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**GEOTECHNICAL PLANNING REVIEW REPORT (GPRR)
FOR
A COMMERCIAL DEVELOPMENT
AT
LOT 325 RP & 505 IN D.D. 210 and
ADJOINING GOVERNMENT LAND,
HO CHUNG, SAI KUNG**

**附件f , Geotechnical
Planning Review Report**

Client: Kin Hing Door Engineering Limited
Registered Geotechnical Engineer: SLN And Associates Ltd.

July 2024

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1.0 INTROCUATION

1.1 Background

The application site is located at Lot 325 RP & 505 in D.D.210 and adjoining government land, Ho Chung, Sai Kung (the Site). A site plan (1:5000) is shown in *Figures 1*.

The proposed development is temporary shelter and for open storage of building materials. It basically comprises of 3 single-storey structure does not exceed 6.5m high and the total floor area amounts to 620m². In addition, there will one loading/unloading zone, two heavy goods vehicle parking and three private car parks. The conceptual drawing of the proposed development is shown in *Appendix A*.

Owing to the application of Section 16, it is mandatory to submit a Geotechnical Planning Review Report (GPRR) to assess the geotechnical feasibility of the proposed development. SLN & Associates Ltd. has been appointed to be the Geotechnical Consultant responsible for this study and submission. 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.

1.2 The Study Approach

The geotechnical planning review is generally carried out in accordance with the common practice as described by “GEO Advice Note for Planning Applications under Town planning Ordinance (Cap.131)”.

2.0 THE SITE THE FEATURES

The site is at Ho Chung, Sai Kung with an area of approximately 2670m². The Hiram's Highway runs along the east of the Site. The Luk Mei Tsuen Road is along the south-west of the Site. Site photos taken in July 2024 are presented in *Appendix B* (see Photos 1 to 14). According to the available SIS records obtained from Geotechnical Engineering Office (GEO), there is a registered geotechnical feature no. 7SE-D/C283 lies within the northwestern of the Site and one registered geotechnical feature no. 7SE-D/F103 is located outside the southwestern of the Site.

There is a group of private villas at the north of the Site. They are supposed not to be affected by the proposed development.

Lot Index Plan and Features Location is shown in *Figure 2*.

3.0 DESK STUDY

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 the Geotechnical Information Unit (GIU) of GEO.

3.1 Geological Maps

The geology of the Study Area is shown on the Hong Kong Geological Survey Map (HKGS) Sheet 7 (scale 1:20,000). An extract of the published geological map showing the Site and its vicinity is produced in *Figure 3* and described below.

3.1.1 Solid Geology

The geological map indicated that regional around the Site is underlain by coarse ash crystal Tuff (Krl_cat) of the Long Harbour Formation which belongs to the age of Cretaceous.

3.1.2 Superficial Geology

Entire Site is surrounded by Colluvium (Qd).

The information obtained from the existing ground investigation records shown below is consistent with this founding.

3.2 Adjacent Features and Associated Studies

For the two man-made features: 7SE-D/C283 and 7SE-D/F103, their basic information is summarized below:

Table 3.1 Summary of the Basic Information of Features

FEATURE	TYPE	GEOMETRY			CURRENT CTL	MAINTENANCE AGENT
		LENGTH	HEIGHT	ANGLE		
7SE-D/C283	Cut Slope	50m	7.5m	40°	2	Private & HyD
7SE-D/F103	Fill Slope	51.4m	3.8m	30°	2	HyD

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 summarized in the table below.

Table 3.2 Summary of Previous Studies / Upgrading Works

FEATURE	SLOPE ASSESSMENT / UPDATING WORKS / MAINTENANCE RECORDS
7SE-D/C283	None
7SE-D/F103	None

The slope information and maintenance responsibility of features are enclosed in *Appendix C* for easy reference.

3.3 Existing Ground Investigation (GI)

There are two archived GI carried out 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 STATION
Feature No. 7SE-D/R11 (2&3) No.26 Luk Mei Tsuen Road, Sai Kung	Fugro Geotechnical Services Ltd	2019	2 drillholes (DH1 and CH1)
‘Dualling of Hiram’s Highway between Clear Water Bay and Marin Cove to Ho Chung and Improvement to Local Access to Ho Chung – Design and Construction (Stage 2)	DRILTECH	2013	3 drillholes (BH16 - BH17)

The location of existing GI is shown in *Figure 4*. The ground investigation records are enclosed in *Appendix D*.

3.4 Natural Terrain Landslide Inventory

According to the Natural Terrain Landslide Inventory (NTLI) provided in GEO’s online SIS, no landslides were observed within 200m offset from the site. A graphical NTLI-Landslide Record is given in *Figure 5*.

3.5 Historical Landslide Catchment Inventory

Based on the information given in GEO's online SIS, no historical landslide catchment inventories were found within 200m offset from the site.

3.6 Boulder Inventory

According to GEO's QRA of Boulder Fall Hazards No.S7_U, no boulder fall records are found in the study area. An extract of QRA of Boulder Fall Hazards No.S7_U is reproduced in *Figure 6*.

3.7 GASP Report

As a part of the desk study, reference has been made to Geotechnical Land Use Map (GLUM) enclosed in GASP – Report IX. The map suggests that the site is categorized as GLUM Class II. Development within this class may possibly require normal site investigation. Another map called Physical Constraints Map indicates that the site does not fall within any physical constraints.

Extracts of the above two maps are shown in *Figures 7 and 8* respectively.

4.0 GEOTECHNICAL CONSIDERATION

4.1 General

For the proposed development, the following geotechnical related construction works are envisaged:

- Ground Investigation works
- Site formation works
- Existing slopes
- Foundation works
- Excavation works.

4.2 Ground Investigation works

In order to investigate and confirm the ground condition and soil/rock properties, a ground investigation program is recommended to be carried out at the proposed site by a GIFW contractor at a later stage.

4.3 Site formation works

Based on the development layout plan, the proposed building will be built mainly on a flat land. Minor site formation works would only be required.

4.4 Existing Slopes

Stability, integrity and condition of any existing geotechnical features will have to be checked during the design stage of the proposed development to ensure the features will not be adversely affected. Any changes in the condition of the feature (e.g. Ground profile, surcharge, G.W.T., etc.) should be considered in the detail design stage. After the detail check, upgrading works if required will be proposed at the GAR submission stage. For the features outside the lot boundary, any adverse effect on the proposed development will also be considered at the GAR submission stage

4.5 Foundation works

The foundation of the proposed development will be designed to sustain the following loads:

1. Gravity load and live load from the proposed building;
2. Lateral wind load and soil load acting on the proposed building.

Since only one-storey buildings will be constructed on the site, the building loads should be relatively small as compared to tall building. If dense stratum or bedrock is found at shallow depth, it would be feasible to use a shallow foundation such as spread footing or raft footing. The actual allowable bearing capacity of the founding soil at the site and the type of foundation to be adopted for the proposed development shall be subject to site-specific GI information and field testing such as plate load test. Reference should be made to “Code of Practice for Foundation 2017” while preparing the detailed foundation design.

It should be ensured that the foundation works used will not cause any adverse effects to the surrounding geotechnical features during the construction period or in the long run.

4.6 Excavation works

It is envisaged that only shallow excavation will be necessary to facilities the construction work for foundation. Should the depth of excavation be more than 1.5m, temporary Excavation and Lateral Support Works (ELS works) should be adopted to support the soil load imposed from the surrounding ground.

Any possible adverse effects incurred during each stage of excavation work shall be fully addressed in the design of ELS works to ensure the damages to the adjacent structures, features, underground utilities, and public road would be avoided.

A monitoring system should also be set up on adjoining land and structure, which may include settlement checkpoints, tilting checkpoints, piezometers and inclinometers. During the excavation and construction of foundation, checkpoint readings should be taken and recorded daily.

5.0 CONCLUSION

From the above geotechnical assessment, which is based on the available geological and geotechnical data, it is considered that the proposed development at the subject Site is geotechnically feasible.

All existing structures, utilities and slopes affecting or being affected by the proposed works will be assessed in due course. Upgrading works will be proposed at the detail submission stage to relevant government departments if found necessary.

Should deep foundation be required, it is recommended that site-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 and foundation designs.

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 properties and to ensure that all the allowable limits on ground movement / vibration are not exceeded.

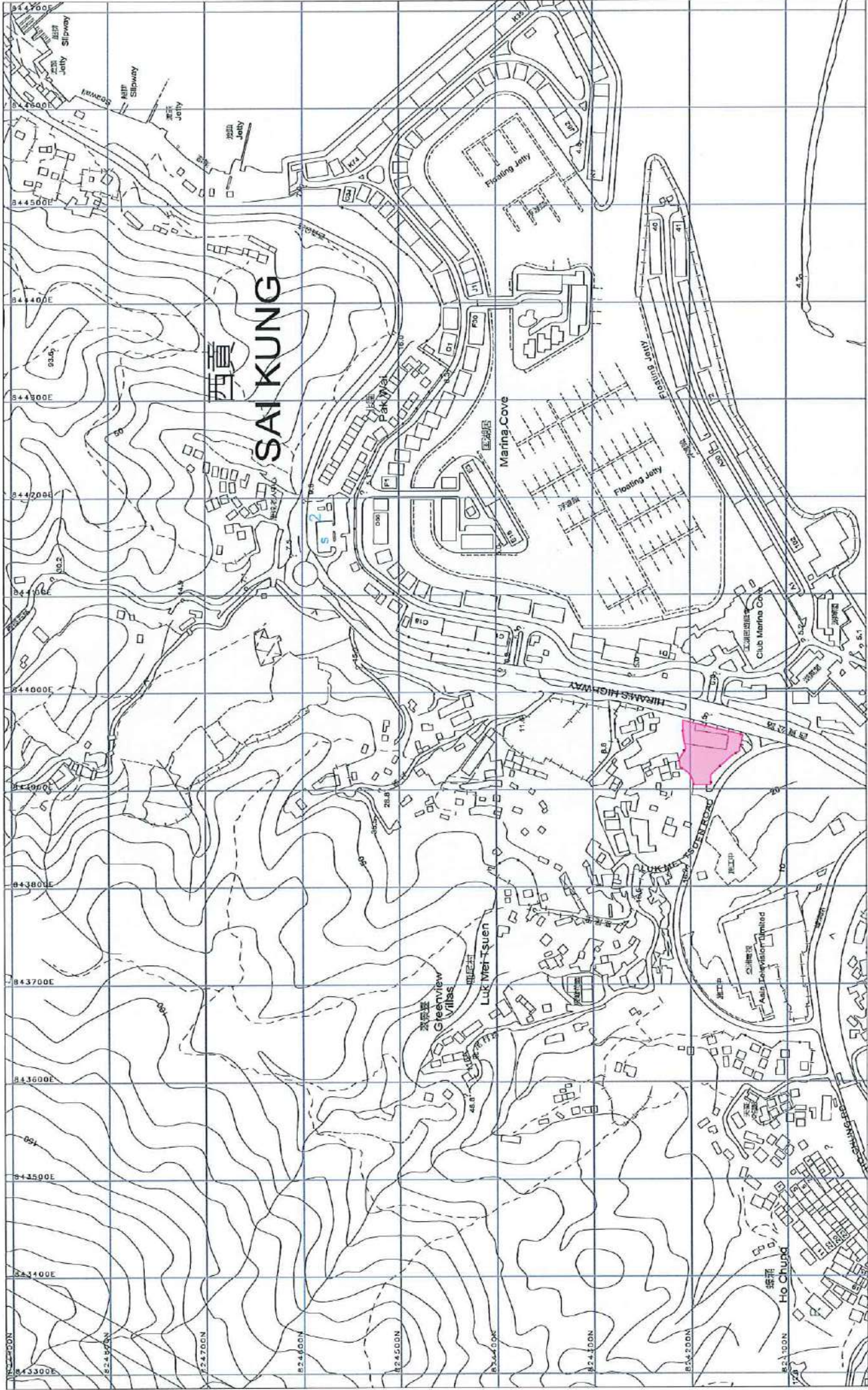
6.0 REFERENCES

GCO, (1988). Geotechnical Area Studies Programme. East New Territories. GASP Report IX. Geotechnical Control Office, Civil Engineering Services Department.

GEO, (2019). Natural Terrain Landslide Inventory. Slope Information System. Geotechnical Engineering Office, Civil Engineering and Development Department.

GEO. QRA of Boulder Fall Hazards. Slope Information System. Geotechnical Engineering Office, Civil Engineering and Development Department.

FIGURE 1 – SITE PLAN (1:5000)

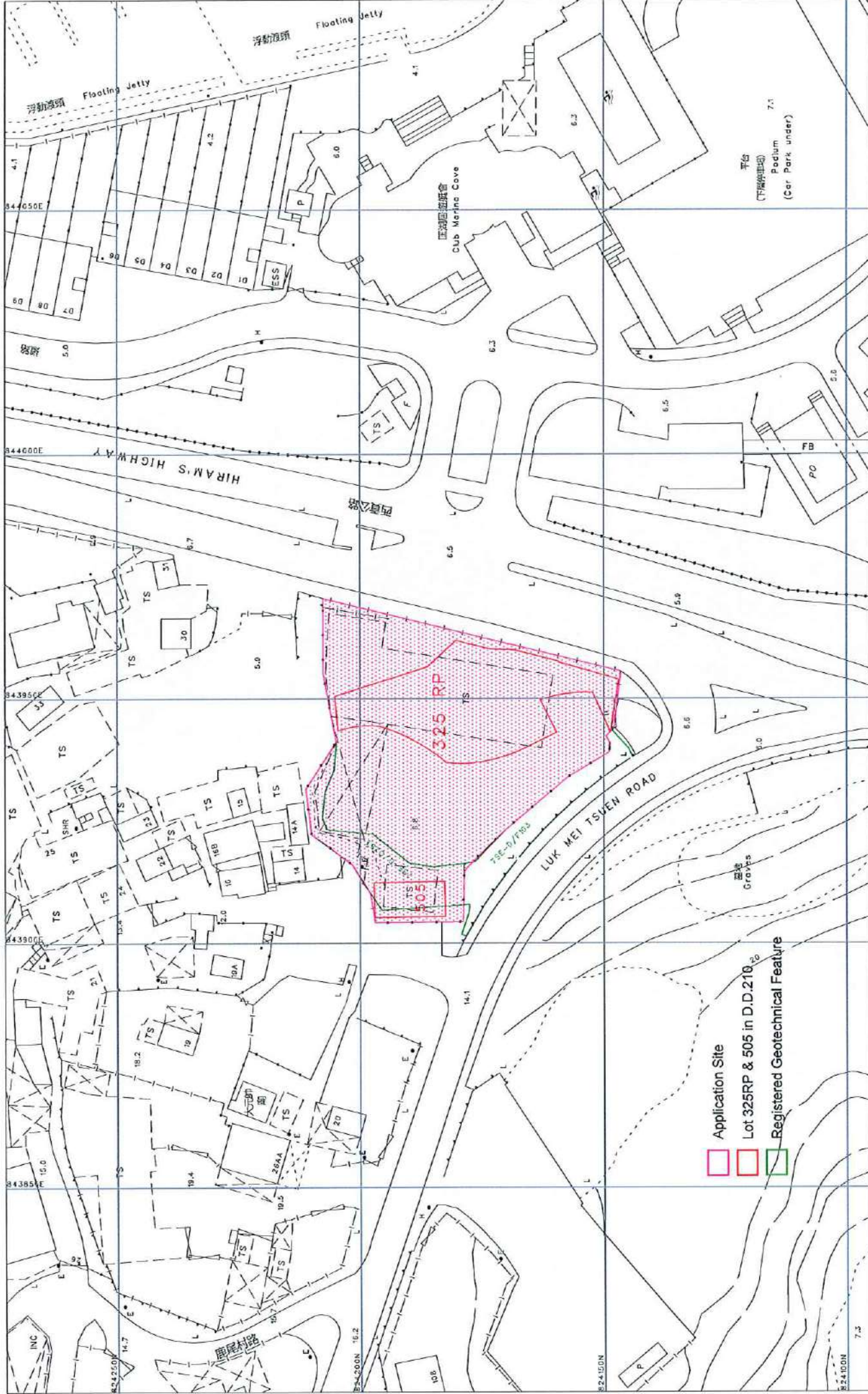


Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

SITE PLAN (1:5000)

Figure 1

FIGURE 2 – LOT INDEX PLAN AND FEATURES LOCATION (1:1000)

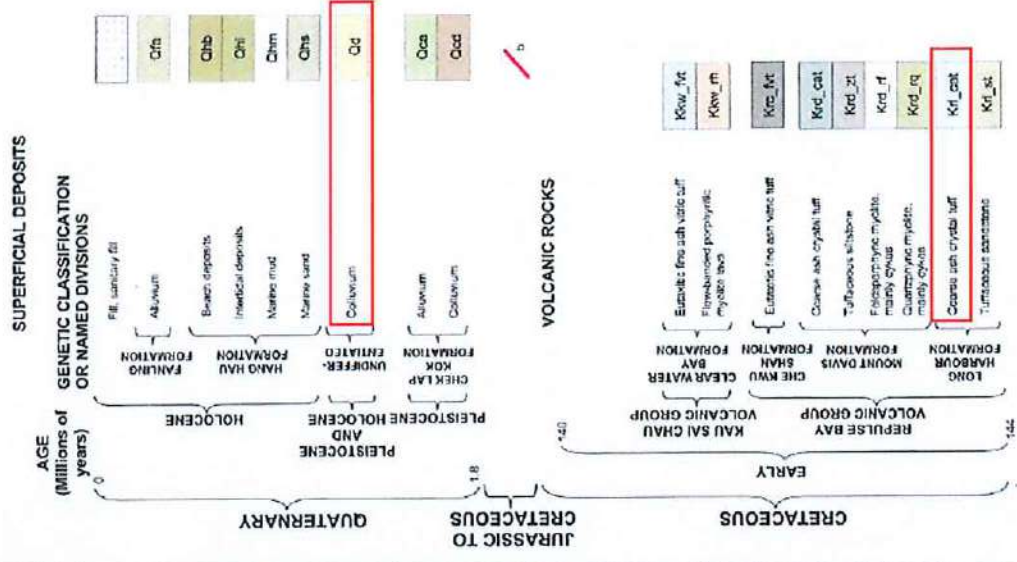
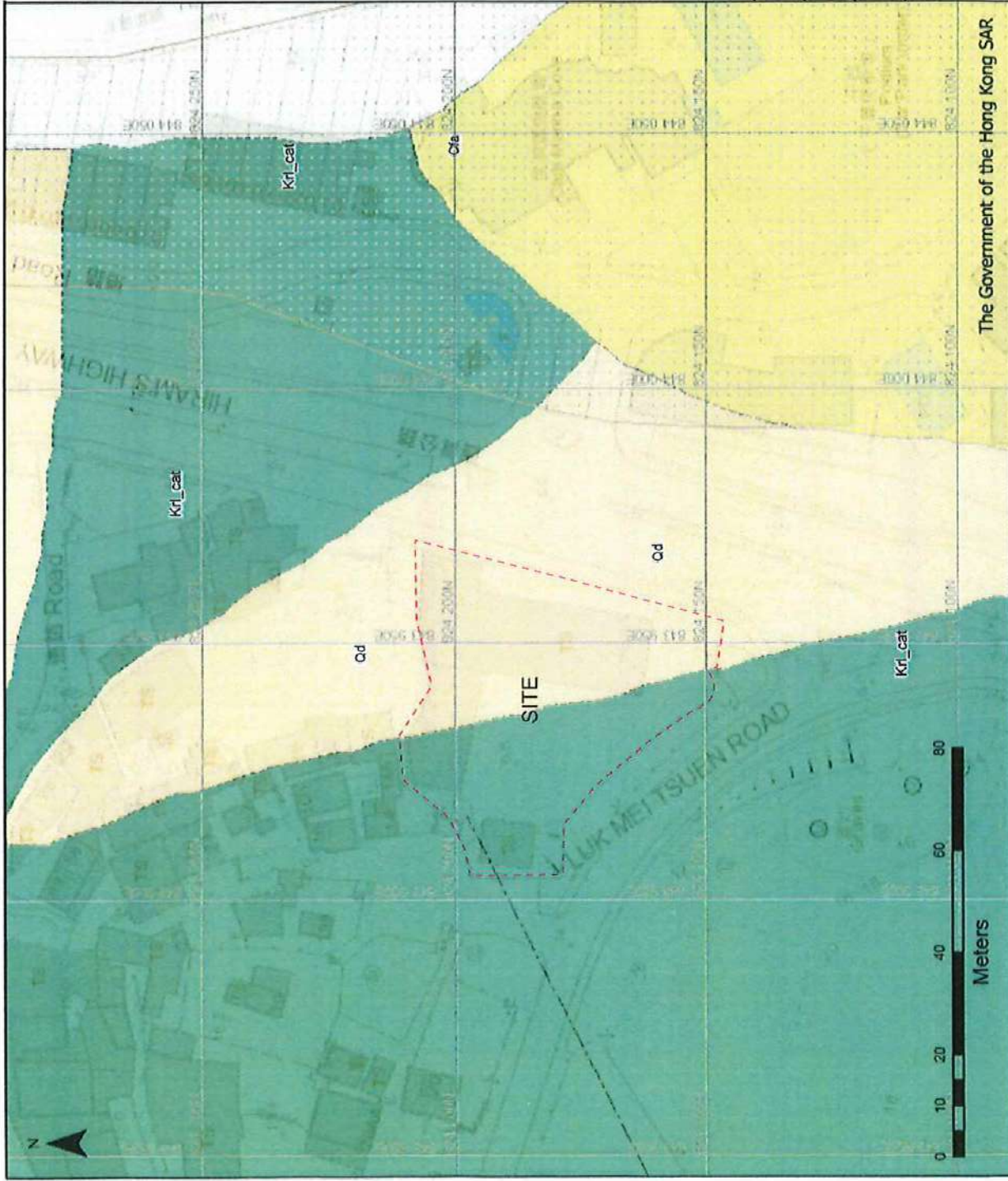


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LOT INDEX PLAN AND FEATURES LOCATION (1:1000)

Figure 2

FIGURE 3 – EXTRACT OF GEOLOGICAL MAP



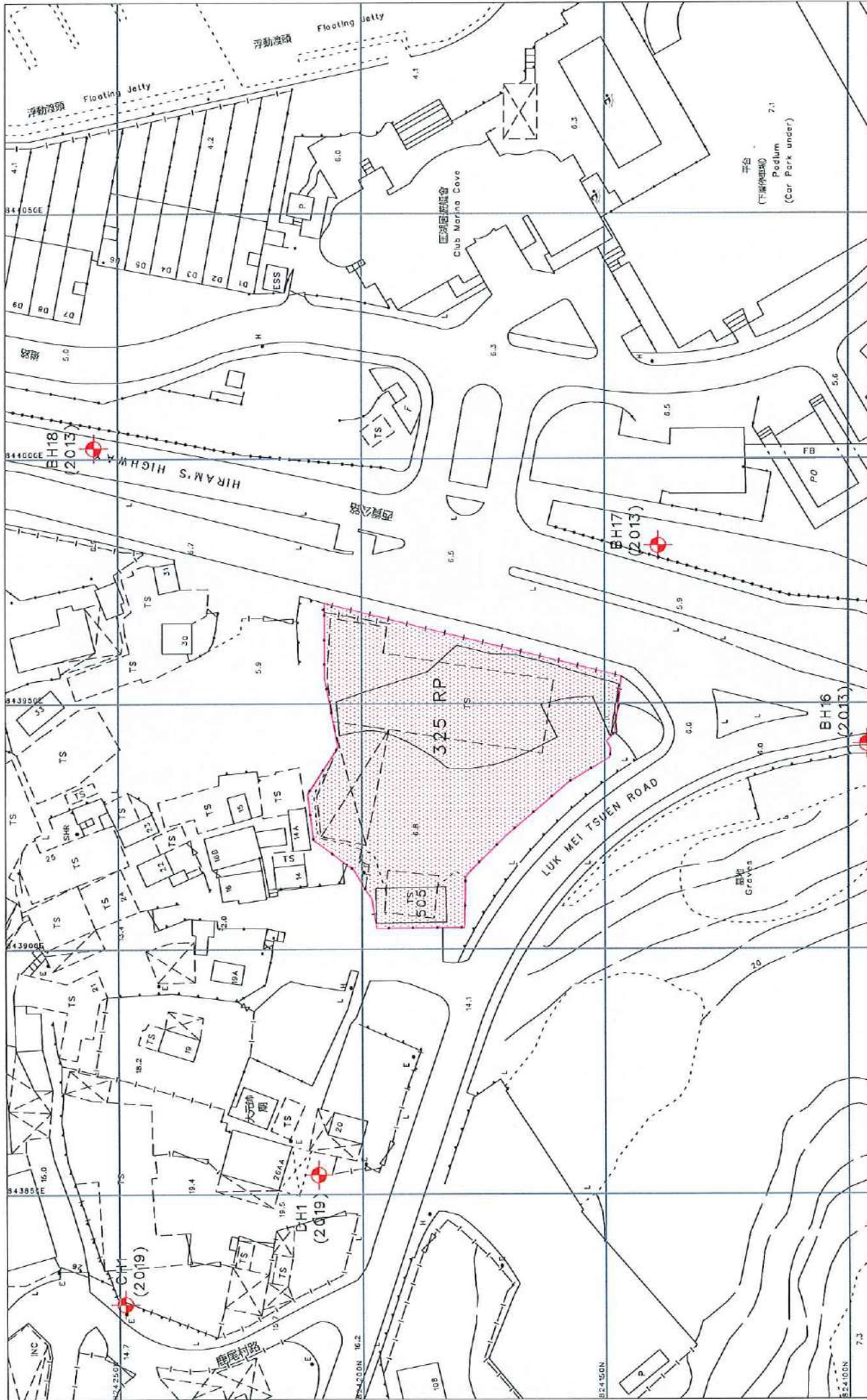
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Figure 3

EXTRACT OF GEOLOGICAL MAP

The Government of the Hong Kong SAR

FIGURE 4 – GROUND INVESTIGATION PLAN

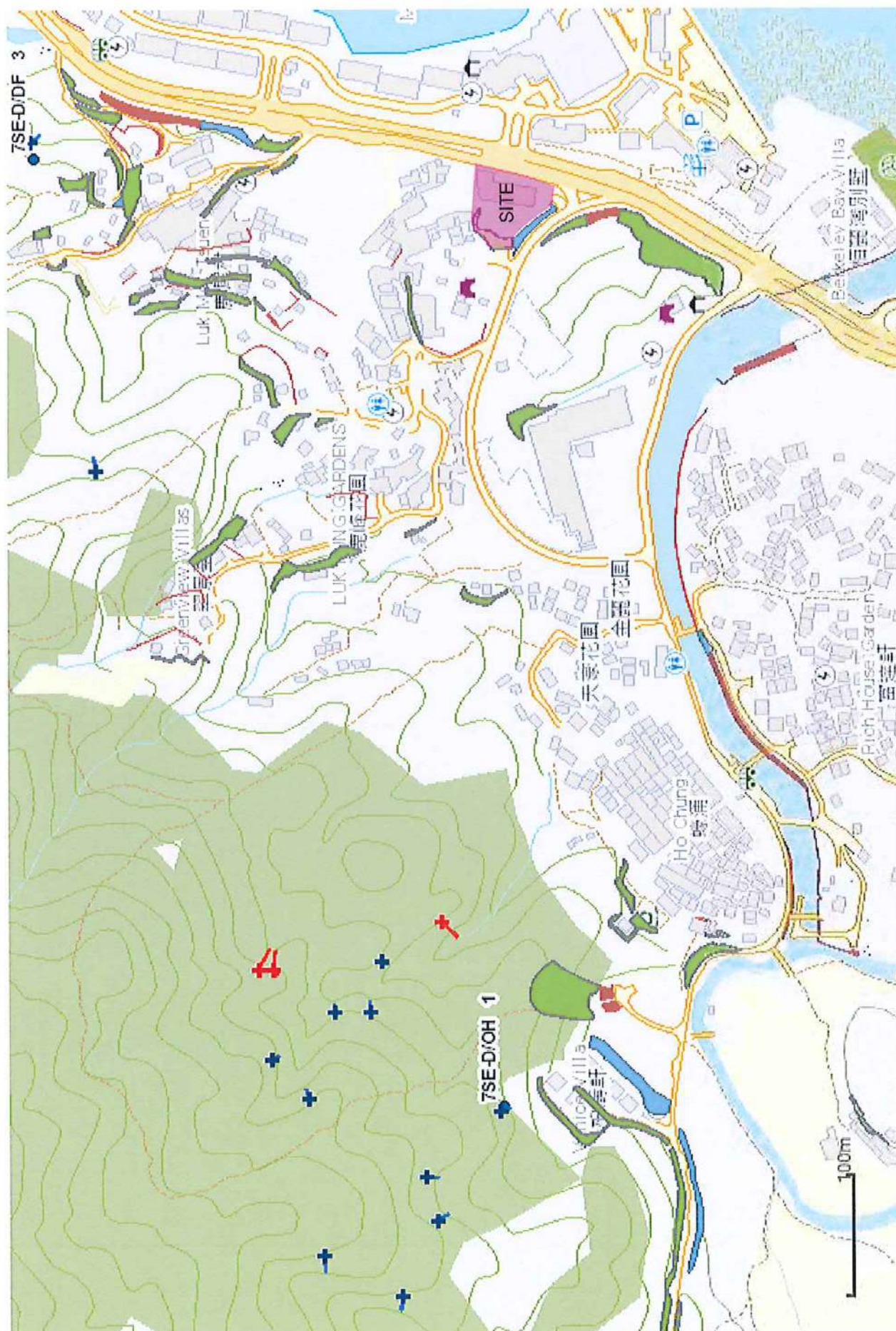


Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

GROUND INVESTIGATION PLAN

Figure 4

FIGURE 5 – NTLI-LANDSLIDE RECORD

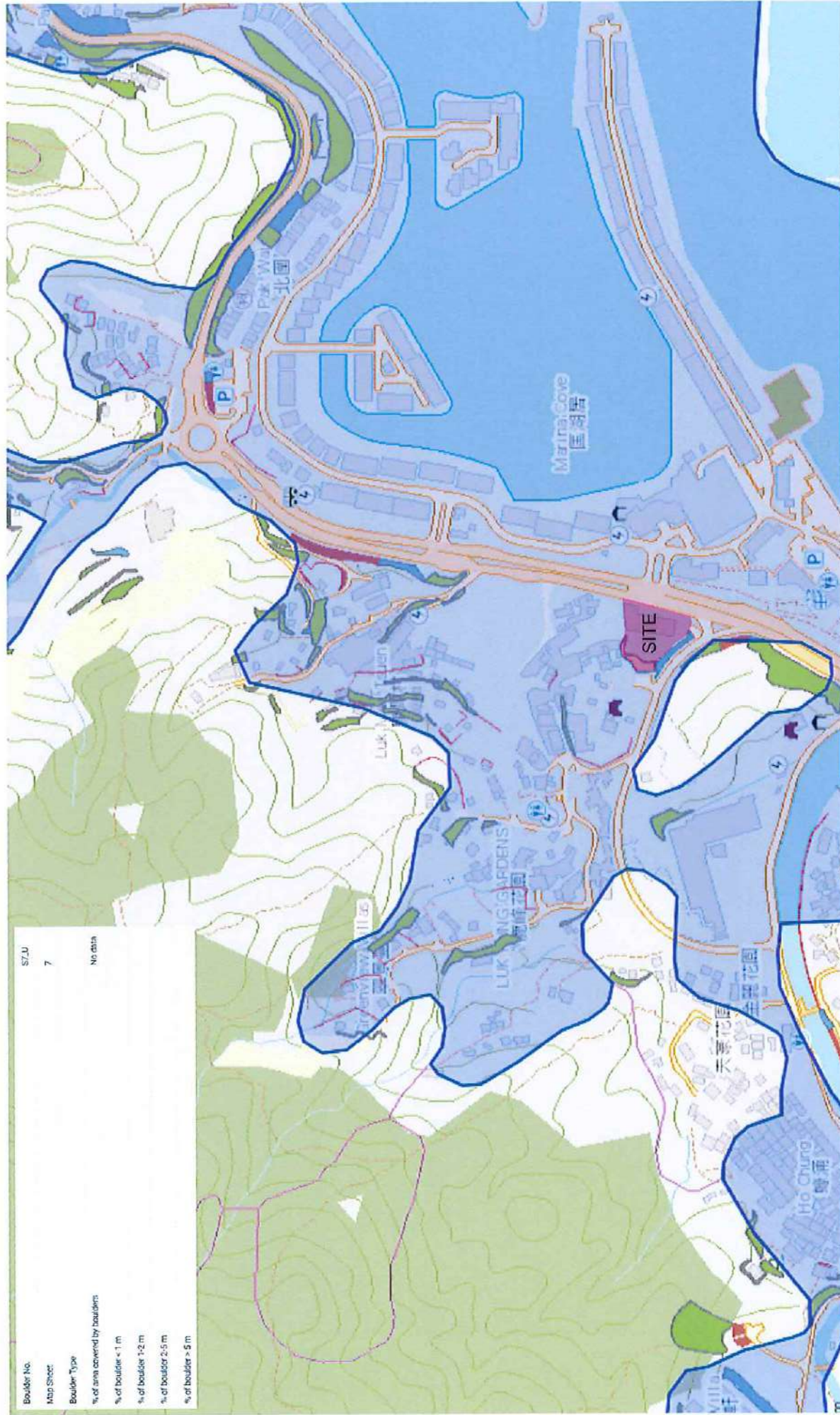


Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

Figure 5

NTLI-LANDSLIDE RECORD

FIGURE 6 – AREA OF QRA OF BOULDER FALL HAZARDS No.S7_U

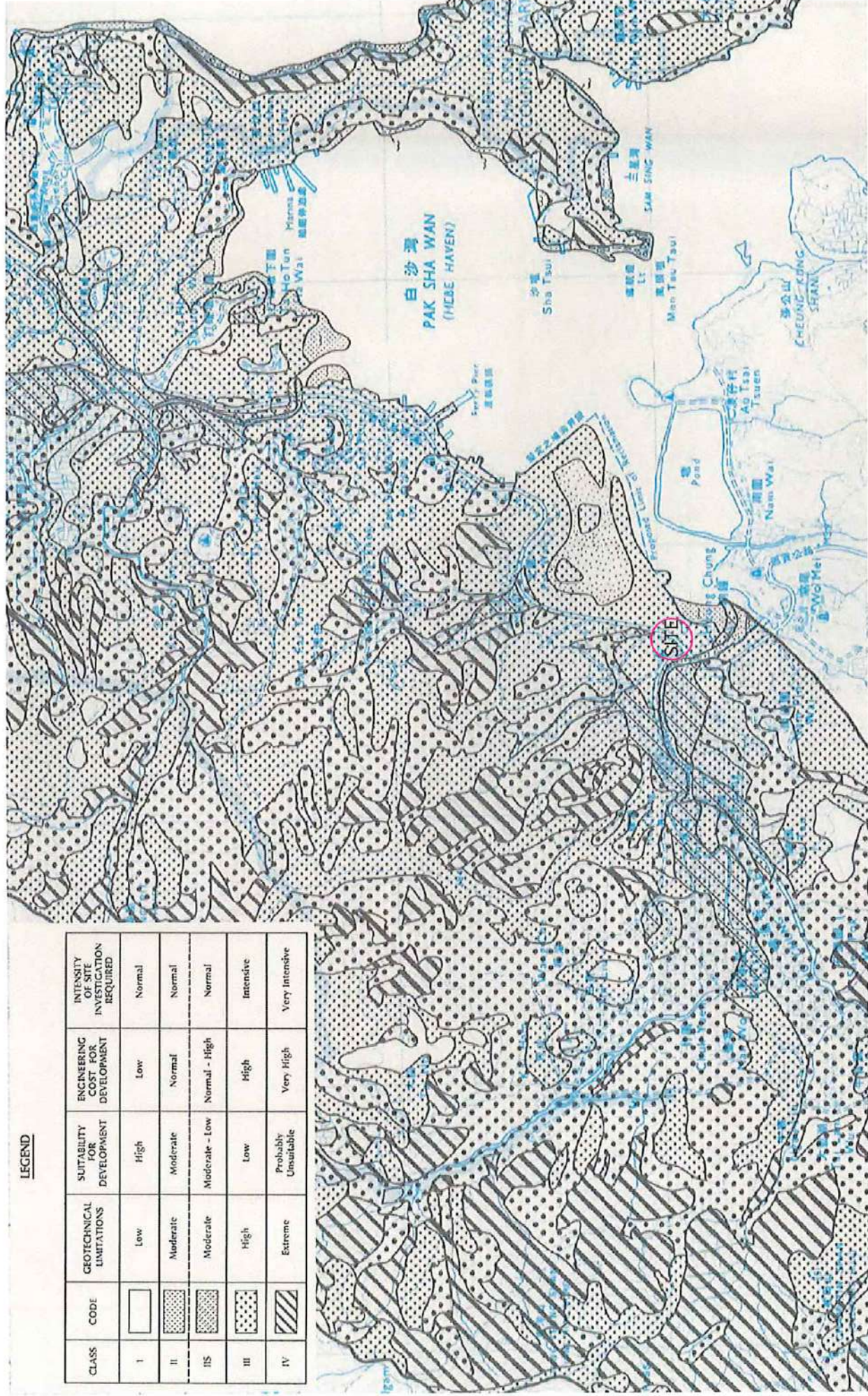


Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

Figure 6

AREA OF QRA OF BOULDER FALL HAZARDS NO.S7_U

**FIGURE 7 – EXTRACT OF GASP REPORT MAP-GROTECHNICAL LAND USE
MAP**



LEGEND

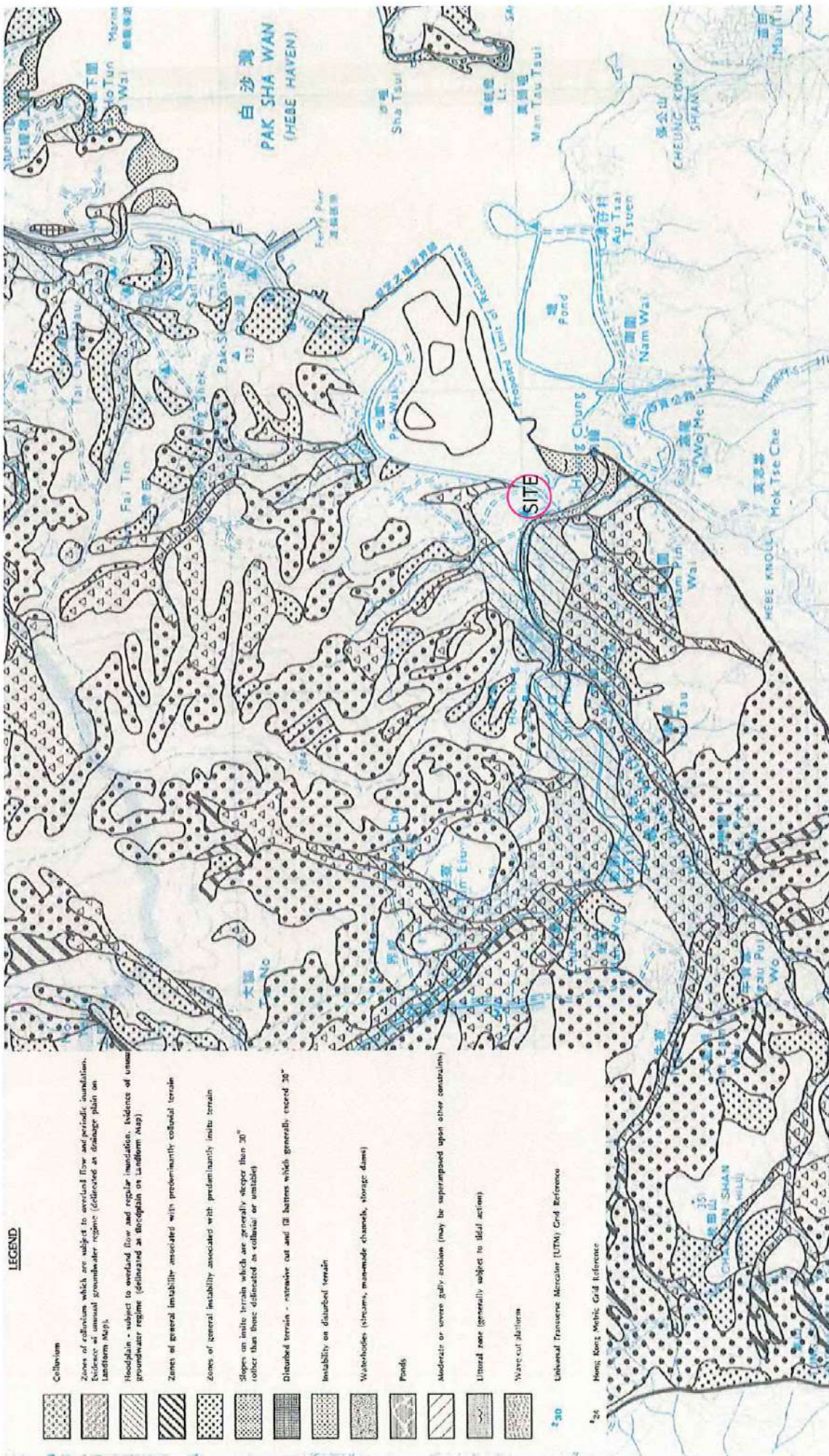
CLASS	CODE	GEOTECHNICAL LIMITATIONS	SUITABILITY FOR DEVELOPMENT	ENGINEERING COST FOR DEVELOPMENT	INTENSITY OF INVESTIGATION REQUIRED
I	[Blank box]	Low	High	Low	Normal
II	[Dotted pattern]	Moderate	Moderate	Normal	Normal
III	[Cross-hatched pattern]	Moderate - High	Moderate - Low	Normal - High	Normal
IV	[Diagonal lines pattern]	High	Low	High	Intensive
V	[Stippled pattern]	Extreme	Probably Unsuitable	Very High	Very Intensive

Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

Figure 7

EXTRACT OF GASP REPORT MAP - GEOTECHNICAL LAND USE MAP

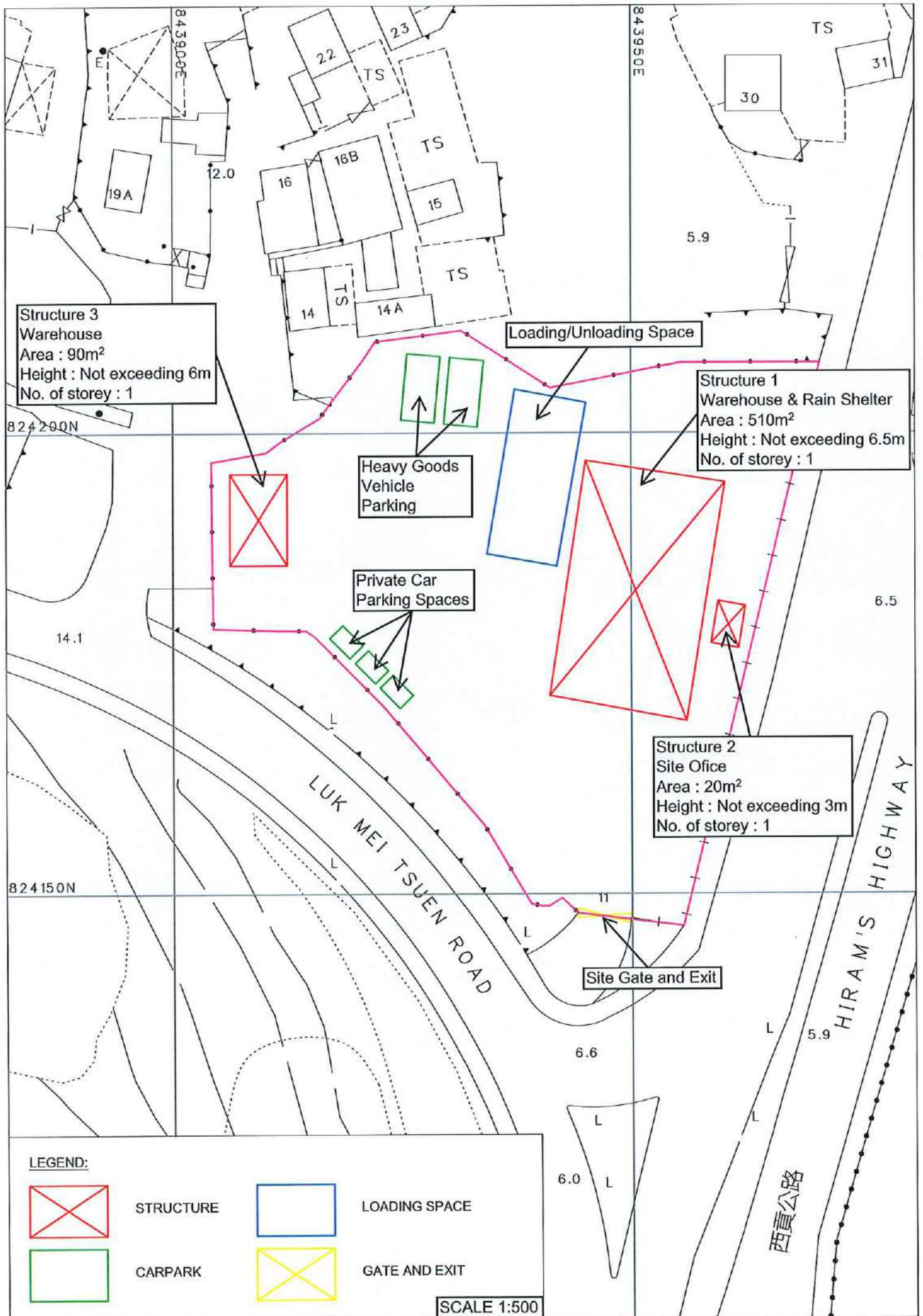
**FIGURE 8 – EXTRACT OF GASP REPORT MAP-PHYSICAL CONSTRAINTS
MAP**



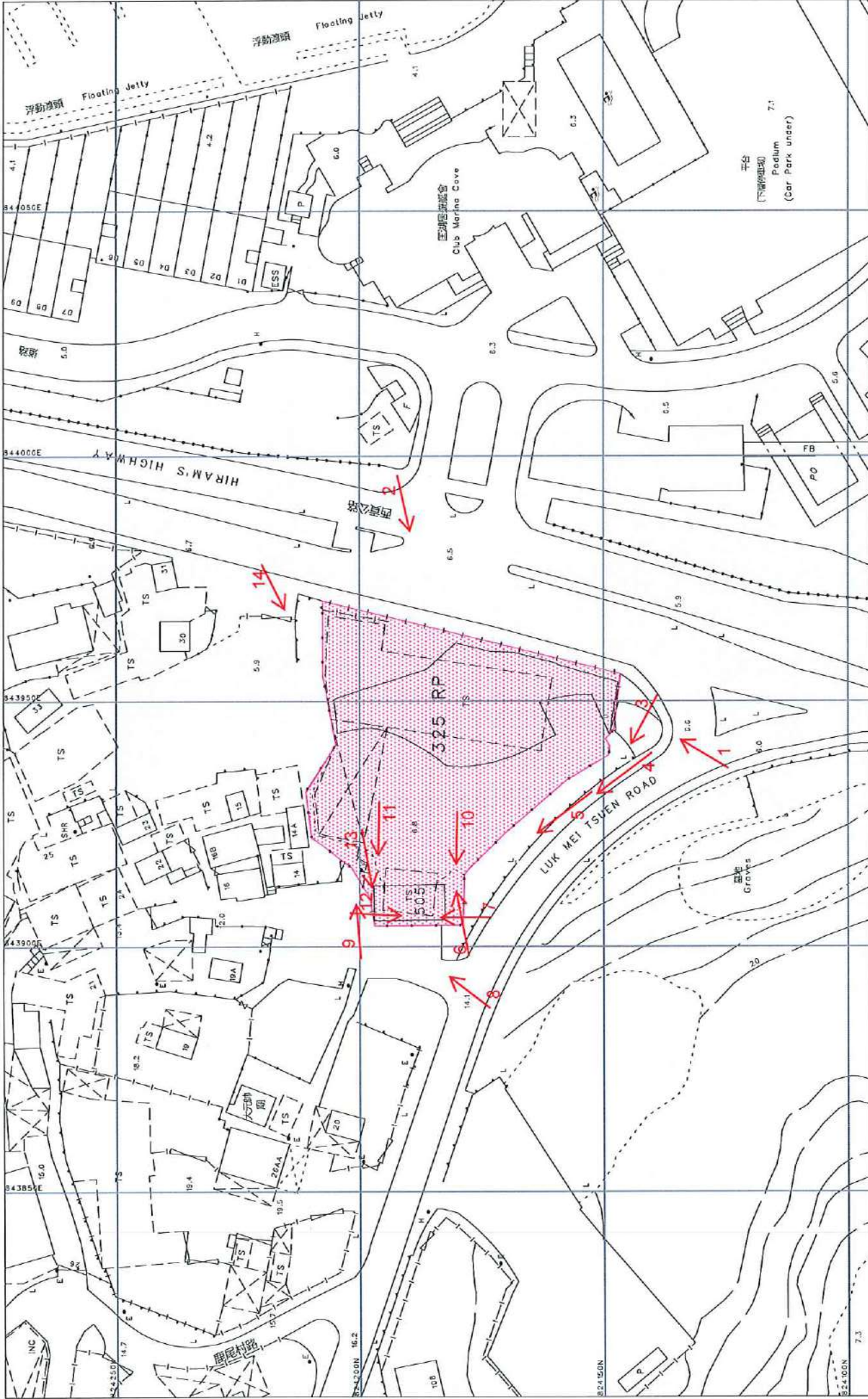
Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

Figure 8

EXTRACT OF GASP REPORT MAP - PHYSICAL CONSTRAINTS MAP



Appendix B – Site Photographic Records



Application for Planning Permission under Section 16 at Lot 325 RP & 505 in D.D.210 AND ADJOINING GOVERNMENT LAND, HO CHUNG, SAI KUNG

SITE PHOTOGRAPHIC RECORDS



Plate 1



Plate 2



Plate 3



Plate 4



Plate 5



Plate 6



Plate 7



Plate 8



Plate 9



Plate 10



Plate 11

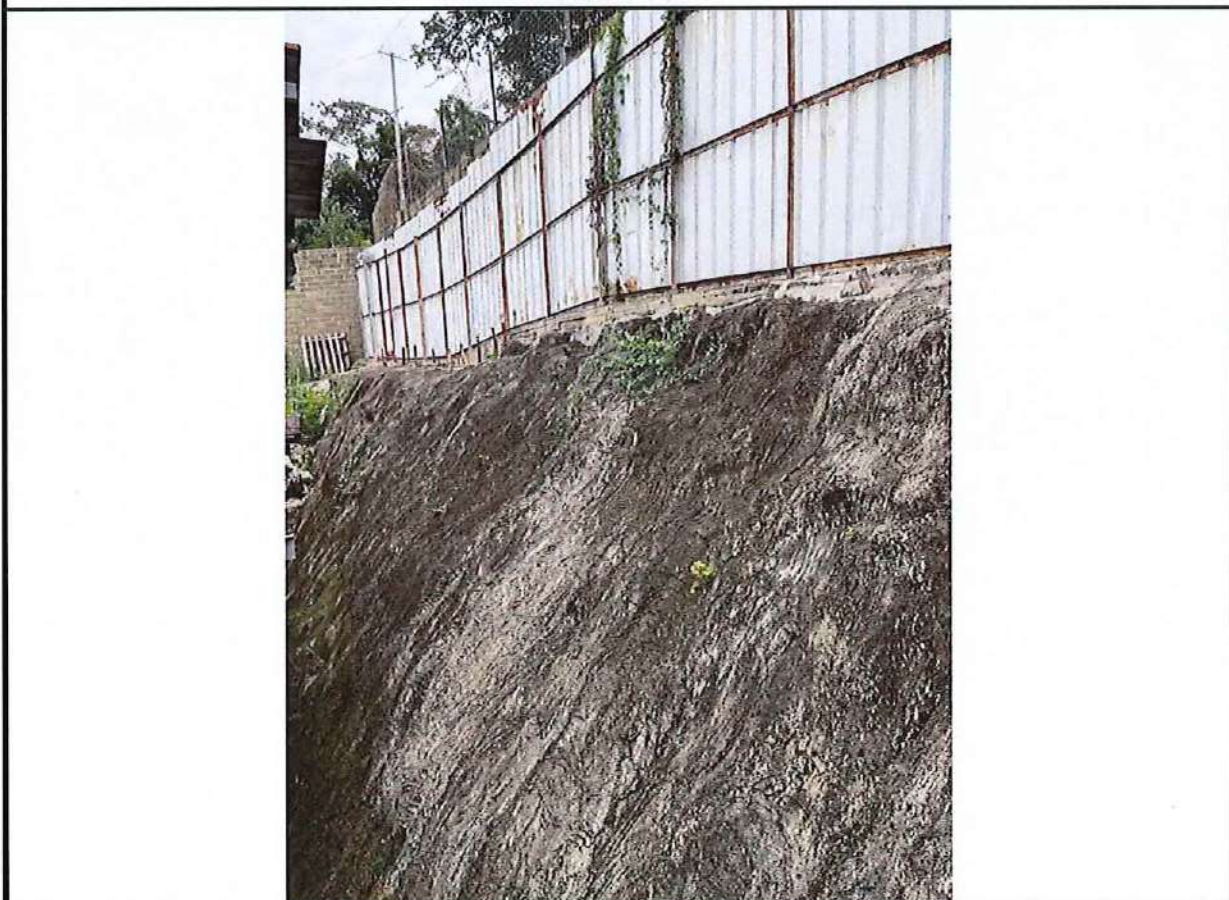


Plate 12



Plate 13



Plate 14

Appendix C – Slope Information and Maintenance Responsibility of Features



BASIC INFORMATION

Location: Adjacent to Luk Mei Tsuen Road, Sai Kung

Date of Formation: pre-1977

Date of Construction/
Modification:

Approximate Coordinates: Easting : 843917 Northing : 824195

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with low traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Construction sites (if future use not certain)

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 7.5 Length (m): 50 Average Angle (deg): 40

WALL PART

N/A



MAINTENANCE RESPONSIBILITY

Mixed Feature Party: STT SX4886 Agent: N/A
Mixed Feature Party: DD210 LOT 505 Agent: N/A
Mixed Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 27-10-2021
Data Source: Project Office
Slope Part Drainage: N/A

Wall Part Drainage: N/A

SLOPE PART

Slope Part (1)
Surface Protection (%): Bare: 0 Vegetated: 0 Chunam: 0 Shotcrete: 100 Other Cover: 0
Material Description: Material type: Soil Geology: N/A
Berm: No. of Berms: N/A Min. Berm Width (m): N/A
Weepholes: Size (mm): 40 Spacing (m): 1.2



WALL PART

N/A

SERVICES

N/A



STAGE 1 STUDY REPORT

Inspected On: 02-03-2001

Weather: Mainly Fine

District: ME

Section No: 1-1

Height(m): H1 : 4 , H2 : 0

Type of Toe Facility: Construction sites (if future use not certain)

Distance from Toe(m): 0

Type of Crest Facility: Road/footpath with low traffic density

Distance from Crest(m): 0

Consequence Category: 3

Engineering Judgement: P

Section No: 2-2

Type of Toe Facility: N/A

Distance from Toe(m): 0

Type of Crest Facility: N/A

Distance from Crest(m): 0

Consequence Category: 3

Engineering Judgement: P



Sign of Seepage: Slope : No signs of seepage
Wall : N/A

Criterion A satisfied: N

Sign of Distress: Slope : N/A
Wall : N/A

Criterion D satisfied: N

Non-routine maintenance required: N

Note: N/A

Masonry wall/Masonry facing: N

Note: N/A

Consequence category (for critical section): 3

Observations: N/A

Emergency Action Required: N

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study: Y

Action By: Government

OTHER EXTERNAL ACTION

Check / repair Services: N

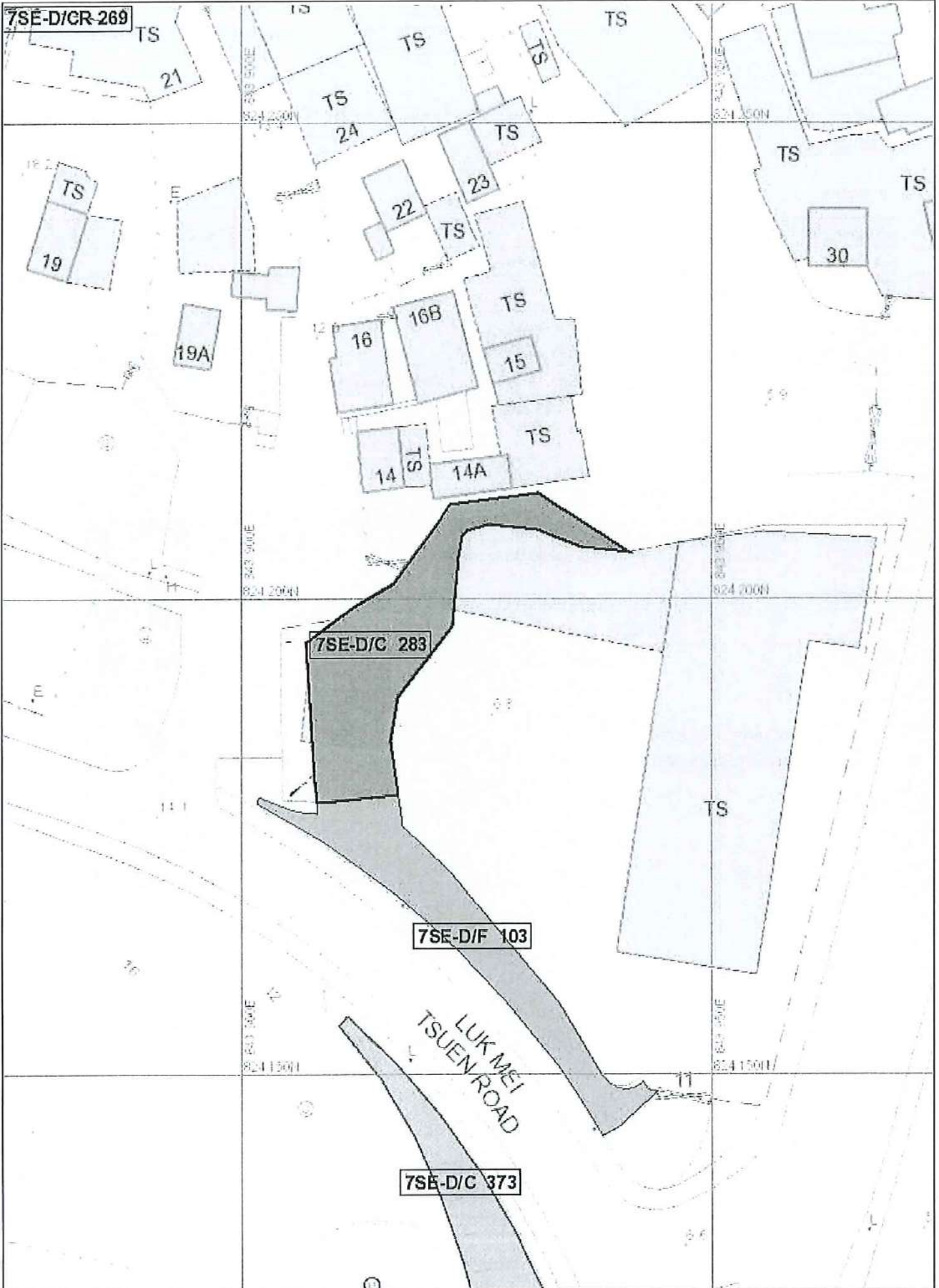
Action By: N/A

Non-routine Maintenance: N

Action By: N/A

PHOTO





Slope Maintenance Responsibility Report

(7SE-D/C283)


**ESTATE MANAGEMENT SECTION
LANDS DEPARTMENT**
List of Slope Maintenance Responsibility Area(s)

1	7SE-D/C283	Sub-Division		1
	Location	Partly within the Green Hatched Black Area of STT SX4886, partly within DD210 LOT 505 and partly within GLA-TSK 3423		
	Responsible Lot/Party	STT SX4886	Maintenance Agent	Not Applicable
	Remarks	Slope information being reviewed.		
2	7SE-D/C283	Sub-Division		2
	Location	Partly within the Green Hatched Black Area of STT SX4886, partly within DD210 LOT 505 and partly within GLA-TSK 3423		
	Responsible Lot/Party	DD210 LOT 505	Maintenance Agent	Not Applicable
	Remarks	Slope information being reviewed.		
3	7SE-D/C283	Sub-Division		3
	Location	Partly within the Green Hatched Black Area of STT SX4886, partly within DD210 LOT 505 and partly within GLA-TSK 3423		
	Responsible Lot/Party	Highways Department	Maintenance Agent	Highways Department
	Remarks	1. Slope information being reviewed. 2. For enquiries about the maintenance of this slope / sub-division of the slope, please contact the Maintenance Agent directly.		

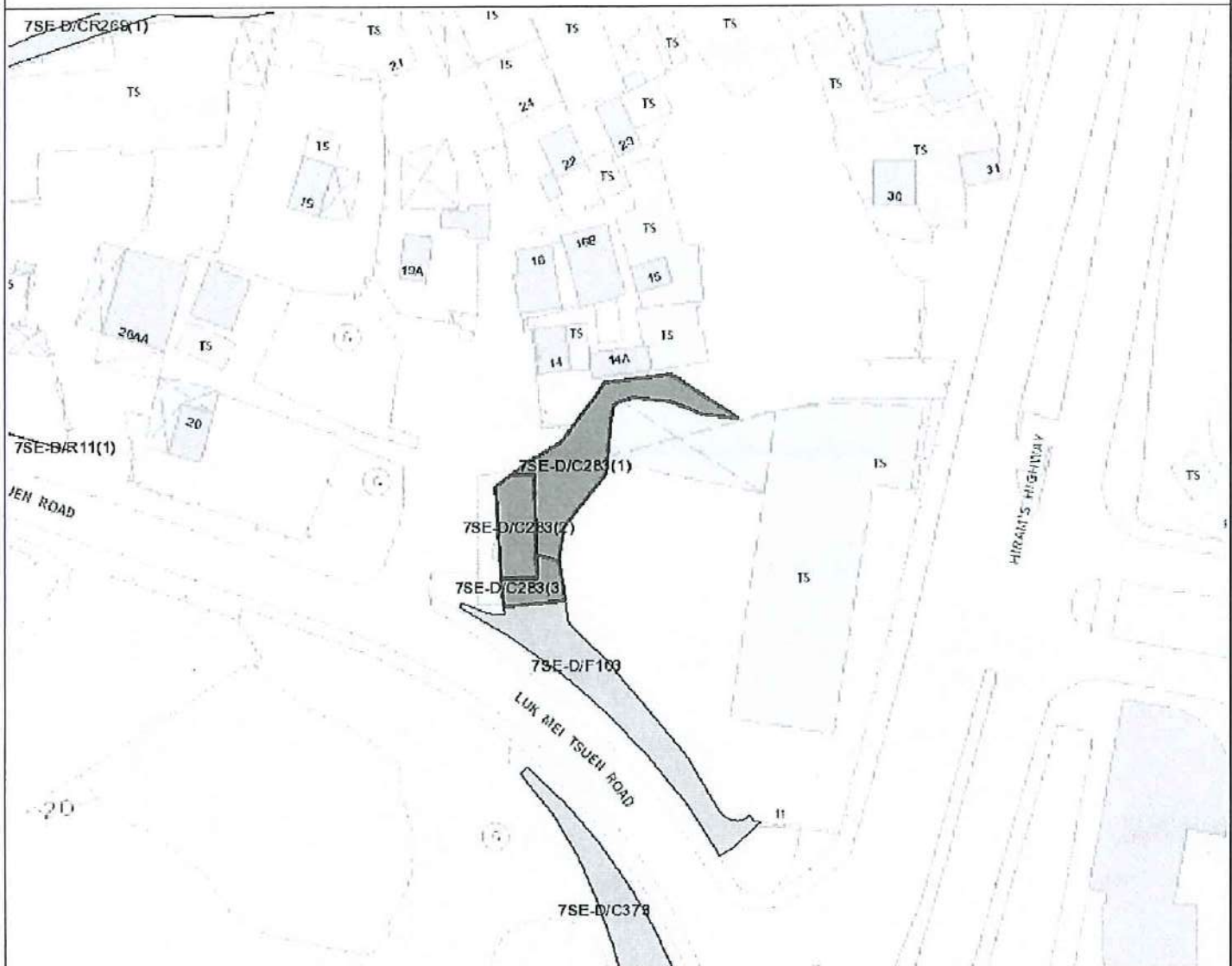
- End of Report -

Notes:






- (i) The location plan in Annex is for identification purposes of slope(s) only.
- (ii) The slope(s) as listed in the Slope Maintenance Responsibility Report may not be shown on the location plan in Annex.

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Location Plan



Legend

-  Slope Area(s)
-  Search Location
-  Slope(s) Maintained by Government
-  Slope(s) Maintained by Private Party/Parties
-  Slope(s) Maintained by Government and Private Party/Parties



ESTATE MANAGEMENT SECTION
LANDS DEPARTMENT

This Plan is **NOT TO SCALE** and intended for **IDENTIFICATION** only. All information shown on this plan **MUST** be verified by field survey.

Printed on: 30/07/2024

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BASIC INFORMATION

Location: Luk Mei Tsuen Road near Hiram's Highway, Sai Kung

Date of Formation: N/A

Date of Construction/
Modification:

Approximate Coordinates: Easting : 843923 Northing : 824167

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Road/footpath with moderate traffic density

Distance of Facility from Crest (m): 0

Facility at Toe: Construction sites (if future use not certain)

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 2

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 3.8 Length (m): 51.4 Average Angle (deg): 30

WALL PART

N/A



MAINTENANCE RESPONSIBILITY

Government Feature Party: HyD Agent: HyD

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 09-01-2023
 Data Source: Project Office
 Slope Part Drainage: (1) Position: On slope Size(mm): 300
 (2) Position: Toe Size(mm): 600

Wall Part Drainage: (1) Position: Crest Size(mm): 300

SLOPE PART

Slope Part (1)
 Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0
 Material Description: Material type: Soil Geology: N/A
 Berm: No. of Berms: N/A Min. Berm Width (m): N/A
 Weepholes: Size (mm): N/A Spacing (m): N/A



WALL PART

N/A

SERVICES

N/A



STAGE 1 STUDY REPORT

Inspected On:

Weather:

District:

Section No: 1-1

Height(m):

Type of Toe Facility: Construction sites (if future use not certain)

Distance from Toe(m): 0

Type of Crest Facility: Road/footpath with moderate traffic density

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:



Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

OTHER EXTERNAL ACTION

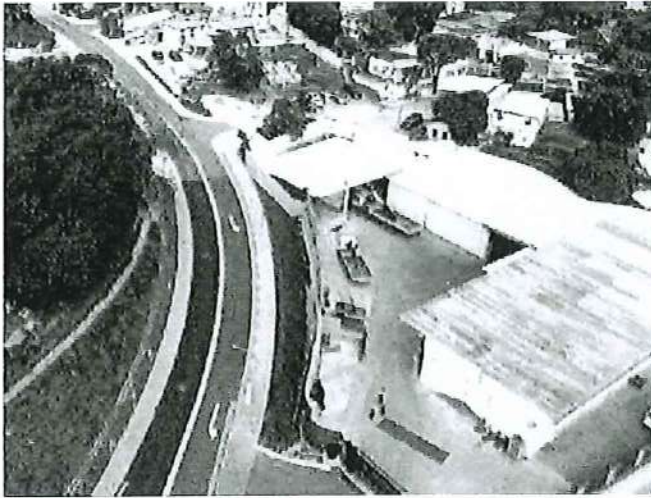
Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO



Appendix D – Ground Investigation Records



Lands Department
Contract No. 5/LANDS/16



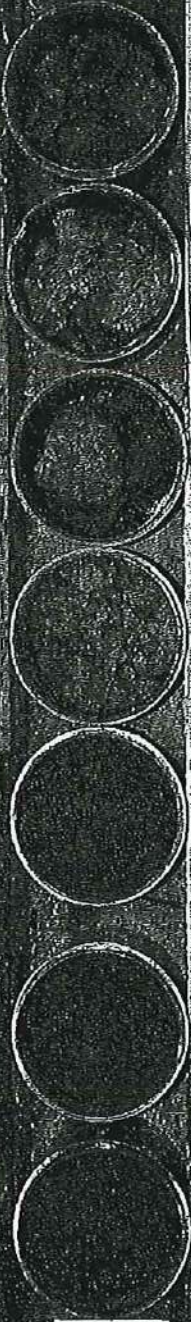
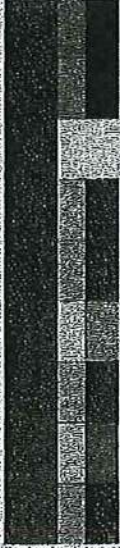
Fugro Geotechnical Services Ltd.

Works Order No. : LD0516/GI/071
Location : Feature No. 7SE-D/R11(2&3)
No.26 Luk Mei Tsuen Road,
Sai Kung

Hole No. : DH1
Box No. : 1 of 1
Depth : 0.00 m. To 6.05 m.
Date of Photograph : 24/8/2019

0 m.

1 m.



000

004

003
009



FUGRO
GEOTECHNICAL
SERVICES LTD

COREHOLE RECORD

HOLE No. **CH1**

CONTRACT No.: **5/LANDS/16**

SHEET: **1** of **1**

PROJECT: **Feature No. 7SE-D/R11(2&3)**
No.26 Luk Mei Tsuen Road, Sai Kung

METHOD: **Portable Coring**

CO-ORDINATES:

WORKS ORDER No.: **LD0516/GI/071**

MACHINE & No.: **FPT-04**

E **843827.58**
 N **824248.82**

DATE from: **17/08/2019** to **19/08/2019**

FLUSHING MEDIUM: **Water**

ORIENTATION: **115°/45°**

GROUND LEVEL: **+17.82** mPD

Drilling Progress	Casing size /depth	Water Level at Shift Start/End	Water Return %	TCR %	SCR %	RCD %	F.I.	Tests	Samples			Reduced Level	Depth (m)	Legend	Grade	Description
									No.	Type	Depth					
17/08/2019	N size										0.00	+17.82	0.00			Dark grey (6YR/4/1), spotted white, mottled yellowish brown, angular COBBLES with occasional coarse gravel of very strong tuff fragments. (RUBBLE WALL)
1				55							1.10	+17.04	1.10		VI	Soft to firm, reddish brown (5YR/4/3) to brown (7.5YR/5/4), spotted white, mottled red, slightly sandy clayey SILT with occasional subangular to subrounded fine to medium gravel of quartz and very weak to weak tuff. (RESIDUAL SOIL)
2																
3																
4																
5																
6	N size															
17/08/2019	6.10m															End of investigation hole at 6.10m.
7																
8																
9																
10																

- Small Disturbed Sample
- Piston sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazer Sample
- 76mm Vibrocore Sample
- 100mm Vibrocore Sample
- Vibrocore Sub-sample
- SPT Liner Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Pressuremeter Test
- Telemetry Survey
- Packer Test
- Impression Packer Test
- Water Sample
- Standpipe
- Piezometer Tip

LOGGED K.H. Lai
 DATE 20/08/2019
 CHECKED V. Wong
 DATE 30/08/2019

REMARKS
 1. CH1 located 1.00m below crest of wall.



Lands Department
Contract No. 5/LANDS/16

 Fugro Geotechnical Services Ltd.

Works Order No. : LD0516/GI/071

Hole No. : CH1

Location : Feature No. 7SE-D/R11(2&3)

Box No. : 1 of 1

No.26 Luk Mei Tsuen Road,

Depth : 0.00 m. To 6.10 m.

Sai Kung

Date of Photograph : 24/8/2019



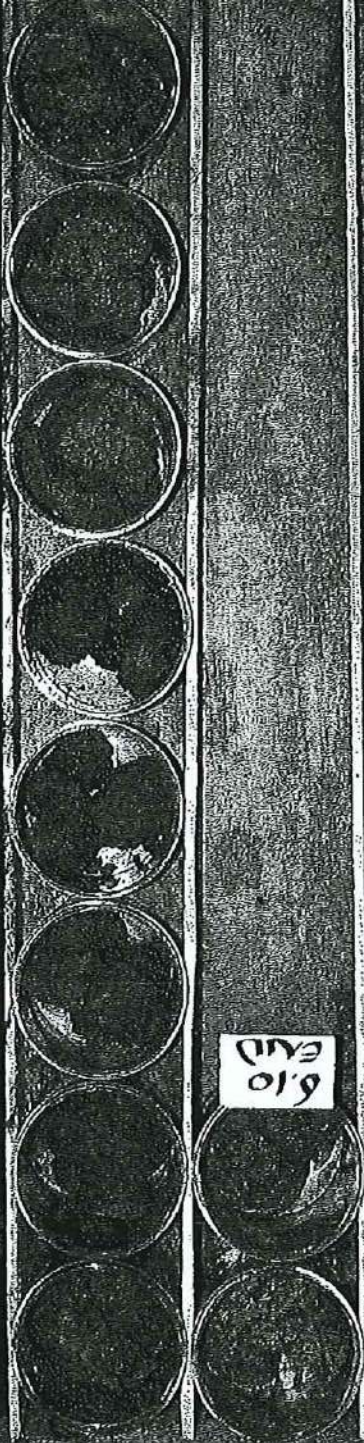
0 m.

1 m.

0.00

1.10

6.10
END





DRILLHOLE RECORD

CONTRACT NO. GE/2011/26

HOLE NO. **BH16**
SHEET 1 of 2

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. GE 49/2011 (HY), Dualing of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

METHOD	ROTARY	CO-ORDINATES	WORKS ORDER NO.	GE/2011/26.20A	
MACHINE	SD28	E 843941.76 N 824093.83	DATE	16.04.2013 to 17.04.2013	
FLUSHING MEDIUM	WATER	ORIENTATION	VERTICAL	GROUND LEVEL	+11.60 mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	ROD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
1	PW								1 0.45	11.60	0.10			Grey (10YR 5/1), CONCRETE, (PAVEMENT) Soft to firm, brown (10YR 5/3), clayey sandy SILT. (OLD TOP SOIL)
2			80	100					2 0.95				VI	Firm to stiff, red (2.5YR 5/8) and light red (2.5YR 7/8) mottled yellow, slightly sandy very silty CLAY. (RESIDUAL SOIL)
3								3.3, 3.6, 3.7, 3.8, 3.9	3 1.45	110.10	1.50			
4									4 1.60					
5	PW 4.45m HW		80	80	0	0	NI		5 2.60	7.15	4.45		IV	Weak to moderately weak, dark grey (10YR 4/1) mottled brown, highly decomposed lapilli lithic-bearing coarse ash TUFF. (Angular, COBBLE of highly decomposed tuff fragments)
6			80	75	63	63	3.3		6 2.60	16.68	4.74		V	From 4.74m to 4.90m: No recovery, assumed to be completely decomposed TUFF.
7			80	75	63	63	3.3		7 3.60	18.70	4.80		II	Very strong, dark grey spotted white, slightly decomposed lapilli lithic-bearing coarse ash TUFF. (CORESTONE)
8			80	75	63	63	3.3		8 3.60	19.10	5.60		V	From 4.74m to 4.90m: No recovery, assumed to be completely decomposed TUFF.
9			80	75	63	63	3.3		9 4.45	15.60	6.70		IV	Weak, light red (2.5YR 7/8) mottled yellow, highly decomposed lapilli lithic-bearing coarse ash TUFF. (Angular, clayey silty sandy fine to coarse GRAVEL and some cobble of highly decomposed tuff fragments)
10			80	75	63	63	3.3		10 4.60	15.54	6.00		V	From 5.60m to 6.20m: No recovery, assumed to be completely decomposed TUFF.
11			80	75	63	63	3.3		11 7.20	15.54	6.00		V	Extremely weak, brownish yellow (10YR 6/6) mottled red and white, completely decomposed lapilli lithic-bearing coarse ash TUFF. (Firm, clayey sandy SILT)
12			80	75	63	63	3.3		12 7.30	15.40	6.20		V	Extremely weak, light grey (5Y 7/2) mottled light red, completely decomposed lapilli lithic-bearing coarse ash TUFF. (Clayey silty fine to coarse SAND)
13			80	75	63	63	3.3		13 8.30	13.20	8.40		V	From 6.06m to 6.20m: No recovery, assumed to be completely decomposed TUFF.
14			80	75	63	63	3.3		14 8.40	12.00	8.60		IV	Weak to moderately weak, light yellowish brown (10YR 6/4), highly decomposed lapilli lithic-bearing
15			80	75	63	63	3.3		15 8.60	11.60	10.00		IV	

- SMALL DISTURBED SAMPLE
- LARGE DISTURBED SAMPLE
- U10 SAMPLE
- PISTON SAMPLE (76mm)
- MAZIER SAMPLE
- 6PT LINER SAMPLE
- WATER SAMPLE
- U100 SAMPLE
- STANDARD PENETRATION TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST
- PERMEABILITY TEST
- PRESSUREMETER TEST
- BORHOLE TELEVIEWER
- PNEUMATIC TIP
- STANDPIPE TIP

LOGGED L. Zhang
DATE 22.04.2013
CHECKED R. Chu
DATE 23.04.2013

REMARKS
1. An inspection pit was excavated to 1.50m deep by hand tools.
2. Constant Head Permeability Test was carried out section from 2.05m to 4.45m.
3. Acoustic borehole televiwer survey was carried out from 14.50m to 19.70m.



DRILLHOLE RECORD

CONTRACT NO. GE/2011/26

HOLE NO. **BH16**

SHEET 2 of 2

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. CE 40/2011 (HY), Dredging of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

METHOD	ROTARY	CO-ORDINATES	WORKS ORDER NO.	GE/2011/26.20A	
MACHINE	SD28	E 843841.76 N 824083.83	DATE	16.04.2013 to 17.04.2013	
FLUSHING MEDIUM	WATER	ORIENTATION	VERTICAL	GROUND LEVEL	+11.60 mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	ROD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11			80	100					18	10.10	10.10		IV	coarse ash TUFF. (Angular, COBBLE and occasional coarse gravel of highly decomposed tuff fragments) Extremely weak, light grey (2.5Y 7/1) mottled brown, completely decomposed lapilli lithic-bearing coarse ash TUFF. (Firm, clayey sandy SILT)
12								3.5 11-20	17	11.30	11.40			
13									19	11.60				
14			80	100	34	24	1.0	NI	T2-101	-1.60	13.40		III	Moderately strong, light grey mottled dark grey, moderately decomposed lapilli lithic-bearing coarse ash TUFF. (CORESTONE)
14			80	100			NA		21	-2.10	13.70		IV	From 13.40m to 13.49m: Weak to moderately weak and highly decomposed. (Angular, clayey silty sandy (fine to coarse GRAVEL and some cobble of highly decomposed tuff fragments)
16	HW 14.60m		80	100	99	99		2.2	T2-101	-2.60	14.60		II	Extremely weak, light yellowish brown (10YR 6/4), completely decomposed lapilli lithic-bearing coarse ash TUFF. (Firm, clayey sandy SILT)
16		3.20 at 1650 3.60 at 1680	80	100	100	100			T2-101	-1.85	16.85			Weak, brownish yellow (10YR 6/6), highly decomposed lapilli lithic-bearing coarse ash TUFF. (Angular, fine to coarse GRAVEL of highly decomposed tuff fragments)
16			80	95	46	30	>20		T2-101	-4.78	16.38		III	Strong to very strong, grey spotted white, slightly decomposed lapilli lithic-bearing coarse ash TUFF. Joints are medium to widely spaced, occasional closely spaced, rough planar and rough undulating, iron and manganese oxide stained, occasional calcite coated, dipping at 15° to 25°, 65° to 75° and subvertically from 17.20m to 17.56m, 18.21m to 18.89m and 19.17m to 19.35m.
17			80	100	61	54	6.9		T2-101	-5.20	16.60		II	From 16.38m to 16.80m: Moderately strong and moderately decomposed.
10			80	100	34	21	>20		T2-101	-17.82	17.82			
10			80	100	79	73	3.8		T2-101	-18.07	18.07			
10			80	100	79	73	0.6		T2-101	-18.27	18.27			
10			80	100	79	73	0.6		T2-101	-18.77	18.77			
10			80	100	79	73	0.6		T2-101	-19.02	19.02			
10			80	100	79	73	0.6		T2-101	-19.18	19.18			
10			80	100	79	73	0.6		T2-101	-19.28	19.28			
10			80	100	79	73	0.6		T2-101	-19.44	19.44			
20		3.10 at 1800								-6.20	19.64			End of hole at 19.86 m.

- ↑ SMALL DISTURBED SAMPLE
- ↓ LARGE DISTURBED SAMPLE
- U/S SAMPLE
- PISTON SAMPLE (16mm)
- MAZIER SAMPLE
- EPT LINDER SAMPLE
- ▲ WATER SAMPLE
- U100 SAMPLE
- ↓ STANDARD PENETRATION TEST
- ∇ IN-SITU VANE SHEAR TEST
- ⊥ PACKER TEST
- ⊥ PERMEABILITY TEST
- ⊥ PRESSUREMETER TEST
- ⊥ BOREHOLE TELEVIEWER
- ⊥ PIEZOMETER TIP
- ⊥ 67MM PIPE TIP

LOGGED L. Zhang

DATE 22.04.2013

CHECKED R. Chu

DATE 23.04.2013

REMARKS

DRILTECH

DRILTECH GROUND ENG. LTD.



CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25. 20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH 16**

BOX NO.: **1 OF 4**

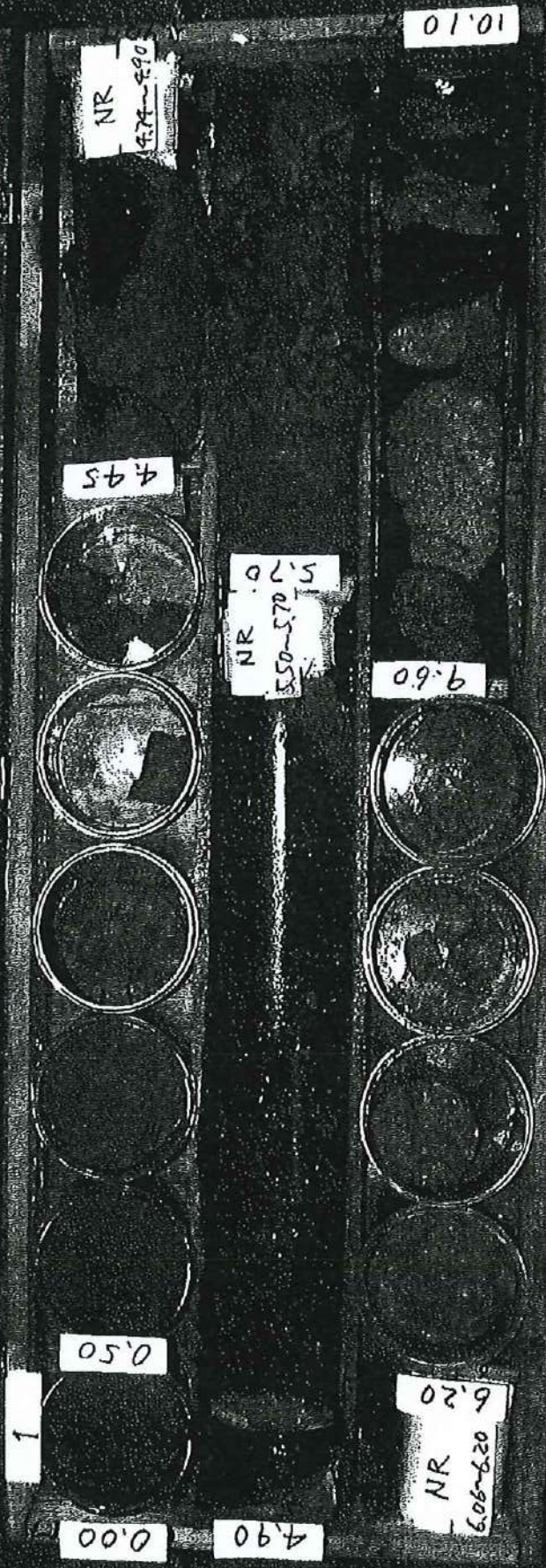
DEPTH: **0.00** m TO **10.10** m

DATE OF PHOTOGRAPH: **18 / 4 / 2013**



0m

1.0m



0.00

0.50

1

4.90

4.95

NR 0.0-5.70-5.75

09.6

NR 6.20-6.06-6.20

01.01

NR 4.74-5.90



DRILTECH GROUND ENG. LTD.



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25.20A

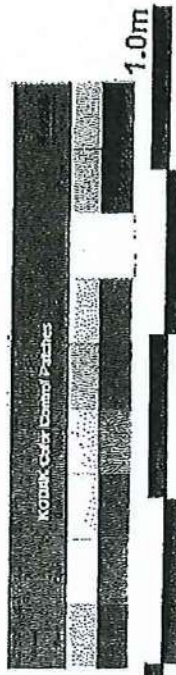
JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH16**

BOX NO.: **2 OF 4**

DEPTH: **10.10** m TO **16.23** m

DATE OF PHOTOGRAPH: 18 / 4 / 2013



0m

1.0m



10.10

13.20

14.50

15.85

16.23

13.70

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25. 20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH16**

BOX NO.: **3 OF 4**

DEPTH: **16.23** m TO **18.77** m

DATE OF PHOTOGRAPH: 18 / 4 /2013



0m

1.0m

16.23

17.20

18.07

18.77

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO. : GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO. : GE/2011/25.20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO. : **BH 16**

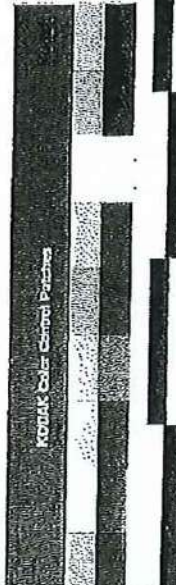
BOX NO. : **4 OF 4**

DEPTH : **18.77** m TO **19.86** m

DATE OF PHOTOGRAPH: **18 / 4 / 2013**

0m

1.0m



18.77

19.86
END





DRILLHOLE RECORD

CONTRACT NO. GE/2011/25

HOLE NO. **BH17**

SHEET 1 of 2

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. GE 49/2011 (HY), Ducting of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chiung - Design and Construction (Stage 2)

METHOD	ROTARY	CO-ORDINATES	WORKS ORDER NO.	GE/2011/25.20A	
MACHINE	SD19	E 843982.26 N 824138.98	DATE	30.04.2013 to 03.05.2013	
FLUSHING MEDIUM	WATER	ORIENTATION	VERTICAL	GROUND LEVEL	+6.43 mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
30.04.2013	PV								1 0.00 2 0.45 3 0.95 4 1.45 5 1.50 6 2.60 7 3.60	16.43 15.93 15.43 14.93	0.00 0.50 1.00 1.50	[Cross-hatched pattern]		Very pale brown (10YR 7/4), clayey sandy SILT with some subangular fine to coarse gravel of rock fragments. (FILL)
1														Light yellowish brown (10YR 6/4), clayey silty fine to coarse SAND with some subangular fine to coarse gravel of rock fragments. (FILL)
2			60	100										Grey (10YR 6/1), clayey sandy SILT with some subangular fine to coarse gravel of rock fragments. (FILL)
3														Medium dense, light brown (7.5YR 6/4), clayey silty fine to coarse SAND with some subangular fine to coarse gravel of rock fragments. (FILL)
4														
5		2.12 at 10.50	0	75					T2-120	4.20	4.20			Angular to subangular, grey (10YR 5/1) mottled brown, slightly sandy clayey silty fine to coarse GRAVEL and COBBLE of rock fragments and with occasional concrete fragments. (FILL)
6		3.10 at 0600	0	100					T2-120	4.80				
7		PW 6.60m IW	0	50					T2-120	5.60				
8			0	0						7.00	7.00			No recovery, assumed to be FILL.
9			0	0						8.00	8.10			Subangular, pale yellow (2.5Y 7/4) mottled grey, slightly clayey silty sandy COBBLE and occasional coarse gravel of rock fragments. (FILL)
10										0.10	0.20			
11										0.90	0.90			Extremely weak, pale yellow (2.5Y 7/3), completely decomposed coarse ash TUFF. (Firm, clayey sandy SILT)

↓ SMALL DISTURBED SAMPLE ↓ LARGE DISTURBED SAMPLE ▨ UFG SAMPLE ▨ PISTON SAMPLE (76mm) ▨ MASTER SAMPLE ▨ SPT LINER SAMPLE ▲ WATER SAMPLE ▨ URD SAMPLE	↓ STANDARD PENETRATION TEST ↓ BI-SHU VAIE SHEAR TEST ▨ PACKER TEST ▨ PERMEABILITY TEST ▨ PRESSUREMETER TEST ▨ BOREHOLE TELEVIEWER ▨ MEZONETER TIP ▨ STANDPIPE TIP	LOGGED <u>L. Zhang</u> DATE <u>07.05.2013</u> CHECKED <u>R. Chu</u> DATE <u>09.05.2013</u>	REMARKS 1. An inspection pit was excavated to 1.50m deep by hand tools. 2. Constant head permeability test was carried out at section from 11.20m to 12.70m.
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DRILLHOLE RECORD

CONTRACT NO. GE/2011/25

HOLE NO. **BH17**

SHEET 2 of 2

PROJECT Ground Investigation - New Territories East (Term Contract), Agreement No. CE 48/2011 (HY), Dualing of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

METHOD		ROTARY		CO-ORDINATES		WORKS ORDER NO.		GE/2011/25,20A						
MACHINE		SD19		E 043902.20 N 024138.90		DATE		30.04.2013 to 03.05.2013						
FLUSHING MEDIUM		WATER		ORIENTATION		VERTICAL		GROUND LEVEL						
								+6.43 mPD						
Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	RQD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11									12	10.20	-3.77	10.20	V	As sheet 1 of 2.
12			0	100				2.4 6.8, 13, 15 17-42	13	11.10			V	Extremely weak, pale yellow (2.5Y 7/3) mottled light yellowish brown, completely decomposed coarse ash TUFF. (Clayey silty fine to medium SAND with occasional angular fine gravel of tuff fragments)
13		2.24 21 1500 30.05.2013 31.05.2013							14	12.10				
14									15	12.20				
15									16	12.60				
16			0	95				4.6 7.9, 10, 12 17-35	17	13.20				
17									18	14.10				
18									19	15.10				
19									20	15.20				
20									21	16.00				
21									22	16.30				
22									23	17.10				
23									24	18.10	-11.77	18.20		End of hole at 18.20 m.
24														

- ± SMALL DISTURBED SAMPLE
- ▬ LARGE DISTURBED SAMPLE
- ▨ UFB SAMPLE
- ▩ PISTON SAMPLE (16mm)
- ▧ MAZIER SAMPLE
- SPT LAYER SAMPLE
- ▲ WATER SAMPLE
- U100 SAMPLE
- ↓ STANDARD PENETRATION TEST
- V IN-SITU VANE SHEAR TEST
- ⊥ PACKER TEST
- ⊥ PERMEABILITY TEST
- ⊥ PRESSUREMETER TEST
- ⊥ BOREHOLE TELEVIEWER
- ⊥ PIEZOMETER TIP
- ⊥ STANDPIPE TIP

LOGGED L. Zhang
 DATE 07.05.2013
 CHECKED R. Chu
 DATE 09.05.2013

REMARKS

DRILTECH

DRILTECH GROUND ENG. LTD.



CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)

WORKS ORDER NO.: GE/2011/25.20A

JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH 17**

BOX NO.: **1 OF 2**

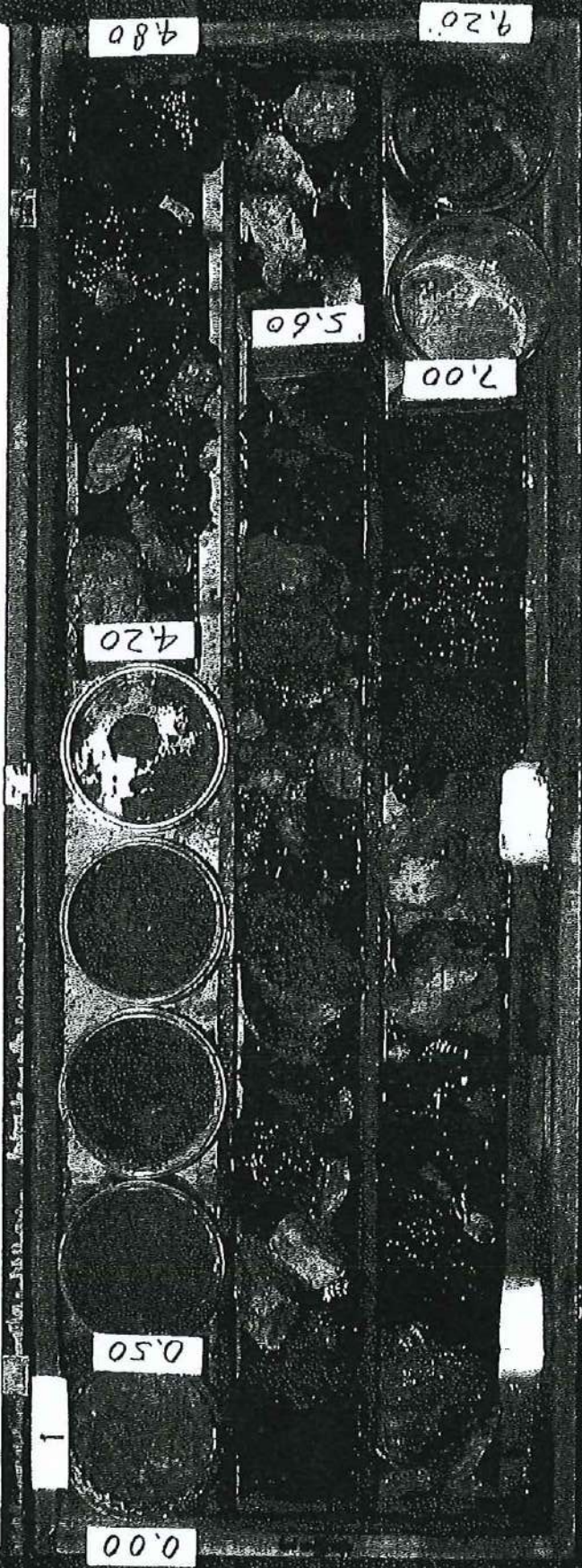
DEPTH: **0.00** m TO **9.20** m

DATE OF PHOTOGRAPH: **8 / 5 / 2013**



0m

1.0m



0.00

0.50

4.20

4.80

5.60

7.00

9.20

DRILTECH

DRILTECH GROUND ENG. LTD.



CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)

WORKS ORDER NO.: GE/2011/25. 20A

JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH17**

BOX NO.: **2 OF 2**

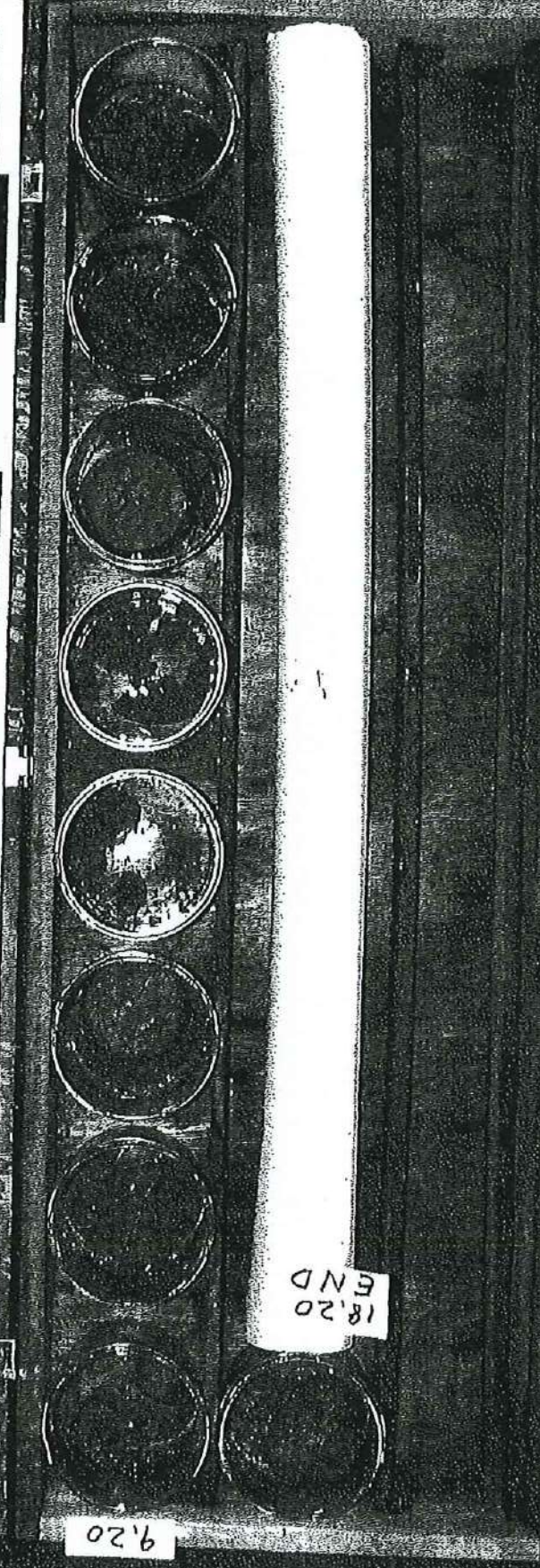
DEPTH: **9.20** m TO **18.20** m

DATE OF PHOTOGRAPH: **8 / 5 / 2013**



0m

1.0m



9.20

18.20
END



DRILLHOLE RECORD

HOLE NO. **BH18**
SHEET 1 of 2

CONTRACT NO. GE/2011/25

PROJECT Ground Investigation - New Territorias East (Tomb Contract), Agreement No. GE 49/2011 (HY), Ducting of Hired's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

METHOD	ROTARY	CO-ORDINATES	WORKS ORDER NO.
MACHINE	SD19	E 844002.20 N 024254.88	GE/2011/25.20A
FLUSHING MEDIUM	WATER	ORIENTATION	VERTICAL
		GROUND LEVEL	+7.00 mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	RCD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
24.04.2013	FW									17.03	0.00			Brown (10YR 5/2), clayey sandy SILT with some subangular fine to coarse gravel of rock fragments. (FILL)
1									18.60	0.60				Pale brown (10YR 6/3), clayey silty fine to coarse SAND with some subangular fine to coarse gravel and occasional cobble of rock fragments. (FILL.)
2			75	88					15.60	1.20				Subangular, pale red (2.5YR 7/3), light brownish grey (10YR 6/2) and light grey (10YR 7/2), slightly clayey silty sandy fine to coarse GRAVEL and COBBLE of rock fragments. (FILL)
3			76	88	0	0	NA		15.10	1.60			V	Extremely weak, red (10R 5/6) mottled yellow, completely decomposed coarse ash TUFF. (Clayey silty fine to coarse SAND with some angular fine to medium gravel and cobble of tuff fragments)
4			76	88	30	30	NI		14.50	2.60			IV	From 2.32m to 2.50m: No recovery, assumed to be completely decomposed TUFF.
5			75	88	30	16	>20		3.39	3.48				Moderately weak to moderately strong, yellowish brown (10YR 5/6) mottled grey, highly decomposed coarse ash TUFF. (Angular, gravelly COBBLE and BOULDER of highly and moderately decomposed tuff fragments)
6			76	88	0	0	NA		13.15	3.85			V	From 3.85m to 4.00m: No recovery, assumed to be completely decomposed TUFF.
7			75	88	34	34	>20		11.80	5.20			IV	Extremely weak, very pale brown (10YR 8/3) mottled light red, completely decomposed coarse ash TUFF. (Clayey very silty fine to coarse SAND with some angular fine gravel of tuff fragments)
8			75	88	62	62	>20	2.2	11.52	5.48			III	From 4.70m to 5.00m: No recovery, assumed to be completely decomposed TUFF.
9			75	88	66	55	6.3		10.47	6.53			V	Weak to moderately weak, yellowish brown (10YR 5/6), highly decomposed coarse ash TUFF. (Angular, COBBLE and some coarse gravel of highly decomposed tuff fragments)
10			75	100	88	81	>20		10.18	6.82			II	Strong to very strong, grey spotted white, slightly decomposed coarse ash TUFF. (CORESTONE)
			75	100	100	98	1.9		7.45	7.49			III	From 5.20m to 5.48m: Moderately strong and moderately decomposed.
									6.65	7.69			II	From 6.53m to 6.82m: No recovery, assumed to be completely decomposed TUFF.
									8.60					Very strong, grey spotted white, slightly decomposed coarse ash TUFF. (CORESTONE) Joints are medium to widely spaced, occasional very closely and closely spaced, rough planar, iron and manganese oxide stained, dipping at 5° to 15°, 45° to 55° and 65° to 75°.
									8.83	3.60	10.00			From 7.46m to 7.66m and 10.53m to 10.80m: Moderately strong and moderately decomposed.

<ul style="list-style-type: none"> ↑ SMALL DISTURBED SAMPLE ↓ LARGE DISTURBED SAMPLE □ U10 SAMPLE ▨ PISTON SAMPLE (Navy) ▨ WATER SAMPLE □ SPT LIQUID SAMPLE ▲ WATER SAMPLE ▲ U100 SAMPLE 	<ul style="list-style-type: none"> ↓ STANDARD PENETRATION TEST ∇ IN-SITU VANE SHEAR TEST ∩ PACKER TEST ∩ PERMEABILITY TEST ∩ PRESSUREMETER TEST ∩ BOREHOLE TELEVIEWER ∩ PIEZOMETER TIP ∩ STANDPIPE TIP 	<p>LOGGED <u>L. Zhang</u></p> <p>DATE <u>29.04.2013</u></p> <p>CHECKED <u>R. Chu</u></p> <p>DATE <u>08.05.2013</u></p>	<p>REMARKS</p> <p>1. An inspection pit was excavated to 1.20m deep by hand tools.</p> <p>2. Acoustic borehole televiewer survey was carried out from 12.11m to 17.11m.</p>
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DRILLHOLE RECORD

CONTRACT NO. GE/2011/26

HOLE NO. **BH18**
SHEET 2 of 2

PROJECT Ground Investigation - New Territories East (Terrestrial) Agreement No. GE 40/2011 (IV), Dualing of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

METHOD	ROTARY	CO-ORDINATES	WORKS ORDER NO.
MACHINE	SD10	E 844002.20 N 824264.88	GE/2011/26.20A
FLUSHING MEDIUM	WATER	ORIENTATION	VERTICAL
		GROUND LEVEL	+7.00 mPD

Drilling Progress	Casing Size	Water Level (m) Shift Start/End	Water Return%	TCR%	SCR%	ROD%	Fracture Index	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11			76	81	58	38	>20		T2-101	10.29			II	As sheet 1 of 2.
			75	88	53	37	13.5 NA NR		T2-101	10.63 10.80 11.17 11.29			III II V	Extremely weak, pale yellow (2.5Y 7/4), completely decomposed coarse ash TUFF. (Silty, clayey sandy SILT)
13		2.07 at 1600 3.21 at 0200	76	100	92	70	4.2 11.8		T2-101	11.47 11.71 11.93			II	From 11.29m to 11.47m: No recovery, assumed to be completely decomposed TUFF. Very strong, grey spotted white, slightly decomposed coarse ash TUFF. Joints are medium to widely spaced, occasional very closely and closely spaced, rough planar, iron and manganese oxide stained, occasional calcite and chlorite coated, dipping at 15° to 25°, 26° to 35° and 65° to 75°.
14			75	100	86	77	4.3 13.0 >20		T2-101	12.83 13.58 13.79			III II	From 13.79m to 13.86m: Moderately strong and moderately decomposed.
15			75	100	67	67	7.1 >20		T2-101	14.28 14.45			II	
16			75	100	83	83	8.1		T2-101	14.67 14.82				
17		1.83 at 1600	75	100	100	100	1.7		T2-101	15.63 17.23				End of hole at 17.23 m.

- ↓ SMALL DISTURBED SAMPLE
- ↑ LARGE DISTURBED SAMPLE
- U10 SAMPLE
- PISTON SAMPLE (76mm)
- HAZIER SAMPLE
- SPT LINER SAMPLE
- WATER SAMPLE
- U100 SAMPLE
- STANDARD PENETRATION TEST
- IN-SITU VANE SHEAR TEST
- PACKER TEST
- PERMEABILITY TEST
- PRESSUREMETER TEST
- BOREHOLE TELEVIEWER
- PIEZOMETER TIP
- STANDPIPE TIP

LOGGED L. Zhang ✓
DATE 20.04.2013
CHECKED R. Chu ✓
DATE 08.05.2013

REMARKS

DRILTECH

DRILTECH GROUND ENG. LTD.



CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)

WORKS ORDER NO.: GE/2011/25.20A

JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH18**

BOX NO.: **1 OF 6**

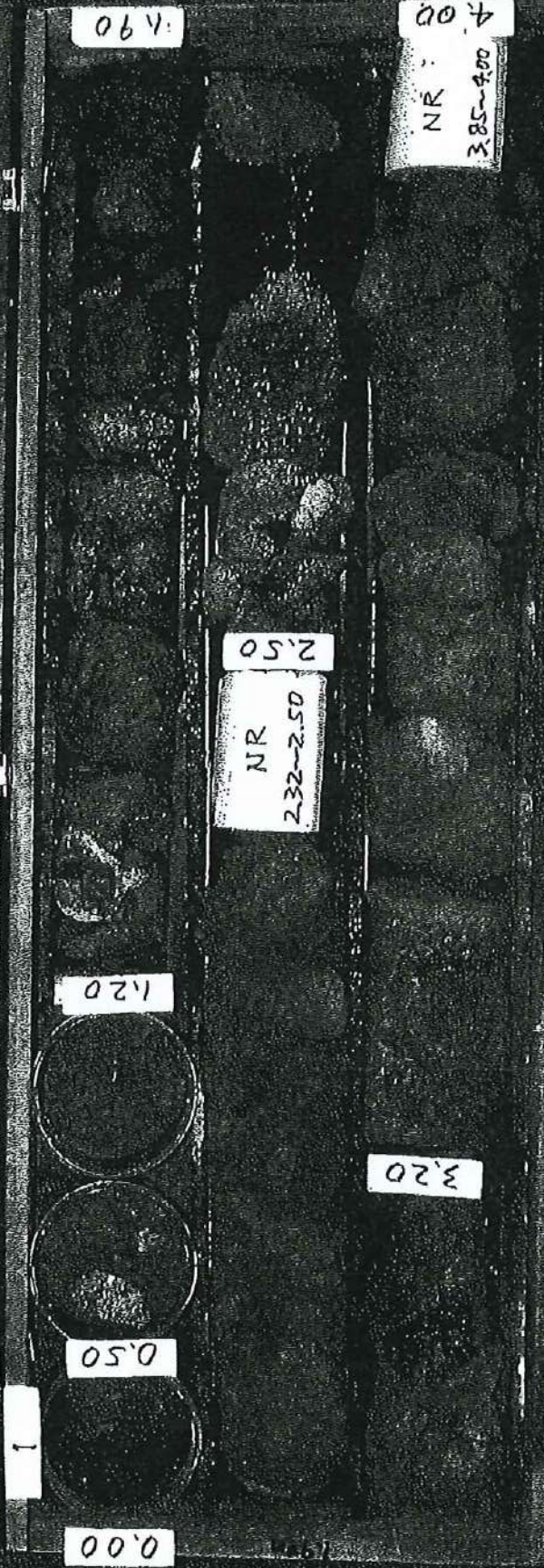
DEPTH: **0.00** m TO **4.00** m

DATE OF PHOTOGRAPH: **30/4/2013**



0m

1.0m



0.00

0.50

1.20

NR
2.32-2.50

2.50

3.20

NR
3.85-4.00

4.00

4.90

DRILTECH

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO. : GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO. : GE/2011/25.20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO. : **BH 18**

BOX NO. : **2 OF 6**

DEPTH : **4.00** m TO **(7.21)** m

DATE OF PHOTOGRAPH: 30/ 4 /2013



0m

1.0m

4.00

5.20

5.70

NR
4.70-5.00
5.00

NR
6.53-6.82
6.82

(7.21)

Cont'd

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)

WORKS ORDER NO.: GE/2011/25.20A

JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH-18**

BOX NO.: **3 OF 6**

DEPTH: **(7.21)** m TO **9.93** m

DATE OF PHOTOGRAPH: 30/4/2013



0m

1.0m

Cont'd

(221)

2.46

8.50

9.93



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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25.20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Duanling of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung-- Design and Construction (Stage 2)

HOLE NO.: BH 18
BOX NO.: 4 OF 6

DEPTH: 9.93 m TO 12.93 m
DATE OF PHOTOGRAPH: 30/ 4 /2013



0m

1.0m

9.93

NR
11.29~11.47

10.90

11.93

12.93

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CIVIL ENGINEERING AND DEVELOPMENT
DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW
TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25.20A

JOB TITLE : Agreement No. CE 49/2011 (HY)
Dualing of Hiram's Highway between
Clear Water Bay Road and Marina
Cove and Improvement to Local
Access to Ho Chung - Design and
Construction (Stage 2)

HOLE NO.: **BH-18**

BOX NO.: **5 OF 6**

DEPTH: **12.93** m TO **(15.63)** m

DATE OF PHOTOGRAPH: 30/ 4 /2013



0m

1.0m

12.93

13.79

14.67

(15.63)

Cont'd



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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

CEDD CONTRACT NO.: GE/2011/25
GROUND INVESTIGATION - NEW TERRITORIES EAST (TERM CONTRACT)
WORKS ORDER NO.: GE/2011/25. 20A

JOB TITLE: Agreement No. CE 49/2011 (HY)
Dualling of Hiram's Highway between Clear Water Bay Road and Marina Cove and Improvement to Local Access to Ho Chung - Design and Construction (Stage 2)

HOLE NO.: BH18

BOX NO.: 6 OF 6

DEPTH: (15.63) m TO 17.23 m

DATE OF PHOTOGRAPH: 30/4/2013



0m

1.0m

Cont'd

(15.63)

15.93

17.23
END

