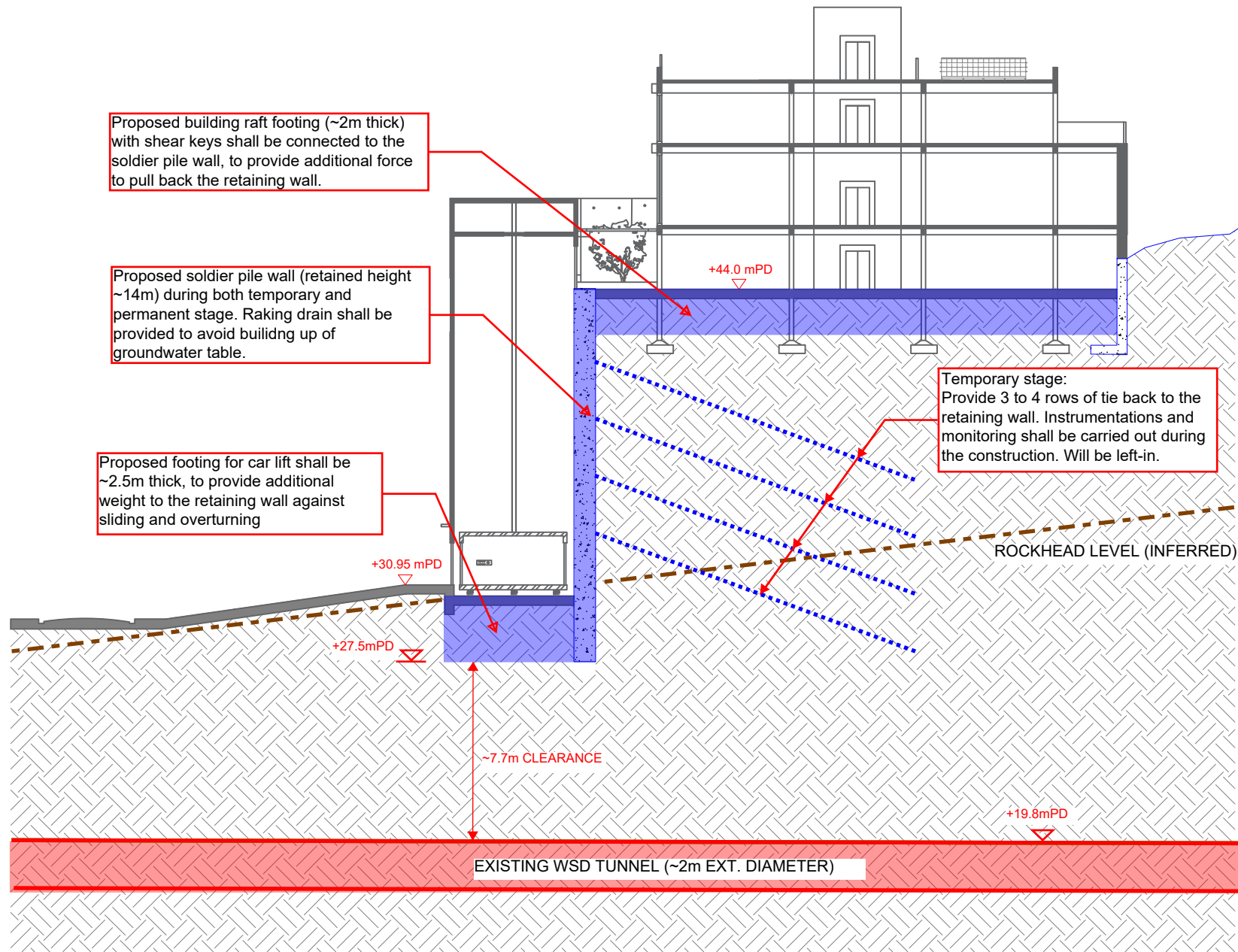
Appendix D **SCHEMATIC SKETCH FROM TECHNICAL FEASIBILITY STUDY**



LEGEND

- MAN-MADE FEATURES
- PORTION OF FEATURE TO BE REMOVED / MODIFIED
- SITE BOUNDARY
- BUILDING LINE

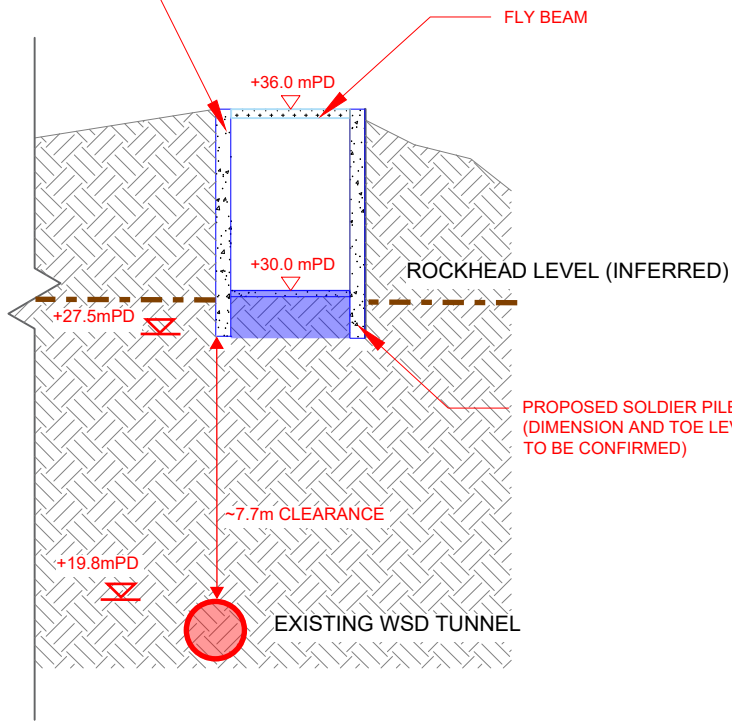
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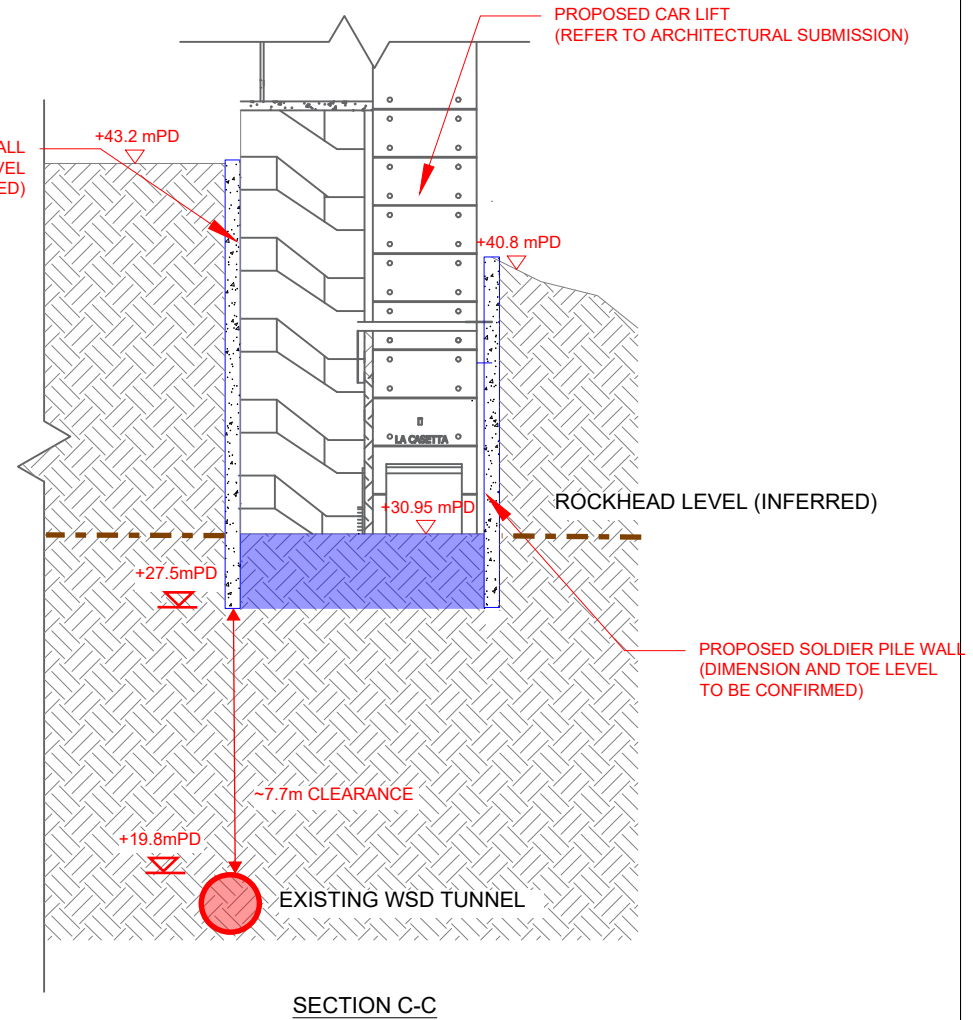
SECTION A-A

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PROPOSED SOLDIER PILE WALL
(DIMENSION AND TOE LEVEL
TO BE CONFIRMED)



PROPOSED SOLDIER PILE WALL
(DIMENSION AND TOE LEVEL
TO BE CONFIRMED)



SCALE	1:250 (A4)	DATE	AUG 24
DRAWN BY	HW	CHECKED BY	EH
JOB NO.	7076981	REVISION	A

Appendix E **AS-BUILT DRAWINGS OF WSD TUNNEL**

826300E

826400E

825800N

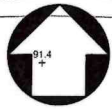
825800N

825700N

825700N

826300E

826400E

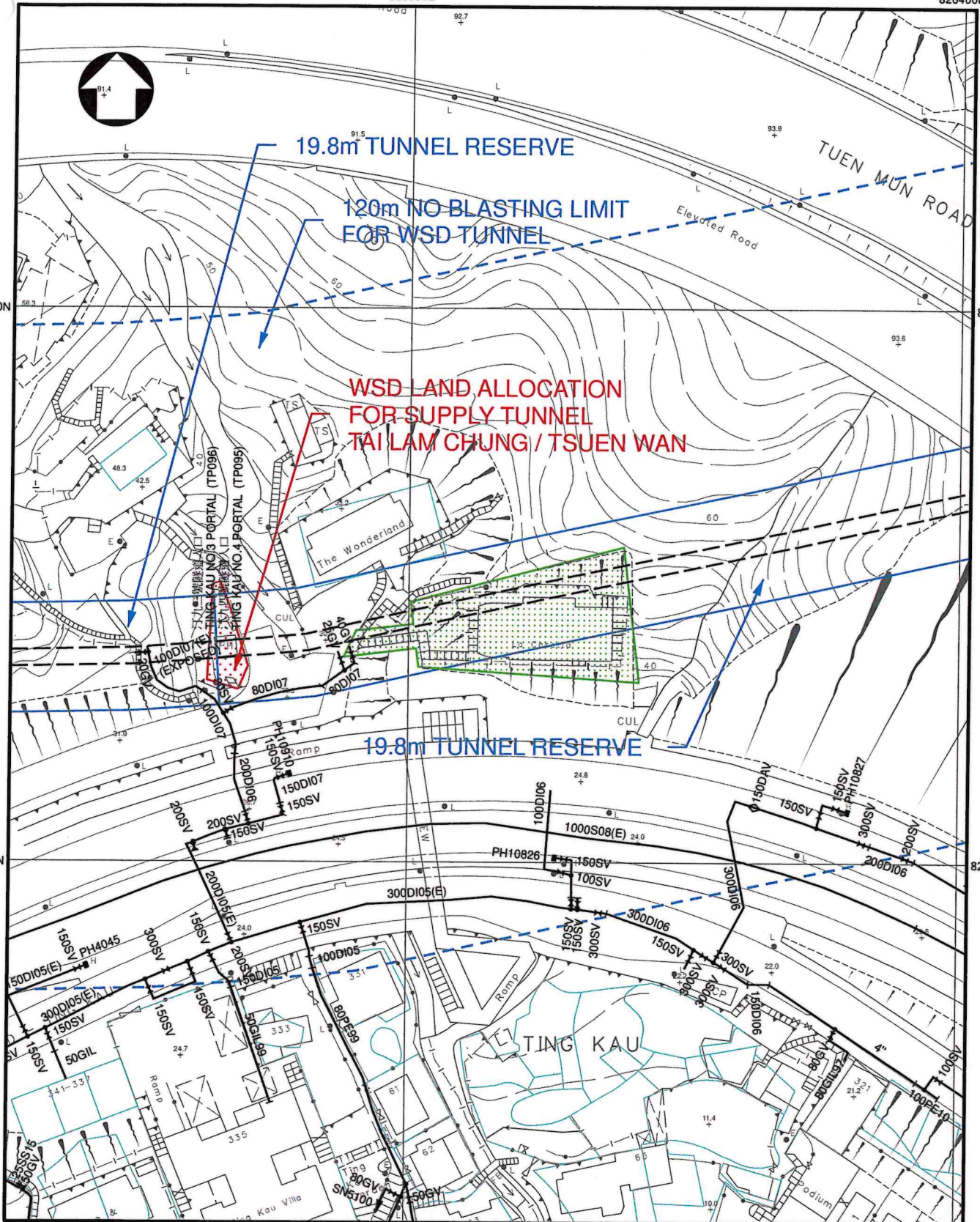


19.8m TUNNEL RESERVE

120m NO-BLASTING LIMIT FOR WSD TUNNEL

WSD LAND ALLOCATION FOR SUPPLY TUNNEL TAI LAM CHUNG / TSUEN WAN

19.8m TUNNEL RESERVE



- NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
 2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.
 3. INFORMATION ON ALIGNMENT OF MAINS IS OF INDICATIVE VALUE ONLY. WHERE POSITIONAL ACCURACY MAY BE OF IMPORTANCE, DETAILS SHOULD BE SITE CHECKED.
 4. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO. 3988.
 5. NO EXISTING SALT WATER MAINS IN THE VICINITY OF THE SITE.
 6. NO PROPOSED WATER MAINS IN THE VICINITY OF THE SITE.
 7. NO EXISTING WSD CABLE IN THE VICINITY OF THE SITE.
 8. NO PROPOSED WSD CABLE IN THE VICINITY OF THE SITE.
 9. THE SITE IS NOT WITHIN WSD GATHERING GROUNDS.
 10. NO WSD SLOPES ARE AFFECTED IN THE VICINITY OF THE SITE.

SUBJECT SITE



PRIVATE LOT BOUNDARY (FOR REF. ONLY)



PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/6-SE-18A, 18B, 18C & 18D

FILE REF: (7) IN WSD/M/SP 3052/60/8S/98 PT.3

REF. CODE: 27W24M

SHEET 1 OF 1

SCALE 1:1000



水務署
Water Supplies Department

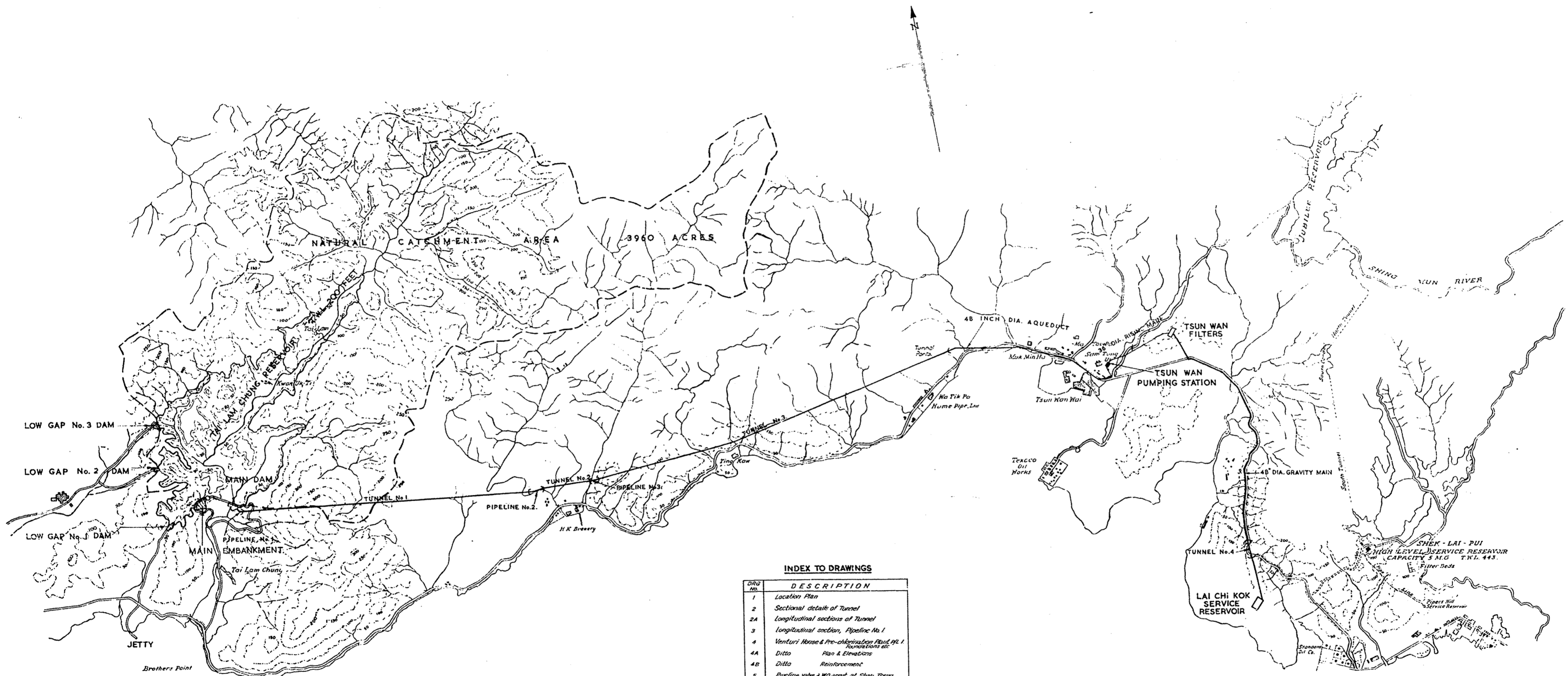
HONG KONG WATER SUPPLY.

TAI LAM CHUNG SCHEME. TUNNELS & PIPELINES GENERAL PLAN OF SCHEME

CONTRACT No.20/54

DRAWING No.1

WORK AS EXECUTED
DATE OF COMPLETION, MARCH 1957



INDEX TO DRAWINGS

DRG NO.	DESCRIPTION
1	Location Plan
2	Sectional details of Tunnel
2A	Longitudinal sections of Tunnel
3	Longitudinal section, Pipeline No. 1
4	Venturi House & Pre-chlorination Plant, etc.
4A	Ditto Plan & Elevations
4B	Ditto Reinforcement
5	Pipeline valve & W.C. argt. at Shan Tseng
5A	Tunnel Portals at Shan Tseng & Lai Chi Kok
6	Brewery Reservoir crossing - Pipeline
6A	Ditto Valve Staircase details
6B	Ditto Drilling & Grouting Record
7	Detail of Shaft at Tin Kau
8	Argt. of Valve at Choi Wai Kok
9	Constructional details at Valve Houses
10	Typical pipeline details
11	Details of Steel Specials

Feet 1000 2000 3000 4000 5000

SCALE:- 1:20000

Contours in Metres shown thus

This is a photographically reduced print and only the scale(s) shown may be used for measurement.

Rennie, Dixon & Gault
ENGINEERS
ARTILLERY HOUSE,
ARTILLERY ROAD,
WESTMINSTER, S.W.1.

W4407

T.L. 1033.R.

HONG KONG WATER SUPPLY

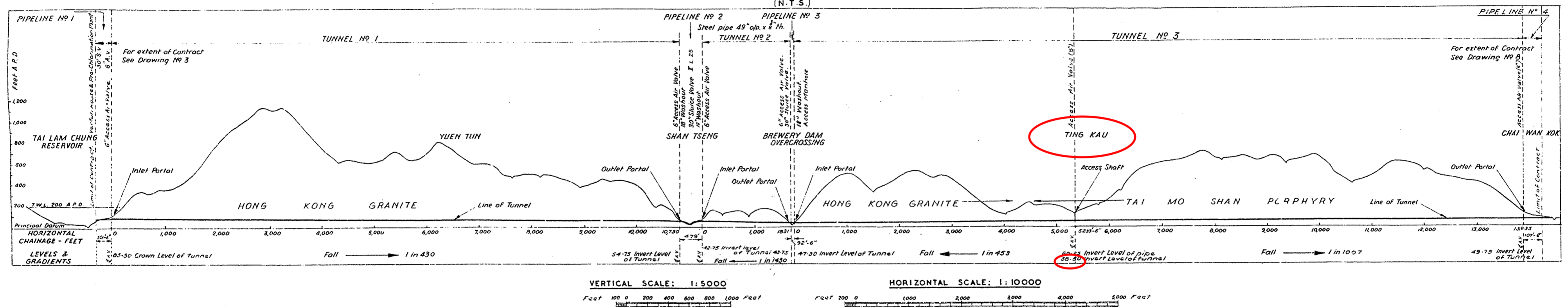
TAI LAM CHUNG SCHEME

CONTRACT No.20/54 DRAWING No.2

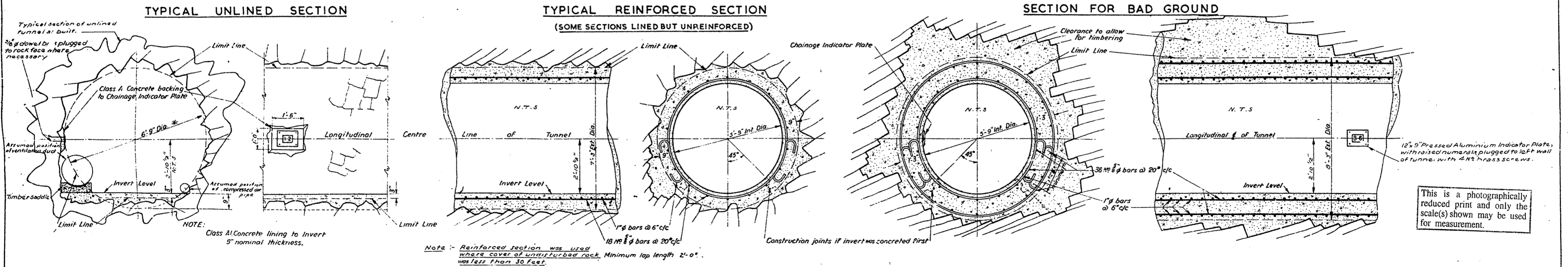
TUNNEL CONTRACT. SECTIONAL DETAILS OF TUNNEL.

WORK AS EXECUTED
DATE OF COMPLETION, MARCH 1957

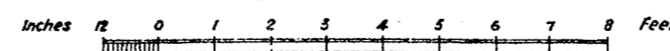
LONGITUDINAL SECTION ALONG C OF AQUEDUCT



TUNNEL DETAILS



SCALE FOR DETAILS 1/2 INCH TO ONE FOOT



This is a photographically reduced print and only the scale(s) shown may be used for measurement.

British & German
ENGINEERS,
ARTILLERY HOUSE,
WESTMINSTER SW1.

W4407'2 T.L.402.R

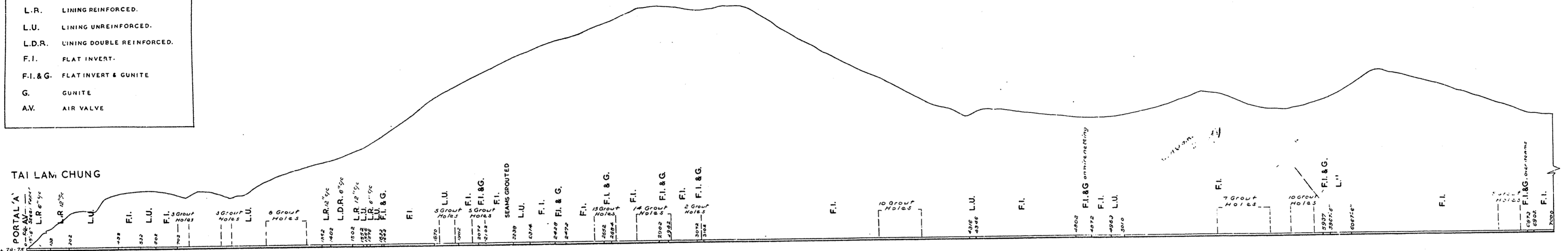
HONG KONG WATER SUPPLY

TAI LAM CHUNG SCHEME TUNNEL CONTRACT — LONGITUDINAL SECTION

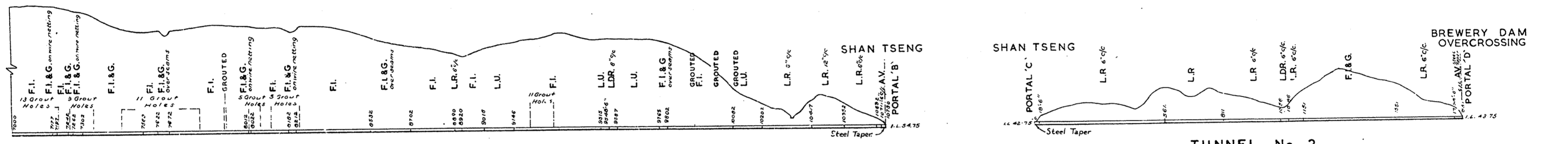
CONTRACT No 20/54 DRAWING No.2.A

WORK AS EXECUTED
DATE OF COMPLETION MARCH 1957

LEGEND	
L.R.	LINING REINFORCED.
L.U.	LINING UNREINFORCED.
L.D.R.	LINING DOUBLE REINFORCED.
F.I.	FLAT INVERT.
F.I.&G.	FLAT INVERT & GUNITE
G.	GUNITE
AV.	AIR VALVE

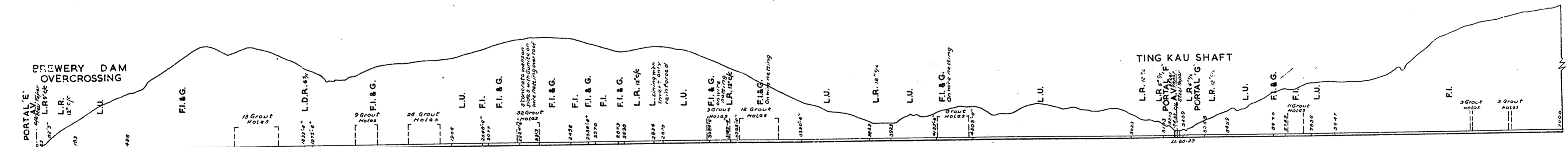


TUNNEL No. 1.

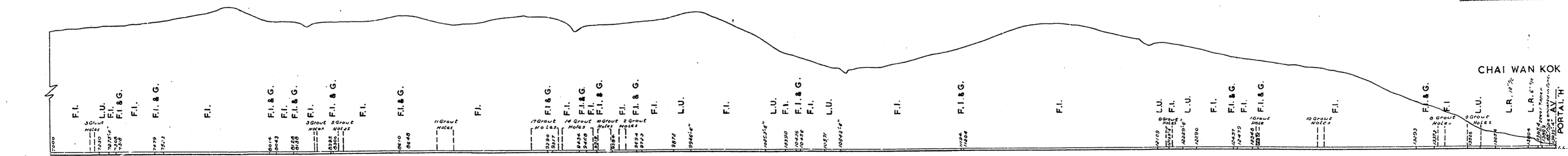


TUNNEL No. 1.

TUNNEL No. 2



TUNNEL No. 3.



TUNNEL No. 3.



This is a photographically reduced print and only the scale(s) shown may be used for measurement.

BINNIE GEACON & GOURLEY
ENGINEERS
ARTILLERY HOUSE
ARTILLERY ROW
WESTMINSTER, U.W.I.

W4407/3 I.L. S.92R.

Appendix F **RESPONSE TO COMMENTS FOR GEO & WSD COMMENTS**

Proposed Development of La Casetta DD399 Lot 453 Ting Kau

Comments from Geotechnical Engineering Office, Civil Engineering and Development Department (2024.07.18)

Item	GEO's Comments	SMEC Responses
1	<p>Section 5.2.3 and Appendix A – It is noted from the location plan that part of Feature no. 6SE-D/F178 falls within the site boundary. Please ask the Consultants to review and clarify if the feature would encroach onto the footprint of the proposed buildings and if any modification works of the slope feature will be required. In addition, Appendix A should be updated to clearly show the location of the man-made features and details of the proposed development including any site formation.</p>	<p>Noted. The location of the man-made features and details of the proposed development are now presented in the schematic layout plan in Appendix C.</p> <p>Although part of Feature no. 6SE-D/F178 falls within the site boundary, the slope feature is located outside the building boundary. It is considered that the proposed development will not affect the feature. Nevertheless, modification or upgrading works of the feature might be required if the existing stability of the feature is found to be below the current geotechnical standard in detailed design stage.</p>
2	<p>Figure 1 – Location Plan – “6SE-D/CR57” should read “6SE-D/CR47”. Please ask the Consultants to revise the typo.</p>	<p>Noted. The typo in Figure 1 is revised.</p>

Proposed Development of La Casetta DD399 Lot 453 Ting Kau
 Comments from Water Supplies Department (2024.07.18)

Item	WSD's Comments	SMEC Responses
1	<p>No excavation, drilling or filling shall be carried out within 60 metres on plan (attached) from the centre line of the WSD Tunnel as shown on the plan except:</p> <p>(a) Minor excavation works for lamp post pits, trial pits, trenches for utility laying etc. with depth of excavation less than 2 metres or with minimum clearance of 20 metres on plan from the tunnel;</p> <p>(b) Drilling that involves no blasting or heavy machinery inducing excessive vibration and with a minimum clearance of 20 metres on plan from the tunnel; and</p> <p>(c) Filling works inducing additional vertical and horizontal pressure of not more than 5% of the total overburden pressure on any tunnel.</p>	<p>Based on the as-built drawings, the level of the existing WSD tunnel near the proposed development is approximately +19.8mPD.</p> <p>Although the proposed development will involve excavation and drilling works within the tunnel reserve zone, in order to avoid any adverse impact on the WSD Tunnel, the geotechnical scheme is revised as shown in Appendix D. With the following considerations, the potential impact of the proposed development on the existing WSD Tunnel is relatively insignificant.</p> <p>a. The proposed development, which includes the construction of a car lift by excavating the existing ground, and the re-development of the residential building with same no. of levels, will not introduce additional loadings or increase the hydrostatic pressure to the WSD Tunnel.</p> <p>b. There is sufficient clearance (~7.7m) of more than two times the diameter of the tunnel, which is only 2 m in diameter, between the proposed structure (i.e., the proposed footing structure at +27.5 mPD) and the tunnel crown (at +19.8 mPD).</p> <p>c. Based on the available GI records, the rockhead level above the tunnel is relatively high, approximately +30mPD at the location of the</p>

		<p>proposed car lift. Hence, there is a significant rock cover above the tunnel, which is about 7.7 m. It is therefore considered that the proposed development will induce minimal impact to the tunnel.</p> <p>d. The proposed construction method, without blasting or percussive piling method, will induce minimal vibration to the adjacent ground as well as the tunnel, which is located at about 11.2 m below ground.</p> <p>Practice Note “DSD PN No. 2/2017 - Assessment on the Effects of Construction Activities on Drainage and Sewage Tunnels and their Associated Structures”, which is extracted in the following page, has been identified as an additional reference. It is considered that the proposed geotechnical works generally fulfil the requirements specified in the Practice Note.</p> <p>On the other hand, it shall be noted that after the WSD tunnel was completed back in 1950s, there were precedents that nearby developments were approved and constructed, for instance, the original development of La Casetta (1979), the Wonderland (1964), and the Lido Green (1976).</p> <p>Nevertheless, detailed impact assessment on the tunnel shall be carried out in the detailed design stage and construction stage based on more comprehensive geological information and geotechnical data. In addition, instrumentation monitoring shall be carried out during the construction stage to ensure the works would not affect the tunnel.</p>
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boundaries of tunnel PZs of the DSD Tunnels are shown in the attached Plan Nos. HKWDT/01, HKWDT/02, KTTSDT/01, LCKDT/01, TWDT/01, NWNTST/01, NWNTST/02, THET/01, THET/02 and TKOST/01. Their detailed alignments shall refer to the drainage record plans kept by the respective District Division of DSD. DSD shall be consulted if there is any query concerning the alignments and/or the extents of the tunnel PZs of the DSD Tunnels.

- 3.2 Each proposal shall be assessed based on its individual technical merits and subject to the requirements as stipulated below.

Site Formation or Foundation Works

- 3.3 Where construction works (including site formation, foundation works or excavation for basements, shafts, tunnels and the like) other than ground investigation are proposed within the tunnel PZs of the DSD Tunnels, the following requirements on the works and the effects of the works shall be followed:

- (a) Changes in vertical or horizontal pressure

The vertical or horizontal pressure on any structure in soil due to the proposed construction works (including filling and dewatering) and due to change of loads transmitted from foundations (including loads arising during construction) shall not be varied by more than 20kPa, or by 5% of the total overburden pressure for structures at depths greater than 20m, whichever is the greater. For structures in rock, where it is not possible to assess the change in ground pressure due to the above operations, the hydrostatic pressure shall not be increased or decreased by more than 50kPa.

- (b) Differential movement

Differential movement resulting from the works shall not produce final distortion in any structures exceeding 0.1% of internal diameter/width and the total movement in any structure shall not exceed 20mm in any plane.

- (c) Limits of peak particle velocities

The peak particle velocities induced to the DSD Tunnels resulting from blasting (where permitted) or from driving or extraction of piles or any similar operation which can induce vibration shall not exceed 25mm/sec for blasting and 15mm/sec for other operations.

- (d) Clearance from Structure

- i. No hole or excavation shall be sunk or excavated within a distance of 3m from any point of the DSD Tunnels without prior agreement by DSD for the works and the method to be employed.

- ii. No pile, foundation, borehole, well, soil nail, horizontal drain, rock bolt/dowel, part of a ground anchor and/or other geotechnical installation shall be driven or constructed within a distance of 3m from any point of the DSD Tunnels.
- 3.4 The project proponents shall submit proposals for monitoring the effects on the DSD Tunnels to DSD for agreement before commencement of works. Subsequent data together with the interpretation shall be submitted to DSD during construction until completion of the works or movement/ pressure change becomes steady after completion of the works, whenever is later. Where the proposed works or any part of the proposed works shall come within a distance of 10m from any point of the DSD Tunnels, the submission shall also include detailed method statements for constructing the proposed works and for monitoring the alignment/depth of the proposed works.

Ground Investigation Works

- 3.5 Where ground investigations are proposed within the tunnel PZs of the DSD Tunnels, the project proponents are required to submit the following information to DSD.
- (a) Details of the exploration and locations of the proposed exploration holes, trial pits, trenches, field testing or instrumentations.
 - (b) Proposed depth of drillholes, pits, trenches, field testing or instrumentation.
 - (c) A method statement for sinking drillholes, excavating trial pits and trenches including back-filling, conducting field testing or installing instrumentation.
 - (d) A method statement for monitoring and checking the alignment and depth of drillholes when the minimum distance from a drillhole to any point of the DSD Tunnels is less than 10m in any plane.
- 3.6 Proposals will also be examined with reference to the following guidelines:
- (a) Clearance from structure

No drillhole shall be sunk within a distance of 3m from any point of the DSD Tunnels.
 - (b) Changes in vertical or horizontal pressure

The vertical and horizontal pressure on any structure in soil due to ground investigation works (including field testing like plate load test, pressure meter test, packer test or any operation) shall not be varied by more than 20kPa, or