Appendix A

Proposed Development at Lot Nos. 332 (part), 333(part), 334(part), 335 (part), 337 (part), 338 (part), 339 (part), 340 (part), 341 (part), 342 (part), 344, 345 (part), 346 (part), 347 (part), 348, 350, 351, 352 (part), 354 (part), 355 (part), 356 (part), 357, 358, 360 (part), 361, 362 (part), 363 (part), 365 (part), and 366 (part) and Adjoining Government Land in DD332L, Cheung Sha, Lantau Island, New Territories

GEOTECHNICAL PLANNING REVIEW REPORT

REVISION 0

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1. INTRODUCTION

Philip So & Associates Ltd. was appointed to carry out Geotechnical Planning Review Report (GPRR) for the premises at Lot Nos. 332 (part), 333(part), 334(part), 335 (part), 337 (part), 338 (part), 339 (part), 340 (part), 341 (part), 342 (part), 344, 345 (part), 346 (part), 347 (part), 348, 350, 351, 352 (part), 354 (part), 355 (part), 356 (part), 357, 358, 360 (part), 361, 362 (part), 363 (part), 365 (part), and 366 (part) and Adjoining Government Land in DD332L, Cheung Sha, Lantau Island, New Territories

This GPPR is made based on desk study and review of available documentary information and proposed development plan. The geology and site conditions are described. Potential geotechnical constraints are identified in the assessment.

2. THE SITE AND THE FEATURES

The site is at a relatively flat ground at Cheung Sha in Lantau Island. Site photos taken in February 2024 are presented in **Appendix A** (see **Photos A to H**). The site location plan with photo directions is presented in **Figure 1**.

According to the available SIMAR reports retrieved from Lands Department and SIS records obtained from Geotechnical Engineering Office (GEO), there is no registered geotechnical feature lies within or in the vicinity of the site (see **Figure 2**).

3. DESK STUDY

Desk study has been carried out to search and review the existing building records, previous ground investigation data and geotechnical study reports kept by the Geotechnical Information Unit (GIU) of Geotechnical Engineering Office (GEO) and the Buildings Department (BD).

3.1 Geological Maps

The geology of the Study Area is shown on the Hong Kong Geological Survey (HKGS) Map Sheet 13 (Shek Pik), 1:20,000-scale HGM20 series. The local geology of the Study Area is presented in **Figure 4** and described below.

3.1.1 Solid Geology

The 1:20,000 scale geological maps indicated that regional area around the Site is underlain by feldsparphyric rhyolite (rf).

3.1.2 Superficial Geology

The Site is underlain by debris flow deposit (Qd).

3.1.3 Structural Geology

No fault or photolineament has been recorded within or in the vicinity of the Site.

3.2 Enhanced Natural Terrain Landslide Inventory

In 1995, the GEO compiled the Natural Terrain Landslide Inventory (NTLI) from an interpretation of high-altitude (8,000ft and above) aerial photographs dated from 1945 to 1994 (King, 1999). In 2007, the GEO produced an Enhanced Natural Terrain Landslide Inventory (ENTLI) using low-altitude (8,000ft and below) aerial photographs to update the NTLI.

In accordance with GEO Report No. 138 (GEO, 2016), landslides are classed as either “Relict” or “Recent”, depending on their appearance in aerial photographs. “Relict” landslides are defined as those where the main scarp is well-defined but vegetation has re-established on the scar on the earliest set of available aerial photographs. “Recent” landslides are defined as having occurred within the timespan of the aerial photograph coverage. These are typically identified as having a light tone on the aerial photographs and are bare of vegetation.

The ENTLI has recorded no relict or recent landslide within the Site (see **Figure 3**).

3.3 Historical Landslide Catchment (HLC) Inventory

Historical Landslide Catchments (HLCs) have been defined by GEO based on the results of the ENTLI. According to the inventory, no catchment is located at or in the vicinity of the Site (see **Figure 3**).

3.4 Large Landslide Study

The Large Landslide database was prepared by Scott Wilson (1999) for the GEO. Interpretation of landslide details with Map Sheet Ref No. 13-NE-C was conducted using the low altitude (3,900 ft.) 1963 aerial photographs to identify features thought to be landslides with source area greater than 20 m wide. The database has no record of large landslides within or close to the Site.

3.5 Reported Landslide Incidents

The GEO has recorded no landslide incident within the Site. (see **Figure 3**)

3.6 Relevant Previous Ground Investigation Works

There is no previous ground investigation report relevant to the Site.

3.7 DH Orders

No DH Order is present relevant to the features within the Site.

3.8 Stage 2 Studies

According to the GIU, there is no Stage 2 Studies carried out for the features within the Site.

3.9 Stage 3 Studies

According to the GIU, there is no Stage 3 Studies carried out for the features within the Site.

4. IMPACTS OF PROPOSED WORKS ON EXISTING SLOPES/RETAINING WALLS & NATURAL HILLSIDE

4.1 Impacts from the Proposed Works to the Registered Slope Features

As mentioned in Section 2, there is no registered slope feature within or at the vicinity of the application site.

4.2 Impacts from the Proposed Works to the Natural Hillside

As mentioned in Section 3.2 and 3.3, the ENTLI has recorded a no relict or recent landslide and no HLC catchment within the Site. The natural hillside (NH1) (as shown in **Figure 3** and **Photos A, B, C and F**) surrounds from north to east of the application site has an angular elevation more than 20° from the application site (see **Figures 3A and 3B**). The angular elevation is above the 'Alert Criteria' of 20° with respect to the concerned natural hillside according to the GEO Report No. 138 (2nd Edition). In addition, the natural hillside (NH2) located at southwest of the application site may affect by the proposed development (as shown in **Figure 3**). Thus, further study of the natural hillsides is required.

5. CONCLUSION

Based on the above discussion, it can be concluded that the proposed development is considered to be feasible from geotechnical point of view. The construction would be straight forward unlikely posting particular problems to the surrounding area under careful planning, proper execution and vigilant supervision.

It is essential to search and review the background information of existing building, geotechnical features and underground services within and in the vicinity of the site. Site investigation is proposed to reveal/confirm the subsoils and the ground regime within and in the vicinity of the site as well as to determine the engineering properties of subsoils and rock. The ground investigation field works should be preceded under supervision of suitably qualified engineers and technically competent persons conforming the requirements specified in the "Code of Practice for Site Supervision 2009" published by the BD.

For safety and cost effective, the foundation design and retaining wall stability assessment and excavation planning as well as the design of geotechnical structure should be based on geological horizons inferred from the ground investigation results, groundwater table interpreted from the piezometer/standpipe monitoring records and geotechnical parameters determined and adopted by field and laboratory testing.

A comprehensive precautionary monitoring program including settlement markers, tiling, vibration check points as well as groundwater observation wells shall be implemented to ensure demolition of foundation of existing buildings and substructure construction being carried out safety and soundly.

A natural terrain hazard study shall be carried out to assess the potential natural terrain hazard which may pose to the proposed development. The study will be carried out in the next stage of the project.

FIGURES

Figure 1

Site Location Plan

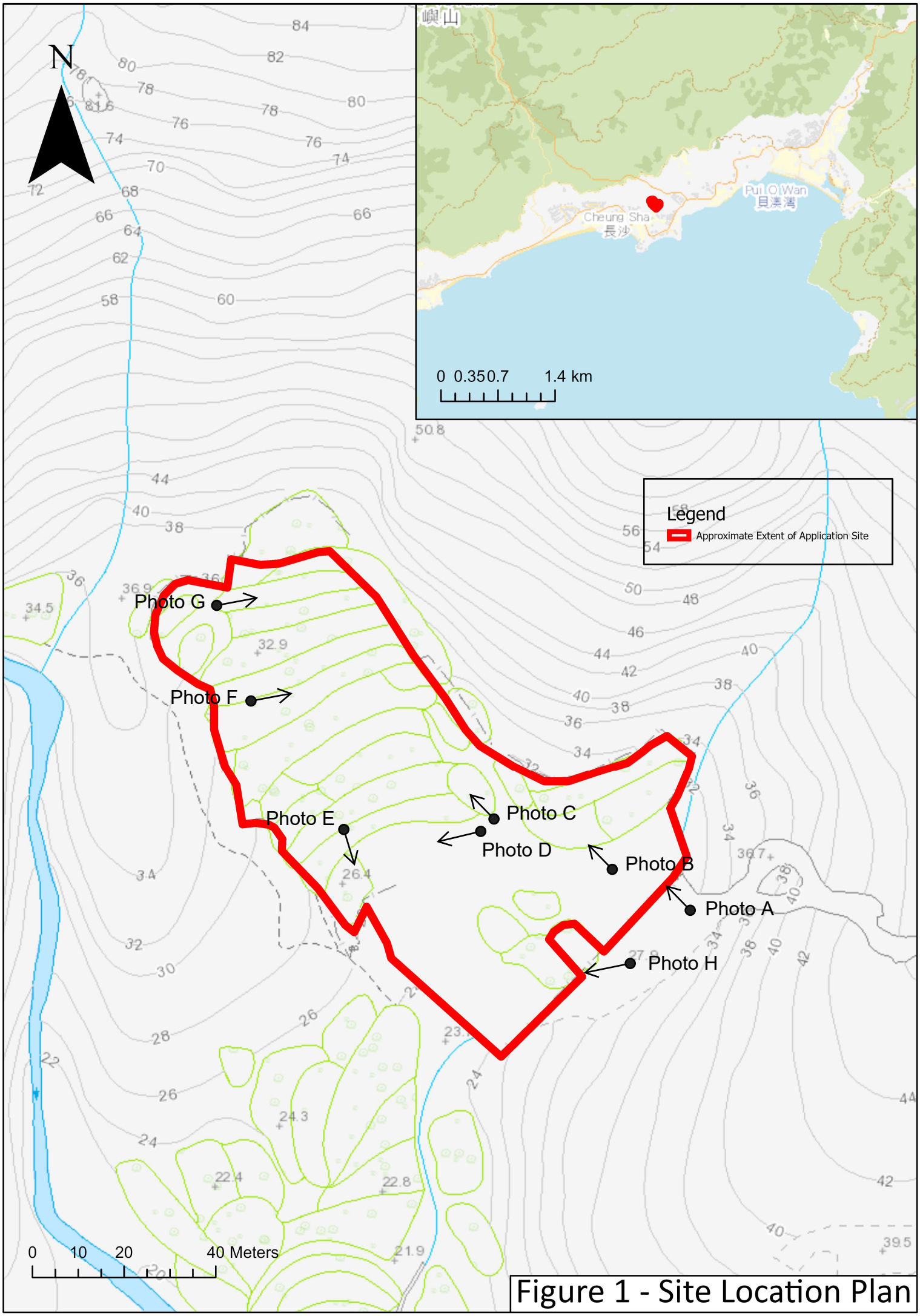

Figure 1 - Site Location Plan

Figure 2

Registered Man-made Features

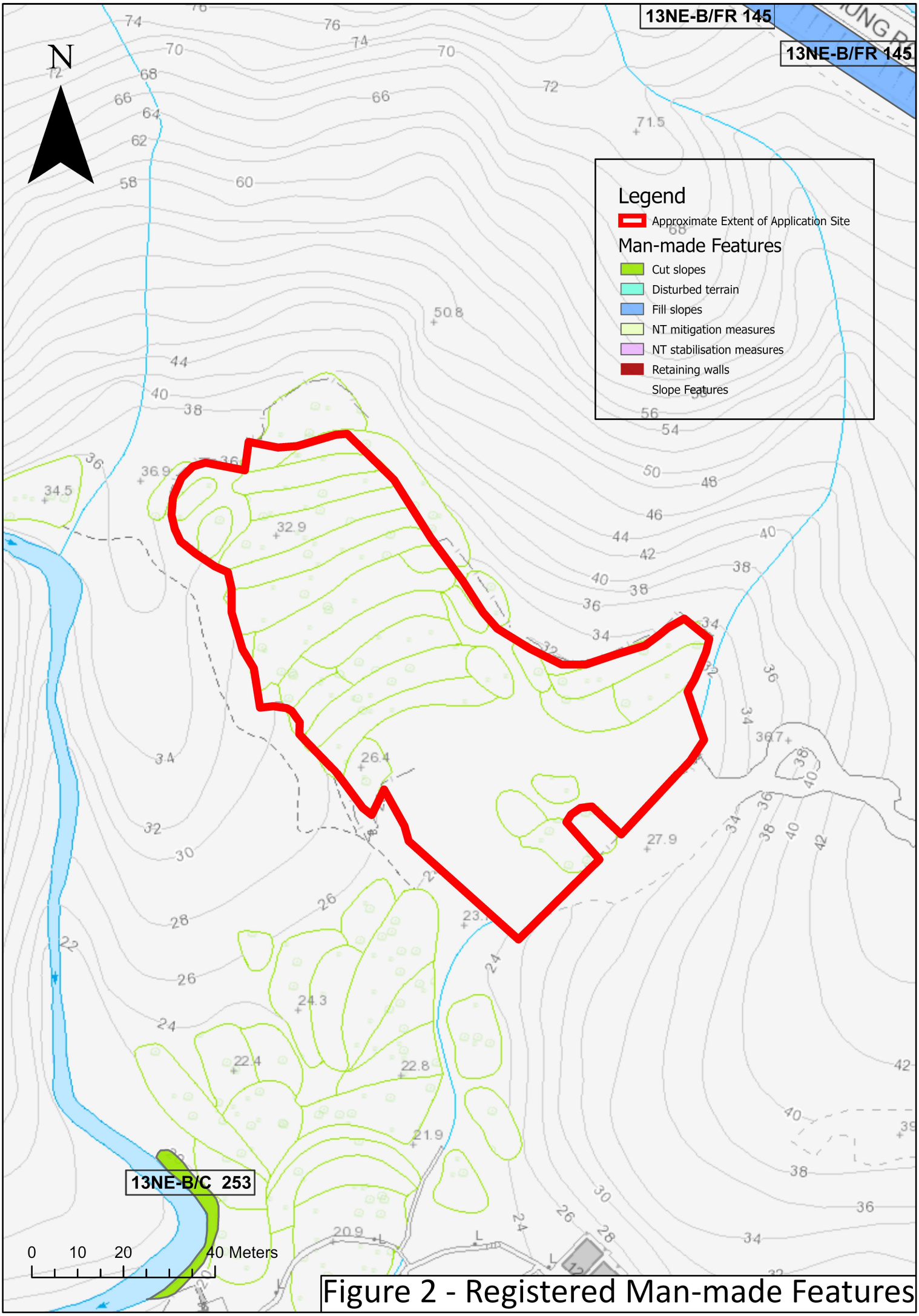

Figure 2 - Registered Man-made Features

Figure 3

Past Instabilities

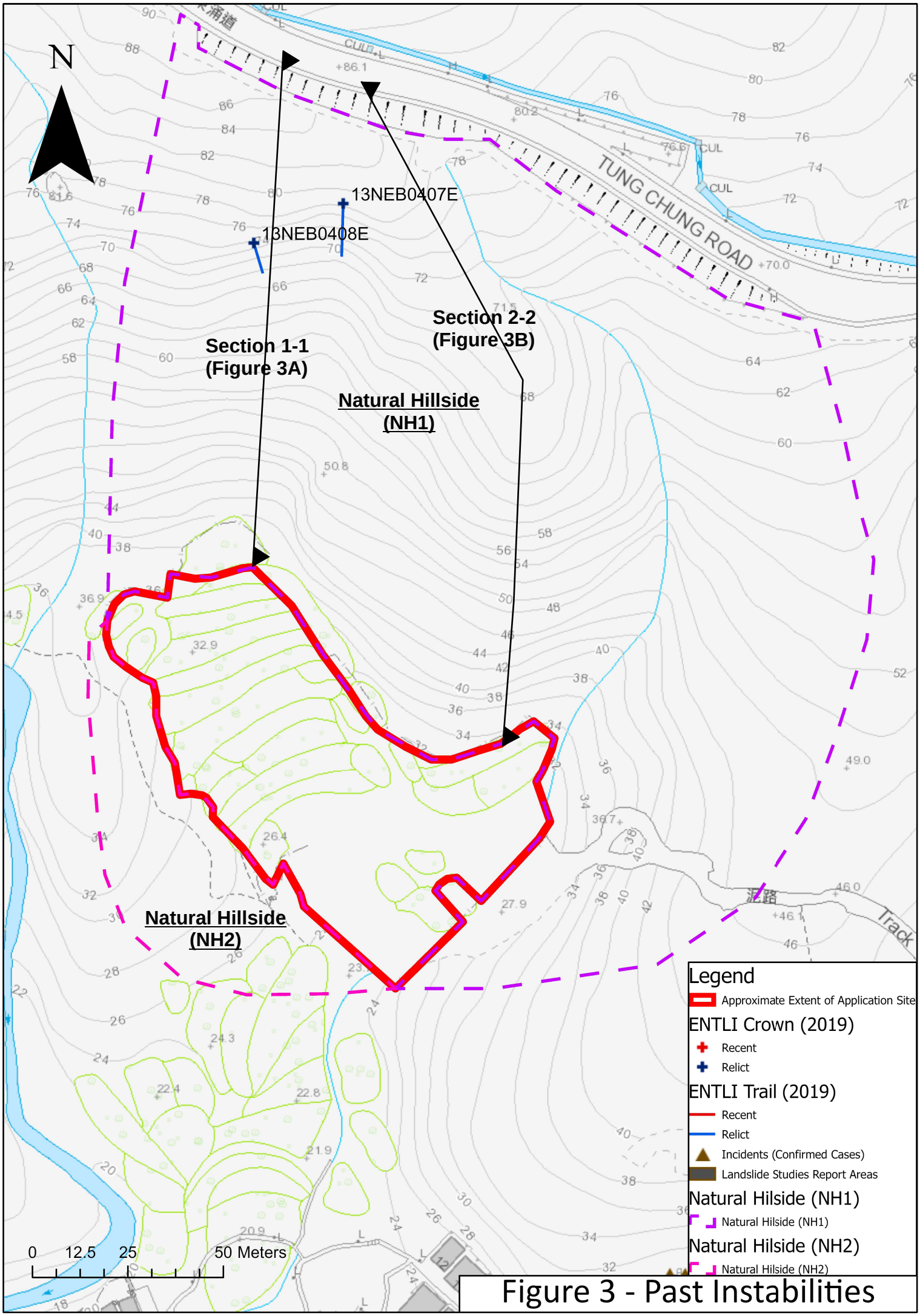

Figure 3 - Past Instabilities

Figure 3A

Section 1-1

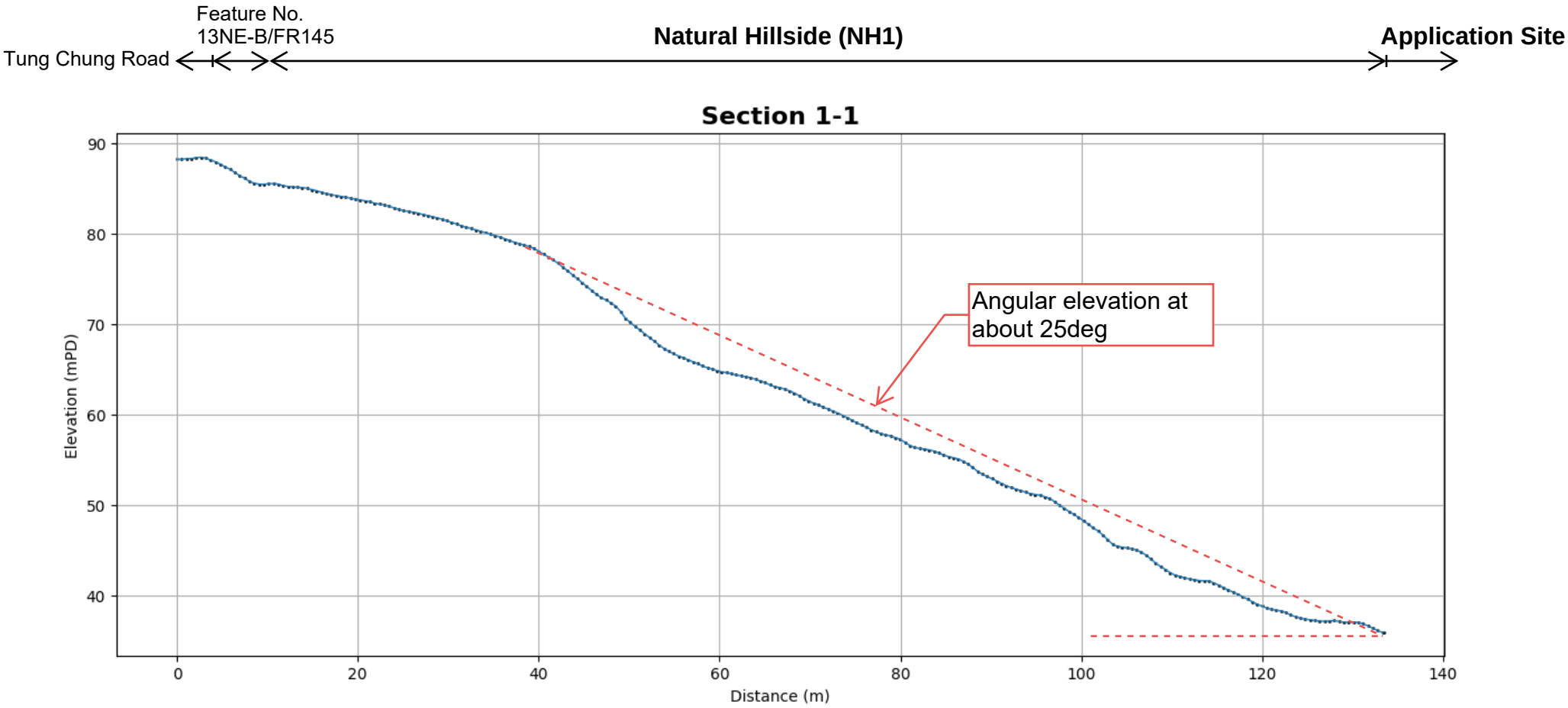

Figure 3A - Section 1-1

Figure 3B

Section 2-2

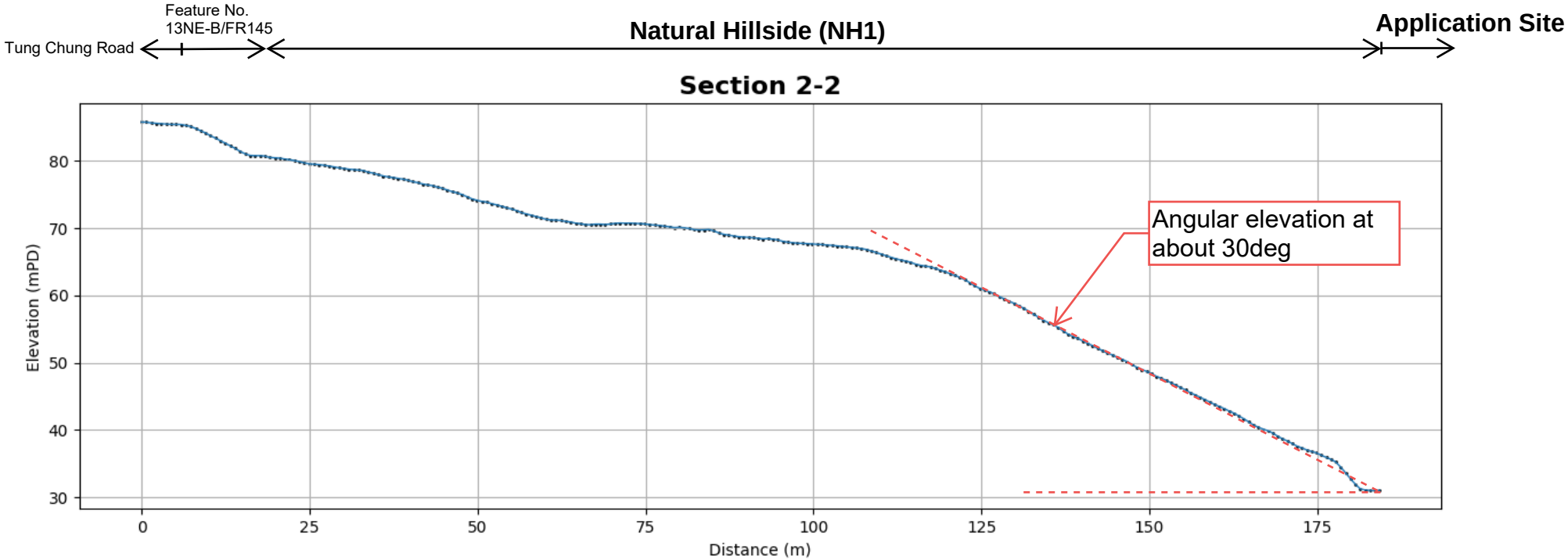

Figure 3B - Section 2-2

Figure 4

Geological Map

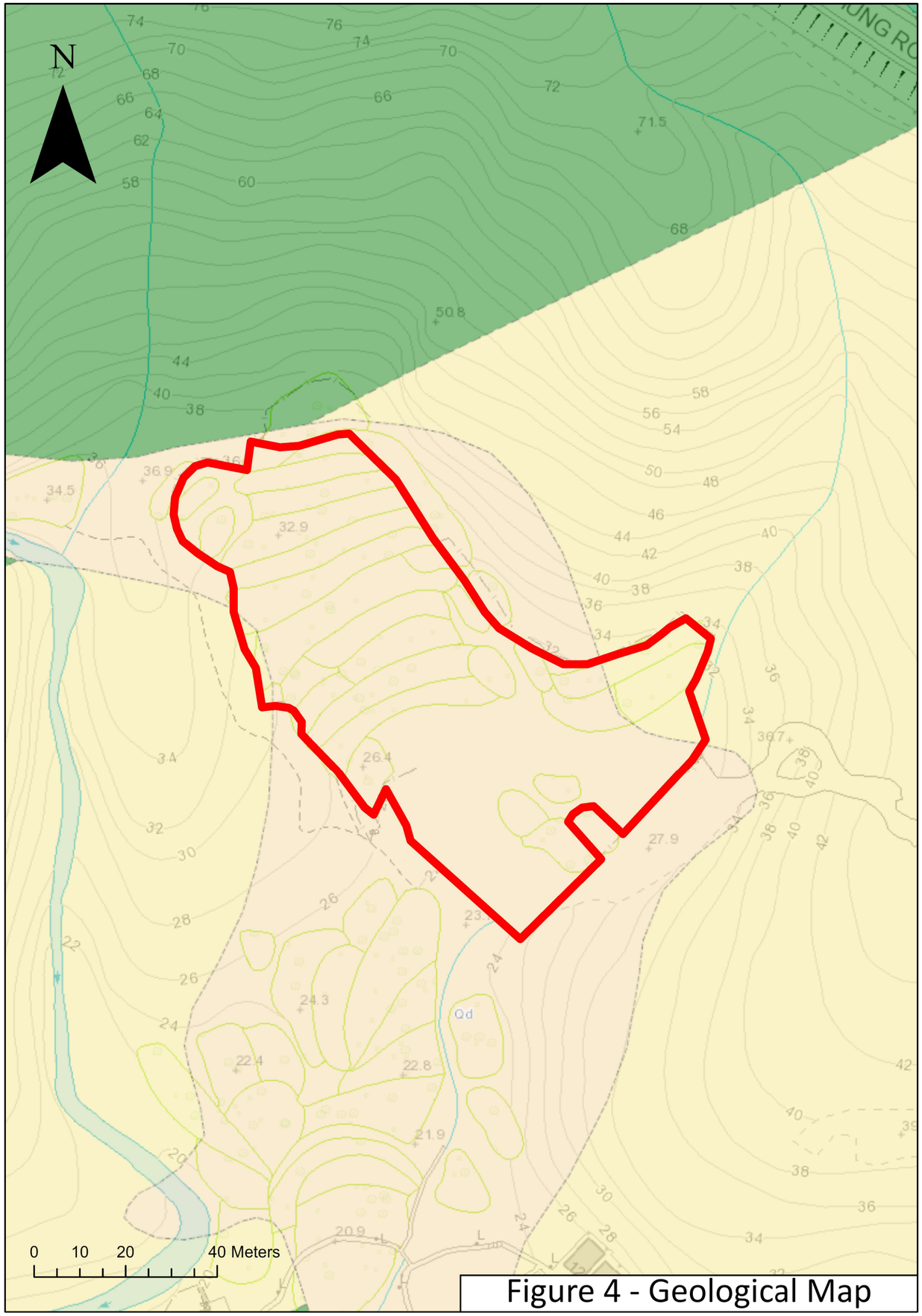

Figure 4 - Geological Map

Legend

Approximate Extent of Application Site

- Approximate Extent of Application Site

Superficial Geology

- elm - Marine mud
- HHH - Undivided; mainly dark grey marine mud
- ms - Marine sand
- msb - Sand banks
- mss - Sand sheets; channel infill
- PCK - Undivided; clay, silt, sand and gravel
- Qa - Alluvium
- Qam - Estuarine deposits
- Qams - Estuarine mud and sand
- Qat - Terraced alluvium
- Qb - Beach deposits - Sand
- Qbb - Beach deposits - Cobbles and boulders
- Qbr - Beach deposits - Beach rock
- Qbs - Back shore deposits - Sand or gravel
- QCK - Alluvium; some estuarine and marine deposits
- Qct - Channel and transgressive deposits
- Qd - Debris flow deposits
- Qdl - Slide deposits
- Qdt - Mixed debris flow and talus deposits
- QHH - Marine mud
- Qi - Estuarine deposits
- Qmm - Marine mud
- Qms - Marine sand
- Qpa - Terraced alluvium
- Qpd - Debris flow deposits
- Qrb - Raised beach deposits - Sand
- QSW - Estuarine and marine deposits
- Qt - Talus (rockfall) deposits
- tbm - Marine mud

Solid Geology

- Cmp - Metasiltstone, metasandstone; graphite-bearing
- Cts - Undivided, metasandstone with metaconglomerate and phyllite
- DBH - Sandstone and Siltstone
- EPC - Undivided, dark grey thinly bedded siltstone and dolomitic siltstone with mudstone
- JAC - Fine ash vitric tuff
- JCB - Undivided, mainly trachydacite and rhyolite lava
- JHI - Undivided, mainly fine ash tuff
- JLC - Undivided, mainly tuffite
- JLH - Coarse ash crystal tuff
- JLT - Rhyolite lava and tuff
- JMD - Coarse ash crystal tuff
- JMK - Undivided, mainly tuffaceous mudstone, siltstone and breccia
- JNM - Undivided, mainly fine ash vitric welded tuff with lapilli tuff
- JSK - Undivided, dacite lava with tuff, sandstone and siltstone
- JSM - Fine ash to coarse ash tuffs, tuff-breccia and tuffite
- JSS - Undivided, mainly eutaxite
- JTC - Mudstone and siltstone
- JTM - Coarse ash crystal tuff
- JTS - Sandstone, siltstone and mudstone with conglomerate and tuff
- JTU - Andesite with tuff and tuffite
- JYT - Coarse ash crystal tuff
- Jcs - Eutaxite
- Jln - Tuffite and tuff
- Jmw - Trachydacite lava
- Jnl - Crystal and vitric tuff
- Jpk - Siltstone, tuffite and tuff
- Jsl - Tuff-breccia
- Jsp - Lapilli-ash crystal tuff
- Jtt - Eutaxite
- KKO - Calcareous breccia with conglomerate and coarse sandstone
- KPI - Conglomerate and coarse sandstone with siltstone
- KPS - Sanstone and siltstone with conglomerate; tuffaceous conglomerate and sandstone at its base
- PTH - Mudstone, siltstone and sandstone
- a - Andesite or Andesite lava
- ap - Aplite
- as - Aegirine-bearing siltstone with dolomitic siltstone
- at - Altered tuff and sedimentary rock
- az - Zeolite-bearing siltstone with aegirine-bearing siltstone
- b - Basalt
- bbt - Block-bearing tuff
- br - Sedimentary breccia
- bt - Block-bearing tuff and tuffite
- ca - Coarse ash tuff
- cat - Coarse ash tuff
- cg - Conglomerate
- cs - Chert
- d - Dacite
- dz - Dolomitic siltstone with calcareous siltstone
- e - Eutaxite
- fa - Fine ash tuff
- gc - Coarse-grained granite, > 6mm
- gd - Granodiorite
- gdf - Fine-grained granodiorite, < 2mm
- gdm - Medium-grained granodiorite, 2-6mm
- gf - Fine-grained granite, < 2mm
- gfg - Greisenised fine-grained granite
- gfm - Fine- to medium-grained granite
- gm - Medium-grained granite, 2-6mm
- gr - Graphite schist or graphite bed
- l - Lamprophyre
- lq - Quartz latite
- lt - Lapilli tuff
- m - Mudstone
- mq - Quartz monzonite
- p - Pegmatite
- pQ - Undifferentiated solid geology (offshore)
- q - Quartz vein
- qz - Quartzite
- r - Rhyolite lava
- rdf - Feldsparphyric rhyodacite
- rf - Feldsparphyric rhyolite
- rh - Rhyolite lava
- rq - Quartzphyric rhyolite
- s - Sandstone
- sl - Siltstone
- sls - Siltstone with sandstone
- sm - Siltstone and dolomitic siltstone with mudstone
- sqf - Fine-grained quartz syenite, < 2mm
- sqm - Medium-grained quartz syenite, 2-6mm
- ssl - Sandstone and siltstone
- t - Undifferentiated Tuff and tuffite
- ta - Trachyte lava
- tb - Tuff-breccia
- tbp - Tuff-breccia and pyroclastic breccia
- tq - Quartz trachyte
- tt - Tuffite
- ug - Microgranite
- v - Vent material
- vt - Vitric crystal tuff

APPENDIX

Appendix A

Photographs

Photo A
General view of site entrance at southeast of the Site, looking northwest

Photo B
General view of the eastern portion of the Site, looking northwest

Photo C
General view of middle portion of the Site, looking northwest

Photo D
General view of middle portion of the Site, looking southwest

Photo E
General view of southern portion of the Site, looking south

Photo F
General view of northern portion of the Site, looking east

Photo G
General view of northern end of the Site, looking east

Photo H
General view of southern end of the Site, looking west